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Adapted Physical Educators' Perspectives of Educational Research

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ABSTRACT

Purpose: Educational research often provides insight into the potential best practices to use within the classroom setting. Yet, limited information is available on teachers' perspectives toward research in the field of adapted physical education (APE). The current study examined adapted physical educators' perceptions toward research. **Method**: Sixty general physical education and APE associations within the United State of America were emailed a survey adapted from the National Center for Research Policy and Practice. **Results**: One hundred twenty-four adapted physical educators were included within the study. Spearmen correlations and frequency counts of open-ended responses were used to analyze the data. Overall, findings indicated that a majority of participants had conducted research, with most participants mentioning it helped them learn more about a particular issue they were facing. Adapted physical educators reported a high rate of engagement with research and that research has a positive impact on important issues, such as behavior management and advocating for students with disabilities. Although positive overall perceptions toward educational research were reported, several items that related to the usefulness and accessibility of research were ranked quite low. In addition, it was found that higher levels of education and years of experience were correlated with lower perceptions toward the validity and usefulness of research. **Conclusion**: This study highlights the important role research plays in the practice of adapted physical educators; however, researchers need to present their research findings in a more practical way for teachers to translate to their own situations.

The art and implementation of teaching is a complex practice. This has led educators to question how to navigate the complexities associated with the "art of teaching" (Montgomery & Smith, 2015). Some of the greatest challenges for teachers include identifying effective pedagogical strategies, distinguishing between efficient and inefficient teaching strategies, and determining the extent to which an activity promotes student learning (Montgomery & Smith, 2015). Educational research, which is defined as education research as the "scientific field of study that examines education and learning processes and the human attributes, interactions, organizations, and institutions that shape educational outcomes" (American Educational Research Association, 2020), could be a useful tool for educators to overcome the complexities associated with the "art of teaching". However, educational researchers are often perplexed as to why research in the field of education is seldom used by educators within kindergarten through the 12th grade (K-12) settings (Montgomery & Smith, 2015). This may be because teachers in K-12 settings often have expressed the belief that academics and research articles focus on theory over applicable practices that support teachers' daily challenges (Bevan, 2004; Harrison, Davidson, & Farrell, 2017; Montgomery & Smith, 2015; Vanderlinde & van Braak, 2010). Furthermore, within the fields of education and kinesiology, researchers often do not prioritize the dissemination and accessibility of research to practitioners (Armour, 2017; Casey, Fletcher, Schaefer, & Gleddie, 2017).

Although prior research that studied a variety of practitioners from the broad field of education suggests an overall negative undertone toward educational research, (Armour, 2017; Bevan, 2004; Harrison et al., 2017; Montgomery & Smith, 2015; Vanderlinde & van Braak, 2010); it is still unknown whether similar sentiments extend to adapted physical education (APE) teachers. APE programs have the same overall objectives as general physical education programs; however, APE programs specialize in making accommodations and modifications to personalize the programs to meet the individual needs of students with disabilities (Dunn & Leitschuh, 2014). Adapted physical educators are unique compared to general physical educators, as they need knowledge about

both physical education curriculum (e.g., sport skills, locomotor skills, and fundamental motor skills) and skills associated with special education (e.g., adaptations, behavior management, assessment). Hence, APE is often referred to as a multidisciplinary field that incorporates key aspects from both physical education and special education (Dunn & Leitschuh, 2014). For an adapted physical educator the extensiveness of scholarly research that could be useful to a particular lesson or child may be quite intimidating. This is further complicated by the fact that useful research for adapted physical educators may be found in academic journals associated with special education, physical education, or other related fields (e.g., physical therapy, disability studies). In relation to practitioners that work with youth in physical activity settings, Armour (2017) suggested that it is impractical "to expect teachers to both understand and connect these different sources of knowledge that, in themselves, are dynamic" (p. 44). Armor continues to explain that many researchers make very few attempts to synthesize knowledge across disciplinary boundaries, yet we expect practitioners to do this on a daily basis. Furthermore, researchers often adopt isolationist practices that further prevent integration between disciplines (Armour, 2017; Evans & Davies, 2011), which is problematic for adapted physical educators, who are in a uniquely multidisciplinary profession.

The majority of concerns articulated by K-12 teachers revolve around the issues of dissemination, accessibility, and relevance (Armour, 2017; Casey et al., 2017; Montgomery & Smith, 2015). School leaders and teachers alike have often explained that academic research is difficult to access and, therefore, rarely utilized (Armour, 2017; Casey et al., 2017; Coburn, Honig, & Stein, 2009; Harrison et al., 2017; Montgomery & Smith, 2015; Penuel et al., 2017). One major factor to this inaccessibility is that academic research findings are generally published within academic journals, which are written primarily *by* and *for* tenured and tenured-track faculty at universities. Academic journals regularly require the use of academic jargon and technical language, which create additional barriers to easily read and comprehend research (Binswanger, 2015; Borg, 2010; Funk, Tornquist, & Champagne, 1989). The difficulty with properly accessing academic research is directly influenced by the tenure and promotion process, which is commonplace at most universities (Armour, 2017; Binswanger, 2015). For example, publishing in high impact journals continues to be a crucial component of receiving tenure and promotion for most scholars. Montgomery and Smith (2015) point out that this is problematic, as:

> Most well respected journals are those which do not accept articles unless they have undergone a process of "peer review," [thus] it comes as no surprise that even researchers who have a strong interest in contributing to K–12 education still write predominantly for an audience of their university peers … As a result, the research writing that university faculty produce conforms to certain, standard assumptions about what is considered acceptable by those peers in terms of content, conventions for communicating that content, and the standards for judging that content. (p. 102)

The rigorous and persistent standards established by academic journals results in K-12 teachers' often perceiving that educational research is inaccessible, as well as void of much usefulness to their day-to-day duties and practices.

Scholars are often puzzled by the pessimistic responses voiced by K–12 teachers in relation to educational research (Bevan, 2004; Montgomery & Smith, 2015). For example, school leaders and K-12 teachers have explicitly indicated that research is often not timely enough to be useful and is published in locations that they are unlikely to access (Armour, 2017; Casey et al., 2017; Harrison et al., 2017; Penuel et al., 2017). Teachers have also questioned the validity of research findings, the sustainability and feasibility of using research, and the usefulness of research interventions in their own classes (Harrison et al., 2017; Penuel et al., 2017). The negative perceptions toward educational research become increasingly perplexing when considering that educators have frequently expressed that they would like to learn additional strategies and evidenced-based practices to improve students' learning (Bevan, 2004; Bittner, McNamara, Adams, Goudy, & Dillon, 2018; Drill, Miller, & Behrstock-Sherratt, 2012; Montgomery & Smith, 2015). However, educators usually get information concerning effective teaching strategies from other colleagues or general online searches, rather than from reading, synthesizing, and interacting with empirical research. Unfortunately, high quality research often is circulated within academic research journals instead of disseminated in locations where teachers are more likely to encounter it (Armour, 2017).

When K-12 teachers engage with research in a meaningful way, their teaching skills and day-to-day practice are likely to benefit (e.g., Bittner et al., 2018; Wong et al., 2015). For example, many scholars have suggested that teachers can increase their teaching efficiency by developing the skills to identify evidence-based practices, using evidence-based practices within their instruction, and, when the scientifically based evidence is not available, independently use basic research concepts to find solutions (Montgomery &

Smith, 2015; Vanderlinde & van Braak, 2010). Employing evidenced-based practices may be even more important when considering students with the greatest needs, such as those with disabilities. For example, 27 evidenced-based practices have been identified that can lead to beneficial outcomes for children on the autism spectrum (Wong et al., 2015). Each evidenced-based practice is connected to specific outcomes that are based upon the child's age, as well as the duration and implementation of the particular evidenced-based practice. Bittner et al. (2018) highlight the importance of general and adapted physical educators' understanding and use of evidence-based instruction with regards to teaching children on the autism spectrum. Bittner and colleagues (p. 19) stated that:

> Professionals' depth of understanding of established evidence-based practices (e.g., exercise, visual schedule, video modeling) may lead to stronger and more meaningful instruction for students [on the autism spectrum] in a variety of settings and content areas (e.g., physical education). Specifically, if practitioners successfully used an array of evidence-based practices when teaching physical education curriculum standards, it would subsequently allow students with ASD to more effectively learn physical activity skills and increase their activity engagement.

Understanding and employing theoretically driven practices is essential when teaching students with unique and complex needs. Yet, too often, adapted physical educators—particularly, trainee or new-to-service—rely heavily on trial-and-error of unreliable practices, rather than the academic literature, to find educational practices (Colombo-Dougovito, 2015).

There is a growing amount of research emphasizing the importance of using research within teachers' daily practices, including the use of research specific to teaching children with disabilities in physical education settings (e.g., Bittner et al., 2018; Dillon, Adams, Goudy, Bittner, & McNamara, 2017; Healy, Nacario, Braithwaite, & Hopper, 2018). However, little is known about how adapted physical educators access and perceive research. Therefore, the current study sought to examine adapted physical educators use of research and perceptions toward research. The following research questions guided this inquiry:

a. How frequently do adapted physical educators conduct and/or use research, and for what purposes?
b. Where do adapted physical educators access research?
c. What are adapted physical educators' perceptions toward research?

Method

Participants

The current study examined adapted physical educators' perceptions toward educational research. A multistage sampling technique (Creswell & Plano Clark, 2018), in which multiple samples at various stages of the research process are recruited, was used for this study. More specifically, 60 physical education and APE associations within the United States of America (US) were initially asked to e-mail their members a survey on their perceptions toward educational research. The e-mail invitation included a link to Qualtrics (i.e., the hosting platform) that contained an embedded informed consent form, a demographics survey, and a perceptions survey. After the initial round of recruitment, the investigators emailed 19 former adapted physical educators of the year in the US to complete the survey and, using a snowball sampling procedure, all adapted physical educators of the year were asked to forward the message to their APE colleagues. Inclusion criteria consisted of being a current, practicing adapted physical educator in the US. The institutional review board at the lead author's affiliated university approved the procedures for this study.

Survey development

The research perception survey employed in the present study was modified from a survey originally developed by the National Center for Research in Policy and Practice (NCRPP; Penuel et al., 2017). The original survey was developed to examine school and district leaders' perceptions toward educational research. The original survey initially underwent two rounds of interviews with educational leaders across the nation. The survey was then pilot tested with 265 education leaders. The pilot test data were used to generate reliability scales, as well as to identify additional issues with the survey content. Overall, each survey construct had adequate reliability coefficients (Cronbach's alpha coefficients ranged from .67 to .93).

The investigators revised the NCCRP survey to better suit the purposes and population of this study. Two of these investigators are current adapted physical educators that have conducted and contributed to multiple research studies. The survey revisions included minor grammatical alterations in wording and sentence structure. After the initial adaptation of the survey questions, seven experts reviewed the survey and provided feedback on content relevancy and question structure. The APE experts each had at least three years of

experience, either as an APE higher education professor (n = 4) or as an adapted physical educator (n = 3) and have been involved with conducting research. After receiving critical feedback, the researchers reexamined and revised the survey questions. All changes were discussed by the four investigators until 100% agreement was achieved.

The final version of the survey had 42 questions. The first 10 questions served as a demographics survey. These questions asked participants to provide demographic information such as gender and the highest college degree attained. In addition, the survey included questions specific to their professional role and experience, such as their current status as an adapted physical educator, years of experience as an adapted physical educator, student age groups that they teach, and their highest level of APE training. The remaining 32 questions were divided into three sections based on the aforementioned research questions.

Nine questions were developed to specifically address how frequently adapted physical educators use research and for what purposes. This section of the survey was divided into two multiple-choice questions, five Likert style questions, and two open-ended questions. Within the two multiple-choice questions, participants were asked to indicate how frequently they conducted research and why they did or did not frequently conducted research. In addition, five Likert style questions (1 = Never, 4 = All of the time) were used to collect data on how often the participants had encountered research that impacted their practices. Finally, the two open-ended questions included: (1) "Share an experience you had where you used research to inform a decision with regards to your teaching?"; and (2) "Think about a time when a piece of research you encountered changed your thinking or opinions about possible solutions to a professional problem you encountered. What was that piece of research and how did you use it?".

Three questions were used to identify where adapted physical educators accessed research. The first question in this section asked respondents to identify what mediums they used to access educational research from 14 possible sources. The sources ranged from consulting with experts in the field (e.g., school administrators, university professors) to peer networks (e.g., professional associations) and media (e.g., textbooks, journal articles). The second question asked participants whether they had access to a university library (yes or no), and the third question asked how frequently they use a library system to access research (1 = Never, 5 = Daily). Nineteen Likert style questions (1 = Strongly Disagree, 4 = Strongly Agree) were used to assess respondents' agreement with statements about the relevance, value, and credibility of research as it related to their own work. An example item from this section included "By the time research findings are published, they are no longer useful to me".

Data analysis

The descriptive statistics were analyzed and reported for all the demographic information, and for multiple-choice and open-ended questions. Cronbach's alpha was used to determine internal consistency between all the Likert style questions (n = 24) and found that the survey items had an acceptable overall reliability score of .890, which is considered to be good (George & Mallery, 2003). In addition, the Likert style questions used to assess research question one (five questions, Cronbach's alpha coefficient = .90) and research question three (19 questions, Cronbach's alpha coefficient of .84) both had good internal consistency coefficients. Spearman's correlation coefficients were used to analyze the correlations between each Likert style question and key demographic variables (i.e., gender, level of APE training, level of education, years of experience), as well as the multiple-choice question of "how often they conducted research".

For the open-ended questions, an inductive category development method (Thomas, 2006) was used to analyze the data. Inductive category development begins with determination of categories emergent in the data, followed by comparing them with old categories and forming new categories into larger themes until consensus is reached for all data. First, two of the investigators individually analyzed the responses and generated codes. The codes were then organized into meaningful category. Each category was given a description. Next, the two investigators met to discuss the discrepancies in their coding and developed categories that reflected both of their codes and categories. After reexamining the categories, the researchers reviewed each statement again within each category and discussed discrepancies. Statements were moved to other categories until 100% consensus was reached among the two researchers. Finally, a third investigator reviewed the categories and definitions until 100% consensus was attained.

Results

Demographics

One hundred twenty-four adapted physical educators completed at least 80% of the survey and were included within the analysis. The participants comprised of 59.7% females (n = 74) and had APE teaching

experience that ranged from one to 41 years (*M* = 13.65, *SD* = 9.70). In total, 36 states and one US territory (Guam) were represented in this survey. The most commonly represented states were New York (21%, *n* = 26), Maryland (12.9%, *n* = 16), and Missouri (9.7%, *n* = 12). Most participants reported that they primarily delivered APE services with an itinerant service-delivery model (29.8%, *n* = 37). In addition, the most commonly indicated level of training with regards to APE was a bachelor's degree with one or two courses in APE (30.6%, *n* = 38), which was followed by a master's degree in APE (29.8%, *n* = 37). Sample demographic statistics are displayed in Table 1.

Frequency of use of research

The majority of the participants indicated that they had conducted research (*n* = 76, 61.3%). Within the group who reported that they had conducted research, participants indicated that they did this on a yearly (*n* = 31, 25%), monthly (*n* = 32, 25.8%), weekly (*n* = 11, 8.9%), or daily (*n* = 2, 1.6%) basis. The most common reasons cited for those who indicated that they conducted research on a daily, monthly, or yearly basis included: (a) "to discover better ways of teaching" (*n* = 39, 51.3%), (b) "to improve my ability to advocate for students and field" (*n* = 37, 48.7%), and (c) "because

Table 1. Participant demographics and professional development attendance.

	Sample (*N* = 124) % (*n*)
Gender	
Female	59.7 (74)
Male	39.5 (49)
Prefer not to comment	0.8 (1)
Highest level of formal APE training:	
Bachelor's with one or two courses in APE	30.6 (38)
Bachelor's with concentration in APE	7.3 (9)
Master's in APE	29.8 (37)
APE state endorsement	21.8 (27)
Doctorate in APE	3.2 (4)
None	4.8 (6)
Other	3 (4)
School Type	
Private	2.4 (3)
Public	73.4 (91)
Special/Segregated School	17.7 (22)
Residential School	1.6 (2)
Other	4.8 (6)
Age of Students Taught	
0–3	9.7 (12)
4–7	59.7 (74)
8–11	69.4 (86)
12–15	64.5 (80)
16–18	45.2 (56)
19 or above	28.2 (35)
Primary delivery of APE service model:	
Self-contained or one on one	23.4 (29)
General PE	16.9 (21)
One-on-one, self-contained, and general PE	25.8 (32)
Itinerant	29.8 (37)
Other	4.0 (5)

Note. APE = Adapted physical education, PE = Physical education.

it is good for my professional development" (*n* = 33, 43.4%). Of the 48 participants who indicated that they did not conduct research or conducted research on a yearly basis, the most common reasons cited for not regularly conducting research included: (a) "my job is to teach not do research" (*n* = 45, 93.8%), (b) "have no time for research" (*n* = 38, 79.2%), and (c) "other" (*n* = 15, 31.3%). Within the "other" response, participants that indicated that they did not regularly conduct research cited issues such as "[I have] never been asked to conduct research" and "Professional development needed. Lack of support".

The four-point (1 = Never, 4 = All of the time) Likert style statements that addressed participants regularity of encountering research that impacted their professional lives; the highest ranked statement was "How often have you encountered research that expanded your understanding of an issue" (*M* = 2.51, *SD* = .57). This was followed by "How often have you encountered research that provided a framework for making improvements in the field" (*M* = 2.38, *SD* = .61) and "How often have you encountered research that provided a common language and set of ideas for you and your colleagues" (*M* = 2.35, *SD* = .66). The lowest ranked statements were "How often have you encountered research that brought attention to an issue that you had not faced" (*M* = 2.26, *SD* = .51) and "How often have you encountered research that changed the way you look at problems you face in job" (*M* = 2.20, *SD* = .57). Only 88 participants completed this portion of the survey, as this was the last set of Likert style questions in the survey. How frequently they had conducted research was the only variable significantly correlated with any Likert scale questions. This variable was negatively correlated with the question "How often have you encountered research that provided a common language and set of ideas for you and your colleagues" (*r* = —.302, *p* = .004), and positively correlated with the question "How often have you encountered research that brought attention to an issue that you had not faced" (*r* = .211, *p* = .048). Figure 1 displays the correlation coefficients between the identified variables and the Likert style questions.

For the open-ended questions, a qualitative inductive analysis (Thomas, 2006) was conducted. The first question was: "Share an experience you had where you used research to inform a decision with regards to your teaching?". As the open-ended questions were not required to be completed, only 78 participants (63%) completed the first question. Nine categories constructed from the first open-ended question, which included: (a) informs best practice, (b) professional development, (c) leadership, (d) advocacy, (e) disability specific, (f) assessment, (g) behavior management, (h)

	How often have you encountered research that:				
	Expanded your understanding of an issue	Provided a framework for making improvements in the field	Provided a common language and set of ideas for you and your colleague	Brought attention to an issue that you had not faced	Changed the way you look at problems you face in job
Gender	-.180	-.123	-.159	.017	-.003
Level of Education	.078	-.001	-.061	-.027	.012
Level of APE Training	.098	.029	.083	-.015	.123
Freq of Conducting Research	.087	.190	-.302*	.211*	.190
Yrs of Exp	-.185	-.115	-.146	-.081	-.090

Figure 1. Research frequency correlation summary.

* = $p < .05$, Yrs = Years, APE = Adapted physical education, Freq = Frequency, Exp = Experience.

curriculum, and (i) I do not use research. Some of the responses were categorized into two categories when deemed appropriate. Table 2 displays an overview of the categories, example statements, and a frequency count of the categories for the first open-ended question.

The second open-ended question analyzed was: "Think about a time when a piece of research you encountered changed your thinking or opinions about possible solutions to a professional problem you encountered. What was that piece of research and how did you use it?". Only 68 participants (55%) completed the second open-ended question. Seven categories were constructed from the second open-ended question, which included: (a) informs best practice, (b) research is not useful or cannot comment, (c) program design, (d) advocacy, (e) disability specific, (f) behavior management, and (g) collaboration and personal growth. Some of the responses were categorized into multiple categories (e.g., up to three different categories) when deemed necessary. Table 3 displays an overview of the categories, example statements, and a frequency count of the categories for the second open-ended question.

Access to research

To identify how adapted physical educators' access and obtain research, three questions from the survey were analyzed. For the question that pertained to identifying mediums used to access research, the most commonly reported sources used included consulting with colleagues ($n = 94$, 75.8%), and professional state conferences ($n = 84$, 67.7%). The sources that were the most seldom cited were the state department of education ($n = 19$, 15.3%), "Other" ($n = 4$, 3.2%), and "I don't use research in my professional life" ($n = 1$, 0.1%). Table 4 displays an overview of the sources adapted physical educators indicated using to access research. In addition, 56.5% ($n = 70$) of the participants indicated that they had access to a university library. The most commonly reported frequency for using the library system to access academic research was never ($n = 53$, 42.7%), which was followed by yearly ($n = 39$, 31.5%), monthly ($n = 25$, 20.2%), and weekly ($n = 7$, 5.6%).

Perceptions toward research

Nineteen Likert style statements (1 = Strongly Disagree, 4 = Strongly Agree) were used to assess participants' perceptions toward the relevance, credibility, and value of research. The highest ranked statements were: "Researchers provide a valuable service to education practitioners" ($M = 2.69$, $SD = .66$) and "A well-designed study with strong findings can change people's minds" ($M = 2.69$, $SD = .66$). The lowest ranked statement was: "Education research is a waste of money" ($M = 1.65$, $SD = .51$). Table 5 displays an overview of the results of this section.

Gender was the only variable not found to significantly correlate with any of the statements, $p > .05$. Level of education was found to have a significant positive

Table 2. Overview of analysis of open-ended question one responses.

Category	Definition	Ex Quote	Freq
Informs best practice	Utilizing instructional strategies to improve successful engagement and learning through daily lessons	I used research on throwing soft object as hard as possible get correct body mechanics from students, instead of focusing on getting the object to the target.	26
		I participated in a HR and learning study where I tried to get my students HR in the correct zone and send them back to class to see if they learned better after PE.	
Disability Specific	Comments targeted toward a specific disability	I read some research for students who are visually impaired that helped change the way I conducted some of my units.	14
		I work with students with autism. Based on the research I have done on the neurological aspects of autism, I have changed the way I teach some skills and adapted the materials and equipment to better meet the needs of my students. I also researched executive functioning deficits in students with autism and have a better understanding of my students' behaviors.	
Behavior Management	Addressing means to guide students' actions to be positive and on-task	At a regional conference in TX, one session discussed research in regards to behavior. The overall takeaway I had was that teachers and students alike can determine the antecedent, behavior, and consequence. However, the consequence is often perceived different by the student. Their consequence is generally seen as positive. With this in mind, when my students present behaviors, I try to understand what the consequence is from their perspective. Allowing me to level with them from several different approaches.	11
		Mindfulness has helped with our behavior managements. It took research to prove to other teachers how it could help.	
Assessment	Collecting data to inform discussions and practice	Utilizing standardized assessments and researching the beat assessments to use helped me determine needs of my students.	9
		I use either the Test of Gross Motor Development by Dale Ulrich or how a student scores on the Ohio PE Standards to choose which classrooms and environments will be best suited to each child's needs. From these scores and the student's likes and dislikes as well as the student's personality the facts and research helped placed the students in the best possible environment for PE based on their physical, emotional and social abilities.	
Advocacy	The act of positively promoting the field to stakeholders	SHAPE America research on why students need more PE presented in front to school board members.	9
		I used research to advocate for use of music in my class to increase activity level.	
I do not use research	Have not engaged in research or do not find it useful	Research has not influenced my job/work with my students.	7
		I have found that educational research is often outdated and no longer practical.	
Curriculum	The structured scope and sequence of the information delivered to the students	Our district content area curriculum department used a student feedback survey to gain current perspectives in high school certain classes. The data was shared amongst a group of established content area teachers in the district. Through the research, we identified many strengths and areas of improvement to build the quality of our elective classes.	6
		Conducted a study on the length of time it would take to teach my 3rd graders to be proficient with dribbling a basketball with both hands.	
Leadership	The act of supporting others by delivering information that directly supports students	I conducted a state-wide needs survey to identity the greatest needs of APE teachers in the State and provided professional development for the areas of greatest need. I also conducted research on a new piece of equipment to see if the equipment improved school readiness for student.	5
		I used research to assist my PE Department supervisor on the Universal Design for Learning in her understanding of it. We used my classes to design lessons & create videos for our department to learn from, which assisted in my teaching.	
Professional development	The act of gaining knowledge that directly benefits students	I read many books related to autism and various other challenges. I explored many methods for evaluation of progress. I researched communication techniques. I attended conferences from which I gleaned many innovative ideas. I researched adaptive equipment and behavioral techniques to accommodate challenges.	3

Freq = Frequency, PE = Physical education, HR = Heart rate, APE = Adapted physical education, SHAPE = Society of Health and Physical Educators.

correlation with three statements: (1) "Educational research is too impractical to be useful for teachers" ($r = .185$, $p = .027$); (2) "Educational researchers segregate themselves from practitioners and daily practice" ($r = .214$, $p = .017$); and (3) "Educational research can be used to support any opinion" ($r = .198$, $p = .027$). Level of APE training had significant positive correlations with the statements: (1) "Research can address practical

Table 3. Overview of analysis of open-ended question two responses.

Category	Definition	Ex Quote	Freq
Research is not useful or cannot comment	Have not engaged in research or do not find it useful	It is difficult to say since there is such little research out there that supports the students that I work with. There is no research: it has been more trial and error being adaptable and doing what works best. There isn't any.	24
Informs best practice	Utilizing instructional strategies to improve successful engagement and learning through daily lessons	Over the years I'll come across articles in professional journals that deem certain traditional exercises dangerous and I implement the newer techniques with my students and try to educate them (as well as my colleagues) about the reasons for the changes. 10+ years ago when research into video modeling was first introduced. It changed the way I worked with many of my students.	20
Program Design	Considering multiple factors that guides the development of the mission and vision of an APE program	Design a peer teaching program in APE with regular education students working with special education students in PE. We researched on standard based grading during CLT and professional developments. We found the benefits and side effects of using this grading system. Helped us to enhance the benefits for our school. Also to create solutions for the side effects.	12
Disability Specific	Comments targeted toward a specific disability	Reading studies and paper about various disabilities helps to keep me up to date on techniques I can use to help those students. Teaching techniques for students with autism, down syndrome, muscular dystrophy etc. Hands on experience with different disabilities and watching stories of individuals with disabilities and how they have overcome disabilities-inspires thinking outside the box. And research I have done to write various grants and new courses.	8
Behavior Management	Addressing means to guide students' actions to be positive and on-task	Communication research that opened the doors for relationship building and increased participation. In our school district we researched better ways to discipline students. We can across PBIS which has changed the way our schools handles discipline problems.	7
Advocacy	The act of positively promoting the field to stakeholders	At a professional conference recently, I was exposed to data on teacher stress and burnout. I returned to my school and started an employee health and wellness initiative.	2
Collaboration and personal growth	The act of two or more people sharing ideas and thoughts with equal power within the conversation	I like to read research and then discuss it with colleagues. Understanding how other professionals perceive the information they've been given and then collaborating on how best to solve an issue or problem.	2

Freq = Frequency, PE = Physical education, APE = Adapted physical education, PBIS = Positive Behavior Support Intervention.

Table 4. Sources used to access research.

	Sample (N = 124) % (n)
Books	43.5 (54)
Academic Journals	52.4 (65)
Professional Journals	62.9 (78)
Professional Newsletters	36.3 (45)
Social Media	45.2 (56)
Web-Based Sources	46.8 (58)
National PD	58 (46.8)
State PD	67.7 (84)
Consulting with University Professors	25.8 (32)
Consulting with Colleagues	75.8 (94)
Consulting with School Administrators	20.2 (25)
State Department of Education	15.3 (19)
School Delivered PD	33.9 (42)
I Don't Use Research	0.8 (1)
Other	3.2 (4)

APE = Adapted physical education, PD = Professional Development.

problems facing schools" ($r = .191$, $p = .034$); and (2) "Research can provide a valuable service to education practitioners" ($r = .248$, $p = .005$). The frequency in which participants indicated they conducted research was found to have significant negative correlation with the statement "Educational researchers segregate themselves from practitioners and daily practice" ($r = -.234$, $p = .009$). In addition, the frequency variable was found to have significant positive correlation with the statement

"Educational research provides results that can help leaders improve education outcomes" ($r = .205$, $p = .022$). Lastly, years of experience was found to have a significant positive correlation with the statement "Educational research is a waste of money" ($r = .255$, $p = .004$). Figure 2 displays the correlation coefficients between the identified variables and the questions.

Discussion

This study aimed to examine adapted physical educators' perceptions toward and use of research. The current study suggests that many adapted physical educators use, access, and have engaged in research. Although this may initially appear to be counter to a plethora of research that has expressed that K-12 practitioners often feel that educational research has little influence to their practices (e.g., Coburn et al., 2009; Harrison et al., 2017; Montgomery & Smith, 2015), these findings are similar to two recent studies that utilized a similar survey to the one presently employed (Hopkins, 2016; Penuel et al., 2017). These studies found that a national representation of school administrators and state science leaders held

Table 5. Perceptions toward research.

To what extent do you agree or disagree:	M (SD)
Research helps identify solutions to problems facing schools	2.57 (0.63)
There is a disconnect between the research world and the ed world	2.57 (0.71)
Research addresses questions that help us make better decisions	2.56 (0.59)
When confronted with a problem or decision, it is valuable to speak with ed researchers	2.56 (0.65)
Ed research is too impractical to be useful for teachers	1.86 (0.65)
I can find evidence to contradict the findings of any ed research study	2.19 (0.61)
Ed researchers segregate themselves from practitioners and daily practice	2.36 (0.73)
By the time research findings are published, they are no longer useful to me	1.84 (.069)
Research can address practical problems facing schools	2.65 (0.63)
Research can provide a valuable service to ed practitioners	2.69 (0.67)
Ed research is a waste of money	1.65 (0.51)
Ed research is usually objective	2.46 (0.63)
Ed research provides results that can help leaders improve ed outcomes	2.64 (0.65)
The claims that research studies make are trustworthy	2.44 (0.56)
Ed research reports are rarely consistent with each other	2.01 (0.47)
Ed research can be used to support any opinion	2.31 (0.75)
Ed research is generally conducted to improve the careers of researchers, not to improve schools	2.09 (0.70)
A well-designed study with strong findings can change people's minds	2.69 (0.67)
Researchers frame their results to make political points	2.10 (0.59)

M = Mean, Ed = Education.

generally positive views toward the usefulness of research and engaged with research regularly. For example, Penuel et al. (2017) found that school administrators reported using research when making decisions for a variety of purposes (e.g., designing professional development, curriculum adoption). Further, it should not be surprising that participants had a generally positive view toward research due to the reported high levels of use of research. Landry, Lamari, and Amara (2003) suggest that the frequency of one's use of research may result from the need to acquire relevant research that addresses a particular problem. Thus, these findings may align with previous studies that have suggested that teachers engaged in research are often very interested in practical ways to improve their practices (Drill et al., 2012; Montgomery & Smith, 2015).

Although many of the scores from the Likert scale statements revealed that teachers in this study had positive perceptions toward the usefulness of research and the need for high quality research, many stated they believed research was not useful to their practice. For example, when participants were asked to discuss a piece of research that had been useful to them, 35% of the respondents reported that either research was not useful to them or that they couldn't think of any research at the moment. One participant noted that they had never been asked to conduct research. Although research may not be a direct component of many educators' jobs, this sentiment highlights the need for more collaborative relationships between researchers and educators. Furthermore, within the open-ended responses very few were able to identify a specific research study that influenced them. This aligns with Penuel et al. (2017) findings, who suggested that this may be because recalling the name, authors, and year of publication may have been too lofty of a goal for practitioners outside the field of academia. To encourage researcher-practitioner collaboration, specific methodologies must be examined and implemented. Casey et al. (2017) outlined four approaches to practitioner-based research that may be applicable to the physical education and youth sport fields. One approach highlighted, the action research approach, enables teachers to collaborate with researchers in order to effectively collect and analyze data, as well as interpret the findings.

In order to promote teachers' usage of and perceptions toward research, it is essential to locate what sources are being used to access research. Based on the present findings, attending and presenting at conferences, as well as publishing in the professional journals where adapted physical educators are accessing research, may be ideal locations to disseminate research to this population. This once again aligns with Penuel et al. (2017) research, who suggested accessing research may be less of the issue for educational leaders than earlier research would have us believe. Furthermore, in contrary to contemporary images of inaccessible researchers in ivory towers, adapted physical educators in the present sample reported that they leveraged their affiliations with professional associations and peer networks to access research. The intentional efforts to promote the access and use of research through professional associations and networking among colleagues should be studied and compared with other approaches such as using online technology to disseminate knowledge. Scholars should also consider presenting their research at conferences that practitioners are more likely to attend, such as The Society of Health and Physical Educators (SHAPE America) or state APE or general physical education conferences. Even though a majority of participants from this study appear to be accessing research and have access to a university library system, only a minority of them are accessing these resources on a regular basis. University library systems often are crucial mediums to use when identifying research, as universities often prioritize providing their students and staff access to the latest research (Willinsky, 2014). Furthermore, subscriptions to academic journals can be quite costly. Taking into account all of the expenses K-12 schools have to consider, these

To what extent do you agree or disagree:	Gender	Level of Ed	APE training	Freq of Research	Yrs of Exp
Research helps identify solutions to problems facing schools	-.049	-.085	.102	.073	-.016
There is a disconnect between the research world and the ed world	.024	.084	.091	-.131	.013
Research addresses questions that help us make better decisions	-.019	-.098	.099	.167	-.033
When confronted with a problem or decision, it is valuable to speak with ed researchers	.033	-.082	.061	.100	-.074
Ed research is too impractical to be useful for teachers	-.015	.185*	-.031	-.134	.130
I can find evidence to contradict the findings of any ed research study	-.092	.024	-.135	-.051	-.044
Ed researchers segregate themselves from practitioners and daily practice	-.126	.214*	.090	-.234*	-.031
By the time research findings are published, they are no longer useful to me	.027	.060	138	-.099	-.008
Research can address practical problems facing schools	-.010	-.119	.191*	.017	-.164
Research can provide a valuable service to ed practitioners	.006	-.032	.248*	.077	-.064
Ed research is a waste of money	-.077	.151	.066	.013	.255*
Ed research is usually objective	-.080	-.059	.036	-.041	-.029
Ed research provides results that can help leaders improve ed outcomes	-.167	-.099	.058	.205*	-.174
The claims that research studies make are trustworthy	-.091	-.028	.123	-.087	-.033
Ed research reports are rarely consistent with each other	-.035	.008	-.078	-.034	.096
Ed research can be used to support any opinion	.016	.198*	-.083	.024	.163
Ed research is generally conducted to improve the careers of researchers, not to improve schools	-.130	.078	.015	-.057	-.012
A well-designed study with strong findings can change people's minds	-.068	.004	.000	-.016	-.079
Researchers frame their results to make political points	-.082	.072	-.048	.006	.036

Figure 2. Research perception correlation summary.

* = *p* < .05, Yrs = Years, Ed = Education, APE = Adapted physical education, Freq = Frequency, Exp = Experience.

institutions may not be willing to cover academic journal subscriptions. In order to make their research more readily available to teachers researchers should consider alternative mediums to disseminate their research, such as social media platforms and open-access journals. Scholars should consider publishing their research in reputable open-access journals in APE, such as the *European Journal of Adapted Physical Activity*, as well journals with a large practitioner focus, such as *Journal of Physical Education, Recreation and Dance* (JOPERD) and *PALESTRA*. Growing teachers' access to research is essential in increasing their access and use of it.

Professionally engaged teachers are generally very interested in concrete ways to improve their practice (Drill et al., 2012; Montgomery & Smith, 2015). Unfortunately, high quality research is primarily circulated in academic research journals instead of being disseminated in locations where teachers are more likely to encounter it (Armour, 2017; Casey et al., 2017). Mediums such as blogs, podcasts, and social media may be ideal to disseminate research to educators. For example, McNamara, Healy, and Haegele (2019) recently surveyed 94 adapted physical educators on their professional use of social media. Adapted physical educators reported frequently using social media networks, such as Facebook and Twitter, to access information related to teaching physical education to students with disabilities. In addition, a majority of the participants (49%) spent approximately an hour a day using their social media accounts. However,

teachers may be more likely to use social media to find pictures, videos, or quick information related to their profession, and may not take the time to read an entire academic article. Nonetheless, the use of more flexible avenues of dissemination may lead to more accessible two-way communication routes, where scholars and teachers can more easily influence one another, and in turn benefit their field (Armour, 2017). Thus, efforts that are more concerted should be made to disseminate research to adapted physical educators through "unconventional" ways, as it has been suggested that these settings may be ideal to foster networks where educators can share knowledge, develop their practice, and engage in collaborative professional learning (McNamara et al., 2019).

Evidence regarding some of the individual characteristics within the present sample may help further explain the results. According to correlational analyses, years of experience and higher levels of education were correlated with lower perceptions toward the validity and usefulness of research. Surprisingly, this suggests that those with greater amounts of training and experience had more negative views on the importance or usefulness of research. This finding may indicate that teachers with higher levels of education and years of experience may believe educational research is not addressing their particular problems or needs in the K-12 setting. In addition, "for many K–12 teachers, research is something that is either "done to them," or "forced upon them" in the form of poorly implemented policies

which require extensive amounts of additional time, resources, or documentation on the part of the teacher" (Montgomery & Smith, 2015, p. 103). Future research should further examine how different groups of adapted physical educators perceive the relevance and validity of research in their professional lives.

Armour (2014) proposed a translational research mechanism called "pedagogical cases" in an attempt to bridge the gap between researchers and practitioners within the field of physical activity education. This framework aims to help researchers summarize research from multiple "fields in a concise, focused, and engaging and relevant manner" (Armour, 2017, p. 45) to physical activity education practitioners, such as general and adapted physical educators. The original framework requires that academics working together on studying the complex needs of a specific young learner come from different backgrounds and disciplines (Armour, 2014). The most recent iteration of the model (Casey, Goodyear, & Armour, 2016), proposes that academic teams should also incorporate the expertise of practitioners, as these practitioners are able to offer a critical reflection on the outcome, as well as the applicability of the research. However, the pedagogical cases framework is only at preliminary conceptual stages (Armour, 2017), as well as this model may not be able to overcome the persistent, complex, and widespread research to practice gaps within educational research. Nonetheless, with the dearth of translational models available within the field of physical education, this framework may be a valuable starting point for distributing research to both general and adapted physical educators.

Limitations

Several limitations should be addressed. First, as with most survey research, many of the survey questions were not able to determine the rationale behind the participants' answers (Portney & Watkins, 2009). Future research should utilize individual or group interviews to explore in greater depth adapted physical educators' usage and perceptions of research. This may alleviate this limitation, as this would allow the researchers to ask follow-up questions and gain further insight on the matter. Second, this study only used simple face validity methods within the adaptation process of the survey, thus these results should be generalized with caution (Portney & Watkins, 2009). Third, comparisons between adapted physical educators within different states may be problematic. Each state in the US controls the parameters for teaching certificates. States have the ability to require, or not require, specific criteria for teaching APE. Hence, depending on the state from which an adapted physical educator resides, the degree of training and education related to APE may differ drastically (McNamara & Dillon, 2020). Fourth, the results were self-reported and therefore dependent upon the trustworthiness of the participants' responses (Portney & Watkins, 2009). Fifth, and finally, a selection bias may exist within the present sample, as those participants were recruited through national and state level organizations in the US. While these organizations intend to serve the profession as a whole, not every adapted physical educator is a member of such organizations and those that are may have a greater motivation in seeking out new information to use in their own teaching practice.

Conclusion

Overall, adapted physical educators reported a high rate of engagement with research—including many whom conducted research—and that research has a positive impact on issues that may be most pertinent for their situation. Findings also demonstrate that a disconnect between researchers and adapted physical educators may exist; especially when considering participants with higher levels of education and experience. This may be partially due to the fact that high quality research is often published in academic journals that are often unused or inaccessible to teachers (Armour, 2017; Drill et al., 2012; Montgomery & Smith, 2015), and a disincentive for academic scholars may exist in publishing in locations such as blogs that are more utilized by teachers (Armour, 2017; Binswanger, 2015; Frey, 2003). This study highlights the important role research plays in the practice of adapted physical educators; however, researchers must make a more concerted effort to provide research findings in a more practical way so that teachers may better translate findings to their own situations (Drill et al., 2012; Montgomery & Smith, 2015). Future researchers should examine more efficient means to increase adapted physical educators' access and use of research within their daily lives.

What does this article add

Limited information is available on adapted physical educators' access and perspectives toward research. Thus, this article begins to build our understanding of how adapted physical educators engage and perceive research. Within the results, it was interesting to note that there was a high rate of engagement with research and that research has a positive impact on issues that may be most pertinent for their situation. In relation to

how this population accesses research, the most commonly reported sources used included consulting with colleagues, professional state conferences, and professional journals. Entities that disseminate research, such as professional development organizations and academic journals, should use this information to better reach these groups of professionals. Surprisingly, higher the level of education and years of experience were correlated with lower perceptions toward the validity and usefulness of research. This suggests that adapted physical educators with greater amounts of training and experience may have more negative views on the importance or usefulness of research. Perhaps adapted physical educators are simply using what they believe has worked for them in the past, thus they no longer spend as much time seeking out growth through research. In addition, one pattern constructed from the open-ended responses was that research was not very useful to adapted physical educators' daily practices. These findings highlights the need for researchers to use more practical ways to better disseminate research for adapted physical educators to translate to their own context. In addition, this article may guide future research examining more efficient means to increase adapted physical educators' access and use of research within their daily lives.

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