

TECHNOLOGY

Current Technology Trends and Issues Among Health and Physical Education Professionals

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Abstract

Health and physical education professionals who implement technology appropriately can contribute to helping students become physically educated individuals (NASPE, 2009). It is imperative that professionals be knowledgeable and resourceful in how to integrate technology effectively, but it is unclear what current challenges professionals face in this regard. Therefore, the purpose of this study was to identify the current trends and issues surrounding technology among health and physical education professionals, as discussed in a professional online forum. This mixed-methods study involved the collection and analysis of technology-related discussion posts from the first year of the SHAPE America Exchange online forum. Researchers collected 110 discussion threads from 241 SHAPE America members about technology topics ranging from pedometers to social media in an attempt to investigate the nature of the discussions and to determine the demographics of the participants. Discussion posts were examined within and across specific technologies, and major themes were established. Quantitative data analysis included descriptive statistics of participant demographics and types of technologies discussed. Results revealed the

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most commonly discussed technology topics were activity monitors, mobile devices, and social media. Major themes included networking and sharing resources, implementing technology for teaching, technology selection, data collection and management solutions, and logistics issues. Results of this study indicate that professionals are aware of and interested in implementing a variety of technologies into their teaching; however, they are still unsure about selection, management, and implementation. The online forum provided a resource to address these issues.

Today's teachers are faced with the considerable challenge of meeting the needs of a new generation of students who have never known life without a computer, video-game console, cellular phone, or Internet access, a challenge that is dramatically changing the scope of education. Today's youth have been completely normalized by digital technologies, evidenced by its full integration into every aspect of their lives (Green & Hannon, 2007). Instructional technology is one of many tools educators can use to enrich the presentation of content and convey information to students. Through enhanced planning and communication, technology also has the potential to facilitate more effective instruction in physical education (PE; Eberline & Richards, 2013). As schools continue to battle to keep pace with ever increasing demands to upgrade technological infrastructure and future technological innovation, these lingering issues will undoubtedly affect the entire dynamic of the educational environment, as students are accustomed to and familiar with technology as one of the primary tools for receiving information.

The emergence of social networking technologies and the evolution of digital games have helped shape new ways in which people are communicating, collaborating, operating, and forming social constructs (Klopfer, Osterweil, Groff, & Haas, 2013). Currently, many technology resources and ideas are available for implementation in health and physical education (HPE), including pedometers, accelerometers, heart rate monitors, active video gaming, and handheld technologies such as tablet computers and GPS units (Jodoin & Robertson, 2014; Juniu, 2011; Krause & Sanchez, 2014; National Association for Sport and Physical Education [NASPE], 2009; Sibley & McKethan, 2012; Thompson, 2008). These innovative technologies are valuable in providing objective and accurate activity monitoring

and in increasing motivation for students. Moreover, these ongoing advances in technology provide educators with creative and efficient ways to assess student learning, which then enhances teaching and learning, thus contributing to a quality PE program (NASPE, 2009).

Themes and trends in PE have altered regularly because of emerging and constantly changing societal influences that affect perceptions of the role of public school PE (Jefferies, 2012). In January 2011, a document entitled, “PE 2020 National Initiatives” was created to identify recurring themes and visionary ideas among professionals in the PE field. One of the areas of change identified as likely to affect K–12 PE teaching by the year 2020 was *advances in technology*. It was determined that technological innovation would affect the way students learn PE content and how physical educators teach (Jefferies, 2012).

Because of the influence and primary position of technology in education, it is important for HPE teachers to demonstrate confidence and competence with regard to using technology in HPE settings. In response to this need to include technology in the educational lives of 21st century students, leading educational organizations have established standards to guide professional educators in this mission. Upon graduating, teacher candidates in accredited programs are required to demonstrate proficiency in various aspects of technology implementation within the classroom (NASPE, 2008). Additionally, the International Society for Technology in Education (ISTE), whose mission is to advance teaching and learning excellence through innovative uses of technology, established the ISTE Standards to support teachers, students, and administrators in schools and across all subject areas. For example, the Standards for Teachers state that effective teachers design and develop digital age learning experiences and assessments and they model digital-age work and learning (ISTE, 2008).

Despite the development of standards, availability of preservice and in-service training, and multitude of literature available designed to enhance skills and knowledge related to instructional technology, physical educators have reported varying levels of competence in this area (Gibbone, Rukavina, & Silverman, 2010; Liang, Walls, Hicks, Clayton, & Yang, 2006; Woods, Goc Karp, Miao, & Pearlman, 2008). It is imperative that HPE professionals possess the neces-

sary knowledge and resources available to integrate technology effectively in the K–12 classroom. An additional resource, the Society of Health and Physical Educators (SHAPE America) Exchange, was created in 2014. This online forum provides a space for HPE professionals to ask questions and share ideas on topics relevant to their teaching. One of the most frequent topics of discussion is technology. Given the ever changing nature of technology, it is not surprising that this specific area is gaining so much attention within this professional community. Despite the widespread availability of resources for technology use and implementation, many questions still remain among professionals in the HPE field. Therefore, it is imperative that the most current issues and trends in technology are identified so appropriate resources, such as practical literature and workshops, as well as preservice teacher preparation programs, can be kept up to date based on the current demands in the field. It is also important, as the PE2020 initiative has reached its halfway point, to determine the progress being made in the area of technology. Therefore, the purpose of this study was to determine the most current trends and issues revolving around instructional technology implementation among professionals in PE, as identified by inquiries currently being made by HPE professionals on the SHAPE America Exchange online forum.

Method

To determine the current technology trends and issues occurring among PE professionals, the researchers employed a mixed-methods design approach, involving an exploratory look into the first full year of Exchange online forum threads surrounding the topic of technology in PE. This study was approved by the university's institutional review board and SHAPE America, and informed consent of participants was not required because of the semipublic availability of the online forum and the nonidentification of participants in the study.

Participants

This study included 241 professional members (71% female, 29% male) of SHAPE America who participated in the Exchange Online Community All-Member Forum from June 2014–June 2015 in a technology-related posting, which consisted of professionals in the area of HPE. Participants were distributed across all 50 U.S. states;

Washington, DC; and outside of the United States, with New York ($n = 18$), Illinois ($n = 15$), and Virginia ($n = 14$) having the highest representation. Participant demographic data were included only if the participants' profiles included that information. Sixty-six participants provided years of experience, 176 provided work positions, and 91 provided education level. Of those, 27% had at least 10 years of teaching experience, 38% were elementary level and 15% were secondary level teachers, and 74% held a master's degree.

Data Collection and Analysis

In this study, the researchers collected and analyzed 110 discussion threads from the Exchange Online Community All-Member Forum that is available to members of SHAPE America. The researchers collected all forum postings that involved technology over the first year of the forum. Specific data collected included participant demographics as provided (professional position, teaching level, education, gender, etc.), types of technology addressed, and specific issues surrounding the technology. The researchers identified specific keywords to search (e.g., technology, computer, tablets, apps, pedometers) and collected threads that included those keywords. For each thread collected, researchers identified the nature of the initial post, role of technology in the thread (i.e., question or announcement about technology or technology offered as solution), and demographics of those involved in the discussion.

The forum posts were analyzed through a grounded theoretical perspective that involved the development of categories of concepts and themes derived from the data and conceptualization and category definition (Corbin & Strauss, 2008). Three researchers independently evaluated several thread topics and results were compared and discussed until 100% intercoder reliability agreement was established. They then independently and collaboratively analyzed the posts to establish confirmability and reduce potential bias (Patton, 2002). Once the researchers collected information for all posts related to technology, they searched for common themes regarding the nature of the threads. In addition, quantitative data analysis using IBM SPSS 20 included descriptive statistics of the sample and types of technologies discussed in the forum.

Results

One hundred ten threads on a variety of technology topics were analyzed. The most commonly discussed technology categories by frequency of thread topic were activity monitors (e.g., pedometers, heart rate monitors; $n = 34$), mobile devices (e.g., tablet computers, apps; $n = 32$), and social media ($n = 18$). Other topics included active gaming, computers, office tools, and general technology. In addition, 58% of initial thread posts were questions and 20% were announcements about technology. Of the threads that posed a question related to technology, a solution in the form of a reply was provided 92% of the time. The remaining 22% of initial thread posts comprised nontechnology-related announcements ($n = 8$) and questions ($n = 16$); however, a technology-related response was provided.

Data analysis revealed five major themes surrounding the nature of the threads about technology in the forum. These themes are discussed below, with sample representative thread posts derived from the data.

Networking and Sharing Resources

The Exchange served as a platform for professionals to network and share resources. Particularly, there were 18 announcement-style initial thread posts where participants shared ideas from topics including active video gaming, social media, and apps. For example, a female elementary PE teacher and wellness coordinator with 26 years of experience from Wisconsin shared her thoughts on what the “dialogue, learning, and growth [on] the new SHAPE America online Xchange community will offer...” She emphasized the need for professionals to engage in professional development to provide best practice and particularly mentioned social media as a form that has “completely elevated my learning, teaching, collaboration, and networking.” She went on to say,

Twitter, Facebook, and now, SHAPE America’s Xchange, offer an incredible opportunity for sharing, collaborating, and learning as a never ending, ongoing form of professional development. Instead of waiting for those “hit or miss” professional development opportunities to come through district inservices that far too often are not necessarily

geared towards HPE, or having long periods of time between conferences, classes, and workshops, educators can empower themselves on a continual basis by tapping into these powerful networking tools. If you or your colleagues are not currently utilizing Twitter or Facebook for professional growth, take a moment now to get started...Consider encouraging and helping your district and state colleagues to get started on using social media to fuel their interest and professional development. The level of collaboration and sharing can only serve to help raise the level of PE programs across our country and empower educators everywhere to feel connected to an ongoing source of growth and rejuvenation on a professional level.

Implementing Technology for Teaching

There were 33 threads surrounding ideas for technology implementation in HPE, including Nintendo Wii, pedometers, FitBit activity tracker, heart rate monitors, and tablets. One participant offered ideas on how to use specific technology for teaching. A female elementary HPE teacher from Kansas shared her ideas for using her iPad in her classes:

I am entering the 2nd year of iPad use in my PE class . . . I currently have 9 to use in PE class, while our classrooms are getting their own, which can be brought to class when needed. Apps I have found helpful in PE class are as follows: Interval Timer, Bng Score, Stopwatch, Pedometer, Skeleton ID, Sworkit and Sworkit Pro, Team Shake, Scoreboard and a wide variety of Alphabet, Number/Color Recognition, Addition & Subtraction apps . . . most of these are free apps, a couple run .99 or \$1.99. I also have i-nigma on my iPads, as we will be using QR codes in several activities. I have also added some 6th grade Health apps, and general Health apps that I feel will be useful in my classes in regards to Health issues. I'm excited to continue to learn ways use iPads & their apps in the PE setting. Hope this helps!

A male educator from Illinois sought suggestions on how to use Chromebooks in PE:

My Junior High School is getting wired for wifi this spring and students will have access to chrome books. I approached my Superintendent requesting the use of chrome books in Physical Education class and got his approval if . . . I could “wow” him with lesson plan for Physical Education class using chrome books. I need everyone’s help: What have you done that is successful, will “wow” the Supt.?

He received many replies to his inquiry. One individual suggested using Google Apps to “wow” the superintendent:

After participating in the PhysEdSummit 2.0 this weekend, I fell in love with Google Apps for Education. One great idea that you could do as a summative, on-going assessment is a Sportfolio housed in GoogleDocs that your students add to over the course of the year. This will not only wow your Supt., but is a great project to have students share at parent–teacher conferences.

Some individuals posed questions that were not initially related to technology; however, replies to their questions included technology as a solution. For example, a female physical educator from Minnesota sought ideas for how to teach yoga to elementary school children:

I want to bring Yoga into our physical education classroom . . . Teaching Yoga to kids is a challenge and we would love any help to make it a great experience for the students. We are planning to teach the students in the classroom a couple of times and then we are going to bring it to the students before school on Mondays. We would love to get any tips, ideas, activities, poses, or encouragement!

An elementary PE teacher offered a solution in reply with the use of an iPad, an app, and a projector:

I started doing yoga with my K–3 students last year as a unit during PE time, we used an app on the iPad called Super Stretch Yoga. I arranged for a projector and speakers in my gym, and then projected the app on the screen. The kids really liked the app because it has cartoon drawings with fun animal names for each of the poses. Followed by a video sample of the pose performed by young children. At that age they are so willing to try new things, and really enjoyed the unit. Good luck!

Data Collection and Management

Nine threads were analyzed that involved inquiry into technology for data collection and management. Specific tools that were discussed included QR codes, iPads, PowerPoint, and Excel. A female PE teacher from Illinois posted an initial thread question about the use of a website to track students' laps: "Has anyone used this? www.studentlaptracker.com. It is a scanner that scans student's QR codes as they complete their laps. Or what else have you used with great success?" She received a reply that offered an example as to how it is being used in schools:

We are currently utilizing laptracker technology at 26 elementary and middle schools to monitor student progress in qualifying for the Rod Dixon Kid's Marathon. So far, we are pleased that we did so - the system works well, saves a great deal of time and effort, and is quite cost effective when measured against other systems. We will be exploring additional ways to embed other applications within our curriculum in the near future.

Other professionals sought ideas for how to manage attendance, grading, and general assessment tasks. A female instructor in higher education from Connecticut asked about using the iPad in PE:

. . . Is there an app anyone can recommend if I want to do typical tasks such as attendance and grading but most importantly want to be able to write onto my rubric when

my students are being assessed? Ability to email, download, and print is a must.

She received a response that recommended the TeacherKit app: “You can take attendance, perform grading, and record notes on students. It will generate various reports that I’ve found useful as well. Here’s the link: <http://www.teacherkit.net/>”

Logistics and Settings

Professionals sought information on some of the logistical aspects of using technology for teaching. Nine threads were analyzed that addressed the theme of implementing tablets, projectors, fitness testing, pedometers, and YouTube in the classroom or gym. For example, a male elementary PE teacher with a master’s degree and 17 years of experience from New York was interested in using tablets in the gym:

I want to start using iPads in the gym, but I am wondering if there’s an ‘easy’ way to sync all of them at once. Is there some sort of networking that could be done or do I have to set up each iPad separately?

One professional offered a possible solution: “I eventually found out that I could create a ‘PE’ iTunes account as long as my director had the login information. Each iPad is connected to this account and with one purchase, the app shows up on each mini.”

Other professionals sought ideas on using projectors in the gym. A female professional from Nebraska posted,

Our physical education teachers have found using projectors for instruction is very effective: posting objectives, listing instructional cues, showing video clips, etc. Does anyone have a solution to the “projector on the cart” problems in the gym? Just having to roll it out onto the gym floor and then back into the office is a hassle, but even more concerning is tripping over cords, bumping into the cart, objects hitting the projector, etc. Does anyone have a projector permanently mounted in the gym? Please share ideas.

She received several replies. One professional addressed her question and offered a practical solution:

I have the same problem in our gym and just got approved for a flat screen TV that will be mounted on my gym wall. I will have it hooked up to an Apple TV so that I can wirelessly stream or mirror content from my iPad straight to the screen. I think this will be a great alternative to the old projector cart that like you said becomes a hassle and safety issue as well.

Another professional offered an opinion on this topic at an advocacy and justification level:

One of the teacher behavior indicators that our PE teachers in Tennessee are being evaluated on is their use of technology toward student learning. Most teachers are getting a “pass” because they use music, which I think is mistaken and continues to marginalize our profession. OK . . . if a PE facility has stereo speakers up in the rafters of the gym, I tell these teachers that there should be a projector up there as well. Wired or wireless. Firstly and foremost, the justification for the cost of this projector would be for student learning. Secondly, tell your principal/budget manager that this projector then can be used for athletic events, open house events, etc. I am so tired of hearing that the projector/hardware would be damaged by thrown balls. Thirdly, it would assist teachers concerning their evaluation! Put it permanently up in the rafters, or someplace safe, in a cage to protect it. **ALL** teachers deserve having access to the most up-to-date technology and the Internet. This fairly inexpensive upgrade could be the first step toward more technology for programs that have little to none.

Technology Selection

Fifteen threads were analyzed that involved questions surrounding the selection of technology to serve a specific purpose. These questions included opinions on which pedometers, heart rate monitors, tablets, online resources, and apps were the best option for par-

ticular classes or situations. For example, a female elementary PE teacher with 15 years of experience from Oregon sought suggestions for which pedometers to select: “We will be piloting pedometers for each child at one middle school and one elementary next year. The classroom teachers will manage them. Any suggestions on the best ones for not too much money?” She received the following response in reply, which not only provided a suggestion for which to select, but also ideas for how it was implemented and managed at each grade level:

Hi, ALL! Our school (city – PreK–8) has been on pedometers for about 6 years now. They are terrific. We purchased 2 “Walk 4 Life” class packs that worked well for about 4 years, but many of them “lost their lives” whether it was the display or the internal counter, etc. This past year we purchased the Digi Walker as per suggestions from THIS Forum. They came highly recommended for length of life and simplicity of use. These were (purchased with Box Top 4 Education \$ (invaluable source of FREE income!) The Pre-K are taught WHY people use them; how to put them on (we purchased velcro waist straps from Flag House), how to open and reset; and how to read the number of steps in a PE period. As the students move into the 2nd grade they are taught the “walk test” for stride length, how the number of steps is converted into mileage, and the calories perceived (the weight of each student is part of input in the higher grades). To manage this we use sturdy shoe organizers that hang on the inside of a metal cabinet in the gym and on a bulletin board in the multipurpose room. Each pocket in the organizer has a BIG number on the outside (magic marker) and it corresponds with the number you place on the inside cover of the pedometer. In our grade books each student is assigned a pedometer number and they use THAT pedometer all year long. Starting in Grade 2 we have the students begin to LOG IN on individual sheets that are kept in a class folder. (if you use a different color for boys/girls it makes it a bit easier to give them out...assign students to distribute and collect) At the end of each unit the students can begin to compare the

step counts as to their activity level and see which activities give them more movement. The pedometers we use also have TIME in ACTIVITY which becomes very important when assessing the students and gives us feedback as to how long the class as a whole is active each PE period. YOU WILL LOVE USING PEDOMETERS! The kids even begin to ask for them as gifts for holidays/birthdays to use at home.

Discussion

Ongoing technological innovations offer enormous potential to enhance the quality of students' PE experience (Eberline & Richards, 2013). Therefore, this study involved the extraction and examination of 110 technology-related online forum threads among professionals of SHAPE America. Given technology's prominence in society and education (Jefferies, 2012), it is important to gain an understanding of the current trends and issues that professionals in this field are experiencing.

With the existence of educational standards, variety of conferences and workshops available, and access to digital and print media that afford opportunities to learn and experience appropriate technology integration education, it could be easily assumed that technology integration knowledge and skills would be ample among professionals. Yet there are still major questions lingering for HPE professionals surrounding the selection, implementation, and logistics of technology in HPE. Expectedly, these resources and requirements may have had an effect on lesser skilled professionals by at least providing an awareness of the possibilities of technology use to the point that they are attempting to use it in HPE settings. The great news is that many professionals in this field are knowledgeable and willing to offer their ideas and suggestions for technology implementation.

For every initial question posed about technology, most had multiple solutions offered in reply. Responses ranged from novel suggestions based on personal experience to a sharing of resources garnered from participation in previous workshops or conference sessions. Individuals who participated in the online forums tended to share specific details surrounding the context of their inquiries and responses, which led to richer, more authentic discussions. Those who

replied to the online forums not only offered suggestions, but also oftentimes provided detailed explanations and elaborate descriptions for the logic or rationale guiding each idea and recommendation. In many cases, respondents shared additional contact information accompanied by offers to provide supplementary resources and follow-up information if desired. The data collection phase revealed a general atmosphere of support and comradery among contributors in the online community. This finding offers significant implications, as “comfort level of teachers” has been identified as a factor that has limited technology integration in PE settings (Gibbone et al., 2010). If teachers are able to use the support offered in this online forum, it may increase comfort levels, thus facilitating a potential increase in technology integration.

It is noteworthy to highlight that almost a quarter of the threads analyzed were included in this paper not because of the initial thread post, but because a technology-related response was provided. These data demonstrate that some HPE professionals are proficient enough to apply their knowledge and experience regarding technology to offer solutions, ideas, and suggestions for nontechnology-related issues. Accordingly, as the integration of technology continues to remain a prevalent feature in the discussion of effective teaching practices, it will be interesting to observe the number of respondents who will employ some aspect of technology when proposing potential solutions to nontechnology-related inquiries in future threads. Technology has not always been a part of an initial question on the forum at this point, but it seems inevitable that in some respect technology will be a potential part of answers in the future. With regard to curriculum outcomes, it is perhaps more ideal for technology to be part of the solution, instead of what drives the initial question (Juniu, 2011). Oftentimes, teachers who desire to integrate specific educational technologies tend to design lesson plans around the digital tools and resources that will be used, as opposed to allowing learning goals and objectives to be the primary guide for decisions concerning instruction and implementation (Harris & Hofer, 2009). With this online forum, participants have the opportunity to post questions regarding curriculum-based learning goals, and peers are able to provide suggestions on how to promote learning goals and outcomes through appropriate forms of technology. In effect, this

forum may help to offset the temptation of using technology just for technology's sake. Thus, in their quest to become more tech savvy, educators who use this online forum to exchange ideas and resources about technology are able to glean significant benefits from the knowledge, expertise, and experiences of others.

Conclusion

Health and physical educators are faced with standards-based, student-driven, and societal expectations to implement technology in their teaching. There are ample resources to improve knowledge and skills related to technology integration, but the results of this study imply that professionals in the HPE field are still in need of assistance in this area, particularly in technology selection and logistics, data collection and management, and teaching implementation. Through the use of the online forum, professionals in the field were able to seek ideas from their peers and were offered solutions a majority of the time. This suggests that HPE professionals are aware and making an effort to integrate technology, but still do not seem to have all of the resources needed to accomplish their goals. Despite this, there were limitations to this study. The participants in this study may represent an atypical group of physical educators. Consequently, because the study did not involve a random sample of participants, the results may not be universally generalizable. In addition, it was not possible to provide a full description of the sample, because demographic information was not fully available for all participants. The online community forum can be viewed as another potential resource for professionals, in addition to the conferences, workshops, websites, and journals that have been provided to them in the past. The results of this study indicated that activity monitors, mobile devices, and social media were the most commonly discussed technology tools. This suggests that these topics may need to be more thoroughly addressed in preservice teacher preparation programs, workshops, conferences, and media. In addition, the themes derived from the data indicate a need not only to introduce these technology tools, but also to discuss them in a way that provides teachers with the skills to select, manage, and implement the tools appropriately. Ultimately, it is clear that PE2020 was on point by identifying advances in technology as a major theme among HPE professionals,

and the Exchange has provided a place for them to share their issues and to explore solutions.

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The content knowledge test in Health and Physical Education is designed for prospective teachers of K-12 health and physical education. Examinees typically have completed a bachelor's degree program in health and physical education, health and exercise science, physical education and wellness, an equivalent degree, or have prepared themselves through some alternative certification program.

13. Continuing education and professional development as a health educator.

1. Assessing learning needs for individuals and diverse groups (e.g., identify developmentally appropriate instruction, cognitive abilities, multiple learning styles, and purposes of pretesting).
5. Current issues, trends, and laws affecting the choice of appropriate physical education activities.

Quality physical education has strong support from both parents and child health professional organizations.

Several models and examples demonstrate that physical education scheduled during the school day is feasible on a daily basis.

Page 198 Share Cite. Suggested Citation: "5 Approaches to Physical Education in Schools." Institute of Medicine. 2013. *Educating the Student Body: Taking Physical Activity and Physical Education to School*. Washington, DC: The National Academies Press. doi: 10.17226/18314.

Exergaming appears to increase acute physical activity among users and is being used in school settings because it is appealing to students. The education which is related to health is also known as health education. Health education is a profession of educating people about health. Areas within this profession encompass environmental health, physical health, social health, emotional health, intellectual health, and spiritual health, as well as sexual and reproductive health education. Health education can be defined as the principle by which individuals and groups of people, learn to behave in a manner conducive to the promotion