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PEDAGOGY

Cooperating Teachers' Participation and Beliefs Regarding Teacher-Educator Functions

Hillary M. Robey and Jennifer M. Krause

Abstract

The student teaching experience is a significant learning opportunity for preservice teachers (Clarke et al., 2013; Matsko et al., 2020). This field experience requires preservice teachers to work closely with a cooperating teacher (CT), who serves a fundamental role within teacher preparation programs, providing the classroom context and K-12 teaching experience for teacher candidates. An extensive body of literature provides compelling evidence that CTs lack appropriate preparation to support student teachers, resulting in inconsistent and potentially ineffective supervision during the student teaching experience (Clarke et al., 2014; Matsko et al., 2020). Therefore, teacher preparation programs should support and prepare CTs for their significant roles in supporting preservice teachers' training.

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Physical education teacher education (PETE) literature documents that physical education CTs (PECTs) facilitate the transfer of knowledge learned in PETE programs into practice within K-12 school environments (Richards et al., 2014). Unfortunately, most PETE faculty are limited in supporting PECTs during the preservice teacher's transition from theory to practice. Therefore, CTs can draw on their own experiences as student teachers to inform their supervisory style and practice (Amaral-da-Cunha et al., 2019). Ultimately, this results in a wide variance in how CTs participate and engage during their supervisory experience. PECTs' unawareness of how to supervise is untenable if the intention is to provide the best preparation for the next generation of physical education teachers. For PETE programs to provide high-quality and meaningful support for PECTs, a comprehensive understanding of how PECTs engage during the student teaching experience is essential.

Clarke and colleagues' (2014) review of six decades of CT literature identified 11 teacher-educator roles CTs might engage in during the student teaching experience. The 11 identified teacher-educator roles are presented in Table 1 and offer potential avenues for thinking differently about how CTs might participate during the cornerstone student teaching experience.

While these 11 teacher-educator roles are identified as possible roles that CTs partake in, it is unclear whether PECTs are aware of these specified roles, participate in them, or believe these teacher-educator roles are important to participate in. Suppose physical education teacher education (PETE) programs are to provide and create professional development opportunities and training programs to prepare and inform PECTs. In that case, they first must identify how PECTs participate in these roles and their beliefs about the importance of these teacher-educator functions identified by Clarke et al. (2014).

Conceptual Framework

This study's conceptual framework was informed by the socialization theory, specifically occupational socialization, and the influence of teachers' beliefs on behavior. Together, these theories support one another and provide a comprehensive understanding of a phenomenon or phenomena, establishing a framework-specific philosophy.

Table 1
Summary of the 11 Teacher-Educator Roles

Teacher-Educator Role	Definition
Role 1: Provider of Feedback	Providing information regarding aspects of the student teacher's performance or understanding
Role 2: Gatekeeper of the Profession	Providing both formative and summative assessment of student teachers, the latter of which plays a significant role in student teachers' entry into the profession
Role 3: Modeler of Practice	Modeling teaching practice for student teachers
Role 4: Supporter of Reflection	Encouraging and engaging student teachers in reflective practice
Role 5: Purveyor of Context	Providing context for the student teacher as well as the often-hidden dimensions of K-12 teaching
Role 6: Convener of Relation	Building and maintaining a working relationship with the student teacher
Role 7: Agent of Socialization	Socializing student teachers into the teaching profession
Role 8: Advocate of the Practical	Providing first-hand knowledge of the day-to-day workings of a classroom, a dimension of teaching that is important to successful classroom practice
Role 9: Gleaner of Knowledge	An increase in one's own professional knowledge because of the interaction with student teachers
Role 10: Abider of Change	Making changes in day to day duties, responsibilities and educator role to accommodate the student teacher who is to be a part of or taking a leadership role in their classroom environment
Role 11: Teacher of Children	Being a K-12 teacher

Occupational Socialization

Socialization refers to how people learn the norms, customs, and ideologies central to their culture through interactions with one another and social institutions (Billingham, 2007, as cited in Richards & Gaudreault, 2016). A subset of the socialization theory is occupational socialization, which seeks to understand the ways new employees acquire the skills, knowledge, and dispositions required to become productive members of the workplace environment (Bauer & Erdogan, 2011). As a subset of occupational socialization, teacher socialization is a "field of scholarship which seeks to understand the processes whereby the individual becomes a participating member of the society of teachers" (Zeichner & Gore, 1990). Teacher socialization theory describes the induction into teaching as a blend of one's childhood school, the mini apprenticeship of student teaching, and learning while doing (on-the-job training). Teaching comes with socialization processes for those who are – or learning to become –

part of the teaching profession (Pike & Fletcher, 2014). Socialization theory explains how student teachers learn their roles as teachers from mediated entry into the profession. Similarly, PECTs may mediate their conceptions of supervisory roles based on memories of receiving supervision and learning to teach when they were student teachers. Therefore, the occupational socialization theory can be applied to CTs, who hold onto their experiences as a preservice teacher and, as research suggests, can gain new insights about teaching and learning as a CT, even if they are not formally enrolled in a PETE program.

Teacher Beliefs

For teacher education and professional development programs to succeed, teachers' beliefs about teaching and learning should be considered (Verloop et al., 2001). Research on teacher beliefs is complicated due to a lack of agreement in defining the construct of 'beliefs' and different perspectives on the relationship between knowledge and belief (Jones & Carter, 2007). The literature distinguishes teacher beliefs from teacher knowledge, but this distinction remains somewhat arbitrary because knowledge and beliefs are intertwined in a teacher's mind (Lombaerts et al., 2009; Pajares, 1992). Pajares (1992) proposes that teacher beliefs are often supported by subjective experience rather than by empirical data or evidence-based knowledge. The definition of beliefs used in this paper comes from Haney et al. (2003), who define beliefs as "one's convictions, philosophy, tenets, or opinions about teaching and learning" (p. 367). As such, teacher beliefs may include subjective theories about how students learn, what a teacher should or should not do, and which instructional strategies work effectively.

For that reason, understanding teachers' beliefs enables teacher education programs to influence teachers' views of teaching and learning, and this process plays a role in supporting the program's goals for their teacher candidates. To conceptualize the merging of teacher socialization and teacher beliefs, one must envision the construct of teacher socialization, which seeks to understand how a teacher enters the profession while also envisioning teacher beliefs, potentially influencing the nature of teachers' actions.

Over the past 70 years (1950-2021), substantial research has worked to identify how CTs engage as members of the student

teaching experience. However, there is a lack of literature identifying how PECTs participate in the student teaching experience and their beliefs about their participation. Therefore, this study aimed to identify how PECTs participate in 11 teacher-educator roles and their beliefs about engaging in these roles. Together, these findings offer PETE programs an understanding of how to prepare PECTs for their supervisory roles.

Methods

This study is part of a larger project exploring the relationship between the beliefs and experiences of PECTs and was approved by the researcher's university's institutional review board. The current study design used a phenomenological research approach to describe PECTs' perceptions and lived experiences of beliefs and participation in 11 teacher-educator roles. In a phenomenological study, the researcher gains insight into the phenomenon of interest by interviewing knowledgeable participants (Creswell, 2013). Specifically, this study explored the lived experiences of PECTs to understand the nature of their beliefs about their roles and whether they participate in 11 teacher-educator functions.

An interpretive perspective guided this research paradigm. The interpretivist worldview suggests that meaning is made through human interaction and that the social world is "produced through meaningful interpretations" (Pascale, 2011, p. 22, cited in Jones et al., 2014). Interpretivist positions are founded on the philosophical belief that reality is socially constructed and fluid. Thus, what we know is always negotiated within cultures, social settings, and relationships with other people (Crotty, 1998). From this perspective, validity or truth cannot be grounded in an objective reality.

Instrumentation and Data Collection

Based on the literature review and suggestion for further inquiry into 'participation in teacher education,' the 11 teacher-educator roles identified by Clarke and colleagues (2014) were refined to a semi-structured interview guide. The individual interviews consisted of open-ended and in-depth questions about PECTs' perceptions and lived-experiences on the description, usage, and benefits of their beliefs and how they participated in the 11 teacher-educator roles as PECTs. For example, the PECTs were asked about their participation

or engagement in providing feedback. Specifically, the type of feedback and how much feedback they provided their student teacher(s). Another sample interview question included asking if they engage as gatekeepers of the profession. Specifically, if they play a role in whether student teachers enter the teaching profession and believe PECTs should engage as the profession's gatekeepers. Participants were encouraged to elaborate on their answers and allow a natural flow of conversation to direct the discussion and explore the PECTs' thoughts, feelings, and experiences in greater depth (Patton, 2002). The interviews ranged between 45-90 minutes via telephone.

Participants

The range in the number of participants to be interviewed was informed by Creswell (2013), who, from his numerous reviews of qualitative research, indicated phenomenology research ranges from three to 10 individuals. Therefore, interviews concluded once the researcher established that data saturation was achieved. Data saturation is reached when there is enough information to replicate the study (O'Reilly & Parker, 2013), when the ability to obtain additional new information has been attained, and when further coding is no longer feasible (Guest et al., 2006). Failure to reach data saturation impacts the research's quality and hinders content validity (Kerr et al., 2010). Upon completing the second round of reading the data, it was determined that five interviews were appropriate for the research quality.

A purposive sample of the five PECTs for the study was based on their willingness to volunteer and their unique demographic information. Of the 118 PECTs who participated in the first phase of the broader study, 75 volunteered to participate in this supplementary study. The PECTs selected included those that had different levels of education (bachelor's, master's, doctorate), a differing range in the number of student teachers supervised (one to 20+), and varying amounts of years of teaching experience (five to 40). Three of the PECTs in the study supervised students from at least three different universities in the same state at which they taught. Table 2 represents the demographic information for the five PECTs interviewed for the study. Pseudonyms were used to protect participants' identities.

Table 2
Summary of Demographic Characteristics

PECT (Age)	State	Grade Level	Degree Earned	Years of Experience	Number of STs	CT Training Received
Taylor (28)	CO	Elem.	Bach.	5	1	No
Linda (62)	HI	Elem.	Mast.	40	20	Yes
Dave (46)	ID	Middle	Mast.	19	14	Yes
Brett (47)	NY	Elem.	Ph.D.	19	19	Yes
Kim (32)	CO	Elem.	Bach.	8	2	No

Epoche

Phenomenological researchers seek to describe and understand truth without bias. Requiring researchers to participate in an epoche process to be mindful of one's own experiences related to the phenomenon being studied (Moustakas, 1994). To be aware of one's own biases, a researcher must acknowledge personal judgments before and during data collection. The authors involved in this study shared and discussed their experiences with CTs and the student teaching experience. The authors talked about their experiences during their student teaching experience and working closely with a PECT. The epoche process continued during data analysis as the authors routinely questioned and challenged the sources of the themes as they emerged.

Data Analysis

The researchers implemented Moustakas' (1994) approach to data analysis. Once interviews were completed, the audio recordings were transcribed, and the transcriptions were read numerous times. The data were analyzed through a deductive approach. The data were systematically examined to determine whether the participation and beliefs of the 11 teacher-educator roles were supported or should be rejected. The first stage of analysis involved reading the interview transcripts numerous times to become familiar with the data. Next, the analysis comprised deductive coding, which included the predefined set of codes known as a 'codebook' (i.e., the 11 teacher-educator roles), and assigning those codes to the qualitative data. The analysis includes highlighting keywords and phrases, coding, and grouping these into related categories. Before the conclusion of

data analysis, the intercoder agreement was established to ensure the independent coders agreed on the coding of the data.

Rigor refers to establishing the credibility and trustworthiness of data. For this study, it was demonstrated through attention to and confirmation of information discovery (Denzin & Lincoln, 2005). The criteria include credibility, dependability, conformability, and transferability. All five participants were provided a copy of their interview transcript and asked to question and confirm the congruency between their remarks and the research interpretations. All participants who participated in the member-checking process confirmed the findings and agreed with the data interpretation, and the essence of their remarks was captured. The process of member checking with the participants promoted validation, which established the credibility of the findings (Creswell, 2013).

Results

During each interview, PECTs were asked how they participated in each of the different teacher-educator roles and their beliefs about the 11 teacher-educator roles. Each teacher-educator role is presented separately with specific interview data to exemplify the participant's beliefs and unique experiences of serving as a PECT during the student teaching experience.

Providers of Feedback

All five PECTs provided examples of providing feedback to their student teachers. When asked how she provides feedback for her student teacher, Taylor mentioned that she would "Observe the teacher candidate teaching classes and provide feedback." Linda also shared an example of how she delivered feedback:

> I would sit with the student teacher, I'd say, "Okay, these are the kinds of things I see. And these are the things I need you to work on, and I want you to think about X, Y, and Z. Let's see if we can improve your teaching by doing these things."

In the same way, Dave provided several examples of how he would give his student teachers feedback, and the type and amount of feedback would change depending on the student. For example,

he shared one experience of having to give repeated feedback to one student teacher who was having trouble grasping teacher movement:

> One student teacher struggled with having students behind them while they were instructing, so he constantly had kids making faces and disrupting him. I repeated a million times, I would say, "All right, you have to have your back against the wall. It will make a huge difference, or your classes will keep being distracted." (Dave)

Brett shared an example of providing feedback to a student teacher who was having a hard time positioning themselves appropriately in the teaching space, "I repeated to him a million times, 'You have to keep your back against the wall. It will make a huge difference.' It took a lot of feedback with him." When asked whether they believed providing feedback was necessary, the five PECTs unanimously agreed it was an essential part of their responsibility. Kim said, "I believe if a lesson falters, the CT should provide immediate feedback to achieve success".

Gatekeepers of the Profession

The five PECTs each mentioned how they assess student teachers throughout the placement. Four PECTs noted that while they understand their assessments of student teachers are important, ultimately, they do not have the final say in whether the student teacher will enter the teaching profession. During her interview, Linda shared her experience of recommending that one of her student teachers should not pass, but rather the PETE program had the student teacher placed with a new PECT partway through the placement and ended up passing under the new PECT:

> Really, their grade is given by the university professor. One [student teacher] was pulled from me halfway through her experience because she was not going to pass with me. She ended up passing but under someone else. So, they passed her. I didn't pass her because she wasn't making the changes necessary with me.

When asked to describe the roles and responsibilities of a PECT, the five PECTs mentioned assessing the student-teacher. Brett stated,

"It is our job to make sure the student teacher is ready to teach in a classroom. We can submit the evaluation with recommendations."

Modelers of Practice

Without a doubt, *Modelers of Practice's* role was the most cited role that PECTs participated in, and they believed that other PECTs should participate. All five PECTs discussed how they model their teaching for their student teachers. Linda shared different examples of how she had modeled her teaching for her student teachers:

> The student teacher would teach the lesson. Then I would teach the second lesson and take their lesson and tweak it. Show them how they could do it differently.

In the same way, Kim and Brett described their depiction of being a *Modeler of Practice* for their student teachers, which goes beyond just the teaching portion of being a PE teacher:

> I also believe it is my duty to model the passion, responsibility, love, and drive it takes to be an effective teacher in physical education settings by "walking the walk and talking the talk." I think it is important to model being a professional. (Kim)

> I think it is important to model being a professional. How do you speak when you're at work? How do you talk to parents or students? How do you speak to your colleagues? How do you dress? I think it is important to model it [teaching]. (Brett)

When asked if he believed PECTs should participate as a *Modeler of Practice*, Dave said, "Cooperating teachers need to model what a seasoned teacher looks like for the student teacher to gain a professional perspective. Most people learn from others, modeling good practices."

Supporter of Reflection

During interviews, the PECTs described their experiences of providing meaningful opportunities for their student teachers to reflect on their teaching. Interestingly, each time the PECTs were asked

to talk about the role of Supporters of Reflection, all responses were followed or accompanied by the role of providing feedback as well.

> Sometimes they [student teacher] would teach all three lessons, but while we're transitioning from class to class, I would say, "Have you thought about this? Why were you doing this? How does that meet your objectives?" Or make suggestions for ways they could improve their lessons. (Linda)

> You also need to make sure that you're setting up that student teacher to be successful, by plenty of reflection time, plenty of those conversations at the end of the day, tons of feedback. (Kim)

Brett referenced supporting the student teacher's reflection process with "Daily reflection with the student teacher, helping them create and deliver effective lessons, and reflect on the learning as a result." In the same way, Linda said she is intentional about "Engaging them in discussions to reflect on the lessons they teach." as often as she can.

Gleaners of Knowledge

When discussing the role of the *Gleaners of Knowledge* during the interviews, the five PECTs mentioned that they always learn something new from supervising student teachers. Interestingly, this role is not something that the PECTs actually "do;" instead, it results from their participation. The PECTs shared examples of how they gleaned new knowledge from their interactions with the student teachers. Kim described being a PECT as a "cool" opportunity for her and her student teacher because they are learning something new:

> It can be a really cool opportunity for not only the student teachers to learn but also for us. I learn and refine a lot of my practices when trying to teach someone else.

Likewise, Dave mentioned how he had taken ideas and activities his student teachers used and would implement them when he taught even after the student teacher was gone:

> I think that there's going to be a good handful of things I'm going to learn from them [student teacher] or a different spin on something that I do already, and I'm going to say, "Hey, wow. This was cool. That's a great way to teach that ..." but it's really refreshing to see, hear, and experience a different way to do something.

When asked about her experience as a *Gleaner of Knowledge*, Linda shared that, "Occasionally, a student teacher knows a topic that is new, and it's fun to learn something from them."

Purveyors of Context

Similar to the *Gleaners of Knowledge*'s role, the role of *Purveyors of Context* is a role that does not require PECTs to "do" anything; instead, PECTs innately embrace this role due to the nature of their position as PECTs. During the interviews, all five PECTs described how they provide the context and environment for the student teaching experience. For example, Brett shared the expectations for his student teachers in terms of providing the context by which the student teachers engage throughout the entire school day beyond the classroom:

> That expectation follows them [student teacher] as well, I say "I have to be here at 7:00 so you're here at 7:00. That's my expectation of you, because I want to show you what the context of this really is". I don't want them to become a lazy lump and bypassed because they didn't learn the work ethic in student teaching . . . (Brett)

Kim explained her function as a *Purveyor of Context*, "My responsibility as a cooperating teacher is to provide a safe and rigorous environment to allow the student teacher to experience what a physical education classroom and school environment feel like."

Conveners of Relation

When discussing the role of fostering relationships with the student teachers, all five PECTS shared experiences and indicated that one PECT's role is to cultivate this relationship. The PECTs shared examples of the fantastic relationships they fostered while working with student teachers and described some challenging relationships

that arose with some student teachers they mentored. Brett shared an example of how he supported student teachers beyond lesson planning and teacher reflection:

> The poor girl was a mess. She sat here and cried in my office, trying to tell me that she couldn't student teach and could I help her? She just cried and looked at the floor. I didn't know what to do, so I just waited for her to finish crying. We had a nice conversation. I talked with our university supervisor . . . we found a solution right away, but this is also what we [cooperating teachers] do. (Brett)

Linda mentioned that a PECT's responsibility is to "build a professional relationship that allows constructive criticism." Some could argue that the development of a relationship between the PECT and a student teacher is inherent to the student teaching context structure.

Agents of Socialization

All five PECTs mentioned that they play an integral role in socializing their student teacher into the profession and provided multiple examples of how they do this. For example, during her interview, Kim shared ways she encouraged her student teachers to participate in different realms of the teaching profession beyond the walls of the gym:

> For my student teachers, if I had before and after school clubs, my expectation was they were there because a big part of being a PE teacher is doing some kind of extracurricular with their kids. We do early release professional development with the district, so I always have my student teachers come with me. I think it is important though for them to understand what they're getting themselves into.

Taylor explained that one of her goals when supervising a student teacher includes ensuring they experience the "unknowns" or the things not always taught in a teacher preparation program:

> While mentoring teacher candidates in classroom management, teaching, planning lessons, dealing with behaviors, and discipline is important, I also want them

> to experience all the other things you don't learn about in college like -recess duty, dealing with parents, staff, comrade, etc.

Brett gave examples of the types of experiences he tries to provide his student teachers: "I inform my student teacher about things outside of the classroom, such as fundraising, district, and state "happenings" and help them see the entire picture of the teaching profession."

Advocates of the Practical

During interviews, the five PECTs described their experiences of helping the student teachers know the day-to-day routines of being a PE teacher as an *Advocate of the Practical*. During his interview, Brett discussed that when student teachers come to his school, they get to experience the "real world' happenings of the life of a PE teacher:

> I give them everything from how the kid reacts to knowing the other teachers in the building, the administrators, the custodians, and introducing them to secretaries, and everything that you would need to when you walk in the gym for your real job.

Linda and Kim also described how they are *Advocates of the Practical* and what it truly means to fulfill the role of a PE teacher in today's K-12 schools:

> We go over the rules of the school. What the procedures are for going to lunch and recess, and bigger school community things, as well, as how to manage kids. We discuss different ways to start your own classroom. (Linda)

> I think is important for cooperating teachers to help student teachers understand the workload and what it really takes to be an effective teacher in a building. (Kim)

When asked to describe the role of *Advocates of the Practical*, Taylor said, "Many things go on outside of the gym, and it is important we allow them to experience all areas of being a teacher."

Abiders of Change

All five PECTs shared experiences of adjusting their day-to-day tasks and teacher roles to accommodate having a student teacher in their classroom. The PECTs were not cynical about their day's changes when supervising; they just adjusted their day. Examples included using their planning periods to look over student teachers' lesson plans or rearranging the curriculum taught for the student teacher's EdTPA assessment. Brett shared how he makes changes to his day to work with his student teacher:

> . . . if you look in the background, I'm actually doing twice as much work, because every planning period that I have is speaking with them and working with them to help them get better.

Linda mentioned designating time each day to reflect with the student teacher, which they would not do if they were not supervising a student teacher, "I plan for daily meetings with student teachers reviewing the day's lessons."

Teachers of Children

Teachers of Children's role was similar to the *Convener of Relation*'s role in that PECTs did not do anything different or add a new function to their list of duties when serving as a PECT. Due to the nature of being an educator, all PECTs are *Teachers of Children* by trade. When asked about this role, four of the five PECTs were confused about how the *Teachers of Children's* role was considered a teacher-educator role. After an explanation, the PECTs came to understand the role. For example, Linda said, "I teach Kindergarten through Grade 6 and not K-12." Similarly, Brett explained, "K-12 sort of threw me off because I am specific K-5." Overall, it was apparent that PECTs do not consider the *Teachers of Children* as a role or responsibility of a PECT because it is something they already do.

The 11 Teacher-Educator Roles

Taylor, Linda, Dave, Brett, and Kim provided detailed examples of how they partake in the 11 identified teacher-educator roles. Furthermore, all five PECTs expressed a belief that PECTs should participate in the teacher-educator roles in some capacity. To sum-

marize, Linda indicated all of the teacher-educator roles are necessary for PECTs to engage during the student teaching experience, stating:

> As a mentor teacher, I believe my roles are to support teacher candidates in refining their teaching techniques, support planning/lesson design practices and classroom management strategies, reflect and engage in the school. . . We need to do it all.

Equally, Dave concluded his interview by saying, "I believe CTs should participate in these roles because they have been vetted. Modeling, providing feedback, and different forms of assessments are all important. Just the tip of the iceberg." Brett stated, "I believe CTs should participate in these educator roles."

Discussion

The PECTs in the current study provided examples of their participation within these roles, which support previous research on CT's roles and responsibilities (Clarke et al., 2014; Rajuan et al., 2007). The five PECTs confirmed that they participate in numerous teacher-educator roles during the student teaching experience, and they believe PECTs should participate in these roles. This study also found that the level of education and amount of student teachers supervised did not impact how the PECTs participate or their beliefs about how PECTs should engage throughout the student teaching experience. These findings seek to answer the call of Clarke et al. (2014), who made a claim that "without a clear understating of how CTs participate- or are expected to participate- in teacher education, it is difficult to know how best to support that work" (p. 164.). This study attempted to theorize Clarke et al. (2014) work and empirically support previous literature surrounding CTs.

Understanding teachers' belief structures is critical to improving teacher education programs and teaching practices (Pajares, 1992). Richardson (1996) stated that "attitudes and beliefs are important concepts in understanding teachers' thought processes, classroom practices, change, and learning to teach" (p.102). Understanding PECT's beliefs about serving in the PECT role can help PETE programs identify PECT supervisory practices. For teacher preparation

programs to support knowledge transfer from theory to practice, they need to recognize CTs' beliefs (Verloop et al., 2001). Thus, PETE programs should be aware of PECTs' beliefs about the 11 teacher-educator roles to ensure the PECT's beliefs of their role align with the PETE programs' beliefs about expectations of PECTs. Below, the 11 teacher-educator roles are discussed individually and then jointly.

The 11 Teacher-Educator Roles

Providers of Feedback: Conclusively, the PECTs in this study believed they and all other PECTs should provide feedback to their student teachers. This finding supports Clarke et al. (2014), who stated, "Providing feedback is clearly one of the most significant elements of CTs work with student teachers, and this provision is not only expected but also largely defines the work of the CTs" (p. 175). Acknowledging PECT's delivery of feedback opens a discussion about understanding how PECTs are delivering feedback. For example, is it verbal or written? How much feedback is the PECT giving their student teacher? Is the feedback being provided appropriate for the student teachers' developmental phase? Is the PECT giving the student teacher the correct type of feedback that promotes reflection on the student teacher's part? Beck and Kosnick (2002) found that preservice teachers in their study often cite a need for more explicit feedback from CTs to negotiate this decision-making process. Similarly, Shantz and Ward (2000) conducted a study in which they asked preservice teachers to complete questionnaires about their field experience. The respondents articulated a need for more positive, constructive feedback from CT. From the current study, we can say that PECTs deliver feedback. However, further investigation into the type, amount, and delivery of feedback is needed to understand how PECTs participate as *Providers of Feedback* fully.

Gatekeeper of the Profession: While the PECTs report that they engage in this role and believe it is important, it is unclear how much weight the PECT's evaluations of the student teachers hold in their passing the student teaching experience. Moreover, it is unknown if PECTs completely understand how to deliver the summative assessments on behalf of the student teacher. Clarke et al. (2014) suggested further investigation into the role of *Gatekeeper to the Profession*: 1.) Are CTs knowledgeable enough for summative evaluation? 2.) Are the tools that are available sufficient for summative evaluation? and

3.) Are CTs' summative evaluations discerning enough to ensure that individual differences and performance standards are recognized and accurately reported? While the present study did not seek to answer these three questions, it supports the implications of this study that continued efforts of how PECTs are evaluating and assessing student teachers be explored.

Modelers of Practice: It is a firmly held expectation that the student teaching experience is an opportunity for student teachers to observe the modeling of teaching practice (Clarke et al., 2014). Beyond observing the PECT within the gym's four walls, the student teachers may see their PECT in staff meetings, leading parent-teacher conferences, or supervising during lunch or recess duty. CT's participation in teacher education as a modeler of practice is an important aspect of their role and is expected by teacher preparation programs (Clarke et al., 2014). However, it is unclear from the findings in this study if the modeling practice by PECTs is aligned with the affiliated PETE program. A high level of continuity of these expectations would require PECTs to fully understand the PETE programs' philosophical underlings of teaching and learning, teacher dispositions, and engagement to parallel the PETE program's desires.

Supporters of Reflection: Clarke et al. (2014) stated, "The expectation that CTs ought to encourage and engage student teachers in reflective practice is evident in virtually every university's 'Teaching Practice Handbook'" (p. 178). The current study highlights the involvement of PECTs in helping their student teachers reflect. The data support work by Stegman (2007), who documented strategies that enhance reflections for CTs in guiding student teachers: offering suggestions and observations from personal experience, providing supportive commentary, advice, and insight, recommending instructional and participatory strategies, and validating thoughtful lesson preparation. These strategies are similar to the interviews' responses on how PECTs encourage reflective practices for their student teachers. Nevertheless, it remains unknown if PECTs appropriately direct student teachers through a reflective process that is meaningful to their development as a novice teacher. The suitable type and amount of reflection practices remain unknown; however, it is evident from the results of the present study that PECTs engage their student teachers in reflective practice and believe it is crucial for their role as

a PECT. Further investigation into the reflective practices of PECTs is warranted to understand how PECTs engage in this role fully.

Gleaners of Knowledge: The role of *Gleaners of Knowledge* is one of only a few roles in which PECTs do not do anything to partake in the role. The five PECTs identified themselves as *Gleaners of Knowledge*, which supports previous literature in that CTs have an increase of new knowledge during their time working closely with the student teacher. One of the biggest motivators for serving as a CT is increasing one's professional knowledge because of student-teacher interaction (Clarke, 2006). With a better understanding of the exact types and ways PECTs gain new knowledge when serving in this role, there is a case for arguing that serving in this role could be compensated with some professional development or continuing education credit, dependent upon numerous factors at the associated university.

Purveyors of Context: Arguably, one of the most important roles of a CT is providing context for student teachers because, without context, there is no student teaching experience. The five PECTs mentioned providing 'real-life experiences' for student teachers throughout the interviews. Supporting preservice learning in a K-12 setting is vital to student teachers gaining the necessary skills for a smooth transition into the profession. CTs have an essential job in managing that context and introducing student teachers to the obvious and often hidden dimensions of teaching as appropriate to and considering a student teacher's stage of readiness (Clarke et al., 2014). The current study did not ask any specifics about the PECTs school contextual setting, rather just demographic information. Therefore, further exploration into the contextual environments and settings important for student teachers to experience the most diverse cultural, political, and social-economic contextual setting for student learning is needed. Once identified, PETE programs could use contextual environments to identify placement sites and PECTs that can provide the settings ideal for the transfer of learning.

Conveners of Relation: One of the aspects of the CT role not often mentioned in a 'Student Teaching Handbook' is the relationship formed by the CT and student teacher during the student teaching experience. *Convener of Relation* is partially a result of working closely with the student and a role that PECTs can intentionally

foster throughout the student teaching experience. During the interviews, the PECTs described their different negative or positive relationships with their student teachers. Stewart et al. (2017) state that the CT advises and offers guidance, leadership, and possibly even friendship to their student teacher. Thus, supporting the notion that CTs do create some type of relationship with their student teacher. Likewise, Clarke (2006) reported that CTs felt that establishing a personal connection with the student teacher was important to establish and maintain throughout the placement to be an exemplary mentor. It would be beneficial for PETE programs to add information about the innate relationship between the PECT and student-teacher interaction to the 'Student Teacher Handbook' to provide a more comprehensive understanding of the PECT role.

Agents of Socialization: The *Agent of Socialization* role is a multifaceted involvement providing abundant learning opportunities for the student teacher. Literature suggests that CTs significantly influence student teachers and how they participate in and distinguish the teaching profession, with research highlighting the socialization process that occurs during field experiences. Noteworthy, all five PECTs recognized their role as an *Agent of Socialization* and declared the importance of this role during the student teaching experience. Similarly, all PECTs were able to detail how they are mindful of providing or encouraging their student teachers to interact within different schools or community settings. "CTs are powerful agents of socialization, and they must be aware of the messages that they communicate (both implicitly and explicitly) to student teachers and how these messages impact student-teacher learning" (Clarke et al., 2014, p. 182). It is unclear what type of socialization instances PECTs provide their student teachers that are the most beneficial in the socialization process. Further investigation to understand the complex role of PECTs engaging as *Agents of Socialization* is required.

Advocates of Practical: The data determines that PECTs agree to participate in the *Advocates of Practice* role and believe it is important for PECTs to engage. PECTs shared how they help with lesson planning and assist the student teacher in classroom management. Supporting literature identifies practical elements that may include but are not limited to helping the student teacher adapt to their classroom placement, lesson planning, pacing and transitions of the

lesson, and classroom management (Moore, 2003). CTs carefully guide student teachers in the school classroom's practicalities (Beck & Kosnik, 2000; Rajuan et al., 2007). The CT provides the platform to bridge the gap between knowledge and skills learned through PETE programs and the practical application of methods during the student teaching experience (Christenson & Barney, 2011). PECTs link theory and practice for student teachers in connecting to "real world" teaching. Thus, it provides student teachers the opportunity to know what it is like in the physical education classroom.

Abiders of Change: While PECTs are the superior and in charge of their classroom and students, they change their day-to-day duties, responsibilities, and teacher roles to accommodate the student teacher. The idea that PECTs make changes to their day-to-day schedules was evident in the interviews. For example, Dave shared that he often used his plan period to help the student teacher plan a lesson or reflect and provide feedback; he is, in turn, using his designated plan time to assist and support the student teacher. What is clear from the current study is that PECTs are aware of their changes during their days when they supervise a student teacher and believe it is an essential role for PECTs to partake. While CTs relish the opportunity to work with student teachers, there are unspoken and often hidden dimensions of their work that they quietly and patiently accept. They do so without bother despite the impact it may have on them (Clarke et al., 2014). For example, emotional tolls such as frustration, annoyance, distraction, loss, and/or relief that working with a student teacher can have on CTs often go unrealized (Hastings, 2004). Further inquiry into identifying how PECTs make changes to their day may provide a more comprehensive understanding of PECTs' engagement in this role.

Teachers of Children: Of the 11 teacher-educator roles, the only role that did not materialize from the interviews organically was the role of being a *Teacher of Children*. This confusion may manifest because most of the interview questions asked PECTs to share their PECT supervisory role experiences and did not think it was as relevant as the other roles when working with a student teacher. Due to the nature and expectations of a CT, PECTs must view themselves as K-12 teachers and teachers of future teachers (teacher-educators) in unison. The role of being a K-12 teacher and CT is a "conflict of dual

loyalties to student teachers and to the pupils they teach" (Rajuan et al., 2007). While this may seem obvious, it is important to remember that this responsibility is often overlooked when looking at CTs' literature and their relationship with the student teaching experience. This teacher-educator role will be further explored in the limitations section.

This study provides insight into the perceptions of five PECTs' participation and beliefs of PECTs about their roles during the student teaching experience. Further research in this area is needed before this complex and multifaceted role can be understood entirely. Beyond understanding the role, continued research can help identify the support structures required to assist PECTs throughout the student teaching experience.

Limitations and Future Research

The first limitation of this study is researcher biases. Qualitative research is subject to the researcher's interpretations (Creswell, 2013). Acknowledging at the beginning of this study, the researchers may have believed PECTs did participate in most of the teacher-educator roles is an important consideration. Another limitation of this study is a convenience sample because the PECT participants may have differed from PECTs who did not participate (Creswell, 2013). As with most qualitative research, there is a risk to internal validity due to the nature of the data's self-reporting. The interviewees may have responded to interview questions based on what they thought they should say rather than the truth.

Future studies could employ a larger and geographically more diverse sample to generalize to the larger population. One recommendation for future research is to study the consistency between PETE faculty, university supervisors, and K-12 school administrators regarding their beliefs and understandings of how PECTs should participate in the 11 identified teacher-educator roles. Much of the field experiences literature is presented from three viewpoints: the student teacher, the university supervisor, and the PECT. Adding new perspectives and perceptions about PECTs, such as views of PETE faculty, would add a broader perspective on the expectations of PECTs. Another extension related to PECTs' participation and beliefs would be to systematically observe the participation and actions of the PECT during the student teaching experience. Observing

PECTs would provide the opportunity to compare the self-reported data to objectively observed data. Additionally, examining PECTs' knowledge and understanding of adequate supervision and completing the role accurately per PETE program expectations could stand in great stead in understanding how to prepare PECTs for their role. Furthermore, inquiring if PECTs believe they do the role well could add to understanding PECTs' engagement, as this study indicates PECTs believe they should engage in the 11 teacher-educator roles.

In conclusion, this study provides insight into the relationship between participation and beliefs of PECTs. Supporting CT research, this study acknowledged 11 teacher-educator roles that PECTs participate in during the student-teaching experience and that PECTs believe are part of the responsibility of serving as a supervisor during the student-teaching experience.

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PEDAGOGY

Investigating the Impact of Learning Modality Shifts on K-12 Students' Physical Activity Participation During the COVID-19 Pandemic

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Abstract

The COVID-19 pandemic created many challenges for K-12 schools during the 2020-2021 school year (e.g., establishing social distancing measures, decisions regarding testing protocols, and transition from in-person to distance learning). Changes in teaching and learning modalities, from in-person to remote learning options, quickly became a reality for many students [an estimated 95%, according to Engzell et al. (2021)]. With an increase in distance learning came changes in students' structured and unstructured physical activity participation. The impact of these changes is unknown and justifies research investigating the effect modality shifts held on students' participation in physical activity and any associated outcomes. A mixed-methods survey was administered to examine changes in K-12 students' learning modality,

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participation in physical activity, and associated outcomes. Changes in learning modality from in-person to online were most frequently indicated (90%). Respondents stated both challenges and success stories associated with students' participation in physical activities resulting from modality shifts (e.g., decreased social engagements, decreased exposure to structured and facilitated physical education, and increased outdoor play). Positive outcomes were most prevalent in children engaging in moderate PA. However, 85% of respondents indicated a decrease in their child's physical activity participation. Our findings justify further investigation of the immediate and long-term impact of school modality shifts on students' engagement in physical activities.

Introduction

Throughout the 2020-2021 school year, the United States K-12 education system faced a breadth of challenges in providing students with an effective learning experience as a result of the COVID-19 pandemic. Select challenges included a swift transition in teaching and learning modalities, maintaining stakeholders' (i.e., students, guardians, educators) engagement and positive moral, and facilitating physically and cognitively challenging learning initiatives online (Roe et al., 2021). This research project explores the impact of learning modality shifts on K-12 students' participation in physical activity and the breadth of outcomes students associate with these shifts during the 2020-2021 school year.

K-12 Schools' Response to COVID-19

The COVID-19 pandemic affected approximately 95% of the world's student population in suspending face-to-face teaching in schools, making it the largest disruption to education in history (Engzell et al., 2021). In 2020, the Centers for Disease Control and Prevention (CDC, 2020b) established an outline of COVID-19 prevention strategies that included personal hygiene, the use of personal protective equipment (PPE), and physical distancing to provide the public with strategies to mitigate the spread of COVID-19. Prior to the start of the 2020-2021 school year, U.S. state school boards began formulating a plan of action to continue learning and instruction while meeting the recommendations of the CDC (NC Department of Health and Human Services, 2020a). The resulting impact of these

measures led to remote learning options (e.g., synchronous or asynchronous virtual courses) emerging as the main method of teaching delivery (Engzell et al., 2021).

The Importance of Physical Activity in Youth Development

Healthy growth and development for children are grounded in the importance of physical activity and movement. Routine engagement in physical activity is well documented as an influential element of students' personal (e.g., increased self-confidence, physical health, self-awareness, mental restoration) and academic development (e.g., increased investment in learning, reflection on content, reliance on social learning) (Bento & Dias, 2017; Committee on Physical Activity, 2013; Holland et al., 2018). The benefits of a physically active body on an intellectual mind have been shown for age groups ranging from early childhood to old age (Rasmussen & Laumann, 2013). In the school setting, physical activity participation in K-12 students has been found to be necessary for its physical health benefits and, later, its direct relationship with increased social, mental, and emotional development (Rasmussen & Laumann, 2013). Students routinely engage in structured and unstructured activities such as Physical Education class (P.E.) and daily recess. These activities provide opportunities for young students to practice movement and motor skills and promote social and emotional learning and development for students of all ages (American Academy of Pediatrics [AAP], 2013).

Benefits associated with physical activity also contribute to positive mental health outcomes, including reduced levels of anxiety and depression and improved self-esteem (Committee on Physical Activity and Physical Education in the School Environment; Food & Nutrition Board, 2013). Demand for mental health care for adolescents has increased over the past decade (Moitabai & Olfson, 2020), and mental health issues among K-12 students are a growing concern as an estimated 20-25% of children in the U.S. experience a mental health disorder each year (Bains & Diallo, 2016). Research suggests that promoting physical activity may protect the mental health of this group (Rodriguez-Ayllon et al., 2019). However, the relationship between physical activity and children/adolescents is complex, and positive outcomes and mental health benefits can depend on the

context and personal experience related to physical activity (Biddle et al., 2019), yet benefits associated with physical activity make it an important component of positive health and development for this age group.

Difficulty of Tracking Physical Education

Virtual or remote learning from home has been identified as a potential indicator for decreased promotion and participation in physical activity for students (Roe et al., 2021). Physical education in schools is foundationally supported by the CDC and is outlined as a planned, sequential curriculum for K-12 based on national standards (CDC, 2021). Before the COVID-19 pandemic, the national standard disseminated to state boards of education recommended implementing 60 minutes or more of daily physical education activities (Physical Education During COVID-19, 2021). Potential adaptations to physical education in remote learning formats included asynchronous pre-filmed videos where students were provided the means to complete the physical activity lessons on a weekly basis (Physical Education During COVID-19, 2021). However, the pivot from in-class physical activity participation to at-home participation shifted the accountability of students' participation from their teacher to the parent or guardian. While teachers could encourage students to remain active and participate in their virtual physical education and daily physical activity on their own, it became difficult to track a student's participation (Physical Education During COVID-19, 2021).

From a review of the literature, there appears to be limited research exploring the impact of modality shifts on K-12 students' physical activity engagement. Therefore, this study focused on the following research questions:

Research Questions

Q1: How, if at all, was physical activity participation influenced as a result of shifts in K-12 students' learning modality?

Q2: What outcomes, if any, are associated with changes in K-12 students' physical activity participation resulting from learning modality shifts?

Methods

A mixed-methods survey was constructed using Qualtrics survey software and administered via social media over a duration of 3-weeks in Fall 2021. The population for this study included legal guardians of K-12 students during the 2020-2021 school year. The study was approved by the University of North Carolina Wilmington Institutional Review Board (#21-0300).

To investigate changes in learning modality associated with the pandemic, respondents were asked, "*During the 2020-2021 school year, was your child's learning format different from previous school years as a direct result of COVID-19?*". Further, respondents were asked, "*What type of learning format did your child change from?*" and "*What type of learning format did your child change to?*" To investigate changes in physical activity participation, respondents were asked, "*Did your child's participation in physical activity change as a result of their school's response to the COVID-19 pandemic?*" Respondents who indicated a change in their child's participation in physical activity were asked, "*Please explain in detail below how your child's participation in physical activity changed as a result of their school's response to the COVID-19 pandemic?*" Lastly, to investigate outcomes associated with changes in learning modality, respondents were asked if they associated positive or negative outcomes with their child's participation in the previously mentioned physical activity over the 2020-2021 school year. Respondents who indicated either outcome were asked to explain those outcomes in detail.

Frequencies and percentages were computed for all questions to analyze responses to closed-ended questions. An open coding technique was used for open-ended responses. Responses were first coded into corresponding groups individually by two researchers. Next, coding notes were shared to identify congruencies in coding, and upon agreement, categories were created from the list of codes. Lastly, each researcher recorded responses using the agreed-upon codes and categories. Two researchers each used the predefined value categories to code responses. Codes were compared and discrepancies were addressed to determine final code categories.

Results

Following data collection, cleaning and the removal of incomplete surveys, our final working sample included 211 surveys. Students ranged in grade level from kindergarten to twelfth grade, with first grade most frequently indicated (28%). Our sample consisted of 56% male (43% female) and 84% self-identifying as *white or Caucasian*. Fifty-seven percent of students attended public schools, and 23% attended charter schools.

Shifts in Learning Modality Associated with the COVID-19 Pandemic

The vast majority (92%; N=194) of our sample indicated their child had experienced a change in learning modality during the 2020-2021 school year as a direct result of COVID-19. Most of these individuals (90%; N=174) changed from an in-person to a fully virtual/remote learning modality.

Q1: Participation in Physical Activity Associated with Shifts in Learning Modality

Of respondents who indicated their child had experienced a change in learning modality (92%; N=194), 92% indicated their child's participation in physical activity changed because of their learning modality shifting. When asked how their child's participation changed, respondents indicated increased and decreased participation forms. Seven change categories were constructed from respondents' data (Table 1). However, decreases or the absence of physical activity participation were most frequently indicated (85% of respondents). The absence of extracurricular activities (41%), decreased general physical activity participation (34%), and an increase in unstructured physical activity participation (26%) were the three most frequently indicated change categories. One respondent indicated, "*Decreased. During in-person school, he would have recess every day and PE a couple of times a week. Remote school reduced PE to once a week and having two working parents made daily recess difficult.*" Table 1 shows each change category indicated by >10% of respondents, the percentage in which each category was coded from respondent data and select quotes from respondents for each category. Interestingly, seven percent of respondents indicated an in-

Table 1
Changes in Physical Activity Participation Resulting from Modality Shifts

Category	Percentage	Select Respondent Quote
No extracurricular activities	41	• "*We stopped playing sports due to health concerns for my child.*"
Decreased physical activity	34	• "*He was more sedentary. I had to make him do physical activity daily.*"
Increased unstructured physical activity	26	• "*Extracurricular after school activities were limited so my son began running*"
Logistical physical activity changes	25	• "*Gym class was outside. They set up a gaga ball pit for them. Inside, the gym was half closed off as an eating area to help distance kids while they ate lunch.*"
Decreased social physical activity	22	• "*Activities with friends were often discouraged by other parents.*"
No physical activity	19	• "*My student ceased to participate in anything. My student slept a lot and was eventually diagnosed with depression.*"
Increased screen time	13	• "*Less active overall - sitting in front of computer screen most of each day.*"

**Percentages do not equal 100% because respondents could indicate more than one change*

crease in their child's physical activity associated with shifts in their learning modality.

Q2: Outcomes Associated with Physical Activity Participation During Modality Shifts

Positive Outcomes

Of children who had experienced a shift in learning modality, 14% of the parents associated a positive outcome(s) with changes in their child's participation in physical activity resulting from learning modality shifts. Nine positive outcome categories were constructed from respondents' data. Most respondents stated that their child's adapted participation in physical activity was associated with maintaining physical or mental health (indicated by 95%). Maintained mental health (54%), physical health (41%), and exposure to social contexts (40%) were the three most frequently indicated positive outcomes categories identified. Table 2 shows each positive outcome category indicated by >10% of respondents (who associated a positive outcome), the percentage in which each category was coded

Table 2
Positive Outcomes Associated with Changes in Physical Activity Participation Resulting from Modality Shifts

Category	Percentage	Select Respondent Quote
Maintained mental health	54	• "*My child was able to rejuvenate mental fatigue.*"
Maintained physical health	41	• "*My son continued to practice soccer which gave him much needed physical activity and maintained his physical health.*"
Exposure to social groups	40	• "*She wasn't isolated. She was around other kids and always had interactions with them.*"
Increased unstructured physical activity	35	• "*Spent more time participating in unstructured activities that built confidence and improved overall physical health.*"
Increased time spent outdoors	32	• "*Because activities were cancelled, all the kids in our neighborhood were home to play outside every day at lunch and after school.*"
Technical skill development	28	• "*He has become a very good tennis player.*"
Increased self-confidence	17	• "*Outside of school activities-built confidence.*"
Maintained normalcy	16	• "*Gymnastics team helped maintain some sense of normalcy.*"
Developed new hobbies	16	• "*She learned archery & rope climbing.*"

**Percentages do not equal 100% because respondents could indicate more than one outcome*

from respondent data and select quotes from respondents for each category.

Negative Outcomes

Of K-12 students who had experienced a shift in learning modality, 86% of their parents associated negative outcomes with their child's participation in physical. We coded nine negative outcome categories from respondents' data. The three most frequently coded negative outcome categories included decreased physical (80%), decreased social interactions (79%), and a decrease in motivation to engage in physical activities (71%). Table 3 shows each negative outcome category indicated by >10% of respondents (who associated a negative outcome), the percentage in which each category was coded from respondent data and select quotes from respondents for each category.

Table 3
Negative Outcomes Associated with Changes in Physical Activity Participation Resulting from Modality Shifts

Category	Percentage	Select Respondent Quote
Decreased physical health	80	• "*He gained weight, lost muscle and worst part his drive to participate diminished.*"
Decreased social interactions	79	• "*He did these activities alone. Missed team sports.*"
Decreased motivation to be physically activity	71	• "*My child lost interest and motivation to participate in physical activities.*"
Decreased mental health	66	• "*Lack of contact with other peers as well as activities seemed to negatively impact emotional well-being.*"
Increased screen time / dependency	59	• "*She grew an increased dependency on her computer and phone.*"
Decreased body image	57	• "*My child gained excessive weight and didn't gain skills/physical confidence that he should have at that age.*"
Decreased social skills	56	• "*The lack of team sports meant a lack of learning to play as a team.*"
Decreased diversity of physical activity	43	• "*There was a lot less focus on the variety of activities they usually participate in during a school setting.*"
Deceased desire to go outdoors	33	• "*My kid doesn't want to go outdoors as much anymore.*"

**Percentages do not equal 100% because respondents could indicate more than one outcome*

DISCUSSION

This study aimed to identify the impacts of learning modality shifts associated with changes in K-12 students' physical activity engagements during the 2020/2021 academic school year. Further, we aimed to explore the breadth of outcomes, if any, associated with changes in K-12 students' physical activity engagement resulting from modality shifts. Our findings demonstrate that many students experienced modality shifts and adapted their physical activity participation as a result. Further, our findings show that the changes made in K-12 students' physical activity engagements are associated with a range of positive and negative student outcomes. The following sections will discuss these findings and their implications further.

K-12 Students' Adaptations to Physical Activity Due to COVID-19

Guardians in our study frequently expressed the hardship of structured extracurricular activities (e.g., school sports, specialty

camps, social gatherings) no longer being provided for their child. Many of these activities were associated with structured physical activity engagements, opportunities to socialize, soft and hard skill development, and provided guardians with forms of routine childcare. As a result of these activities no longer being provided, K-12 students were pushed to demonstrate adaptability and self-reliance in their physical activity and social engagements. Unfortunately, our data demonstrates this was not a productive responsibility to place on most students (85% of respondents indicated a decrease in their child's physical activity participation).

Outcomes Associated with Changes in Student's Physical Activity Participation

Many of the respondents reported that shifts in their child's learning format created challenges in maintaining their physical activity participation. Parents identified both positive and negative outcomes in their children related to their participation in physical activity due to learning modality change. Of those respondents, 84% indicated their child experienced negative outcomes, whereas only 14% indicated positive outcomes. Due to the learning modality change, many parents who indicated negative outcomes noted their child was participating in fewer extracurricular activities and reduced structured activities such as P.E. when they were not attending in-person school. Some respondents who indicated their child's ability to spend more time participating in outdoor play with the increased amount of time spent at home saw positive outcomes. This may provide some evidence to support the idea that physical activity participation in children promotes healthy growth and development.

Implications of Changes in K-12 Students' Physical Activity Engagements

The amount of structured physical activity students had been receiving during the school day greatly decreased during the 2020/2021 school year because of learning modality changes. While some children still could participate in extracurricular and physical activities outside of the school day, which indicated positive outcomes such as maintaining both physical and mental well-being, many were not participating in much physical activity at all. Participants in our study noted that their child had decreased physical, emotional, and

mental health as a result of this loss of physical activity and interaction. 80% of the respondents indicated negative outcomes correlated these changes in their child with decreased physical health and 79% with decreased mental health. The data in this study indicates changes in physical activity affecting outcomes associated with a child, with increased physical activity levels correlating with positive outcomes and decreased physical activity levels correlating with negative outcomes.

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SPORT

Dimitrios Vikelas: The First President of the International Olympic Committee and His Role in the Implementation of the First Olympic Games

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Abstract

This paper explores the life of Dimitrios Vikelas, specifically as it relates to his work in bringing the first modern Olympic Games to Athens, Greece, in 1896. The increasing professionalization of the Olympics has shifted the focus of the Games toward sport and the building of superstars rather than the ethical values that can be gleaned from this international event. Discussing Olympism and Vikelas' core values with students is an important way to reintegrate fair play and sportsmanship into all levels of sport. The paper examines the history behind the concept of international sporting games, specifically the ancient Olympic Games, their much-imitated early European counterparts, and the Modern Olympics. By teaching Vikelas' philosophy of brotherhood and sportsmanship in the classroom, we can begin to breath the spirit of Olympism back into the Olympic Games.

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Introduction

The modern Olympic Games have undergone a considerable evolution since its resuscitation in 1896. As the rescheduled 2021 Olympic and Paralympic Games closed in Tokyo, discussing Olympism and its core values is an important way to reintegrate the concepts of fair play and sportsmanship into all levels of sport. This paper explores the life of Dimitrios Vikelas, specifically as it relates to his work in bringing the first modern Olympic Games to Athens. This work was expanded from Kantzidou's (2004) proceeding in the 12th International Seminar on Olympic Studies for Postgraduate Students. The present manuscript represents the completion of that work. The purpose of the manuscript was to examine the history behind the concept of international sporting games, specifically the ancient Olympic Games, their early European counterparts, and the modern Olympics.

The Birth of Modern Sport in Europe

Since the beginning of the 17th century, there has been a remarkable amount of activity in the field of sports throughout Europe. Europeans have a history of both team games and individual contests, specifically the organization of athletic games in the pattern of the ancient Olympic Games.

In 1610, Robert Dover and William Penny Brooks organized athletic games in England that mirrored the spirit of the ancient Olympic Games (Mouratidis, 1994). In the 1770s, a part of Germany witnessed similar games: Leopold F. Franz, governor of Dessau, organized these games on September 24 each year. These games were held as a birthday present for Franz's wife. Students of the village Niesk of Goerlitz and the surrounding area were invited to take part in the Olympic Games around the same time as Franz's games in Dessau (Morbach, 1998).

Of course, one should never forget the "*Dessau Pentathlon*" established by Jochan Bernhardt Basedow in *Philanthropinum*. Basedow founded the event in Dessau in 1774, using the ancient Greek pentathlon as a model (Saurbier, 1966).

Flash forward to France in 1972, during the fourth year of the French Revolution. During the drawing up of the Revolutionary calendar, Gilber Romme suggested that the extra day of leap years be

fixed as the day of the French National Olympiad (Morbach, 1998). The glory of the ancient Olympic Games spread all over Europe through the study of Greek writings.

This glory was being shown in two ways. Initially, the spread of the Olympic Games was characterized by a keen interest in bringing to light the cities and facilities where these games were held. Secondly, the organization of athletic events referred to as "Olympic Games" was sweeping across Europe with increased frequency and popularity.

Despite the problems incurred during the long-lasting Turkish occupation, Greece, too, was moving toward establishing the "Olympic Games." Serious effort was made to re-establish the Olympic Games promptly after liberation. The city of Letrina put the games into action first by organizing the "Olympic Games" in 1838 (Giatsis, 2000).

However, the most important effort to revive the Olympic Games was undertaken by national benefactor Evangelos Zappas. Zappas inspired and financed athletic games that he called Olympia. These games took place successfully in the context of a business, trading, and industrial exhibition during the years 1859, 1870, 1875, and 1888-89 in Athens (Mouratidis, 1994). These games were undoubtedly the forerunner of the modern international Olympic Games (Linardos, 1999).

The Rebirth of the Olympic Games

The most direct step toward the rebirth of the Olympic Games was made by French baron Pierre de Coubertin, who organized an International Sports Convention in June of 1894 in Sorbonne of Paris. The convention in 1894 came after his first ineffectual attempt in 1892 (Mouratidas, 1994). The principal purpose of this convention was to awaken the sporting spirit and rally people around the Olympic ideal of Antiquity. As a result, after well-planned preparation (Morbach, A., 1998), the first International Sports Convention started its proceedings on June 16 (Georgiadis, *The Rebirth*). Coincidentally, Dimitrios Vikelas participated in that convention as a representative of the Pan-Hellenic Gymnastic Club (P.G.C.) of Athens, or more correctly, of Greece.

Dimitrios Vikelas was the son of Emmanuel Vikelas from Veroia and Smaragda Mela from Ioannina. Both his father's and mother's families left their hometowns at the beginning of the 19th century

and sought a better fortune by engaging in trade in Constantinople. However, with the beginning of the fight for freedom in Greece (March 25, 1821), both families left Constantinople and settled in Syros. Dimitrios was born on this island of the Aegean on February 15, 1835. He was the firstborn of four children to Emmanuel and Smaragda Vikela. The Vikelas were well off. Smaragda, Dimitrios's mother, was a woman of great learning, and because of this, Dimitrios received an excellent education. Dimitrios possessed a lot of remarkable virtues at a very young age and gave considerable signs of his culture; at the age of 15, he translated the tragedy '*Esthir*' by Rakina (Oikonomou, 1953). In addition, he gave clear indications of his literary talent by writing remarkable poems.

At the age of 17, on May 17, 1852, Dimitrios Vikelas left his parents in Constantinople (Oikonomou, 1953). After passing Syros, he headed toward London, where he was received by his mother's two brothers, businessmen Vasilios and Leonidas Melas. In London, Vikelas was to spend a long period of his life. Here, in London, he reached manhood. Vikelas acquired an academic education and made many acquaintances with important political figures of the time. These acquaintances, along with successful trade and culture ventures, allowed him to amass a large fortune. This fortune allowed him to quit his business activities and devote himself entirely to literature and his country (Oikonomou, 1953). During this time in his life, he met and married his wife, Calliope. During his stay in London, he managed to combine harmoniously his business activities with his literary and social activities. Vikelas spent much of his free time studying and translating texts and writing short stories. His short story '*Loukis Laras*' became well-known all over the world and was translated into many foreign languages. The story brought Greece and Greek literature into the international foreground and gave Vikelas an international reputation.

Thus, the stage was set for Vikelas to contribute to the development of the great interest in philhellenism sweeping the European countries. At 45, he had the economic independence, fame, and affluent acquaintances to play a part in arguing for a more just treatment of Greek affairs by International Diplomacy (Oikonomou, 1953). His love for Greece contributed to his decision to leave London on

November 9, 1876. He returned to Greece, where he would live in Athens for the remaining majority of his life (Oikonomou, 1953).

Dimitrios Vikelas' Part in the Modern Olympic Games of Athens 1896

Despite Vikelas' desire to make a permanent home in Greece, his wife Calliope's serious health problems forced them to leave Athens and move to Paris for the next few years (Oikonomou, 1953). During this time, the first International Sports Convention was to take place in the French capital (16.6 to 24.6.1894; Giatsis, 2000). The convention included representatives from sports clubs all over the world. In addition to these representatives, important figureheads in politics, diplomacy, and culture were also invited to participate in the convention. An invitation to represent Greek athletics was sent to the President of the Pan Hellenic Gymnastic Club (Panellinios Gymnastikos Syllogos/P.G.S.) of Athens, Ioannis Fokianos.

To his great astonishment, in May 1894, Dimitrios Vikelas received a letter from the Pan Hellenic Gymnastic Club (Panellinios Gymnastikos Syllogos/P.G.S.) of Athens. In this letter, the Club proclaimed him a "corresponding member," even though he himself was never involved with athletics (Oikonomou, 1953). His surprise was resolved the next day when a second letter from the club invited him to be their representative in the International Sports Convention taking place in Paris in June 1894. The letter explained that the convention was "for the re-birth of the Olympic Games" (Georgiadis, 2001). Inside the same envelope, there was a twenty-page dissertation on the Ancient Greek Games that Vikelas was to present at the Convention. The fact that he had a complete ignorance of sports issues made him initially consider declining the invitation from the Pan Hellenic Gymnastic Club (Panellinios Gymnastikos Syllogos/P.G.S.) (Linardos, 1991). However, Vikelas began to consider the invitation a unique opportunity for Greece to come into the international foreground. With this goal in mind, he let go of his initial reservation and accepted the authority with satisfaction. On June 6, 1894, he sent a letter to P.G.C. expressing his gratitude for the honor of representing them (Oikonomou, 1953). He then took it upon himself to translate the memorandum (Oikonomou, 1953).

From June 16-24,1894, 60 representatives of sports clubs all over the world assembled in the amphitheater of 'New Sorbonne' in Paris. After settling all issues, they separated into two committees. The first committee was to specify the notions of amateur and professional athletes, whereas the second committee, presided over by Vikelas, had to deal with the organization of the games. In Ancient Olympia, these games were 24, six of which were for the boys (Oikonomou, 1953). Vikelas had a unique opportunity to make his life dream of helping his country come true. During the last general session, Vikelas, without asking anybody in Greece or without authorization, suggested that the first modern International Olympic Games should take place in Athens in 1896. He also added, "Some may say that Athens is far away, that there are not the necessary facilities and means as in Paris or London… this is true. But we must not forget that in Athens there are… monuments and museums of the highest interest…. Then there is the sentimental part of the issue. Since we are talking about the Olympic Games don't you think that Greece has a right to celebrate them on its territory? …Without having any authorization by the Greek government, I simply suggest that the Convention should express a wish: the first celebration of the International Olympic Games should take place in Athens" (Oikonomou, 1953). The Convention accepted Vikelas' suggestion unanimously. At this point, one should admire his readiness for wit and his courage to take this initiative, as well as his optimism and faith in the dynamism of the Greek nation (Oikonomou, 1953).

The news that the games had been assigned to the city of Athens shook the Greek public opinion. As Oikonomou (1953) mentions, "After the first enthusiasm, there was some concern in the form of reasonable questions such as: How could Greeks organize such a great international event in two years, starting from point zero? It was also known to everybody that the government was not in a position to support the games financially, as Greece had declared bankruptcy not that long ago. Under this apprehension and doubt, there were two views, 'The prudent old people' who believed that the so-called experts did not have the necessary knowledge to accomplish such an important project and that Greece run the risk of exposing itself internationally after a possible failure. On the other hand, the young people were more optimistic and sided immediately with Vikelas"

(Giatsis, 2000). Vikelas was soon informed of the situation and the differing opinions of the Greek public. However, he was not able to come to Athens immediately to re-establish peace due to personal health issues. He sent a letter to the warrant officer of the heir to the throne of Constantine, K. Sapountzakis, to inform him and King George the 1st about the issue of the Olympic Games. Vikelas wrote in a letter about the new bond that was being established between Europe and Greece. In the letter, he mentioned the positive impacts the games could have on Greece to strengthen his point of view. He also explained that physical education would be promoted, leading not only to physical well-being but also to the formation of character in the younger generations (Mouratidis, 1994).

Finally, Vikelas arrived in Athens on September 13-25, 1894, and immediately occupied himself with the re-establishment of peace and optimism among the members of the "committee on the Olympians and Legacies" and athletic authorities in general (Mouratidis, 1994). However, he was soon forced to travel to Paris again due to the re-crudescence of his wife's health. His family was struck by tragedy shortly before midnight on October 22, 1894, when Calliope passed away.

On December 13-25,1894, Vikelas returned to Athens where he had many serious problems to solve, such as:

- Re-establishing confidence in the public opinion that the preparation of the games would lead to a satisfactory conclusion,
- Finding the necessary funds to cover the expenses of the organization of the games,
- Planning a methodic way to prompt the building of the sports grounds, and
- Promoting and advertising not only in the interior of the country but also abroad.

The very next day after his arrival in Athens, Vikelas called the correspondents of the Athenian newspaper and informed them of the existing organizational and economic problems surrounding the games. More importantly, he explained the consequences that a possible cancellation of the games would have on the prestige and reliability of Greece abroad. At the conclusion of his speech, he said, "The visitors will find out that Greeks are much better than they

thought them to be. On the other hand, the games will conduce to the spread of physical exercises in the country as well as moral and spiritual uplift… it is a national aim and all Greeks have to work for it… The games will take place now and here or never" (Oikonomou, 1953). A few days later, from January 4-16, 1895, Vikelas was present at a meeting for presidents of Athenian trade and professional corporations who had already raised 2850 drachmas as a sum of assistance for the games. Vikelas did not "doubt that the Greeks abroad [would] not be deaf to our appeal for help under the chairmanship of the successor of the committee…and it is not only about the first Olympic Games. It [would] be a beginning so as foreigners get to know the way of Greece. We have the qualifications that no country has: the prestige of Antiquity and our beautiful nature" (Oikonomou, 1953). After restoring the optimistic climate among the members of the meeting, he exhorted them to raise as much money as possible, acting as pioneers in assistance of the games (Oikonomou, 1953).

On January 10, 1895, Charilaos Trikupis resigned from the office of prime minister, and Nikolaos Diligiannis came to his position as a provisional prime minister. Diligiannis, influenced by his term of office as an ambassador of Greece in Paris, came out in support of the Olympic Games. A consequence of this switch in power was the reformation of the games' organizing committee. The committee was now split into nine subcommittees with Secretary General Filimona Timoleonta and President Heir Constantine. A month after this reorganization, Vikelas was required once again to travel to Paris to settle urgent personal affairs.

During his stay in Paris, he found new sources of revenue for the upcoming Games. The bulk of the revenue came from Georgios Averof's offer, which helped to cover the expenses of the games to a large extent. These comings and goings between Athens and Paris came to an end in 1896. On February 16, 1896, Vikelas came to Athens and immediately busied himself to find solutions to the problems surrounding the games. One of Vikelas' priorities was the promotion, publicity, and advertisement of the games both in Greece and abroad. To materialize this purpose, he set about:

- Regular and frequent sending of informative telegrams about the progress of the Olympic preparation;

- Distribution of illustrated programs of the games and organization of various shows, festivities, and excursions; and
- Dispensation of information and advice for the games (to settle the doubts of the Athenian public) by sending a letter to the Athenian press where he pointed out the following: "[…] it was a great honor for Greece to wreathe the first winners in the International Games. It is a recognition of the superb position that Greece by name has in the civilized world […] for this reason the victory of every athlete either Greek or not honors Greece equally and must be hailed with equal enthusiasm" (Vikelas, 1896).

On March 25, 1896, the second day of Easter and the anniversary of the Greek Revolution in 1821, King George the 1st of Greece opened the first International Olympic Games, certain and confident of their success. King George opened the games in an overcrowded Panathinaiko Stadium among an exceptionally enthusiastic crowd of spectators. Exactly 1503 years later, the Greeks celebrated, with great national satisfaction, the rebirth of the most important pan-Hellenic institution. More than 80,000 spectators graced the first international celebration of sports with their presence. The first international Olympic Games saw 167 athletes from around the world, 83 of them Greek athletes, set the foundation stone and gave the signal for international sports and cultural cooperation.

The rebirth of the modern Olympic Games was envisioned by organizers to serve a much greater purpose than solely international sporting events. They envisioned an international brotherhood where athletes took pride in representing their country with pride, ethical and moral values, and sportsmanship. Studies show this type of sportsmanship and fair play is lacking in all levels of sport today, from youth leagues to the Olympic Games. Vikelas' desire for the Games to transcend nationality with cooperation and fair play is achievable with education. By instructing youth on the importance of fair play and sportsmanship for an athlete, the ideals of Olympism become integrated into sport at the ground level. The history behind the Olympism and the original vision of the Olympic Games is rich and worthy of rebirth.

King George the 1st of Greece recognized the decisive part Dimitrios Vikelas played in realizing the dream of the rebirth of the Olympic Games and their complete success during the dinner he gave on Sunday night, March 31. King George the 1st expressed his gratitude to the public by addressing his guests with the following, "Thank you, Vikelas, for the initiative you had. At first, I was intimidated by your idea, but the successful results of the Games prove that you were absolutely right, and for this reason, I drink to toast your health" (Oikonomou, 1953). In addition, the Greek state honored Vikelas "for his successful efforts in support of the Olympic Games" and awarded him the cross of commanders of the second Order of Sotiros (Royal Decree, 1896).

Shortly after the close of the first modern Olympic Games, Dimitrios Vikelas handed over the presidency of the International Olympic Committee (I.O.C) to Pierre de Coubertin and devoted himself to other issues, focusing on national, social, charitable, and educational issues. However, he continued to show immense interest in the future of the Olympic Games. A letter Dimitrios sent on May 19, 1896, to the new President of I.O.C., asking him to support the Greeks' request that the Olympic Games should be held in Athens in the mid intervals of the International Olympic Games shows specifically his continued dedication to the games (Oikonomou, 1953).

The Games Return to Athens

In 2004, Greece again enjoyed the privilege of organizing and enjoying the Olympic Games: A unique attraction for all the citizens of the world. Greek citizens were united during the games irrespective of political, ideological, class, or religious differences. They participated either as athletes or spectators in this unprecedented athletic and cultural event. As citizens of the world who enjoy this cultural experience, it is important to reflect, even if only for a while, on two people—Phil Hellene Pierre de Coubertin and Dimitrios Vikelas.

The first was the man who inspired the rebirth of the Olympic Games and organized the first International Sports Convention in Sorbonne. The re-establishment of these games was decided on while he was secretary general of the I.O.C. The second one was a well-known scholar and patriot. Dimitrios Vikelas shouldered the responsibility of reorganizing the games and the possible failure that could come with it. His sound reasoning managed to convince the

members of the convention of Athens' superiority compared to that of the other nominees, resulting in their decision to assign the first modern Olympic Games to Athens. Moreover, with his method and dynamics, he contributed significantly to the impeccable organization. Vikelas had the strength to see the games through to successful completion without any dilemma or hesitation.

It is with today's hindsight that full appreciation can be given to the grandeur of spirit with which Vikelas' worded his toast during the closing ceremony of the Sorbonne Convention, "Thanks to sports there are no foreigners anymore, only friends" (Oikonomou, 1953). In the increasingly challenging times that characterize the 21st century, it is more important than ever that citizens of the world allow their minds to broaden, proving in both words and deeds that, thanks to sports, there should be no foreigners, only friends.

Conclusion

When Tokyo won the bid to host the 2020 Summer *Olympics* and Paralympics in 2013, no one could have foreseen the current *impact of COVID-19* on society and sport. The 2020 Olympic and Paralympic Games were delayed one year and were contested with no fans. With the professionalization of Olympic sports in recent years, it is easy for athletes to forget Vikelas' vision of Olympism. Superstars such as Simone Biles, the Williams sisters, and the USA men's basketball team bunked in hotel rooms instead of the athletes' village. These trends have shifted the focus of the Olympics from athletic brotherhood to personal brand building. Personal branding is an important aspect for Olympians to fund their training (Parmentier & Fischer, 2012). The 2020 to 2021 Games delay may have increased athletes' focus on brand development. Interestingly, this dynamic may have shifted from focusing on brand development to sportsmanship during these Olympic Games because athletes may have felt grateful and proud of everyone's athletic accomplishments due to the COVID-19 setbacks in sports.

Critics suggest that the idea of Olympicism is antiquated and too "Utopian" for today's world. Relinquishing the experience of the athletes' village comprises Vikelas' desire that the Olympics convert foreigners to friends. By teaching Vikelas' philosophy of brotherhood and sportsmanship in the classroom, we can begin to breathe the spirit of Olympicism back into the Olympic Games. Ideally, the

empty stadiums of the rescheduled 2021 Olympic Games will be a positive step toward reigniting and instilling Vikelas' philosophy of brotherhood and sportsmanship.

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SPORT

The Effects of Music on Activity Rates, Time in Activity, and Levels of Enjoyment in Junior High School Basketball

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Abstract

Music is a tool physical education (PE) teachers can use to help motivate students to greater physical activity (PA) rates during class activities. Music research in the PE context has found music to increase PA rates in the junior high school context (Brewer et al., 2016), that music increases the enjoyment of the PE experience for students (Barney et al., 2016) and can serve as a distraction during certain workouts (Higginson et al., 2019). This study aimed to examine the effects of music on physical activity rates (steps taken and time in activity) via pedometers of junior high school students in basketball gameplay. For this study, 270 junior high school students (157 males and 113 females) from eight intact seventh-, eighth-, and ninth-grade classes participated. The male and female participants attended different schools. Generally, it was found that the female participants were more active than their male counterparts when music was playing.

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These results and others illustrate music's effect on junior high school student PA rates.

Introduction

Music can be a powerful tool for increasing a person's physical activity. For example, college students' who listened to their personal music devices perceived that they worked harder and worked out longer (Barney et al., 2012). Similarly, Rendi et al. (2008) suggest that music enhances one's endurance and helps 'color' how a person interprets their perceptions of fatigue (Karageorghis & Lee-Priest, 2012). With the growing number of research studies investigating music's use and effect on physical activity, a conceptual framework provides support to the research. Karageorghis et al. (2006) proposed a conceptual framework of four factors relative to the effect of music on a person participating in physical activity; they are (a) rhythm response, (b) musicality, (c) cultural impact, and (d) association. Rhythm response refers to the musical rhythm, most notably the tempo or speed of the music as measured in beats per minute. Musicality denotes to the response to pitch-related elements, such as harmony and melody. The cultural impact indicates the pervasiveness of the music within society. And association pertains to the extramural association music may evoke. The factors exhibit a hierarchical structure (i.e., rhythm response), which is the most important contributor to the motivational quotient of a piece of music (Barney et al., 2020).

In addition to research investigating music's impact on physical activity, a growing number of studies have investigated music in a K-12 physical education (PE) setting. In the elementary PE setting, Barney et. al. (2016) examined the effects of music on fourth-grade students' enjoyment of two activities (tossing/catching and hula hoops) during PE lessons. Fourth-grade students participated in two classes, one with music and the other class with no music for both activities. At the end of the lessons, the students were surveyed regarding their experiences. Also, six students were randomly selected and interviewed regarding their experiences during the study. Results suggested fourth-grade students enjoyed the PE lessons more with music and perceived they worked harder when the music

was popular, familiar songs. Students reported having more energy when music was playing during the lesson.

A second study in the K-12 setting investigated the effects of music in junior high school PE classes (Brewer et al., 2016). For this study junior high school students participated in two lessons in volleyball and basketball. One lesson used music, the other used music, and the other had no music for each activity. Significant differences were noted between gender and activities. The lessons with music had higher step counts for both volleyball and basketball suggesting that music does play a role in increasing the physical activity engagement of students in PE class. Another study in the high school setting produced results similar to those conducted in the elementary and junior high schools. Higginson et al. (2019) studied the effects of distractions of watching a video, listening to music, and having no distractions on students in a spin indoor cycling unit. Students reported their rate of perceived exertion and enjoyment throughout the lesson. During the six-day cycling unit, the students received three conditions: two days of no distractions, two days of music playing, and two days of video. The lessons consisted of a five-minute warm-up and a 20-minute ride. As students pedaled, they were prompted to record their enjoyment level and perceived exertion rate via iClickers. The music component from the study served as a distraction for the students to work through the ride they had to perform.

Finally, there is research dealing with music in physical activity classes at the college and university levels. Barney et. al. (2020) studied the effects of music on physical activity rates (step counts and time in activity) via pedometers of college-aged students in basketball. For this study, college students were enrolled in intermediate basketball classes. Two classes played basketball while music played, and two other classes played basketball with no music playing. All participants wore pedometers as they played basketball to measure their activity. All lessons were 30 minutes in length of gameplay. The findings from this study indicated that when music was played during basketball game play in a college physical activity class, students took more steps and were in activity for more time. The research in the K-12 PE setting and the college and university setting concur that music is a positive tool for PE teachers to implement in their les-

sons and activities. With these types of results, there are still opportunities to strengthen the literature regarding music's impact on PE classes. Thus, this study aimed to examine music's effects on physical activity rates (steps taken and time in activity) via pedometers of junior high school students in basketball gameplay.

Methods

Participants and Setting

Participants for this study were 270 junior high school students (157 males and 113 females) from eight intact seventh-, eighth-, and ninth-grade classes. The male and female participants attended different schools. Both school's classes ran on the block schedule, A-day/B-day, with classes lasting approximately 80 minutes from bell to bell. The female PE teacher's school participants had a student population of 68% Caucasian and 25% Hispanic (USA School Info, 2022). The male PE teachers' school had a student population of 73% Caucasian and 21% Hispanic (USA School Info, 2022). The three teachers (one male & two females) who participated in this study averaged six years of teaching junior high school PE.

The setting in which this study took place consisted of two separate gymnasiums. The female PE teacher's gymnasium consisted of a single gymnasium with four drop-down basketball hoops. The class size for each female class was between 30 to 35 students. The male PE teachers' gymnasium consisted of a single gymnasium with six drop-down basketball hoops. The class sizes for each class were between 40 to 45 students.

Procedures and Data Collection

The university institutional review board (IRB) and the school district approved of the study. Parental and student consent was also secured. Researchers instructed PE teachers on how to wear, use, and read the pedometer properly to ensure reliable data collection. Students were instructed that upon entering the gymnasium, they were to get a pedometer and secure it to the waistband of their shorts. Students were further instructed that after warm-up activities, they were to reset their pedometers back to zero for basketball gameplay for data collection purposes. Then at the conclusion of gameplay, the students were to record their number of steps, time in activity, and

level of enjoyment during the lesson on the student record sheet. A student record sheet was created for each student. Students have a place to record their number of steps, time in activity, and level of enjoyment on their record sheet. The researchers created one statement on the student record sheet to rate their level of enjoyment during the activities on a scale of 1 to 5 (1=lowest level of enjoyment, 5=highest level of enjoyment).

The music selection used for this study consisted of popular, upbeat tempo (120 to 160 beats per minute) songs suggested by the PE teachers (Karageorghis et al., 2006; Priest et al., 2004). The researchers, along with the PE teachers, compiled a list of 40 songs, and then the researchers listened to the songs and narrowed them down to songs they felt were appropriate to play during basketball gameplay. The songs that fit the requirement were made into a playlist and played over a sound system in the gymnasium.

Pedometer Instrument

The Yamax Digi-Walker LS 2525 was the pedometer used to collect student step counts and time in activity. The pedometer model records step counts, distance covered, calories burned, and students' activity time. The pedometer also has a clock that runs when the student is in movement and stops when the student is not moving (standing). Time in activity is recorded in hours, minutes, and seconds. This pedometer was found to be reliable from previous research (Barney et al., 2008).

Results

Data Analysis

Data were analyzed via SPSS (version 28, IBM, 2021). All data were checked for input accuracy. Demographic variables included grade level (seventh, eighth, and ninth) and gender (males and females). Response variables included step counts via pedometry, time in activity, and level of enjoyment (1 = Not Enjoyable, 2 = Mostly Not Enjoyable, 3 = Neither or Not Enjoyable, 4 = Somewhat Enjoyable, and 5 = Very Enjoyable). Descriptive statistics for means (M) and standard deviations (SD)were calculated for both genders and across all grade levels. Tests for indications of multivariate normality were conducted, and adjustments were made as indicated.

Correlational analysis was conducted on variables of interest. A two-way MANOVA with follow-up comparison tests was conducted to examine between grade and gender and within treatment conditions treatment groups. Interaction effects were also examined.

Descriptive statistics (*M*, *SD*, and *Eta2*) are found in Table 1. Significant Shapiro-Wilk tests were not significant for steps with or without music but significant for time in activity with no music (TIA $_{\text{no music}}$ $p < .001$), steps with no music (steps $_{\text{no music}}$ $p < .001$), and time in activity with music (TIA $_{\text{music}}$ $p < .001$), steps with music (steps $_{\text{music}}$ $p < .001$). Further, the Mahalanobis *D* exceeded 22.46 for six response variables. Therefore, assumptions of multivariate normality could not be supported, and a Pillais-Trace adjustment was used.

Inspection of means by gender and grade level showed an unusual outcome with respect to gender. In this study, females were significantly higher than males in both steps and TIA (Female$_{M\text{steps}}$ = 2109, Males $_{M\text{steps}}$ = 1495; Female$_{M\text{TIA}}$ = 21.0, Males $_{M\text{TIA}}$ = 14.35). There was no gender effect for measures of enjoyment.

Conclusions

This study aimed to examine the effects of music on physical activity rates (steps taken and time in activity) via pedometers of junior high school students in basketball gameplay. From this study, the data revealed that the female participants were more active than their male counterparts. This means that the female participants took more steps and had more time for activities while playing basketball. It must be noted that when the researchers saw the data results, they went back to ensure the data was correctly input into the statistical package (SPSS). After confirming that the data were correctly entered, the results revealed that the female participants had more steps and more time in activity across all grades than the male participants. The literature has overwhelmingly shown that males are more active than females (Scruggs, 2007; Trost, 2002). To add to this thought, males also have been found to be more active in all grades (Barney et al., 2014).

These results are exciting for the fact that the female participants were more active than the male participants and that music positively affected both the male and female participants to higher rates of physical activity. These results concur with other research investigating music's effects on K-12 PE students' physical activity

Table 1
Means, Standard Deviations, and Effect Sizes

	7th grade $n = 91$				8th grade $n = 100$				9th grade $n = 79$				Partial *Eta*^{2}
	Male $n = 61$		Female $n = 30$		Male $n = 65$		Female $n = 35$		Male $n = 31$		Female $n = 48$		*Eta*$^2_{gender} = 0.39$
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	
Steps $_{music}$	2113	478.9	2743	704.3	1815	528.6	2530	496.8	1712	520.7	2369	696.7	0.24
Steps $_{no\ music}$	1619**$_{(1V3)}$	476.7	1938	405.0	1356***$_{(2V3)}$	579.1	2059	423.5	1543	502.1	2252	576.9	0.23
TIA $_{music}$	18.6	5.1	24.8	5.5	16.5	4.4	23.8	3.6	15.5	5.2	22.6	5.4	0.32
TIA $_{no\ music}$	15.4	4.7	20.0	4.8	13.5***$_{(2V3)}$	4.8	22.1	5.1	14.0	4.2	22.1	5.1	0.31
Enjoy $_{music}$	4.6	0.5	4.1	0.7	4.2	1.1	4.6	0.9	4.5	0.8	4.5	0.7	0.00
Enjoy $_{no\ music}$	3.8	1.1	3.6	0.7	3.6	0.9	3.7	1.0	3.5	1.1	3.9	.85	0.00

	7th grade $n = 91$		8th grade $n = 100$		9th grade $n = 79$		*Eta*$^2_{grade} = 0.07$
	M	*SD*	*M*	*SD*	*M*	*SD*	
Steps	2259	998	2702	1309	2823	1207	
Cohen's d_{grade}	$d_{7v8} = 0.38$		$d_{8v9} = 0.10$		$d_{7v9} = 0.51$		
Total Wt.	1745	881	2286	1101	2466	1083	
Cohen's d_{grade}	$d_{7v8} = 0.54$		$d_{8v9} = 0.16$		$d_{7v9} = 0.74$		

	Total $n = 201$		
	M	*SD*	Cohen's *d*
Steps $_{music}$	2165***	40.1	
Steps $_{no\ music}$	1752	36.8	$d_{steps} = 10.73$
TIA $_{music}$	19.8***	0.36	
TIA $_{no\ music}$	17.1	0.35	$d_{TotWt} = 7.60$
Enjoy $_{music}$	4.4	0.05	
Enjoy $_{no\ music}$	3.7	0.6	

Note: * = p ≤ .05, ** = p ≤ .01, and *** = p ≤. 001. Effect size indices: (a) Cohen's $d = (M1 - M2)/SD_{pooled}$ is a measure of the magnitude of the effect and is interpreted as follows: ç = small effect size (0.2 – 0.4), çç = moderate effect size (0.41 - 0.7), and ççç = large effect size (> 0.70); (b) *Eta*^{2} is the percentage of variance accounted for due to the effect.

rates. For this study, both males and females and grade levels took more steps, were in activity longer, and had higher levels of enjoyment when music was playing during gameplay. From the literature, Brewer et al. (2016) studied the effects of music/no music on junior high school PE students while they participated in volleyball and basketball games. On average, male students had 41 more steps during volleyball and 220 more steps during basketball while music was playing. Female students had 380 more steps during volleyball gameplay and 345 more steps during basketball with music playing. Barney and Prusak (2015) similarly studied music's effect on elementary-aged (third, fourth, and fifth) PE students. The students participated in walking and Frisbee activities. The results revealed that elementary-aged students took over 350 more steps when music was playing during their walking activities. During the Frisbee activities, elementary-aged students took over 460 more steps when music was playing.

A second point of discussion deals with class size in PE classes. When talking about class size, this deals with the number of students in each class. As mentioned earlier, for this study, the female PE classes averaged 30 to 35 students, and the male PE classes averaged 40-45 students. From the literature regarding class size in the PE setting, Bevan et al. (2010) studied PE resources, classroom management, and student physical activity levels. The researchers concluded that a low number of PE students significantly increased student activity levels. More specifically, with a lower number of students in PE class, the PE teacher spent less time in classroom management, thus increasing physical activity for the students. From this study the researchers feel that the smaller female PE classes allowed for the students to have more room to move around the gymnasium while playing basketball, compared to the male participants. Burson et al. (2021) have stated that the subject of PE in K-12 education is marginalized compared to other content areas. One of the ways PE is marginalized is by having PE classes of 45 or more students in each PE class. PE teachers must work closely with the school academic counselors or others who schedule student classes to change this. In terms of public health, it is important that students accumulate at least the minimal amounts of suggested physical activity across

Table 2
Bivariate Correlations

	Year	Gender	Steps $_{music}$	Total Wt. $_{music}$	Steps $_{no\ music}$	Total Wt. $_{no\ music}$
Year		-.084	.204**	.302**	.167*	.252**
Gender			-.345**	-.458**	-.361**	-.402**
Steps $_{music}$				.542**	.706**	.542**
Total Wt. $_{music}$					.481**	.872**
Steps $_{no\ music}$						.569**
Total Wt. $_{no\ music}$						

Note: * = $p < .05$, ** = $p < .01$

the school day. The authors suggest that similar to other subjects, PE classes should not exceed 30 to 35 students.

Implications of the Study

The results of this study should inform PE teachers of the importance of advocating for their students, particularly in relation to class size. The PE teacher should effectively communicate with their administrators and/or counselors that create the students' class schedule to keep the class size to manageable numbers. Beven et al. (2010) learned from their research that fewer students allow proper and beneficial physical activity for students in PE class activities. The female participants' results support the idea that smaller class sizes give students the space to move as they play basketball.

Another implication of this study was that the female participants had more steps than the male participants. The literature has overwhelmingly reported that males are typically more physically active than their female counterparts (Barney et al., 2012; Deutsch & Hetland, 2012). The results from this study can inform PE teachers that female students are just as capable as male students of being highly physically active. Also, the results of this study once again show that music has an impact on students' increased movement when music is present during class activities. PE teachers need to take advantage of music's effect on student movement.

Limitations

This study examined the effects of music on the physical activity rates of junior high school students in basketball gameplay. This study has noted limitations. The participants came from two schools, findings cannot be generalized or reflective of junior high school students in other junior high schools in other geographic areas.

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PHYSICAL ACTIVITY

Comprehensive School Physical Activity Programming in Dubai International Schools: A Mixed Methods Study

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Abstract

The purpose of this study was to examine comprehensive school physical activity program (CSPAP) policies and practices in international schools in Dubai, the United Arab Emirates. Following an explanatory-sequential mixed-methods research design, the researchers employed the Comprehensive School Physical Activity Program Policies and Practices Questionnaire (CSPAP-Q) and follow-up interviews to describe CSPAP implementation and explore implementation enablers and challenges. A convenience sample of physical education teachers (N=18) participated in the questionnaire, and seven of these teachers participated in individual interviews. Teachers' responses to the questionnaire indicated considerable heterogeneity and numerous gaps in existing school-based physical activity opportunities and promotion

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efforts. Interviews revealed three themes related to CSPAP implementation: (a) time constraints in secondary schools, (b) facilities, and (c) location. This study provides an initial glimpse into whole-of-school physical activity programming in Dubai international schools.

Introduction

Participation in physical activity (PA) has many well-documented health-related, developmental, and academic benefits for children and adolescents (Poitras et al., 2016). The World Health Organization (WHO, 2010) recommends that school-age youth accumulate at least 60 minutes of mostly moderate-to-vigorous PA (MVPA) daily. However, most youth around the world do not meet this guideline (Cooper et al., 2015). According to the WHO (2010), 78.4% of boys and 84.4% of girls were classed as physically inactive.

Schools are a key setting for promoting physically active behavior. Rush et al. (2012) report young people in developed countries spend six to eight hours per day at school. In this context, Ni Chróinín et al. (2012) propose schools are key sites where young people can be active, learn how to be active, and develop an understanding of how important it is to have PA in their lives. To maximize school-based PA promotion, a "whole-of-school" approach is recommended: This involves the participation and support of multiple stakeholders including school staff, families, and community partners (Daly-Smith et al., 2020). Several countries, such as Australia, Finland, Ireland, and the United States, have implemented whole-of-school initiatives to promote youth PA (McMullen et al., 2015).

Comprehensive School Physical Activity Program Framework

The comprehensive school physical activity program (CSPAP) framework in the U.S. has gained particular attention in research as a primary example of the application of a whole-of-school approach to PA promotion (Webster, 2022). Currently, the U.S. Centers for Disease Control and Prevention (CDC) uses a CSPAP as the national framework for school-based physical education (PE) and physical activity (CDC, 2019). A CSPAP is envisioned to include multiple components operating in cooperation to ensure all youth attending a given school, accumulate 60 minutes of PA daily, and in so do-

ing they begin to develop the knowledge, skills, and confidence to pursue a physically active lifestyle (Society of Health and Physical Educators [SHAPE] America, 2015). The components of a CSPAP encompass quality physical education (PE), other PA opportunities, and the implementation support system for the program (Webster, 2022).

Quality PE

The foundational component of any CSPAP is quality PE. A primary and critical focus is on providing students with meaningful learning experiences that translate into a lifetime engagement in PA. SHAPE America (2015) created a guidance document to guide U.S. schools in the provision of quality PE. This publication identifies the essential components of PE as (a) meeting the needs of all students, (b) keeping students active during most of the PE lesson, (c) teaching self-management skills to students, (d) emphasizing knowledge and skills for PA, and (e) providing an enjoyable experience for all students. To create this environment, SHAPE America (2015) recommends that schools work around four pillars: policy and environment, curriculum, appropriate instruction, and student assessment. A well-defined policy helps create an environment that ensures all students receive PE, clearly defining each student's outcomes. The curriculum provides schools with clear guidance regarding expected outcomes within PE programs. Appropriate instruction involves considering the diverse developmental levels that students in all grades will exhibit. Finally, assessment should entail gathering evidence about students' achievements and making inferences regarding student progress based on available evidence.

Other PA Opportunities

Beyond PE, schools may provide additional PA opportunities during the day and/or outside school hours (before/after school). These expanded PA opportunities are intended to reinforce PE and provide supplemental PA experiences for youth (Webster et al., 2020). Opportunities for PA during school involve integrating or maximizing PA at other times of the school day. Classroom-based PA can increase students' PA, reduce sedentary behavior, and support numerous other outcomes, including academic achievement (Webster et al., 2015). PA promotion at recess, during lunch, or at

other break periods during the school day are additional evidence-based strategies for increasing students' PA during school (Huberty et al., 2011; Wang et al., 2005). Outside of school hours, Beets et al. (2009) indicate that a successful before and after-school program has the potential to increase students' daily PA by up to 13%. Active travel to and from school is another before and after-school PA opportunity for students, where permissible. In a cohort study, students who actively commuted to school accrued more minutes of PA than students who used motorized transport (Zhang et al., 2020). Although there were no differences in total daily PA between active and passive commuters, active travel may be viewed as an important strategy that can be combined with other opportunities to help children and adolescents meet PA guidelines.

Implementation Support System.

A CSPAP's implementation support system aims to generate collaboration and cooperation to leverage and sustain implementation efforts. This system incorporates the involvement of all school staff as well as family and community engagement (Webster et al., 2020). Implementing a CSPAP should not be viewed solely as a PE teacher's domain. Deslatte and Carson (2014) report that for a CSPAP to be fully effective, buy-in is needed from administrators, teachers, and other school staff. According to Beets et al. (2016), when staff receive training for PA promotion, they are more likely to feel personally competent in this role. Family and community engagement are also deemed critical to successfully implementing this initiative. Schools are often viewed as the hub of many communities, given their connection to the communities they serve. For a school to provide a successful CSPAP, a collaborative effort must be put in place between schools and local community groups, as well as partnerships. Van Sluijs et al. (2007) refer to numerous studies that reveal how families, communities, and schools, when working together, positively impact students' PA levels and academic performance.

The Context of the United Arab Emirates

Similar to global trends, there is a low prevalence of PA among school-age youth in the United Arab Emirates (UAE). Paulo et al. (2018) reported that only 16% of UAE schoolchildren achieved more than 60 minutes of MVPA each day, falling from 20% in 2005.

In tandem with low levels of PA is a reported rise in obesity rates in UAE children and adolescents, with 38-41% of youth classed as overweight and a further 17-24% classed as obese (Alblooshi et al., 2016). Recently, the UAE government has made considerable efforts to address the issue of physical inactivity among the UAE population. In 2017, the Ministry of Education (MOE) introduced a new health and PE curriculum to be rolled out in all government schools in Dubai. In addition to this, smaller-scale initiatives, such as the Dubai Fitness Challenge 30x30, attempt to raise awareness of PA levels by promoting daily exercise. Despite these recent initiatives to encourage and increase school-based PA promotion in the UAE, there is a paucity of research on the PA programming that exists in UAE schools. Such research is important to understand the nature of such programming, identify current areas of program development that are relatively strong or weak, and create more targeted supports that may aid schools in implementing and sustaining PA opportunities.

The present study focuses on the emirate of Dubai and the specific context of international schools. Dubai is a constantly evolving city in the UAE, with more than 3 million inhabitants. It was reported by the Knowledge Health Dubai Authority (KHDA) in June 2022, that there were 215 private international schools in Dubai offering 18 different curricula with more than 300,000 students attending school. Due to the demand for private schooling, expatriate teachers recruited from around the world are employed in the Dubai education system, with more than 21,000 teachers currently employed in the private sector. This study aimed to examine whole-of-school PA programming in Dubai international schools based on the CSPAP framework. Underpinning this purpose were the following research questions:

- What PA policies and practices within the CSPAP framework exist in Dubai international schools?
- What factors support or hinder PA promotion in Dubai international schools?

Methods

Research Design

This descriptive study employed an explanatory-sequential mixed-methods research design (Edmonds & Kennedy, 2016). Quantitative data were collected via a self-report questionnaire completed by a sample of PE teachers recruited from Dubai international schools, and qualitative data were subsequently collected from interviews with a subsample of these teachers identified to explore in a deeper way this area to understand questionnaire responses better.

Participants

PE teachers were selected as participants for this study because their views of school-based PA programming should be a priority in efforts to build the knowledge base needed to inform policy and practice (Webster et al., 2020). Physical educators are uniquely positioned within the school environment to help document and evaluate existing PA opportunities and the support system in place for these opportunities. Given their professional training and tendency to work with multiple grade levels within a school, PE teachers are called upon to play a leading role in whole-of-school PA programming (McMullen et al., 2015).

Convenience sampling was used to recruit PE teachers (n=18) from Dubai international schools to participate in this study. No sampling restrictions were applied based on a participant's age, gender, or other characteristics. Each participant was employed at a different school. Participants identified as PE teachers who were female (4), male (12), or other (2). A total of seven teachers indicated they were serving as either a primary (3) or a secondary head of PE (4). Participants' years of teaching experience ranged from 2-23 years (M=5.17 years). Among those participants indicating their highest degree earned, eight reported having a bachelor's degree, six reported having a master's degree, and none reported possessing a doctoral degree. All participants indicated they were licensed or certified to teach PE.

Instrumentation

Questionnaire

Quantitative data were collected using the Comprehensive School Physical Activity Program Policies and Practices Questionnaire (CSPAP-Q; Stoepker et al., 2021). The questionnaire is organized into six sections: Respondent Characteristics, Physical Education, PA During School, Before and After School PA, Staff Involvement, and Family and Community Engagement. Within these sections are 53 question sets. Stoepker et al. (2021) reported acceptable content, face validity, and test-retest reliability for all sections of the instrument.

As the original questionnaire was developed for application in the educational environment of U.S. schools, it was slightly modified for application in the context of Dubai international schools. Modifications were based on discussions between the first and second authors and pilot testing with a convenience sample of four PE practitioners working in the study context. For piloting purposes, the following two open-ended questions were included in each questionnaire section: (a) Were any questions confusing? (b) Do any questions need to be revised for clarity? Teachers' feedback focused on incorporating the term "lunch break" into items asking about school recess, adding the British class grading system, and removing items containing the word "district" as Dubai has no district system. The final questionnaire used in the present study included 49 question sets. Additionally, participants had the option to provide their email address if they wished to be invited to participate in a follow-up interview about their school's PA opportunities.

Interviews

The first author conducted follow-up interviews to obtain qualitative data with a subsample of the questionnaire participants (n=7) who agreed to be interviewed. The purpose of the follow-up interview was to explore participants' questionnaire responses further. Interviews were conducted on Microsoft Teams, and audio was recorded with participants' permission. The transcription feature on Microsoft Teams was enabled for data analysis purposes. All participants were asked the same seven questions in the interview, each focusing on one of the CSPAP questionnaire's subsections to better

understand the PA practices and opportunities in Dubai international schools. Examples of these questions include "Approximately how many classroom teachers incorporate PA within their lessons?" "Does your school promote or support students by offering walking or cycling to school?" "Not including time to eat, how long would students have during recess to be physically active?" A semi-structured interview schedule was used, allowing the researcher to probe participants' responses in more depth. The length of the interviews ranged from 6.42-11.56 minutes (M=8.36 minutes).

Procedures

Before collecting data, the second author's institutional ethics board for human subjects research obtained approval to conduct the study. The first author, a PE teacher employed at an international school in Dubai, used his existing professional network to identify and recruit participants. Teachers were sent an invitation via email or WhatsApp. Invitations outlined the aims of the research and included a link to the survey. The online survey platform JISC was used to administer the survey. Clicking the link would direct teachers to a front page that explained the study procedures, protocols, risks, and benefits and served as informed consent. Participants were given the opportunity to provide their contact details at the end of the questionnaire if they wished to be considered for a follow-up interview. The survey was sent to 197 PE teachers and remained open for one month (June 29 to July 29, 2022). Two reminders were sent following the initial invitation message to maximize the response rate. The 18 teachers who completed the questionnaire represented a response rate of 10.9%. Fan and Yan (2010) suggest that a response rate below 10% is common for Internet surveys. The time taken to do the questionnaire ranged from 10 minutes to 2 hours and 47 minutes (M=21 minutes). Therefore, participation could have been burdensome for some teachers. Participants who provided their email contacts in the questionnaire were invited to individual interviews. A total of eight teachers were invited, and seven of them agreed to participate.

Data Analysis

Questionnaire responses were analyzed using descriptive statistics, and responses were categorized into three domains consistent with the most recent review of the CSPAP framework: (a) quality

PE, (b) other PA opportunities, and (c) the implementation support system (Webster, 2022). Interview data were analyzed using a thematic analysis (Braun et al., 2014). Specifically, the first author initially read the interview transcripts multiple times to become familiar with the data. While reading the transcripts, the researcher wrote brief memos reflecting the main ideas and key points in participants' responses. The memos served as codes that captured recurring sentiments. Iterative coding led to the emergence of clear patterns in the data, allowing the researcher to take a more holistic view of participants' responses and identify themes. To help ensure trustworthiness, negative case analysis was used to verify the themes, and the second author served as a peer debriefer for the data analysis procedures.

Results

CSPAP-Q

Quality PE

Items in this domain focused on PE policies, resources, and practices. Most participants—66.7% (12)—indicated their schools have a written policy requiring a specific number of minutes for PE per week, but less than half of participants—44.4% (8)—indicated their school has a written policy for the PE curriculum to be evaluated annually. A total of 72.2% (13) of teachers said their school requires PE lessons to be taught by a certified PE specialist. In all, 85.7% (12) of respondents reported that their schools offered pre-kindergarten (reception) PE, with all schools offering PE from kindergarten (year 1) to 12th grade (year 13). A total of 94.4% (17) of respondents indicated their schools offered PE 1-2 days per week, but only 5.6% (1) of schools offered PE every day. Regarding the length of PE lessons, 55.6% (10) of participants reported their lessons were 40-50 minutes, 27.8% (5) indicated their lessons were 50-60 minutes, 5.6% (1) indicated their lessons were 60+ minutes, 5.6% (1) reported their lessons were 30-40 minutes, and 5.6% (1) said their lessons were 20-30 minutes. A total of 83.3% (15) of the teachers reported that PE grades were based on standards, with 33.3% (6) of schools following British curriculum standards and 66.6% (12) following the international baccalaureate (IB) standards.

A total of 61.1% (11) of the teachers were required to participate in PE professional development at least once per year, with 44.8% (8) of schools providing teachers with financial support for PE-related professional development. Over half of participants—61.1% (11)—indicated their schools have a written policy specifying student-to-teacher ratio in PE lessons. Ratios ranged from 20:1-30:1 (*M*=26:1). A total of 83.3% (15) of respondents reported that teachers are permitted to withhold scheduled lunch breaks from students for academic or disciplinary reasons.

Basketball courts were the main facility available to respondents, with 72.2% (13) reporting that this facility was "often available." However, 50% (9) suggested that the basketball court was not large enough to avoid overcrowding. 88.9% (16) indicated their schools had a budget allocation for PE equipment and supplies, although 50% (9) did not know the amount. Four respondents specified their budget allocations ranging from 10,000-110,000 AED (Amount in Emirati Dirham) per year (*M*=50,000 AED). This converts to $2,722-29,948 USD annually (*M*=13,612 USD).

Other PA Opportunities

Items pertaining to policies, practices, and resources regarding PA during school (recess/break times and classroom-based PA) and PA before and after school were grouped into this domain. Regarding recess/break times, 50% (9) of respondents reported that their school had a written policy specifying the number of recess/lunch break minutes per day students should receive, with breaks ranging from 30-60 minutes (*M*=38.33 minutes). A total of 77.8% (14) felt that pupils or students were physically active between 16 to 30 minutes of their lunch breaks. According to 94.4% (n=17) of respondents, the school staff members most often asked to supervise recess/lunch breaks were classroom teachers. A total of 72.2% (13) of participants indicated their schools did not provide organized activities during recess/lunch breaks, and 50% (9) indicated that recess/lunch break supervisors were not asked to encourage students to be physically active during their lunch breaks. Furthermore, 44.4% (8) of the teachers indicated their schools did not provide equipment to students at recess, and 72.2% (13) reported that there was no budget for recess equipment and supplies. A total of 38.9% (7) of partici-

pants indicated that students could not be physically active during their recess/lunch break when there is inclement weather.

With respect to classroom PA, 72.2% (13) of respondents reported that their schools did not provide classroom teachers with professional development support that encourages teachers to integrate PA into the classroom. Over half of the participants—55.6% (10)—indicated their schools did not have physically active classroom environments (e.g., stand-up desks, cycle desks), with 44.4% (8) reporting that between 1-24% of classroom teachers integrate PA in their classrooms.

In the area of before and after school PA, 94.4% (17) reported their schools made provisions variously for PA clubs or inter-house sports for students before or after school. However, 61.1% (11) indicated schools provided no training for those who supervise, lead, or coach before/after school programs. A total of 88.9% (16) of respondents indicated their schools engaged in interscholastic sports competitions, and 44.4% (8) indicated the "majority" (50-74%) of both male and female students participated in at least one PA club or sport during the academic year.

Implementation Support System

This domain included items focusing on the infrastructure in place to support school-wide PA programming, including a school wellness policy, a school wellness committee, support for staff involvement (specifically, the provision of staff wellness programming), and support for family and community engagement. A total of 50% (9) of participants reported their school had a wellness policy addressing PA, while 66.7% (12) of participants indicated their school had a committee overseeing the school's health policy and programs, 66.7% (12) of respondents reported that their school had a wellness coordinator, and 55.6% (10) of teachers indicated their school's wellness committees had a leader with PA expertise.

Regarding staff involvement, 33.3% (6) of participants indicated their schools offered PA classes/programs to employees in their schools, and 33.3% (6) of these respondents reported that any (1-24%) staff attended or participated in these classes/programs. Specific to family and community engagement, 72.2% (13) respondents reported that their schools did not promote or support walking or cycling to school using designated safe or preferred routes where

available. A total of 55.6% (10) reported that their schools offered community enrichment programs on school grounds outside of the normal school day. Additionally, 66.7% (12) of the teachers reported that their schools ran PE and PA school-based community events, such as health fairs and family fun nights, 50% (9) reported that their schools opened their indoor facilities, and 44.4% (8) reported that their schools opened their outdoor facilities to students and their families outside of school hours.

Interviews

Thematic analysis of the interview transcripts resulted in three themes: (a) Time constraints in secondary schools, (b) facilities, and (c) location.

Time Constraints in Secondary Schools

The example repeatedly resurfacing in this context was that of promoting PA during regular classroom time. Participant 1, who was a secondary school PE teacher, suggested that more time is afforded to primary school teachers to implement PA in their lessons:

> In primary school, a high proportion [of classroom teachers] would be doing physically active lessons. I suppose it could maybe be a lack of creativity in the delivery for secondary school teachers, but I'd imagine it's lots of pressure from senior management and parents about having to get the content delivered and feeling like they do not have enough time. In secondary school, to be honest, I'm pretty much stuck in the classroom for the whole 55 minutes.

Similarly, Participant 5, who was a secondary school PE teacher, had similar views on time constraints due to the academic curriculum: "I would say no teachers integrate physical activity [which is] probably more to do with they are very focused on getting their own lessons done and very much focused on getting their curriculum done before even contemplate[ing] doing anything else." Participant 6, who taught PE across both primary and secondary school, felt primary schools are more suited to implement PA into their lessons: "[In primary schools] the lessons tend to be more practical activities. Within secondary school, lessons are shorter, only 45 minutes

to teach; it's hard to integrate [PA], as there's a lot of theory based in the secondary school."

Facilities

The second theme focused on the facilities available to schools. It became apparent that some schools had more or better facilities for students to be physically active, particularly in the hotter months. Participant 1 mentioned their school has the capacity to host PA opportunities for students during snack/lunch breaks: "They can use the sports hall in the summer months and then in the cooler months they would use the football field." Participant 3, a primary school PE teacher, had a similar issue describing how the provision of PA in the hotter months was more challenging due to the availability of facilities:

> Students receive 20 minutes for snack and 40 minutes for lunch, however, now we are considered "hot weather play" in Dubai, so students are not allowed to go outside for recess. Therefore, they must stay in the classroom and do activities, or they just must go to the canteen and eat. So, they're not allowed outside to play unless we have a free facility where they can take part in physical activity and but in our school that depends on if we have facilities available, which is very unlikely as we do use them for a lot for lessons.

Participant 5 remarked, "[Time spent doing PA] would be very little to be honest. Break times in my school are just two breaks of 15 minutes every day. Also, the way the school is set up as well, not many areas, both nearly from a health and safety perspective, and just a lack of facilities and resources." Further, Participant 7, a secondary PE teacher, indicated, "[Students] have no physical activity during the hot months up until probably the middle of October. Once the weather cools down, then yes, we have lots of outdoor spaces that the kids can go and use."

Location

Schools' locations, including the overall built environment and the weather in Dubai, emerged as a key factor in school-based PA promotion. A focus on active commuting to/from school was particularly prominent within this theme. When asked whether schools

would encourage students or teachers to commute actively, most participants felt walking/cycling to school was not an option for their students. Participant 6 said, "I don't think there's much promotion or encouraging students to walk or cycle to school due to the nature of the region." Similarly, Participant 7 remarked, "Not at the moment, no, due to the location of the school." Participant 4 mentioned,

> There are some students that cycle to school, but it wouldn't necessarily be promoted. In the area that my current school is located [it] is quite in like an industrial area. There's a lot of high-rise buildings and shopping centers and quite a lot of busy roads and traffic. So, in terms of safety, I'm not actually sure if that would be advisable around the current area.

One exception was Participant 2, a secondary school PE teacher, who said, "Yeah, a lot [of students] walk and cycle to school. There's a lot of bikes out there now. Particularly when it's cooler there are a lot that can easily cycle and walk from the Springs and Emirates Hills area." Thus, not all international schools in Dubai are in parts of the city where active commuting is considered too dangerous or challenging.

Discussion

The aim of this mixed-methods study was to examine whole-of-school PA programming in Dubai international schools from the perspective of the CSPAP framework. PE teachers' perceptions were used to understand school PA policies and practices and gain insights into factors supporting or hindering PA promotion. As PE is identified as the cornerstone component of a CSPAP and PE teachers are commonly understood to be the resident experts in schools when it comes to promoting PA (SHAPE America, 2015), gathering PE teachers' views and experiences of PA programming is a significant feature of this study.

Quantitative results indicate there are both strengths and limitations with respect to whole-of-school PA in Dubai international schools. In the domain of quality PE, it was reassuring to find that all participants said their school offers PE and that student-teacher ratios seemed consistent with what would be expected for other subject areas. However, about a quarter of schools did not require that

a specialist teach PE, there was considerable variability reported for the frequency and length of PE lessons, a large majority of schools allowed teachers to withhold PA opportunities from students for disciplinary reasons, and there appeared to be a lack of support for PE teachers' professional development. SHAPE America (2015) recommends that all PE be taught by a licensed/certified PE teacher, that every student be required to take PE daily, totaling 150 minutes each week for elementary students and 225 minutes each week for middle and high school students, and that PA never be withheld as a punishment. Furthermore, in its comprehensive review of school-based PE and PA, the Institute of Medicine (2013) recommended that PE teachers be provided with ongoing professional development, which was identified as an important factor in improving teacher instruction and student achievement.

Participants' survey responses suggested that other PA opportunities during school were limited. There were few organized activities to support students' PA during recess, and there was little to no budget available to purchase recess equipment. Research on organized recess activities has yielded mixed results, with some studies showing this approach increases children's PA and other studies showing no change or decreases in children's PA (Coolkens et al., 2018; McKenzie et al., 2010; Suga et al., 2021). The expected advantage of organized activities at recess is their support for children who are less active at other times during the day and may benefit from more structured PA opportunities during recess (Frank et al., 2018). Portable equipment at recess has consistently been shown to increase children's PA levels (e.g., Erwin et al., 2014; Parrish et al., 2013; Suga et al., 2021). The study's participants also reported a lack of professional development for classroom teachers to promote PA. An intervention in an elementary school showed that classroom teachers' implementation rates of physically active academic lessons increased following professional development (Bartholomew & Jowers, 2011), and numerous recommendations for effective professional development to support classroom teachers' PA promotion have been forwarded in the literature (e.g., Moon & Webster, 2019; Tompkins et al., 2019). In contrast to PA opportunities during school, PA opportunities before and after school appeared more prevalent in the current study, but participants reported a lack of supervisor training. Research has

demonstrated that a brief, 30-minute PA promotion training session for afterschool staff can increase PA and reduce children's sedentary behavior in afterschool programs (Mailey et al., 2021).

Regarding the CSPAP implementation support system, it is apparent that further work is needed to implement staff wellness programming. Although staff wellness continues to be an area of limited focus in CSPAP research, mounting evidence suggests that school staff who are more physically active are also more likely to promote PA with their students (Kuhn et al., 2021; Webster et al., 2015). Active commuting was revealed to be another relatively undeveloped area of support for PA promotion, with implications for the role of communities in designing safe routes to school and the role of school staff and parents in supervising children who walk or bicycle to school when needed. The questionnaire data also evidenced a gap in schools' PA promotion by making school facilities open to students and families outside of school hours. Children have been shown to participate in more PA when schools open their facilities after school and on weekends (Durant et al., 2009; Farley et al., 2007).

The follow-up interviews in this study addressed the second research question concerning factors that facilitate or hinder PA opportunities in Dubai international schools. Participants felt that time constraints were a bigger barrier to CSPAP implementation in secondary schools compared to elementary schools. Research on whole-of-school PA in secondary schools is scant. In one study, a purposive sample of science teachers interviewed about using classroom PA said that they typically integrated PA into lessons (Warehime et al., 2019). Although they perceived barriers to promoting PA (e.g., lack of space, student resistance), insufficient time did not emerge as a theme in the findings. However, extra time needed to teach using PA did surface as a challenge in another interview study conducted with high school teachers who integrated PA into their subjects (English, math, and Norwegian; Schmidt et al., 2022). Despite participants' perceptions in the present study, studies conducted in elementary schools have consistently identified a lack of time as a perceived barrier for classroom teachers. Comparisons of whole-of-school PA programming in elementary and secondary school settings in future research are needed to better understand time as a factor in teachers' PA promotion.

The other themes identified from the interviews were facilities and location as factors in promoting school-based PA. Of particular significance in this regard is the geographical location of the UAE. In Dubai, inclement weather during the academic year is prevalent, particularly in the months of August, September, May, and June. Students spend up to 40% of the school year indoors for PE lessons, classroom lessons, snacks, and lunch breaks. Warmer weather also impacts access to facilities, particularly during snacks and lunch breaks. Many participants alluded to this issue. Schools with ample space and facilities are less affected by the climate. However, school campuses that span primary and secondary grades/years and share facilities are particularly affected. Participants in this study report that students eat lunches in classrooms or canteens without an option to go outside and be active. This highlights the significance of classroom teachers, including PA, during conventional lessons throughout the school day.

A key strength of this study is that it is one of the first investigations to examine whole-of-school PA programming in Dubai international schools. Further, this study begins to address a broader gap: the lack of research on school-based PA policies and practices in the Middle East and North Africa region. Despite these strengths, several limitations need to be acknowledged. The response rate for the CSPAP-Q was low, although not inconsistent with other studies using online surveys. Nulty (2008) suggests that online surveys are much less likely to achieve response rates as high as surveys conducted on paper. A second limitation was convenience sampling, which limits the generalizability of the results. Finally, as data were collected strictly using self-reports, it is possible that some of the results reflect social desirability and that more objective measures would capture different perspectives on the extent and nature of CSPAP implementation within the study context.

In conclusion, this study provides an initial look into whole-of-school programming in Dubai international schools. The data may be useful in informing school leaders about some areas of the CSPAP framework that could be given more attention and priority in efforts to help ensure students have sufficient opportunities to meet PA guidelines as a route not only to improved health and well-being but also to academic performance. Future research is recommended

using a larger sample and drawing on perspectives of other school professionals, including classroom teachers and principals, as well as parents and community partners, to continue to build the descriptive evidence needed to underpin correlational/experimental studies and strengthen practical guidance concerning whole-of-school programming in Dubai international schools.

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HEALTH CARE

CPR Memory and Skill Degradation Among Non-Allied Healthcare Professionals

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Abstract

Cardiopulmonary Resuscitation is defined by the Mayo Clinic as a lifesaving technique that is useful in many emergencies, such as a heart attack, stroke, choking, or drowning, in which someone's breathing and heartbeat have stopped. Under the guidelines put forth by the International Liaison Committee on Resuscitation (ILCOR) and the Emergency Cardiovascular Care Organization (ECC), the American Red Cross and American Heart Association currently require that an individual's CPR certification be renewed every two years. However, data has suggested that non-allied healthcare providers, such as

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school-based personnel, may require more regular training to maintain required CPR proficiency levels. Four hundred non-allied healthcare professionals from a school district in central Georgia were CPR-certified under the American Heart Association (AHA) Heart-Saver curriculum. Participants included 153 males and 247 females from elementary, middle, and high school settings. Participants included administrators, teachers, coaches, and staff. Two tenured college professors from the School of Health and Human Performance were responsible for teaching and certifying study participants. Each of these professors possessed a minimum of five years of CPR certification experience with the American Heart Association. Course sizes were limited to 12-15 participants. All CPR certification courses were implemented under standardized, controlled circumstances. Following the initial certification, twenty-five percent of participants were randomly selected to be reassessed at either three, six, nine, or twelve months, respectively, to determine memory and skill degradation rates and patterns. Degradation of declarative and procedural knowledge was observed during subsequent retest sessions at each of the three-, six-, nine-, and twelve-month marks. Scores depreciated approximately 10% each three-month retesting period, to 88%, 79%, 69%, and 57%, respectively. Data suggest that after six months, participants failed to meet the AHA standards for demonstrating acceptable declarative and procedural knowledge related to CPR implementation. Due to the observed degradation in both declarative and procedural knowledge, it is apparent that a more periodic training and recertification process in CPR is required for school-based personnel. A more consistent and periodic approach to preparing school-based first responders may prove beneficial in maintaining CPR proficiency rates, which very well could save lives.

Introduction

CPR Certification Protocols

Cardiopulmonary Resuscitation, or CPR, is defined by the Mayo Clinic as a lifesaving technique that is useful in many emergencies, such as a heart attack, stroke, choking, and/or drowning, in which someone's breathing and heartbeat have stopped (Mayo Clinic, 2022). The aforementioned circumstances fall into a category of incidences known as Cardiorespiratory Distress, or CRDs, in which the cardiac or respiratory system experiences severe dis-

tress. Currently, the CDC acknowledges that nine out of every ten cardiac arrest situations end in death without immediate treatment (Centers for Disease Control and Prevention, 2022). However, in cases where CPR is administered within the first few minutes, CPR can double or even triple a person's chance of survival (American Heart Association, 2022; American Red Cross, 2022; Centers for Disease Control and Prevention, 2022; Larsen et al., 1993; National Academies of Science, Schultz & McCoy, 2016). Hence, regarding an event of CRD, CPR becomes increasingly critical to the survival of the individual involved. However, CPR must be properly executed to be an effective life-saving measure.

Regarding CPR standardized practices, two major organizations are recognized for advancing recommendations and upholding guidelines. These committees are the International Liaison Committee on Resuscitation (ILCOR) and the Emergency Cardiovascular Care Organization (ECC). They are the authorities by which new CPR recommendations and guidelines are decided and communicated to the public. Currently, the most recent guidelines for CPR are thirty chest compressions to two rescue breaths (American Heart Association, 2022; American Red Cross, 2022; CPR Steps, 2022). According to Blewer et al., "Prompt delivery of bystander CPR (B-CPR) can increase the probability of survival by two-fold" (2017). Yet less than one-third of Sudden Cardiac Arrest (SCA) patients receive prompt B-CPR in the United States, to the detriment of many individuals (Hung et al., 2017). This lack of access to timely CPR continues to prove to be problematic in saving lives under time-sensitive CRD situations. Moreover, this begs the question of why CPR is not being provided in a timely manner. Is there a lack of bystander knowledge and preparation regarding CPR-associated skills? Are current CPR training practices and certification practices across the United States insufficient?

MyCPRcertificationonline.com claims that "For a person who is not in regular practice, the skills and knowledge learned at the first training depreciate drastically in the first year (2022). For this reason, CPR certifications are only valid for two years, after which there is need for renewal" (American Heart Association, 2022; American Red Cross, 2022). Numerous studies (Andresen et al., 2007; Riegel et al.,2005; Spooner et al., 2007) have tended to agree with this prin-

ciple, suggesting that over the course of one calendar year, there is considerable degradation in CPR implementation ability without continued practice, rehearsal, instruction, and/or training. This notion raises the debate as to what the ideal latency period is between training and recertifications. When does depreciation set in and to what degree? How long should a certification last and how should/could continuing education be applied most appropriately?

CPR in the School Setting

When considering emergency, healthcare, and safety personnel in the school setting, three positions often come to mind: the school nurse for general student healthcare, the athletic trainer for all-purpose sports-related healthcare, and the school resource officer for providing safety and a direct line of communication for emergencies on school grounds.

According to the recommendation of the National Association of School Nurses (NASN), each school should have a ratio of one nurse to every one thousand students, or at least one nurse per school on staff (Mangena & Maughan, 2015). How does the U.S. as a whole measure up to these expectations? According to the NASN's national survey in 2018, 81.9% of public schools and 34.6% of private schools reported having a full or part-time school nurse on staff (Willgerodt et al., 2018). With this national baseline for comparison, it appears that the state of Georgia falls short of national expectations. By compounding evidence from statements from the Georgia Department of Public Health and the Georgia Association of School Nurses (GASN), the state of Georgia has 1600 employees providing full-time school nursing services to 1.7 million students; with only 39% of all public schools in Georgia having a full-time nurse in their personnel (Georgia Association of School Nurses, 2022; Georgia Department of Public Health, 2022).

When ensuring that a school's athletes are safe and receive adequate healthcare, having an Athletic Trainer (AT) is necessary. The number of schools employing ATs has significantly increased nationwide over the past decades. In 1994, 35% of secondary schools employed an AT, while the present-day numbers have increased to 70% of public schools and 58% of private secondary schools employing at least one certified AT (Pike et al., 2019). Evaluating schools in Georgia with employed ATs indicates that the culture of athletic

safety is held to a high standard. Through aggregating the data from various surveys, Georgia schools appear to average relatively high AT employment rates; with 73% of public and 56% of private secondary schools having an employed AT on school grounds (Huggins et al., 2019; Pike et al., 2019; Pryor et al., 2015). Furthermore, it is worth noting that AT employment data, which is directly associated with secondary school settings, extends to elementary settings. It is important to understand that most private schools in Georgia are K-12, and a large percentage of public secondary schools reside on the same campus or in close proximity to elementary schools. Hence, ATs employed in secondary settings often serve multiple populations.

Concurrently, to facilitate emergency care and safety within the school population, the deployment of law enforcement officers in school systems has become paramount. The number of school resource officers has risen exponentially throughout the nation, and concerns are predicated on the safety of students. In the 1970s, only a small portion of schools utilized resource officers on campus, with the nation reporting less than 1% of schools employing such personnel (Gottfredson et al., 2020). Presently, approximately 48% of all schools and 65% of secondary schools nationwide employ full-time resource officers to capitalize on the safety of students (Gottfredson et al., 2020). In Georgia, 42% of public schools and 52% of private schools employ at least one resource officer (Georgia Department of Education, 2022).

The synergy of the task force of school nurses, ATs, and resource officers has become the gold standard for healthcare and the attenuation of precarious scenarios in the school setting (Embrey & Rosiack, 2019). However, due to constraints such as funding and staffing, these individuals cannot always be relied upon to be the sole emergency first responders. In many CRD events on school grounds, that responsibility falls to administrators, teachers, coaches, and staff members.

Emergency Medical Service Response Time

The data is relatively conclusive that CRD events tend to result in high fatality rates when immediate, proper, CPR is not administered (American Heart Association, 2022; American Red Cross, 2022; Ibrahim, 2007). Hence the importance of early CPR intervention

from those in close proximity to the patient to increase the chance of survival. Bystander response is an essential element in this chain of survival until Emergency Medical Service (EMS) personnel arrive. Unfortunately, despite the fact that EMS can provide critical prehospital care, response times to such time-sensitive CRD scenarios (choking, anaphylactic shock, stroke, cardiac arrest, drowning, and others) vary significantly based on location (Hsia et al., 2018). A recent study of EMS response times throughout the United States was conducted based on income areas. Results suggested that in high-income areas within the United States, EMS response rates averaged 13.6 minutes. In contrast, EMS response rates in low-income areas averaged 18.8 minutes (Hsia et al., 2018). Response times appeared to be primarily related to the scene's proximity to the location of the EMS provider. On average, response scenes in high-income areas were reported at a mean distance of 6.08 miles from the EMS base of operations, whereas in low-income areas, response scenes were reported at a mean distance of 8.77 miles (Hsia et al., 2018). This same study used National Emergency Medical Service Information System (NEMSIS) data and found that the expected time for EMS arrival to school settings nationwide was between eight and 15 minutes (Hsia et al., 2018). Therefore, based on expected EMS response times, school-based personnel should anticipate being responsible for providing eight to 15 minutes of high-quality CPR prior to EMS arrival, making bystander knowledge of CPR critically important in reducing the risk of death in CRD events on school grounds.

Georgia CPR Requirements for School Personnel

The Georgia State Department of Education does not require teachers to maintain a CPR certification for licensure. However, individual school districts in the state may require employees to have a current Adult, Child, and Infant CPR, AED, and First Aid certification as a condition of employment. (CPR certification for Teachers in Georgia, 2022).

The Georgia High School Association (GHSA) is a National Federation of State High School Associations member. It serves as the preeminent governing body for Georgia High School Athletics. The GHSA's purpose is the "promotion of education in Georgia from a mental, physical, and moral viewpoint, to standardize and encourage participation in athletics, to promote sportsmanship and an ap-

preciation for and study of music, speech and other fine arts through Region and State competitions." As the preeminent governing body, the GHSA sets all guidelines and by-laws by which high school coaches, athletes, trainers, parents, and volunteers must abide in the state, including requirements for CPR and First Aid certifications.

As of April 2019, the GHSA approved a rule change in their constitution, which requires all coaches to receive CPR and AED training (Georgia High School Association Constitution and By-Laws, 2022; Heck, 2019). The exact by-law states, "Every faculty coach, community coach, and student-teaching intern at a GHSA member school must complete: (b) CPR (minimum compressions only) and AED training prior to any team activity or within a maximum of 30 days from the start of a team activity and it must be renewed at a minimum of every two years. NOTE: A fine for every coach who does not complete a rules clinic, or who does not complete the required CPR and AED training, before the assigned deadline will be assessed to the school" (Georgia High School Association, 2022).

Conclusion

Due to a variety of factors, public school and private school settings nationwide have observed an increase in on-site Cardiorespiratory Distress prevalence rates over the past decades (American Heart Association, 2022; American Red Cross, 2022; Elfein, 2021; Roth et al., 2015). This observed increase in CRD events appears to affect students, staff, administration, parents, and campus visitors alike. With the average response time for EMS anticipated at approximately eight to 15 minutes, on-site first responders need to be prepared to provide timely, high-quality CPR until those emergency medical professionals arrive on the scene. It is essential that school-based employees be properly trained in CPR and First Aid to enhance their chances of survival during cardiorespiratory distress events. This study was designed to evaluate how prepared school-based employees are to respond to worst-case scenario CRD events by evaluating CPR memory and skill degradation rates post initial certification.

Methods

Participants

To evaluate the efficacy of the criteria set for the length of time, non-allied healthcare professionals can maintain CPR certification status with credibility, a convenience sample of 400 public-school employees from elementary, middle, and high schools in central Georgia was utilized for this study. Subjects included 153 males and 247 females. The professional positions of participants were noted as follows: Teachers, 257; Administrators, 56; Teachers/Coaches, 47; Staff, 32; and Coaches, 8. Participants represented school settings as follows: High School, 165; Middle School, 137; and Elementary School, 98. Schools were represented as follows: High Schools, 2; Middle Schools, 4; and Elementary Schools, 8.

All CPR certification courses provided to participants were implemented under standardized, controlled circumstances in order to increase validity and reliability. This included utilizing the same location for certifications, identical scripted conditions for implementation, identical instructors, and identical equipment calibrated to AHA specifications. Furthermore, class sizes were kept to 12-15 participants, with a maximum 4:1 instructor-to-student ratio per class, to allow for ideal learning environments for all participants.

CPR Instructors & Content

Two tenured college professors from the School of Health and Human Performance at a medium-sized public liberal arts college in central Georgia were responsible for teaching and certifying study participants. Each of these professors possessed at least five years of CPR certification experience with the American Heart Association (AHA) {CPR, First Aid, and AED}. Moreover, both instructors had certified over 2,000 participants at the time of the study. Each professor also had their AHA instructor certifications renewed in 2021, immediately before the intervention. The professors were supported by three graduate assistants from the School of Health and Human Performance during certifications; each of which had accumulated one year of AHA CPR, First Aid, and AED instructor certification experience.

The study participants' certification courses followed the AHA Heart Saver K-12 program. The course included Adult/Child and Infant CPR, Adult/Child and Infant Choking, Adult/Child and Infant AED, First Aid, and a Written Content exam. The AHA Heart Saver 2020 Skills Forms and Exams were implemented in accordance with all AHA guidelines for assessment during the practical skills portion of the certification course.

Participant Recruitment

The acquisition of participants was carried out via a contact letter sent to school district's boards of education, offering free CPR certification to any employee willing to partake in the study. This recruitment process cultivated all 400 school employees who participated in the study.

Equipment

Prestan CPR equipment was used to complete this study. Prestan 2000-series adult/child and infant CPR manikins were used for all testing sessions for chest compression evaluation. These models provided electronic feedback control on compression rate and compression depth to practitioners. Prestan AED trainers were also implemented for all testing sessions, as well as Prestan CPR safety face shields with oxygen bags for rescue breathing evaluation. Further testing equipment included: WorldPoint, First-On-Scene first-aid kits with stop-the-bleed materials, EpiPen trainers, tourniquets, and SAM splints. The CPR manikins and AEDs were all calibrated prior to testing and sanitized before use. For training and testing purposes, a 2:1 ratio of participants to equipment was implemented for the study.

Baseline and Follow-Up Assessment

A three-hour AHA Heart Saver certification course was implemented immediately before the initial certification assessment. The AHA Heart Saver certification is valid for a two-year period, pending the successful completion of all course assessments. The AHA 2020 Rubrics for Adult/Child and Infant CPR & AED and First Aid were implemented for assessment purposes, along with the 2020 Heart Saver Content Examination. All initial baseline certifications were conducted in a one-week time period. Following the initial certifica-

tion, twenty-five percent of participants were randomly selected to be reassessed at either three, six, nine, or twelve months, respectively, to determine memory and skill degradation rates and patterns.

Data Analysis

For this study, instructors recruited participants who were school employees from counties around the PI's institution. There were 400 total employees who participated in the study. Subjects included 153 males and 247 females. Subjects included 257 teachers, 56 administrators, 47 teachers/coaches, 32 staff members, and 8 coaches. Subjects were employed at 14 separate schools, including two high schools, four middle schools, and eight elementary schools.

The 28th version of the SPSS software was used to complete data analyses. To determine if baseline testing depended on gender, school setting, or professional position, Independent Sample T-Tests and One-Way ANOVAs were applied. To determine how participants performed on the initial testing immediately after training and then again at intervals of three months up to a full year after training (months 3, 6, 9, and 12), to determine degradation patterns in performance, Dependent Sample T-Tests were applied. Repeated Measures ANOVAs were applied to determine if declarative and procedural knowledge degradation occurred over the course of the year and to determine at what respective intervals throughout the year degradation in declarative and procedural knowledge impaired participants' ability to respond appropriately to emergency situations. Within testing, all assessments were two-tailed, with alpha levels set at 0.05 for statistical significance and all CI levels set to 95%.

Results

An Independent Sample T-Test comparing the mean scores between males and females on each of the eight assessed areas of CPR was run to determine if baseline tests were dependent upon gender. (See Table 1) Data indicates that gender did not play a significant role in baseline test performance. A One-Way ANOVA was conducted to determine if the school setting or professional position had a significant influence on each of the eight assessed areas of CPR during baseline testing. (See Tables 2 and 3) Data indicates that neither school setting nor professional position had a significant impact on baseline exam scores.

Table 1
Initial CPR Certification Assessment Scores by Genders

Assessment	Gender	N	Mean	Std. Deviation
Written Test	Male	153	90.8627	3.74000
	Female	247	90.9069	4.13436
Adult CPR	Male	153	95.0850	3.42389
	Female	247	94.3846	3.33280
Child CPR	Male	153	95.2614	3.17633
	Female	247	94.5344	3.17476
Infant CPR	Male	153	95.6340	3.01259
	Female	247	94.9838	2.72890
Adult Choking	Male	153	94.8954	1.45169
	Female	247	94.8623	1.51325
Infant Choking	Male	153	93.1373	2.44965
	Female	247	93.2267	2.44226
First Aid	Male	153	93.9673	2.97007
	Female	247	94.0162	2.95353
AED	Male	153	93.1307	3.69333
	Female	247	93.2227	3.61611

The passing proficiency score for the American Heart Association's CPR certification exam is 84%. During baseline testing, after the initial training, participants performed exceptionally well on the written exam averaging a 94 percent pass rating. However, memory degradation of declarative knowledge was observed during subsequent retest sessions at each of the three-, six-, nine-, and 12-month marks. Scores depreciated approximately 10% at each three-month retesting period to 88%, 79%, 69%, and 57%, respectively. Data suggest that after six months, participants failed to meet the AHA standards for demonstrating acceptable declarative knowledge related to CPR implementation.

Independent Sample T-tests signified statistically significant degradation rates from baseline assessments across all assessed areas at each subsequent three-month retest, except for the three-month to six-month period for Adult and Infant Choking and the baseline to three-month and nine-month to 12-month period for AED implementation. Adult CPR baseline skill proficiency scores averaged 95%. Scores degraded to 88% at three months, 78% at six months, 68% at nine months, and 52% at 12 months. Child CPR baseline skill proficiency scores averaged 95%. Scores degraded to 89% at three months, 79% at six months, 68% at nine months, and

Table 2
Initial CPR Certification Assessment Scores by Professional Positions

Assessment	Position	N	Mean	Std. Deviation
Written Test	Administrator	56	91.7500	4.23084
	Teacher	257	90.7315	4.08813
	Teacher/Coach	47	91.4468	3.08438
	Coach	8	91.2500	4.65219
	Staff	32	89.7500	3.47340
Adult CPR	Administrator	56	94.0893	3.60947
	Teacher	257	94.5759	3.49596
	Teacher/Coach	47	94.8511	2.86644
	Coach	8	95.2500	1.66905
	Staff	32	95.8125	2.84477
	Total	400	94.6525	3.38088
Child CPR	Administrator	56	94.3929	3.14312
	Teacher	257	94.6654	3.34198
	Teacher/Coach	47	95.4255	2.74055
	Coach	8	95.2500	1.66905
	Staff	32	95.7188	2.75018
	Total	400	94.8125	3.19105
Infant CPR	Administrator	56	95.4643	2.62134
	Teacher	257	95.0584	3.03889
	Teacher/Coach	47	95.4468	2.57757
	Coach	8	95.2500	1.66905
	Staff	32	95.9063	2.24843
	Total	400	95.2325	2.85461
Adult Choking	Administrator	56	94.7500	1.37840
	Teacher	257	94.9650	1.42342
	Teacher Coach	47	94.7021	1.82870
	Coach	8	95.0000	.00000
	Staff	32	94.5938	1.79353
	Total	400	94.8750	1.48826
Infant Choking	Administrator	56	93.5357	2.48607
	Teacher	257	93.1751	2.35113
	Teacher/Coach	47	92.7234	2.70026
	Coach	8	92.5000	2.39046
	Staff	32	93.5938	2.68640
	Total	400	93.1925	2.44241
First Aid	Administrator	56	94.2857	2.85220
	Teacher	257	93.7471	2.92254
	Teacher/Coach	47	94.3191	2.93485
	Coach	8	96.8750	2.53194
	Staff	32	94.3125	3.19715
	Total	400	93.9975	2.95624
AED	Administrator	56	93.9643	2.77629
	Teacher	257	93.0078	3.84260
	Teacher Coach	47	93.0851	3.54983
	Coach	8	95.0000	.00000
	Staff	32	92.9688	3.75443
	Total	400	93.1875	3.64150

51% at 12 months. Infant CPR baseline skill proficiency scores averaged 95%. Scores degraded to 88% at three months, 78% at six months, 70% at nine months, and 57% at 12 months. Adult Choking baseline skill proficiency scores averaged 94%. Scores degraded to 89% at three months, 86% at six months, 77% at nine months, and 71% at 12 months. Infant Choking baseline skill proficiency scores averaged 93%. Scores degraded to 86% at three months, 80% at six

Table 3
Initial CPR Certification Assessment Scores by Professional Positions

Assessment	Position	N	Mean	Std. Deviation
Written Test	Elementary	98	91.1224	4.27957
	Middle	137	90.8029	4.02536
	High	165	90.8242	3.78049
Adult CPR	Elementary	98	94.7857	3.63332
	Middle	137	95.7664	3.19066
	High	165	93.6485	3.08182
	Total	400	94.6525	3.38088
Child CPR	Elementary	98	94.8980	3.51577
	Middle	137	95.6861	3.06247
	High	165	94.0364	2.90477
	Total	400	94.8125	3.19105
Infant CPR	Elementary	98	95.1020	2.99308
	Middle	137	95.7883	2.94166
	High	165	94.8485	2.63329
	Total	400	95.2325	2.85461
Adult Choking	Elementary	98	94.9898	1.34314
	Middle	137	94.8613	1.53959
	High	165	94.8182	1.53127
	Total	400	94.8750	1.48826
Infant Choking	Elementary	98	93.2755	2.40609
	Middle	137	93.1898	2.54816
	High	165	93.1455	2.38710
	Total	400	93.1925	2.44241
First Aid	Elementary	98	93.8878	2.92829
	Middle	137	93.9489	2.99588
	High	165	94.1030	2.95417
	Total	400	93.9975	2.95624
AED	Elementary	98	92.8878	3.92686
	Middle	137	93.2701	3.57381
	High	165	93.2970	3.53247
	Total	400	93.1875	3.64150

months, 70% at nine months, and 60% at 12 months. First Aid baseline skill proficiency scores averaged 94%. Scores degraded to 88% at three months, 81% at six months, 65% at nine months, and 43% at 12 months. AED baseline skill proficiency scores averaged 93%. Scores degraded to 91% at three months, 77% at six months, 70% at nine months, and 66% at 12 months. Hence, according to the AHA benchmark of 84% proficiency in declarative and procedural knowledge, results suggest that participants were no longer proficient in CPR at approximately six months post-initial training and certification.

A One-Way Repeated Measures ANOVA was calculated to determine if declarative knowledge, based on Written Exam scores, decreased significantly over time. A significant effect was found ($F(4,396) = 441.37$, $p < .001$). Written Exam scores decreased every three months over the course of the year. A One-Way Repeated Measures ANOVA was calculated to determine if Adult CPR procedural knowledge decreased significantly over time. A significant effect was found ($F(4,396) = 561.82$, $p < .001$). Adult CPR proficiency decreased every three months. A One-Way Repeated Measures ANOVA was calculated to determine if Child CPR procedural knowledge decreased significantly over time. A significant effect was found ($F(4,396) = 701.51$, $p < .001$). Child CPR proficiency decreased every three months. A One-Way Repeated Measures ANOVA was calculated to determine if Infant CPR procedural knowledge decreased significantly over time. A significant effect was found ($F(4,396) = 1165.82$, $p < .001$). Infant CPR proficiency decreased every three months. A One-Way Repeated Measures ANOVA was calculated to determine if Adult Choking Response procedural knowledge decreased significantly over time. A significant effect was found ($F(4,396) = 821.50$, $p < .001$). Adult Choking Response proficiency decreased every three months. A One-Way Repeated Measures ANOVA was calculated to determine if Infant Choking Response procedural knowledge decreased significantly over time. A significant effect was found ($F(4,396) = 1682.79$, $p < .001$). Infant Choking Response proficiency decreased every three months. A One-Way Repeated Measures ANOVA was calculated to determine if First Aid Response procedural knowledge decreased significantly over time. A significant effect was found ($F(4,396) = 2204.563$, $p < .001$). First Aid Response proficiency decreased every three months. A One-Way Repeated Measures ANOVA was calculated to determine if AED Implementation procedural knowledge decreased significantly over time. A significant effect was found ($F(4,396) = 1592.37$, $p < .001$). AED Implementation proficiency decreased every three months.

Discussion

Within this study, the observed degradation rates in both declarative and procedural CPR skills in these non-allied healthcare professionals occurred in a near-constant progression over the course of a calendar year. The significant decline in retest scores observed dur-

ing the six-month period after the initial CPR certification appears to be the most disconcerting finding in this study. These results suggest that participants were not capable of performing high-quality CPR six months post-initial certification. This observation is likely because the participants in this study, as non-allied healthcare professionals, engaged in little to no authentic rehearsal of CPR skills in their regular workplace functions following the initial certification. This finding aligns with standard Motor Behavior research, suggesting that if a skill is not rehearsed regularly, knowledge of how to perform that skill will gradually deteriorate over time, similar to the principle of diminishing returns (Ives, 2019). Hence, whereas allied healthcare professionals (such as doctors, hospital nurses, emergency medical technicians, and other medical professionals), who continuously rehearse CPR skills in authentic pragmatic situations associated with regular work-based functions, appear suited to a two-year CPR recertification cycle, non-allied healthcare professionals (such as school-based administrators, teachers, coaches, and staff), do not appear to be in such a position. Without a more regular CPR training cycle, it is unlikely such school-based non-allied healthcare professionals will be capable of performing necessary high-quality CPR in response to a worst-case scenario CRD situation on school grounds.

The presence of such unqualified practitioners in a school-based setting can obviously be extremely dangerous. If a school-based practitioner is unprepared to respond appropriately to a CRD event, both response time and response accuracy are likely to be diminished, placing a potential victim at significant risk. Early and accurate response rates are essential elements in the chain of survival for a victim of any CRD. Research has consistently shown that the success rate of resuscitation following the timely and accurate administration of an electric shock via an AED to an individual experiencing CRD is approximately 90% (Zed et al., 2008). However, for every minute that passes without administering a defibrillator, the success rate for resuscitation drops from 7% to 10% (Zed et al., 2008; Larsen et al., 1993). As such, the qualifications of first responders in school-based settings trained in CPR can quite literally dictate whether a victim of CRD lives or dies.

In light of the results from this study, it is recommended that CPR training for non-allied health professionals, such as school-

based practitioners, become more regular. Due to the observed dramatic degradation in both declarative and procedural knowledge, it is apparent that more periodic training and recertification in CPR is required for school-based personnel. A more consistent and periodic approach to preparing school-based first responders may prove beneficial in maintaining CPR proficiency rates, which could save lives.

Follow-Up

Replicated versions of this study with other non-allied healthcare professions may reinforce the notion that such practitioners require a shorter latency period between recertifications to maintain proficiency in CPR application. Such additional data could support the argument for more regular recertification requirements.

Limitations

Participants were not monitored between initial and post-testing sessions. Hence, where participants were asked not to "prepare" prior to retest scenarios, there was no way for the investigators to control for participant compliance. However, if participants did "prepare" for the retest sessions, the findings would be even more alarming based on the degradation rates observed. Furthermore, participants' inclusionary status in the study as "initial certification" practitioners was based on self-report data, which showed that none were previously certified in CPR/AED implementation. However, it is possible that some participants may have had CPR training prior to engaging in the study protocols.

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YOU AND THE LAW

Athletic Trainers Why Should Every High School Have One?

Thomas H. Sawyer, Ed.D. and Tonya L. Sawyer, Ph.D.

Introduction

Athletic trainers play a vital role in ensuring the health and safety of student-athletes in high school sports programs. Every high school should have access to athletic trainers either as full-time staff members or as a part-time contracted service. This is necessary for all contact (impact) sports, such as basketball, field hockey, football, gymnastics, ice hockey, lacrosse, rugby, and soccer. All of those sports mentioned have concussion issues. Liability issues in sports focus on impact injuries, specifically concussions, due to the high costs involved in these injuries.

According to the National Athletic Trainers Association (NATA) (https://www.nata.org) and the American College of Sports Medicine (ACSM) (https://www.acsm.org), the following are some of the reasons why every high school should have an athletic trainer:

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1. **Injury prevention:** Athletic trainers are trained to assess and identify potential injury risks. They can develop and implement injury prevention programs, such as warm-up routines and proper conditioning exercises, to reduce the likelihood of injuries during sports activities.

2. **Immediate response to injuries:** In the event of an injury, athletic trainers are on the sidelines to provide immediate care. They can assess the severity of an injury, administer first aid, and make informed decisions about whether further medical attention is required.

3. **Injury management and rehabilitation:** Athletic trainers are skilled in evaluating and managing various sports injuries. They can provide initial treatment, develop rehabilitation programs, and work with athletes to facilitate their safe and timely return to sports activities.

4. **Concussion management:** Concussions are a significant concern in sports. Athletic trainers are trained to recognize the signs and symptoms of concussions. They can implement proper protocols for evaluation, management, and return-to-play decisions per current concussion guidelines.

5. **Health and wellness education:** Athletic trainers educate student-athletes on topics such as nutrition, hydration, injury prevention, and proper training techniques. By promoting healthy habits and injury prevention strategies, they contribute to the overall well-being of student-athletes.

6. **Collaborative approach:** Athletic trainers work closely with coaches, parents, and healthcare professionals to ensure comprehensive care for student-athletes. They can communicate with medical providers, coordinate appointments, and assist in the implementation of individualized care plans.

7. **Emergency preparedness:** Athletic trainers are trained in emergency response and can effectively manage potentially

life-threatening situations that may arise during sports activities. Their presence enhances the overall safety and preparedness of the sports program.

8. **Compliance with regulations:** Many states and athletic associations require the presence of athletic trainers in high school sports programs to ensure compliance with safety standards and regulations. Having an athletic trainer on staff helps schools meet these requirements.

Finally, an athletic trainer in high schools can significantly contribute to student-athletes health, safety, and well-being. Their expertise in injury prevention, management, and education provides valuable support to sports programs and enhances the overall sports experience for student-athletes.

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