Experiences of Preservice and In-Service Teachers in a Comprehensive School Physical Activity Infusion Curriculum

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Abstract: Considering the limited field experience offered for preservice teachers to competently prepare them to implement the Comprehensive School Physical Activity Program (CSPAP) in schools, the purpose of this study was to examine the experiences of preservice and in-service teachers participating in a CSPAP infusion curriculum within a physical education teacher education program. Fourteen preservice teachers enrolled in an elementary physical education course implemented four CSPAP projects in four elementary schools as part of coursework. At the end of the project, the preservice teachers participated in focus group discussions and submitted self-reflection papers, while four in-service teachers who partnered in the program participated in interviews. Guided by Self-Determination Theory, results indicated that the preservice teachers developed competency and experienced autonomy in CSPAP implementation during field experiences. Furthermore, they felt a sense of relatedness with the teachers, classmates, and children throughout the program. Support for future implementation is spurred through the school community. In view of the increasing need for preservice teachers to be equipped with the skills to implement CSPAPs, infusing a CSPAP curriculum within a physical education course is viable to facilitate intrinsic motivation among preservice teachers to implement physical activity programs in the future.

Keywords: curriculum; physical activity promotion; university physical education programs; physical activity leaders; during-school physical activity

1. Introduction

Globally, children and youth exhibit low levels of physical activity and high levels of sedentary behavior [1]. To increase students' physical activity levels, schools in the United States are recommended to implement a comprehensive school physical activity program (CSPAP) beyond physical education (PE) that includes physical activity during the school day, physical activity before/after school, staff involvement, and family engagement [2,3]. Furthermore, schools are ideal settings to promote physical activity as most children and adolescents attend schools [2,3]. An example of physical activity during the school day is incorporating short bouts of movement integration during normal classroom time in general education classrooms [4]. Benefits of movement integration are well documented: positive impact on childhood cognition and brain health [5], enhanced focus and time-on-task during classroom instruction [6–9], and improved test scores [10,11]. In Europe and Africa, there is evidence supporting the use of classroom-based physical activity to promote learning experiences, attitudes towards physical activity, and personal motivation in elementary-aged students from schools in Croatia, Lithuania, Macedonia, Poland, Romania, Serbia, South Africa, and Turkey [12].

Physical Activity Leader workshops are facilitated across the United States to professionally equip teachers and school staff with the resources and knowledge to successfully implement sustainable CSPAPs that are adaptable to the individual school environment [13]. Oftentimes, PE teachers are tasked with the role of Physical Activity Leaders to champion the implementation of CSPAPs in schools. Due to the changing trend of PE teachers taking on responsibilities as Physical Activity Leaders in schools, physical education teacher education (PETE) programs across the United States are restructuring curricula to assist preservice teachers (PSTs) in developing skills to implement CSPAPs [14]. The following are examples of CSPAP programming being implemented in PETE curriculum: At the undergraduate level, a PETE program in a Northeastern United States university implemented a CSPAP named Physically Active School Systems as part of the course curriculum at a school [15]. Erwin and colleagues [16] also provided learning experiences to prepare PSTs to implement strategies for increasing physical activity during recess and in the classroom setting, creating wellness programs for staff, and developing events to involve parents and community members within their PETE program in the Southeastern United States. At the graduate level, a PETE program in the Southwestern United States implemented a CSPAP where students majoring in PE were hired as Physical Activity Leaders in schools as part of the graduate program [17].

Despite previous studies highlighting various strategies provided by PETE programs to strengthen PSTs' competency in implementing CSPAPs, research has remained sparse on the feasibility or effectiveness of different ways PETE programs are integrating CSPAP training into PETE curriculum [18]. Furthermore, very few PETE programs provide field experiences for PSTs to prepare them for CSPAP implementation [19], resulting in PSTs feeling unprepared to take on roles as Physical Activity Leaders [20]. To date, only about 25% of the 144 PETE programs incorporated CSPAP components in the existing courses, and field experiences were often lacking in these courses [19]. A possible solution to providing field experience opportunities for PSTs is by incorporating service learning within the college curriculum through school–college partnerships. School–college partnerships can provide long term sustainability for CSPAP implementations in schools through the support of colleges to overcome barriers in implementing effective and sustainable physical activity programs in schools [21]. Furthermore, providing CSPAP training in PETE curriculum can facilitate in PSTs feeling competent in implementing CSPAPs, as well as a stronger belief in the capability of having a positive effect on youth physical activity, which may result in motivation to implement physical activity programs in the future [22].

To better understand an individual's motivation to action, the Self-Determination Theory (SDT) developed by Deci and Ryan [23] postulates that individuals may be motivated by internal and external factors. Specifically, SDT posits that intrinsic motivation results in long-term desirable behavior outcomes (i.e., more interest, confidence, enhanced performance, persistence, and creativity) than extrinsic motivation [24]. Within SDT, the mini-theory of Basic Psychological Needs Theory includes the assertion that interactions between individuals and context that fuel basic psychological needs of competence, autonomy, and relatedness facilitate intrinsic motivation [25,26]. Competence as a basic need refers to feelings of efficacy in completing tasks in a specified setting. Autonomy encompasses feelings of independence in making decisions and executing actions, and agreement with external forces that impact behavior. Relatedness involves connectedness via forming and maintaining relationships with others in each context and community.

Educators have applied SDT-based instruction to facilitate intrinsic motivation and enhance learning, performance, enjoyment, perceived competence, and physical activity levels in Kindergarten to 12th grade (K–12) PE [27–29]. Interventions have been successfully implemented to encourage application of SDT principles within the practice of preservice and in-service physical educators [30,31]. Designing K–12 PE instruction grounded in SDT may include constructing gradual task progressions to augment competence, creating an autonomy-supportive climate including provision of student choice [27], and supporting formation of nurturing relationships while engaging students in pairs or small groups to satisfy relatedness. To a lesser degree, models or modes of instruction aligned with

SDT principles have been integrated within PETE courses, leading to enhanced feelings of competence, autonomy, and relatedness, and enjoyment and intrinsic motivation in PSTs [32,33]. SDT may be used to frame aspects of courses from the syllabus to instructional tasks and assessment. Specifically, PETE faculty can facilitate satisfaction of basic psychological needs through building relationships with students, providing positive non-controlling feedback, and supporting exploration [27,33].

Given the positive impact of SDT-based interventions in K–12 settings with preservice and in-service teachers, and initial success with PETE students, application of SDT in PETE courses to support PST efficacy, and intrinsic motivation in applying CSPAP in K–12 settings appears appropriate. SDT may be useful in the current study, because intended outcomes of PETE programs include influencing PST motivation and future intentions, such as carrying out CSPAP. In fulfilling basic psychological needs, individuals become more self-determined and intrinsically motivated. If PSTs are intrinsically motivated, they are more likely to initiate and implement CSPAPs on the job and persist to overcome barriers. Investigating the perspectives of both the PSTs and the in-service teachers who partnered with the college in implementing the CSPAP infusion curriculum in their schools will further our understanding of preparing PSTs in CSPAPs implementations. Therefore, the purpose of this study was to examine the experiences of preservice and in-service PE teachers participating in a CSPAP infusion curriculum. The specific research questions were: (1) What are PSTs' experience in implementing CSPAP through the infusion curriculum in relation to basic psychological needs? (2) What would facilitate PSTs' intentions to implement CSPAP in the future? and (3) What were the in-service teachers' experiences in collaborating with the college in the CSPAP infusion curriculum? The results of this study may shed light and expand our knowledge on a CSPAP infusion curriculum through the lens of SDT within a PETE program to prepare PSTs to implement CSPAPs in the future.

2. Materials and Methods

2.1. Participants and Setting

Through school–college partnerships, 14 PSTs (6 females; 8 males) majoring in PE from a college in a United States Northeastern city designed and proposed a CSPAP project as part of their elementary PE methods course; the project was then implemented in four elementary schools. Students in grades K-5 from the elementary schools participated in the program. The elementary schools, located within 10 minutes driving time from the college in an urban school district, were selected based on existing partnerships with the college to host PSTs in the methods course. The in-service PE teachers (3 females; 1 male) from the four elementary schools, who collaborated with the college to implement the CSPAP project, also participated in the study. The teaching experience of the teachers ranged from 1 year to 30 years. The PSTs were recruited through email and in-class announcement by a graduate assistant. The participants (PSTs and in-service PE teachers) were selected through purposeful sampling to represent the population from which the sample was drawn.

2.2. CSPAP Infusion within Elementary PE Methods Course

The elementary PE methods course is a required course taken by PSTs majoring in PE during their second year of a 4-year program in the college where the study was conducted. The semester-long course is designed to help PSTs further their pedagogical content knowledge and to introduce principles of curriculum development and liability issues for elementary grade levels. Besides the two-lecture per week schedule, the PSTs also apply developmentally appropriate practices in school-based laboratory settings once a week. Over the course of the semester, the PSTs taught PE supervised by the course instructor and/or graduate assistants, as well as the in-service PE teachers at the four schools. With the intention of supporting feelings of competency, autonomy, and relatedness for the PSTs, a CSPAP curriculum was designed and infused in the elementary PE methods course over three weeks (Figure 1).
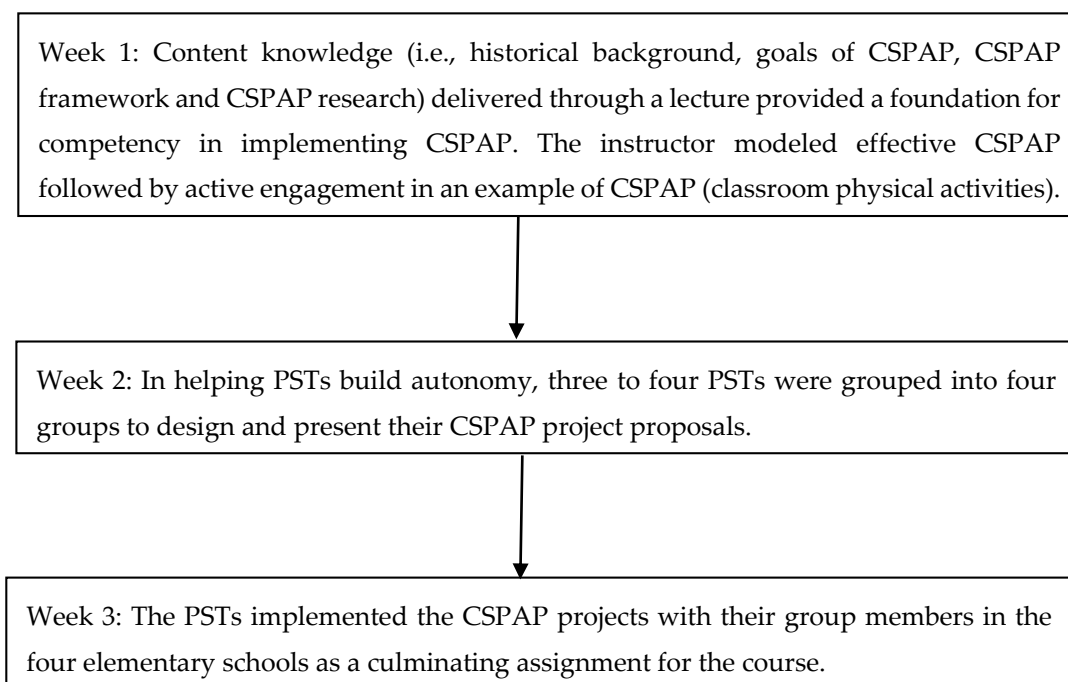
Week 1: Content knowledge (i.e., historical background, goals of CSPAP, CSPAP framework and CSPAP research) delivered through a lecture provided a foundation for competency in implementing CSPAP. The instructor modeled effective CSPAP followed by active engagement in an example of CSPAP (classroom physical activities).

Week 2: In helping PSTs build autonomy, three to four PSTs were grouped into four groups to design and present their CSPAP project proposals.

Week 3: The PSTs implemented the CSPAP projects with their group members in the four elementary schools as a culminating assignment for the course.

Figure 1. The 3-week CSPAP Infusion Curriculum.

In-service teachers at each school site furthered their support by demonstrating attentiveness, allowing the PSTs to fulfill the leadership roles of planning and implementing the project and sharing positive feedback. Student groups worked closely together according to defined roles during out-of-class, in-class, and lab time to support the need for relatedness. To coincide with the elementary PE methods course lab schedule, the PSTs designed and implemented during-school CSPAP projects (i.e., classroom and recess activities), that were integrated with academic content. The project titles, project descriptions, and school site information of the CSPAP infusion curriculum are shown in Table 1.

Table 1. CSPAP program information and school information.

Project Title and Description	School Information
Recess around the world Implemented during recess. The PSTs set up seven stations in the gymnasium to represent the seven continents. At each station, the PSTs led the students with a physical activity that are practiced or are popular with people who live in that continent.	Urban school (Pre-kindergarten to 5 grades) with approximately 300 students (59.7% Hispanic, 24.5% African American, 11.3% White, 4.5% Others). 81.2% of students on free/reduced lunch.
Know your food Implemented with a first-grade class during an academic classroom time in the gymnasium. The PSTs set up three stations (Tic Tac Toe, grocery shopping, and bean bag toss) where they led the students in physical activity integrated with healthy eating content. For example, at the bean bag toss station, the students were split into groups of three or four where they picked a fact card about food from a pile of cards and shared the fact to their group. Then, they tossed their bean bag to the food group that corresponded with the fact.	Urban school (Pre-kindergarten to 1 grades) with approximately 240 students (62.5% Hispanic, 23.3% African American, 10.0% White, 4.2% Others). 78.8% of students on free/reduced lunch.

Table 1. *Cont.*

Project Title and Description	School Information
Brain gains Implemented in three classrooms during the school day. The PSTs led the students on a 15-minute classroom-based physical activity. The activities include "Simon Says" and using GoNoodle.com to project videos on the projector, and the PSTs modeled the movement on the videos for the students.	Urban school (Kindergarten to 5 grades) with approximately 300 students (69.8% Hispanic, 15.9% African American, 11.9% White, 2.4% Others). 89.4% of students on free/reduced lunch.
We run the world Implemented in a classroom. The PSTs set up a variety of stations, each representing different countries (e.g., Jamaica, Dominican Republic, Vietnam, United States, etc.). Students performed a fitness-based movement (e.g., high knees, jumping jacks, running in place, etc.) at each station for about 1 minute. To incorporate interdisciplinary learning, students read a fact about that country before completing the fitness-based movement at each station. After the completion of each station the students received a sticker. Students repeated their favorite station to beat their previous score once they made it "around the world" one time.	Urban school (Pre-kindergarten to 5 grades) with approximately 750 students (66.1% Hispanic, 26.4% African American, 4.9% White, 2.6% Others). 89.4% of students on free/reduced lunch.

During the 3-week period when CSPAP was infused into the elementary PE methods course, the PSTs consulted with the authors (who were their instructors and/or graduate assistants) on the appropriateness of the planned CSPAP project; feedback was provided on any modifications to the activities. The authors also observed the implementation of the CSPAP projects in the four elementary schools to ensure that the projects were well-executed.

2.3. Data Collection and Study Procedures

Informed consent forms were obtained in accordance with the College Institutional Review Board. Approval from the school district and teachers were also secured to conduct the research study. Data collection methods included (a) focus group discussions with the PSTs, (b) written self-reflections pre and post project implementation by the PSTs, and (c) semi-structured interviews with the in-service PE teachers.

2.3.1. Focus Group Discussions

The focus group discussions were conducted upon conclusion of the project in meeting rooms located within the college. Four focus group discussions were conducted and facilitated by four PE graduate students using a focus group discussion guide. During the focus group discussions, the graduate students facilitated conversations among the PSTs who participated in the focus group discussion with their implementation group. The graduate students who facilitated the focus group discussions had prior knowledge and background in qualitative research methodology through courses they took at the college. The graduate students also attended a one-hour training conducted by the first author to be familiar with the focus group discussion protocols and discussion guide. Aligned with the SDT, the focus group discussion guide was created to answer the research questions. The focus group discussion guide included questions and statements such as, "please share your experience participating in the CSPAP infusion curriculum", "Did you feel competent in implementing your CSPAP project?" "What support did you receive/need to be successful in implementing your CSPAP project?" and "How do you plan to implement CSPAP as a future physical educator?" Each focus group discussion was audio recorded and lasted between 30 to 60 min.

2.3.2. Self-Reflections

The PSTs wrote self-reflections in response to instructor-provided prompts before and after the project implementations. For the pre self-reflections, the prompts were centered on perceived competence in implementing the projects. In the post self-reflection, the prompts involved successes, challenges, and overcoming barriers while implementing the project, along with future intentions. Each reflection was 2–4 pages (double-spaced) in length. The PSTs submitted the self-reflections online as part of the CSPAP project assignment.

2.3.3. Semi-Structured Interviews

Each CSPAP project-collaborating in-service PE teacher participated in an individual semi-structured interview at their schools. A semi-structured interview format was used in the study to facilitate follow-up questions [34]. The first author conducted the face-to-face interviews with the in-service PE teachers, which lasted between 30 to 60 minutes. Each interview was audio recorded. An example of a question asked during the interview was 'What are your experiences in collaborating with the college in the CSPAP infusion program?'

2.4. Data Analysis and Trustworthiness

The focus group discussions and interviews were transcribed verbatim after data were collected. Using SDT [23] as a lens, data from the focus group discussions, interviews, and self-reflections were deductively analyzed to examine the perspectives of PSTs who implemented the CSPAP projects and the teachers who supported the implementation of the project. The first and second authors conducted preliminary data analysis by individually reading and rereading the data to identify themes/categories from direct quotes [35]. Then, the two authors met to discuss and agree on the themes/categories that both identified through individual preliminary analysis.

To establish trustworthiness and credibility in the study, the authors engaged in peer debriefing, where the first and second authors discussed the protocols prior to the study, as well as analyzed the data individually and confirmed/agreed on the emerged themes/categories [36]. Furthermore, triangulation was supported through multiple data sources such as focus group discussions, self-reflections, and interviews, as well as comparing results of the current study with previous literature to extend the credibility of the study [36]. Finally, the authors engaged in reflexivity, by being conscious of the biases, values, and experiences that they bring to a qualitative research study [37].

3. Results

None of the PSTs indicated that they had knowledge of CSPAP prior to project implementation. Using the SDT as a lens, results are categorized as (a) building competency and experiencing autonomy; (b) experiencing relatedness with teachers, classmates, and children; and (c) support for future implementation. Results from the study are organized in subcategories under each category below and discussed in detail through quotations gathered from the focus group discussions, self-reflections, and interviews. Participant confidentiality is maintained using pseudonyms.

3.1. Building Competency and Experiencing Autonomy

Opportunities provided within the curriculum for the PSTs to learn new ideas and think "outside the box" for their CSPAP projects helped them gain competency in creating and implementing the projects. Additionally, autonomy was facilitated as PSTs gained hands-on experience and, independent of course instructors, "problem-solved" inhibitors that prevented the smooth execution of the project, thus building their competency in project implementation.

3.1.1. Project Creation and Implementation

The CSPAP curriculum was designed to help the PSTs gain competency in part by creating and presenting their CSPAP project proposals in class before project implementation. Through this experience, the PSTs were able to observe and learn new ideas for designing CSPAP programming from their peers. For example, Calvin mentioned: "It's awesome that we can get this experience, and because everyone was able to present their project to the class, it gave us a lot of different ideas that we can use in our classroom when we get jobs." Nathan echoed: "It was cool to think outside the box a little bit and have to think of something new, whatever we have to do and like when we're teachers, we're going to have to think of things to keep kids involved." Nathan reiterated in his reflection: "Our project was a creative idea and could be used anywhere in any classroom and I think that is the best part about it." As the PSTs gained experience through their project creation and implementation, they also shared their future intentions. For instance, Beth wrote in her reflection: "I could implement my Know Your Food Project when I am a teacher in the future because my experience was so great."

3.1.2. Hands-on Experience

One of the most important aspects of the project was providing hands-on experience for the PSTs to build their competency in implementing CSPAPs in schools. For instance, Nathan said: "We get experience out in the field, in the real world, not just peer teaching." Having authentic experience also reaffirmed the PSTs' intentions regarding CSPAP, as Mark said: "I'm more likely to use it now than I was if we didn't do it now that I've experienced it." Lynette appreciated the opportunity to work with children outside of PE; she said: "I thought seeing them inside the classroom and what they do inside the classroom would help benefit me for future teaching in the gym."

The in-service teachers also agreed on the benefits for the PSTs through the hands-on experience; Ms. Pamela said: "A lot of it is just because they're (PSTs) new, they're just doing the rookie stuff . . . That's classroom management stuff that you learn over time, which I think they all get there." Another teacher, Ms. Sally concurred: "The more exposure they (PSTs) get to working with children long before it comes time for them to be a student teacher, the more successful they'll be."

3.1.3. Overcoming Inhibitors

Several inhibitors that most often represented elements that thwarted the basic need of competence were recognized. The short implementation time, space constraints, and logistical issues were inhibitors that the PSTs overcame during the project. For instance, Nathan said: "Going in, telling it, explaining it, and trying to implement it in that same time when there was few minutes are crucial for just implementing it, it felt kind of rushed, but we made it work." Another PST, Lynette wrote in her reflection: "By choosing activities that are short and simple allows for less time spent on instruction and more time spent on activity."

Besides time constraints, the PSTs overcame space constraints and technology failures during CSPAP project implementation. For example, Mary mentioned: "Although we didn't have that much space where we were in our first class, we were able to do our GoNoodle activity." In another class, Nathan indicated that his group couldn't implement GoNoodle as planned due to technological issues, but they were able to adapt to the situation quickly. He said: "Even if you have technological difficulties, it's still easy to implement, because I just did this Simon Says and then hokey-pokey and those two activities alone got them off their feet for a seven-minute period.'"

3.2. Experiencing Relatedness with Teachers, Classmates, and Children

Throughout the CSPAP project, the PSTs felt connected to the in-service teachers and fellow classmates (group members) as important criteria to implementing the project. Besides receiving support from the teachers and group members, the PSTs also experienced relationship-building with the children.

3.2.1. Relatedness with the Teachers

Preservice and in-service teachers recognized the critical nature of cooperation and collaboration with school personnel in order to effectively implement the CSPAP project. For instance, Calvin said: "We were able to get a class out of their classroom and do this activity. That's huge support, that if we didn't have it, we would not have been able to do the project." Mary echoed: "I think the first teacher that we went to meet was very supportive. She was very excited too, she was like, 'Whatever you need, I'll get it for you'." Lynette added: "Her and her aides and I think there was another teacher that just came in and were doing it with them." The in-service PE teachers also assisted the PSTs when they implemented their project, as Beth said: "She (PE teacher) knew how they learned so then she would tell me what to say to them and I started saying that to them, so that's how they would learn."

Some in-service teachers indicated their enjoyment of learning new ideas from the PSTs with whom they worked. For instance, Ms. Julia commented: "It was a good experience for me because it gave me ideas. It keeps the teacher motivated to keep trying new things like different engaging activities and things like that. It's nice to just see fresh ideas and stuff." Ms. Pamela concurred: "I've been doing this for a long time. I love new people coming in, new ideas because I always want to learn something too. While they're teaching, I'm learning too. I love to see it."

3.2.2. Relatedness with Group Members

With the time-intensive and authentic nature of the project, the PSTs were set up to work closely in groups. Group members provided support that was critical to the success of the project. Kelly commented: "If Tom (another classmate) wasn't there, I definitely think it would have fallen apart because all of the students were very comfortable around him." Beth wrote in her reflection: "In order for this project to go successfully, my teaching partner and I would need support from the other students in the class." Victor discussed a benefit of having support from group members, as he wrote in his reflection: "With the help of our (peers), we had many leaders at each station, guiding each activity, as well as a lot of positive specific, and corrective feedback in order to allow the students to develop at greater rates." The group members appeared to function interdependently with defined roles and understood strengths.

Having worked together as a class throughout the semester, with the CSPAP as a culminating project, Nathan reflected: "We just went out there and enjoyed being with the class and just teaching them (students). I don't know, I just felt they were more excited." Nathan added on how the relatedness provided by group engagement impacted intrinsic motivation: "It was really fun to do especially since this was our last teaching episode as a group . . . it was fun to do with people you've been with all semester and see how you can do something different than just teach."

3.2.3. Relatedness with the Children

The PSTs felt that they initiated a relationship with and were supported by the children during the project; Lynette said: "They (children) followed along and they're really excited. I think that also helped. With them being excited, it was easier for us to get engaged and the students involved." She added: "Their eyes lit up when we walked in the classroom to find out they were doing something besides just listening to the lecture and learning." Calvin concurred: "They're (students) all in it, they're all moving, they're all focused with their friends and having fun."

The in-service teachers discussed their students' enjoyment of having the PSTs at the school. Mr. Benny stated: "They (students) like seeing young people and it's almost like getting a new toy. They get to play with something new. They enjoyed it; you can see it that they were having a good time." Ms. Sally noticed that her students enjoyed the individualized attention given to them by the PSTs, as she said: "You can see how much they (children) like it because they want to come up and hold their hand or they want them to run with them. It's just another person to give that child some attention."

3.3. Support for Future Implementation

The PSTs felt that support from school stakeholders is important for them to feel that they can successfully implement their CSPAP project ideas in the future. Furthermore, the in-service teachers reflected on the support they received from administrators for physical activity programs in the schools.

3.3.1. Personnel Support

The PSTs felt that administrative support is important for future implementation; Mark wrote in this reflection: "We need the support of the principal and other administrators ... The reason being, they are the ones who are in charge of the school. They are the ones who ultimately approve the implementation of the proposal." Tom concurred: "If you get the principal on board, then I think it's a little bit of a trickle-down effect; it will drive through all the teachers."

The in-service teachers had also experienced first-hand the need for administrative support to implement physical activity programs. A teacher, Ms. Pamela, discussed her principal's support in her before-school physical activity program, as she said: "At our school, we are very blessed with having a principal that does believe in physical activity as a way of increasing their education. We have incorporated a physical activity program in the morning." Likewise, another teacher, Ms. Sally, experienced support from her principal: "Many years ago, I went to our principal and said, 'I'd really like to do this walk.' He was really supportive; it has continued ever since. Once the children get in school ... they can walk or jog."

3.3.2. Whole School Collaboration

Collaboration across school constituents, inclusive of administrative backing, family support, and use of cross curriculum activities, were perceived by the PSTs as integral for future CSPAP implementation. For instance, Kelly mentioned the need for widespread support in her reflection: "In order to have a successful program, Recess around The World would need the school as a whole to be in support." Tom also suggested family as another key stakeholder for the success of the project. He wrote in his reflection: "Another great way to use this program would be to start a before- or after-school program doing this. You would only need a little support from the families getting their kids to school earlier or picking them up later."

Another avenue to pursue with whole school collaboration that emerged was cross curriculum. The PSTs felt that collaborating with teachers to integrate cross curriculum of PE with other subjects would promote physical activity in a school. Mark reiterated: "You could develop personal relationships with some of the teachers and ask them their opinion on whether I can ... help across curriculum stuff – if you're friends with the math teacher, like, 'What are you working on Math this week?'." Beth added: "For our future, we can learn how to do stuff like that and like cross-curricular activities and incorporate it into our class so it's not all just PE and no cross curriculum."

4. Discussion

The purpose of this study was to examine the experiences of preservice and in-service teachers participating in a CSPAP infusion curriculum that a PETE program used to prepare PSTs to implement CSPAP in schools. Using SDT as a lens, categories generated from the focus group discussions, self-reflections, and interviews suggest that feelings of competency, autonomy, and relatedness were facilitated within the PSTs during the CSPAP infusion curriculum. Data also suggest that the PSTs appeared to be well equipped to deliver a CSPAP, because they gained enough intrinsic motivation. Furthermore, support for future implementation was discussed by the PSTs and the in-service teachers.

Results from the study indicated that the PSTs developed competency in implementing their CSPAP project through the process of creating and implementing the project. Furthermore, providing PSTs with the choice in creating and presenting their own project ideas supported feelings of autonomy and responsibility, important elements of SDT [23]. In previous literature, Kwon and colleagues [20]

asserted that many PSTs felt unprepared due to the lack of field experience provided in PETE programs. The preservice and in-service teachers in our study unanimously agreed that the hands-on experience provided as part of the CSPAP infusion curriculum helped to further develop their competency in implementing CSPAPs during the course and perhaps in the future. These hands-on experiences are tied to the need for competence and bolstered teacher efficacy and intrinsic motivation in relation to CSPAP. Through the current study, we recognized that inhibitors such as time limitations and logistical issues can hamper feelings of competence during project implementation. Nevertheless, the PSTs overcame these inhibitors and learned to adapt and solve the "problems" as they surfaced, which further aided in developing their sense of competence in implementing CSPAPs. With intrinsic motivation and self-efficacy enhancing persistence when facing obstacles [23,38], hands-on experience leading to feelings of competency is critical. It is important to provide such opportunities for PSTs to experience inhibitors in implementing CSPAPs, as problems (such as lack of space and technological support) are common during CSPAP implementations [39–42].

From the SDT perspective, relatedness is an important element [23] to motivate intentions. In demonstrating relatedness, the PSTs in this study felt supported by and connected to the teachers, children and group members throughout the project. Firstly, the PSTs felt that the teachers with whom they collaborated to implement the CSPAP were very welcoming and accommodating to them implementing the projects. Additionally, the in-service teachers enjoyed the experience working with the PSTs, which may manifest in long-term benefits, such as new ideas the in-service teachers may employ to further advocate for physical activity promotion in the schools. Second, the PSTs felt connected to their group members (fellow classmates), and the CSPAP project was a meaningful culminating project that allowed them to work together as part of the course. Previously, PSTs' relatedness with the teachers, children, and group members throughout the CSPAP project has been found to allow PSTs to productively participate and grow within field experiences when given the opportunity to work together with their peers [43]. Lastly, the preservice and in-service teachers both felt that the children thoroughly enjoyed the presence of the PSTs, which further fueled the PSTs' feelings of relatedness with the children. Children's enjoyment of classroom-based physical activity program has been found to spur the continuation of such programs by the teachers [40].

In discussing building support for future implementation, the PSTs suggested that administrative and teachers' support are important. The in-service teachers also mentioned the significance of administrative support when they started physical activity programs at their respective schools. Indeed, administrative support was perceived as a key component by PSTs for the successful implementations of CSPAP programs [44,45]. Furthermore, support from whole-of-school collaboration, including parental support (especially in transporting students for before school physical activity program), as well as other strategies, such as cross-curriculum integration of physical activity with other subjects, would encourage more buy-in from teachers [41]. Importantly, physical educators have found it effective to implement CSPAP projects in schools through building rapport with the school community (i.e., teachers and parents) [45]. Having the support needed for future implementation of CSPAP projects is vital in contributing to PSTs feeling motivated to establish any new physical activity programs in their schools.

4.1. Limitation and Future Directions

Although results of this study expand our knowledge on the use of a CSPAP infusion curriculum to prepare preservice teacher to implement CSPAPs, the study is limited to experiences of a small number of participants and without a control group from the Northeastern part of the United States. Therefore, the experiences shared by the participants may be relevant to the preservice and in-service teachers of a certain school district, as well as existing policies and norms. Future research may explore and compare the use of a CSPAP infusion curriculum within other university PETE programs from other parts of United States, as well as other countries where physical activity promotion is vital in schools. A longitudinal follow-up study could also examine whether these college-directed/organized

learning opportunities would have a long-term effect on practice in CSPAP, as well as the health and physical activity of the PSTs' students in the future.

4.2. Implications for PETE Curriculum

From the perspective of the university, with the demands on time to provide well-rounded curricula to PSTs, it may be difficult to provide CSPAP curriculum as an entire course. Results from this study suggest that the infusion of the CSPAP curriculum within a methods course appeared to facilitate in building competency, relatedness, and autonomy among PSTs to enhance intrinsic motivation and encourage future implementations of CSPAP. PSTs can also be trained on using tenets of SDT to create CSPAP programs for their students that could further propel the motivation of students to participate in physical activity programs. Strategies such as providing choices for activities and groupings for students have been found to motivate students in their participation in PE [46]. Furthermore, providing field experiences early in the PETE program to prepare the PSTs to implement CSPAPs could build their feelings of competence for future implementation [20]. PETE programs could also consider infusing different types of CSPAPs (such as before/after school, recess, classroom physical activity curriculum, and community engagement programs) into different courses, where applicable, to scaffold the CSPAP knowledge throughout the program until their student teaching internships. Webster and colleagues [47] pointed out that PETE programs appear to place lower emphasis and fewer experiences on certain components of CSPAP (i.e., staff wellness and family/community involvement), possibly due to logistical challenges. Perhaps earlier in the PETE program, PSTs can be provided with opportunities to implement 'easier' CSPAP programs, such as recess and classroom physical activity curriculum, while more experienced PSTs can be provided with opportunities to implement programs that engage the staff and the community. In this way, PSTs can build on their existing knowledge and experience and then extend out to staff and community programming toward the end of the program to provide a challenge more developmentally appropriate for that level. In view of the fact that many PETE programs lack CSPAP field experiences within their course [19], the results from this study showed that a CSPAP infusion curriculum with embedded field experience could provide a meaningful hands-on experience for PSTs to implement CSPAP within an existing course and build competencies to implement CSPAP in the future.

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