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Abstract (Note: 250 words)

Purpose/Method: This qualitative case study examined through an interpretive worldview how current high school (HS) physical education (PE) teachers (n=14) implemented online experiences that could have influenced students' interpretations of their vicarious experiences during the Covid-19 pandemic (spring/fall of 2020). The study sought to better understand teachers' perceptions of how social modeling of PA was implemented online, how online PA experiences impacted opportunities for social comparison among the students, and what teachers' opinions of these practices were in relation to supporting students' PA self-efficacy. Results: The results found that the study participants differed in their opinions on the most effective ways to provide students with PA demonstrations and implement students' PA experiences during online instruction. Many of the teachers relied more on online videos to demonstrate PA, resulting in a decrease in teachers personally modeling PA themselves (theme 1). Due to the stress of the pandemic on students' well-being, teachers and their school districts prioritized students' social and emotional health which influenced how teachers had students participate in PA online (theme 2). This resulted in fewer PA experiences with students participating in front of each other and none of the teachers requiring students to model PA for peers online. Conclusion: This study serves as a starting point to better understand how teachers implemented online instructional practices that could have influenced students' interpretations of their vicarious experiences during the Covid-19 pandemic. The information collected in this study can be used by current PE teachers to design future online practices.

Keywords: vicarious experience, physical activity self-efficacy, social modeling, social comparison

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Introduction

Physical activity (PA) self-efficacy is a person's confidence to be physically active despite common barriers to PA like competing priorities, different interests, or obstacles to PA like inclement weather (Voskuil & Robbins, 2015). Increasing high school (HS) students' confidence to be physically active within physical education (PE) is important because of the many known benefits of PA (United States Department of Health and Human Services, 2020) and the consistent decline in students' PA levels as they age (Metcalf et al., 2015). Furthermore, several studies have found that PA self-efficacy is positively associated with PA (Annesi, 2006; Van der Horst et al., 2007) and at times has been found to predict PA levels (Burke et al., 2015; Gao et al., 2008). These findings validate the importance of examining practices within HS PE to support students' PA self-efficacy.

Quality HS PE emphasizes that students learn how to effectively participate in lifelong PA (Society of Health and Physical Educators [SHAPE] America, 2013). Some objectives of HS PE are that students be able to plan and implement personal fitness programs, demonstrate competency in different lifetime activities, and model responsible behavior while engaged in PA (SHAPE America, 2013). In recent years there has been an increase in states offering online PE options for students (National Association for Sport and Physical Education, 2010; SHAPE, 2016). In most of these online courses, students work through weekly modules that include pre-recorded video demonstrations of PA usually not made by students' teachers, and assignments like tracking PA and completing quizzes asynchronously (Daum & Buschner, 2012; Williams et al., 2020). A recent review of online interventions on PA found that 13 out of 18 of the studies had increases or improvements to affective domains that include self-efficacy and enjoyment (Goodyear et al., 2021). Due to the Covid-19 pandemic, all in-person PE classes were forced to transition to online instruction during the spring of 2020. This was a unique and extraordinary situation in that teachers and administrators had to quickly design online PE programs that mostly operated synchronously without much training or guidance (Jeong & So, 2020; Varea & González-Calvo, 2020). Examining teaching practices during this time through the spotlight of best practices to support students' PA self-efficacy can help guide future online PE.

Vicarious Experiences

Self-efficacy is part of the social cognitive theory that proposes that human thought and action are the product of the reciprocal causation of personal factors (self-efficacy), behavior, and environmental factors like family, peers, and the instructional practices implemented in school (Bandura, 1997). According to Bandura (1997), a person's belief in their capabilities to produce a given outcome for a specific task (self-efficacy) is developed through their interpretation of their (a) mastery experiences (e.g. personal achievements), (b) vicarious experiences (e.g. observations of others), (c) social persuasion (e.g. feedback from others), and (d) physiological and emotional states (e.g. feeling anxious before performing a task). This study sought to examine current HS teachers' perceptions of their instructional practices (environmental factors) within PE that can influence students' interpretations of their vicarious experiences and ultimately their PA self-efficacy (personal factor).

Vicarious experiences are observations of other people and can involve social comparison (Bandura, 1997; Carlin et al., 2015; Gavin et al., 2016; Kosteli et al., 2016). Within an in-person or online PE class, students have a chance to observe others performing PA in several ways (Carlin et al., 2015; Corr et al., 2019). The first is through purposeful

demonstrations of PA in which students' attention (behavior) is directed towards a social model (environmental factor). Examples of this are a teacher demonstrating an exercise to the class in person or students watching a video demonstration online. The second is when students randomly observe (behavior) others around them performing PA (environmental factor). Examples of this include a student in an in-person PE class taking a moment to watch the person next to them practice a skill, or a student observing peers while participating in a competitive activity. While online, random observations of other peers could happen if students are synchronously on camera at the same time. In many traditional (pre-pandemic) online PE programs, students did not have random observations of peers since they were performing PA on their own and not in a group setting (Williams et al., 2020).

When students are able to observe their peers, they have the chance to analyze and compare their own abilities to others through social comparison, which can influence PA self-efficacy in positive and negative ways (Carlin et al., 2015; Corr et al., 2019; Gavin et al., 2016; Kosteli et al., 2016). This process of social comparison is similar to the one described by Bandura (1986) within the social cognitive theory to describe how self-regulation (processes that assist in activating or sustaining goal-oriented behaviors) of behavior is developed. Self-efficacy and self-regulation are both important factors that can influence behavior outcomes like a person's consistent voluntary participation in behavior like PA (Schunk & Zimmerman, 1997; Zimmerman et al., 1992). Often, an observation of someone modeling a skill comes before self-regulation (Schunk & Zimmerman, 1997). For a person to eventually carry out a type of PA on their own, they first need to learn the skill, which often starts with observing a model perform the skill and then practicing the skill themselves (Schunk & Zimmerman, 1997). Once a person starts to practice the skill, they begin the three levels of self-regulation described by Bandura (1986) that include (a) self-observation (paying attention to one's behavior), (b) self-judgment (comparing one's performance to a standard), and (c) self-reaction (using one's judgments to evaluate one's performance). An individual's interpretation of themselves through the three levels of self-regulation can influence their self-efficacy and future actions (Bandura, 1986). Based on this rationale it is important to examine how social modeling of PA was implemented and how implemented PA experiences could influence students' social comparisons during online PE.

Literature Review

Within research on PA self-efficacy, a meta-analysis found interventions that included visual observations of others modeling experiences in-person or online to increase PA self-efficacy had significantly larger effect sizes than the interventions that did not (Ashford et al., 2010). For example, the studies that gave participants a chance to observe peers or an interventionist perform PA had more success than the studies that did not (Ashford et al., 2010). In several studies, participants that observed peers that they felt were similar in skill level to themselves successfully complete a PA, this increased their PA self-efficacy (Gavin et al., 2016; Kosteli et al., 2016). For example, interviews with older adults found that when they observed other similar older adults' successful experiences with PA, it increased their PA self-efficacy (Kosteli et al., 2016). In another example, a female HS student in the study by Gavin et al. (2016) explained that when she observed a similar peer have success that she believed was based on effort and practice, this increased her understanding of how effort and practice could also lead to her success. This observation increased her PA self-efficacy and also motivated her to ask her peer for guidance (Gavin et al., 2016). Modeling a successful performance of PA might also be more beneficial than an unsuccessful performance (Gavin et al., 2016; Kosteli et al., 2016; Lirgg & Feltz, 1991). For instance, one study found that middle school students who watched a skilled/successful model had higher self-efficacy before and after performance on a physical task than the students who watched an

unskilled/unsuccessful model on video (Lirgg & Feltz, 1991). Purposefully asking a student to model PA can also be beneficial to that student's PA self-efficacy (Saville et al., 2014). For example, when some adolescents were asked to demonstrate PA because of their mastery of the PA, this increased their self-efficacy for the task (Saville et al., 2014). Research suggests that students should be asked to demonstrate PA rather than be forced to demonstrate since some students in the Asebo et al. (2022) study did not feel comfortable being visible to other students while performing PA.

Of course, not all observations result in an increase in PA self-efficacy. In several studies, participants described observing peers who they believed were more skilled than they were, and this decreased their PA self-efficacy (Carlin et al., 2015; Corr et al., 2019; Kosteli et al., 2016). For example, student interviews in the study by Carlin et al. (2015), found that middle school students who thought their competence was lower than that of other students felt self-conscious about their abilities. These examples emphasize the importance of how students interpret themselves through social comparison as either similar or not similar in skill or competence to the peers that they are observing and how that can influence self-efficacy (Carlin et al., 2015; Gavin et al., 2016). It is often recommended that social comparison be minimized within PE to assist in supporting students' PA self-efficacy (Asebo et al., 2022; Carlin et al., 2015; Corr et al., 2019; Lodewyk & Muir, 2017). In one study, HS students felt more visible when performing in front of other peers, which increased feelings of anxiety and fear of embarrassment (Asebo et al., 2022). In that same study, students acknowledged that their teachers' decisions for implementation of PA experiences influenced how visible they felt in PE. Some cited strategies to assist in minimizing social comparison are emphasizing individual improvement instead of competition, engaging in competition where all students are participating at the same time in different small-sided games to limit students' feelings of being on display, and limiting PA experiences that put students' public performance of PA on display for other students to observe (Asebo et al., 2022; Carlin et al., 2015; Lodewyk & Muir, 2017; Ridgers et al., 2007). Another important point is that in these examples, participants were describing their self-efficacy compared to peers and not instructors or teachers. The assumption that students are more likely to participate in social comparison with peers, and not teachers, was found in a qualitative study of middle school students' self-efficacy in a math class (Usher, 2009). Based on these findings, to support students' PA self-efficacy it would be best practice to have various successful demonstrations of PA from teachers and students of all skill levels and design PA experiences that limit social comparison among students.

Study Justification

Very few studies to date have examined online experiences that can influence students' vicarious experiences. Previous studies of online PE that were completed prior to the Covid-19 pandemic were of programs that were asynchronous; these involved primarily online videos for PA demonstrations with no opportunities for students to engage in social comparison (Williams et al., 2020). Many PE programs during the Covid-19 pandemic utilized synchronous instruction, which increased the opportunities that students had to observe others performing PA and then participate in social comparisons (Centeio et al., 2021; Varea & González-Calvo, 2020). This increase in observations is important to examine since social comparison can influence students' PA self-efficacy (Carlin et al., 2015; Corr et al., 2019; Gavin et al., 2016).

Method

This qualitative case study examined, through an interpretive worldview, how current HS PE teachers implemented online experiences that could have influenced students' interpretations of their vicarious experiences during the spring/fall of 2020. The research questions that the study sought to better understand were teachers' perceptions of how social modeling of PA was implemented online, how online PA experiences impacted opportunities for social comparison among the students, what teachers' rationale for these practices were, and what their opinions of these practices were in relation to supporting students' PA self-efficacy. The analysis of the data was not an exact measurement of current PE practices, but rather more of a holistic understanding of the practices of select teachers through the eyes of the researchers (Tracy, 2019).

Participants

The study participants were 14 (8 female/6 male) current HS PE teachers who have taught HS PE in the United States for at least three years (Table 1). Implementing the selection criteria of at least three years of teaching HS PE ensured that all participants had experience teaching a full year of in-person PE before the pandemic. The participants represented nine different states in the United States and taught at different public schools. Recruitment of participants occurred at three different phases. The first phase of recruitment involved posting study information on various social media sites. This resulted in one participant enrolling for the study. The second phase of recruitment involved the authors sharing the study information with colleagues in the field of PE. This resulted in another 10 participants. The final phase of recruitment involved emailing the study information to random PE teachers from around the country. This resulted in three more participants. Previous research found that 10-12 interviews within a similar group of people (PE teachers) would most likely be adequate, and therefore, recruitment was ceased at fourteen (at least six male and six female teachers) (Guest et al., 2006; Small, 2009). All interviews were performed by the principal investigator (PI) who had 14 years of experience teaching PE at the elementary, middle school, and college levels.

Table 1

Participant Information

Name/Years of Teaching/State		
1. Melissa/4/CT	6. Patty/27/AZ	11. Mindy/13/WI
2. Cindy/15/IL	7. Jay/29/NC	12. Loraine/11/IL
3. Keith/12/IL	8. Kimberly/10/CA	13. Susan/28/IL
4. Jennifer/17/ID*	9. Jeremy/5/IL	14. Mike/22/MN
5. Edward/9/OH	10. Austin 15/WI*	

* Asynchronous Online Instruction Only

Design

The PE teachers who agreed to be in the study participated in one individual Zoom interview in January of 2021 that lasted approximately 50-60 minutes. Field notes were written by the lead author during the rereading of the transcribed interviews. Analytic memos were written during data analysis by the PI to explain the coding of the data and to reflect on the coding (Tracy, 2019).

Data Collection Methods

Within this qualitative study, interviews were the primary sources of data. Field notes and analytic memos were used to reflect on the research and analysis of the data. The interviews were semi-structured and conducted individually online. The initial interview questions were used to build rapport with the participants (e.g. Why did you get into PE?). These questions were followed by a question to better understand their daily online routines of instruction (e.g. Walk me through a typical PE class online?). This grand tour question allowed the researcher the flexibility to probe into the different sources of PA self-efficacy immediately after participants mentioned them (Patton, 1980). If participants did not mention different experiences that related to students' vicarious experiences, then the researcher asked specifically about students' observations (e.g. Are students watching videos or are you demonstrating PA yourself while online?). Participants were also asked to explain their rationale for their instructional decisions (e.g. Why did you set-up that PA experience that way?) and their opinions on how they could support students' PA self-efficacy in their classes (e.g. If you have a student who has very little confidence to be physically active on their own, what types of experiences and activities and skills do you want them to learn and participate in?). Asking for teachers' opinions, instead of social judgements, was an attempt at limiting social desirability bias (Bergen & Labonté, 2020; Patton, 1980). The field notes were meant to explain how the data were related to the research questions and provide insight into the resulting themes. The field notes served as a self-reflective instrument that allowed the researcher to 'track the path and growth of claims' (Tracy, 2019, p. 146). Analytic memos were written during the coding of the data and theme development. The memos allowed the researcher to reflect, develop hypotheses, and explain the reasoning behind the coding and the connections among the codes (Tracy, 2019).

Analysis

The analysis was guided by the interview data, with the field notes and analytic memos illuminating the process (Tracy, 2019). After an interview was transcribed and a field note was written for each interview, first-level coding began. All the interview data were analyzed by the PI using a deductive thematic analysis to identify themes/patterns using social cognitive theory (Boyatzis, 1998). A codebook was designed based on the sources of self-efficacy. The first-level codes were mastery experience, vicarious experience, social persuasion, and physiological and emotional states. For example, vicarious experience was coded when a PA experience involved students having a chance to observe someone in person or on video participating in PA. Some of the teachers' comments could not be coded by the sources of self-efficacy and resulted in the addition of one other code: teachers' opinions and interpretations. These first-level codes were used to code all the data. At this point, the first peer debriefing session took place with another researcher and followed the procedure described by Barber and Walczak (2009). Once the PI and peer debriefer were in agreement on the first level coding, the PI reviewed all transcripts to ensure that the data were properly coded.

Next, the data were moved into categories based on the first-level codes. For this, the PI created separate documents for each first-level code (mastery experiences, vicarious experiences, etc.) and compiled similarly coded data from different interviews into one document. Only the experiences within the vicarious experiences category were used for this manuscript. An analytic memo was written for the PA experiences in the vicarious experiences category, which started the second-level coding. Here, the PI interpreted and identified patterns of shared meaning and outliers within the coded data for PA experiences that might influence a student's vicarious experiences with an emphasis on answering the

research questions (Braun & Clarke, 2019; Tracy, 2019). At this point, the second round of peer debriefing occurred. Once the PI and peer debriefer were in agreement on the initial findings, the PI wrote up the initial results. Once the initial results were written, three more researchers were added to assist the PI in examining the results to start to generalize and theorize to produce a better understanding of the data, identify themes, and create a storyline.

Credibility and Trustworthiness

To ensure the credibility and trustworthiness of the research findings, different strategies were used within the study. First, the interview questions were designed based on the sources of self-efficacy and were found to be appropriate in answering the research questions during a pilot interview with a current PE teacher. Member checks, peer debriefing, triangulation, and reflective field notes/analytic memos assisted in ensuring the credibility of the participants' data and the researchers' interpretation (Patton, 2002). Member checks were completed during the interviews to verify that the participants' information was being understood correctly by the researcher (Merriam, 1998). During the analysis of the data, peer debriefing was used to assist with the trustworthiness of the analysis (Barber & Walczak, 2009). The peer debriefer helped to identify researcher bias, challenged the assumptions that the first author was making about the data, and provided a different point of view to assist in producing a more robust and critical investigation of the data (Barber & Walczak, 2009). The triangulation of interview data from multiple participants (Table 2 and 3) helped produce credible findings (Tracy, 2019). More than one hundred pages of field notes and analytic memos served as reflective commentary that gave evidence of effective techniques used to generate the results of the study (Shenton, 2004). While writing the results and discussion, the researchers tried to use thick descriptions of the study, context, and results to help ensure credibility

Results

The results found that the study participants differed in their opinions on the most effective ways to provide students with PA demonstrations and implement students' PA experiences during online instruction. This resulted in teachers providing students with different types of PA demonstrations based on what they thought was best for their students and easiest to implement. Many of the teachers relied more on online videos to demonstrate PA, resulting in a decrease in teachers personally modeling PA themselves (theme 1). Due to the stress of the pandemic on students' well-being, teachers and their school districts prioritized students' social and emotional health which influenced how teachers had students participate in PA online (theme 2). This resulted in fewer PA experiences with students participating in front of each other and none of the teachers requiring students to model PA for peers online. Provided below are participant examples to better explain these findings and the researchers' analysis of the data.

Theme 1: During Online PE, There was a Decrease in Teachers Personally Modeling PA

When instruction moved online during the Covid-19 pandemic, some teachers choose to primarily model PA themselves while others relied more on online videos to model PA (Table 2). The teachers that consistently modeled PA synchronously online (6/14: Cindy, Patty, Jeremy, Kimberly, Mike, Susan) did so similarly to Patty who said:

> I would get the students to get their cameras on and get them ready. Then I would tell them what we're doing for the day. They would do actual fitness activities with me.

Even during asynchronous online instruction, Patty and Mike wanted to personally model PA regularly so they recorded videos of themselves to share with their students. According to

Table 2

Participant Quotes for Theme 1

Topic	Quotes
Less Personalized Modeling	'We did a yoga (video), Pilates (video), we did a hip hop fitness (workout) where they basically did like a hip hop dance video for exercise.' Keith 'I'll come on the video, do some stretches or do some jumping jacks. Then we'll plug in a 25-minute video, I give breaks within the video, then we'll do like 10 push-ups and 10 sit-ups for an exit ticket.' Edward 'I have sample workout videos that kids can do… I have Google Slides that's kind of a choice that they can just choose what type of workout they want, what type of level of engagement they want.' Jay 'And we also supply them with like 10 to 12 different (online) videos on our canvas pages that they could always use.' Austin 'I've been giving them once a week, a workout of the week for them to do. Like an online workout (video) or I've made a few videos for them to do.' Mindy
More Personalized Modeling	'I lead them through a yoga session or a Pilates session. Sometimes I will put a (online) video on. But for most part. Yeah, I just do it live right here.' Cindy 'So, with the times we are in now, we did a big unit on bodyweight exercises. And so how to be creative, either, using home furniture or things at home that you can use to get a workout in.' Jeremy 'So, we do HITT training, leg workouts, ab workouts, different YouTube videos (sometimes), and different types of workouts.' Susan 'I do three different workouts. I videotape them and post it.' Mike

Mindy, who did not consistently model PA synchronously but occasionally created a video of herself modeling PA, some of her students told her that they 'loved the workout videos' that she created herself and that they 'wanted more videos' like that 'on what to do' for PA.

The teachers who consistently personally modeled PA did so because they felt like Patty who said:

> I just wanted the students to know that I'm still your teacher. I'm here, I'm doing this too. This is what you would see if we were in the gym. You would see me demonstrating this stuff, you would see me leading the class.

To Patty, her demonstrations of PA were a way to model being physically active while online and hopefully persuade students that they could do it too in real-time. This example also illustrates the idea of leading by example and not asking students to do something that the teacher themselves would not do. Mike and Keith felt when teachers refused to model or participate in PA, this could have affected students' perception of the PA and their teacher. Mike said, 'if you're going to have any credibility (as a PE teacher), you gotta show the kids that you can do this (PA), that you believe it.' He explained that 'we've probably all had instructors who did the opposite, and it was very easy to be resentful.' He believed 'kids are

smart and can spot hypocrisy really fast.' Mike suggested that students may begin to think it is unfair that they must participate in certain physical activities that the teacher would not even participate in. Mike's comments also suggest that a teachers' decision not to participate in a PA might also influence students' confidence to be able to participate in a PA themselves.

The teachers that regularly provided their students with less personalized modeling of PA (8/14: Melissa, Keith, Edward, Jennifer, Jay, Mindy, Loraine, Austin) did so in various ways and for different reasons. When these teachers implemented synchronous online video demonstrations, it was done similarly to Kimberly who described occasionally putting on a video and having the 'students follow along as best they could.' In this scenario, students had to individually modify movements concurrently with the video which might be difficult for some students and not support their PA self-efficacy. Susan admitted that some of her students explained to her that the synchronous online workout videos were often too difficult which might not assist in supporting students' PA self-efficacy. Therefore, she tried to find videos that provided students with low-intensity and high-intensity options. When video demonstrations were given to students asynchronously through video links or postings on a class website, some teachers required students to watch the videos while participating along with the video. Other teachers used the videos to provide students with PA options and did not require students to watch the videos.

Teachers described differing rationale for implementing more online video demonstrations than teacher-led demonstrations. For example, Edward used more online videos because he thought that would motivate students more to participate than watching him demonstrate PA. To accomplish this, he tried to provide students with age 'appropriate workout/dance videos' of celebrities. Jay and Mindy initially led optional synchronous workouts but switched to mostly asynchronous online video demonstrations of PA after having only a few students regularly attend. For Keith, it was easiest to just find an online video rather than create one himself. In Melissa's and Jennifer's school district, teachers were not allowed to have students exercise synchronously on camera, so they supplied students with task charts with online videos to complete on their own. These findings demonstrate the variety of reasons why some teachers used less personalized modeling strategies of PA during online instruction.

Theme 2: During Online PE, Students' Social and Emotional Well-Being was

Prioritized, and This Influenced the PA Experiences That Teachers Implemented

When instruction moved online, the teachers in the study and their school districts emphasized students' social and emotional well-being. This influenced the PA experiences that teachers designed for students (Table 3). For most teachers, student participation in PA was designed to minimize or eliminate peer social comparison while ensuring that teachers could still monitor participation. This was done to primarily protect students' social and emotional well-being. Many of the teachers (10/14: Melissa, Cindy, Keith, Jennifer, Jay, Kimberly, Jeremy, Austin, Mindy, Loraine) eliminated peer social comparison associated with PA by doing everything asynchronously. For these teachers, students were never asked to appear on camera in front of their peers and either had to turn in individual PA videos or activity logs of their PA. For example, Jeremy and Melissa had students turn in videos of themselves participating in weekly PA that were recorded on time-lapse which speeds up the videos and therefore takes less time to grade. In Cindy's online yoga class, she had students keep their cameras on, but they did not have to be seen on camera because they were wearing smartwatches during their workout and submitted their results daily for accountability. The other teachers used activity logs primarily to have students document their PA. These

examples illustrate the various ways that teachers eliminated social comparison while also holding students accountable for participating in PA.

Table 3

Participant Quotes for Theme 2

Topic	Quotes
Social/Emotional Well-Being	'We're not allowed to have the kids work out online. Because our kids come from such diverse lifestyles… It's a whole socio emotional pathway that is really hard to dabble with.' Melissa 'The way things are in the world. I am not comfortable having the kids exercise on the internet, while their cameras are on. Or videotaping themselves.' Keith 'I told my kids, "turn off your cameras." That's embarrassing. I wouldn't want kids watching me work out.' Kimberly 'The students' cameras are supposed to be on the entire time when we're online. But I kind of gave up on that battle because it just wasn't something to me that was that important. I don't want to lose a relationship over. "Hey, put your camera on." I didn't want to do that.' Jeremy 'Students are not pressured to be on camera. And so, how they look, or how they perform isn't quite concentrated on. I have a feeling a lot of kids like it, but I also have a feeling a lot more kids that prefer hands on and tactile (PA) miss being in that (in-person PE).' Loraine 'We kind of went through the whole thing of, what if the student doesn't like how they look or embarrassed about where they live, or whatever. And we basically said, "Too bad, you got to be on (camera)."' Mike
Student Participation in PA (Not on camera synchronously)	'We have a task chart. So, they have to accumulate 100 points a week by completing a certain number of tasks of whatever they choose… They have to video themselves and submit to the teacher. They are time lapse videos. So, if it's like an hour-long workout. It's condensed into five minutes.' Melissa 'Students didn't have to film themselves. The only form of evidence they actually have was there Fitbit summaries… I have them keep their camera on, but they don't have to be in front of the camera.' Cindy 'And one thing they really liked about this class was all of the choice that they had… Students are doing activity logs and can do whatever they want (for PA).' Mindy
Student Participation in PA (On camera synchronously)	'We need to see you doing this stuff (PA). You can send me a (personal) video, but the video is going to be harder to send then just going live (synchronously on camera). Probably only four of them sent me videos. About five/six (students) a class (would participate on video synchronously).' Edward 'I got permission from my principal (that) cameras have to be on… I told students, "Hey if you're uncomfortable in any way you don't want people to see your home or you're embarrassed of siblings walking by, put the camera on your forehead, you can use a different background. It's not that I want to see

	anything. I just need to have that connection with you, you need to have that connection with me, That is the chemistry we have in our gym. We're gonna get this chemistry."' Patty 'You don't like where you live, put a background on your zoom. Turn the lights down and get way back. If you don't have your makeup on. We don't care. But you got to be on the camera.' Mike

Most of the teachers who removed social comparison from students' PA experiences described the positives of this teaching strategy for students' social and emotional well-being. These teachers felt similar to Jay who said:

> Kids are embarrassed sometimes about the clothes they wear or being judged... So how am I going to create an online safe place? I don't pressure them to turn their cameras on (and) I give them multiple opportunities to show me learning.

Melissa, who had students submit individual PA videos, said that 'students aren't seeing each other participate in activities and that goes along with mental health' which she believed 'had increased their PA.' Kimberly and Mindy thought the absence of peer social comparison during PA resulted in some students feeling more comfortable and less anxious or embarrassed during PA. Keith did not make his students participate in PA live on video because he 'believed there would be no participation if we did stuff on camera' and referred to the practice as 'unethical.' He was concerned with students who would be online with their cameras off and explained, 'there could possibly be 40 people just watching your screen' while other students were performing PA. He also mentioned that some students might 'videotape' each other while online which would make students 'very uncomfortable.' The lack of social comparison was not always considered an advantage of asynchronous online PA. For example, both Cindy and Edward mentioned that when in-person, students did not want to be the 'odd person out' who was not participating. This element of social comparison might have influenced a student to participate while in-person, but it was not present online. Despite this rationale, most of these teachers agreed that eliminating social comparison made PA more of an enjoyable and comfortable experience for students online.

The teachers that attempted to have students synchronously participate in PA online while implementing instructional practices to support students' social and emotional well-being described having more student participation than the teachers that did not implement such practices. For example, Edward and Susan requested that students participate fully on camera because they wanted to clearly see their students performing the PA, but they did not have much success with this. During both Edward's and Susan's online classes, some students were performing PA live on camera while other students had their cameras off. For students with their cameras on, this situation could be similar to having to perform PA in front of people in person and might have enhanced the feeling of social comparison. Edward estimated that only 6 out of 100 of his students turned on their cameras and performed the PA live while online. He believed that students did not participate because they were concerned with 'not being cool' because 'that's their whole purpose in life.' Edward said his students will do whatever it takes not to look 'lame.'

Only Patty and Mike described having success with students performing PA live on camera. They described focusing on supporting students' social and emotional well-being by first assisting students in being comfortable on camera and then moving into performing PA while online. For example, to assist in making students feel comfortable on camera, Mike told students to, 'put a background on your screen' or 'turn the lights down and get way back'

from the video. Patty reported similar instructions. Both teachers wanted to see that students were present and did not care if they could only see a part of them on camera. Additionally, Patty had students participate in a 'show and tell' and give 'virtual high-fives' to help students feel comfortable being on camera with their peers. Furthermore, to help students feel more comfortable performing PA on camera and possibly limit social comparison, both teachers also had everyone participating at the same time. Patty told students, 'we're all going to be doing the same thing, including me.' Similarly, Mike told students that they will all 'go through the workout the exact same way,' which might have helped limit social comparison since students might not have time to observe others while participating at the same time. Students were also not allowed to turn their cameras off during class time. For example, when a student in Mike's class turned their camera off, he would email the student after class to enquire about why the student did so and to reiterate the expectation of having the camera on during class. He explained that this strategy worked well and usually resulted in the student having their camera on for the next class. Patty described focusing on students' emotional health online before transitioning to their physical health. Both Patty and Mike worked to limit social comparison by allowing students to not be fully visible on camera and by having all students participate at the same time with no one being allowed to have their cameras turned off.

Discussion

The purpose of the study was to better understand how current HS PE teachers were implementing PA experiences that could influence their students' vicarious experiences during online instruction. According to the study participants, when in-person PE programs transitioned online during the Covid-19 pandemic, teachers had to reshape their instructional practices. This resulted in an increase in less personalized social modeling of PA and an increased emphasis on students' social and emotional health, which influenced the implemented PA experiences for students. Similar to the study by Jeong and So (2020), study participants were using trial and error to establish effective online PE practices during the Covid-19 pandemic. Most of the study participants explained that their actions were designed to increase students' comfort while participating in PA online. Teachers put more emphasis on how students interpreted their emotions during PA than students' actual PA performance. Social cognitive theory emphasizes individuals' interpretation of their mastery experiences as the most significant source of self-efficacy (Bandura, 1997). The teachers in the study considered the stress that the pandemic was causing students and did not want to contribute to that. Therefore, they designed most of their PA experiences with students' social and emotional well-being in mind.

Many of the teachers constructed their online PE classes similarly to previous asynchronous pre-pandemic online PE programs by providing students with online video demonstrations and having students participate in PA privately (Daum & Buschner, 2012). Asynchronous PA participation was mentioned by many teachers in the study as a positive strategy for student participation and enjoyment. This finding is consistent with student opinions of performing PA privately within pre-pandemic online PE (Williams et al., 2020). The teachers that reported having more success having students participate synchronously on camera displayed a more autonomous type of instruction by offering students a choice of how to be seen on camera (Deci & Ryan, 1985). Oftentimes, students' feelings of autonomy have been found to be positively associated with PA (Owen et al., 2014; Teixeira et al., 2012). Another strategy that relates to previous recommendations on how to minimize social comparison amongst students participating in PA publicly was having all students participate on camera at the same time (Asebo et al., 2022; Carlin et al., 2015; Lodewyk & Muir, 2017). When all students have to be on camera and moving, there is less time for students to observe other classmates which might mitigate students' feelings of being on display.

Adding to the literature were teachers' perceptions of the PA demonstrations that they selected and provided to students during the pandemic. When teachers in the current study chose online videos to demonstrate PA, some teachers discussed how these videos were too challenging for students to replicate. Having students participate in an activity that is not appropriate to their skill level and results in a failed attempt can lower students' PA self-efficacy (Carlin et al., 2015). As suggested within the results, showing students a video with demonstrations that provide modifications can allow students to select their level of challenge, which might increase their feelings of success and PA self-efficacy (Moola et al., 2008). Some teachers also felt that personal PA demonstrations were needed during this time to increase students' motivation to participate. There are few studies that have examined the difference between teachers personally demonstrating PA to increase self-efficacy compared to students watching an online video, and further research is needed on this topic. However, it is known that social modeling of PA can assist in supporting individuals' PA self-efficacy (Ashford et al., 2010; Gavin et al., 2016).

The teachers in the study that required students to watch synchronous teacher-led demonstrations or personal/online videos for assignments had a better chance of influencing students' PA self-efficacy than the teachers that posted optional PA demonstration videos. Optional viewing of demonstrations is unlikely to maximize the number of students who see the demonstration and might lessen the influence of that PA demonstration on students' PA self-efficacy. It is important to note that videos or observations by themselves do not ensure effective or efficient learning (Chen, 2012). Videos should be accompanied by proper instruction and an explanation to why the video is relevant to the learner.

The absence of peers modeling PA within this study might also lessen the influence of students' vicarious experiences on their self-efficacy (Gavin et al., 2016). In multiple studies, participants described their abilities in relation to their peers, and when participants felt they were similar in ability to a successful model, this increased their PA self-efficacy (Corr et al., 2019; Carlin et al., 2015; Gavin et al., 2016; Kosteli et al., 2016). These studies provide some validation of the need for teachers to design more ways for students to voluntarily demonstrate PA during online instruction since Asebo et al. (2022) found that students wanted to be asked to demonstrate PA. Based on previous research, providing and requiring students to observe successful demonstrations of PA at various levels of difficulty from multiple people is recommended (Ashford et al., 2010; Carlin et al., 2015; Gavin et al., 2016).

The teachers in the study were deciding how visible students were within online PE which coincides with students in the Asebo et al. (2022) study who interpreted their teachers as the sole decision makers of how PA experiences were designed in regard to student visibility. Most of the teachers limited student social comparison while online because they wanted to protect students' social and emotional well-being. Examining social comparison through the lens of the three levels of self-regulation and how that can possibly influence students' PA self-efficacy can add to the literature on social comparison (Bandura, 1986). For example, when students are on camera synchronously participating in PA, they are most likely engaging in self-observation, self-judgement, and self-reaction as part of the process of self-regulation (Bandura, 1986; Schunk & Zimmerman, 1997). When an individual sees themselves on video, this provides them with an accurate depiction of what they look like performing PA. They can also observe how other peers look doing the same activity. Based on how a student interprets seeing themselves compared to other students could have a positive or negative influence on their PA self-efficacy (Carlin et al., 2015; Kosteli et al., 2016). Furthermore, when students are on display, the student's peers can also possibly be observing, judging, and reacting to their PA performance. This can possibly magnify the feeling of social comparison, which can be harmful to less-skilled students' mental health and can make some students feel uncomfortable (Asebo et al., 2022; Roset et al., 2020).

According to the results, if there are students online that do not have their cameras on, this can possibly compound the feeling of being observed and judged by the students who have their cameras on, which would heighten the feelings of social comparison (Asebo et al., 2022). All of these factors can influence a student's PA self-efficacy (Carlin et al., 2015).

Recommended Online Physical Education Practices

Based on the findings in this study, teachers should consider their students' individual factors (e.g. motivation, well-being) when designing their online instructional practices. Some teachers could have success with synchronous online instruction, while others might have to rely on asynchronous online instruction. Regardless of the type of instruction that best fits a teacher's students, it is recommended to include autonomous teaching practices that assist students in feeling in control and comfortable during PE (Deci & Ryan, 1985). To assist with this in a synchronous online classroom, teachers could first focus on getting students comfortable being on camera before starting to perform movements on camera. Additional strategies include allowing students to be only partially visible on camera, showing students how to change their virtual backgrounds, and giving demonstrations of how the students should be seen on camera during PE. If teachers explain to students that these actions will help lessen students' feelings of being on display, then this might result in more student buy-in (Murfay et al., 2022). It is also recommended that teachers prerecord their PA sessions and then play the video synchronously for students to follow along. This will allow the teacher to then monitor students participating to minimize the chances that students are participating in off-task behaviors like filming others while on camera or turning their cameras off. The pre-recorded PA session can also be posted on a school's webpage for students to complete asynchronously if they choose. In this scenario, the students would have to film themselves completing the activity and submit their videos for attendance. These student options would provide students with multiple opportunities to demonstrate participation in PA while also requiring the students to observe the PA demonstrations.

The other recommendation for future practice is having more opportunities for students to model PA for their peers because peer modeling of PA can support both the modeler's and observers' PA self-efficacy (Gavin et al., 2016; Saville et al., 2014). To help achieve this, teachers could create an assignment where students have to collaborate to create a presentation of an at-home workout. Teachers could provide students with class time to work on the presentation in breakout rooms, which creates a social modeling experience amongst the students and also encourages socialization within PE, which some HS students found to be an enjoyable part of PE (Murfay et al., 2022). These presentations could be turned in as an assignment or played synchronously during class time if the students agree to it, possibly for extra credit.

Limitations and Future Research

Possible limitations of the study included a brief time frame for participant recruitment, two participants who personally knew the lead author, and that participants were only interviewed one time for only 50-60 minutes. Prolonging participant recruitment may have produced a larger sample size that did not include any teachers that the lead author personally knew. Another potential limitation might have been participants answering questions in socially desirable ways. Future research can combine observations with interviews or artifacts like lesson plans to examine if described practices concur with observed practices. Finally, interviewing participants multiple times and for longer periods of time may have resulted in the researcher asking more follow-up questions for a better understanding of participant viewpoints.

This study's findings illustrate the need for future studies that examine students' perceptions of their vicarious experiences online during the Covid-19 pandemic. For example, do students prefer watching online videos or demonstrations from their teachers, and how does this impact their PA self-efficacy? Individuals in previous studies that reported an increase in PA self-efficacy have described observing a successful demonstration from someone that they believed was similar to them (Gavin et al., 2016; Kosteli et al., 2016). With this in mind, would students relate to individuals in online videos more or less than their teachers or their peers? Would students see a professional trainer in an online video and interpret that person as more highly skilled than they are and how would that influence their PA self-efficacy? Asking students about being on camera during PA would also be advantageous. Researchers could inquire about students' opinions about participating in PA on camera and what actions could be taken to assist students in feeling more comfortable doing so. Now that many students have experienced both in-person and online PE, their opinions on what practices they believe influenced their PA self-efficacy the most would be valuable.

Conclusion

This study serves as a starting point to better understand how teachers implemented online instructional practices that could have influenced students' interpretations of their vicarious experiences during the Covid-19 pandemic. All participants in the study had to change the operation of their PE programs, which changed both the PA demonstrations that students observed and the PA experiences that students participated in. The information collected in this study can be used by current PE teachers to design future online practices. Researchers can also use this information to design studies to examine students' thoughts about their experiences that can influence their vicarious experiences and PA self-efficacy. Continuing to examine how PE practices align with best practices to support students' PA self-efficacy can hopefully assist in supporting students' PA self-efficacy, increasing students' participation in PA, and improving the profession.

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