

Exploring Online Physical Education Teaching: What Have We Done and What Have We Learnt?

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Résumé de l'article

Engaging with physical education teachers who were compelled to integrate technology into their lessons during the COVID-19 pandemic is crucial to understanding how the pandemic has presented this 'new normal' circumstance. It is vital to gain insight into the initial experiences of physical education (PE) teachers who transitioned to online physical education (OLPE) teaching, as well as to identify potential areas for improvement in the future. This study investigated the perspectives of secondary school PE teachers on OLPE teaching during the COVID-19 lockdown, their professional development, online training opportunities and future perceptions. Using a mixed-methods approach, this study analysed data from 35 secondary school PE teachers in Fiji, using Google Forms to collect quantitative data and semi-structured interviews for qualitative data. The quantitative data was categorized by age, gender, school setting, qualifications, and teaching experience, while the qualitative data was analysed by themes. The study found that teachers struggled with OLPE due to lack of preparedness, poor Internet connectivity, and lack of emphasis on PE during lockdown. Despite their readiness, integrating technology remains challenging due to a lack of incentives, limited support, and fear of the unknown. The study emphasises the vital importance of technology in creating engaging and relevant PE experiences and recommends the provision of specialised resources, personalised curriculum guidance, and a change in teacher training institutions' paradigms to incorporate contemporary technological applications in PE.



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Exploring Online Physical Education Teaching: What Have We Done and What Have We Learnt?

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Abstract

Engaging with physical education teachers who were compelled to integrate technology into their lessons during the COVID-19 pandemic is crucial to understanding how the pandemic has presented this 'new normal' circumstance. It is vital to gain insight into the initial experiences of physical education (PE) teachers who transitioned to online physical education (OLPE) teaching, as well as to identify potential areas for improvement in the future. This study investigated the perspectives of secondary school PE teachers on OLPE teaching during the COVID-19 lockdown, their professional development, online training opportunities and future perceptions. Using a mixed-methods approach, this study analysed data from 35 secondary school PE teachers in Fiji, using Google Forms to collect quantitative data and semi-structured interviews for qualitative data. The quantitative data was categorized by age, gender, school setting, qualifications, and teaching experience, while the qualitative data was analysed by themes. The study found that teachers struggled with OLPE due to lack of preparedness, poor Internet connectivity, and lack of emphasis on PE during lockdown. Despite their readiness, integrating technology remains challenging due to a lack of incentives, limited support, and fear of the unknown. The study emphasises the vital importance of technology in creating engaging and relevant PE experiences and recommends the provision of specialised resources, personalised curriculum guidance, and a change in teacher training institutions' paradigms to incorporate contemporary technological applications in PE.

Keywords: online physical education (OLPE), physical education (PE), physical education teachers (PETs), professional development (PD)

Exploring Online Physical Education Teaching: What Have We Done and What Have We Learnt?

Technological integration has opened up new avenues for innovative teaching approaches in recent years, resulting in a significant shift in the educational landscape. One notable shift that has occurred in the field of physical education (PE) is the increasing prevalence of online instruction. Global events, like the COVID-19 pandemic, have presented unprecedented challenges that have accelerated the adoption of remote learning and forced educators to reconsider conventional methods of teaching PE in virtual environments. COVID-19 had a significant impact on many facets of human life in every nation worldwide (Bacher-Hicks et al., 2021; Pokhrel & Chhetri, 2021; Raaper & Brown, 2020; Wargadinata et al., 2020). After COVID-19 was declared a global pandemic in March 2020, Fiji prioritized health and safety. The second community outbreak of the pandemic began in April 2021 and prompted the Fijian government to implement more anti-pandemic initiatives. As a precaution against the spread of the COVID-19 virus, schools were closed in Fiji as children and teachers were advised to refrain from contact with one another. From April 2020 to June 30, 2020, and beginning again in April 2021, the Ministry of Education (MOE) released a group of measures to help ease the learning process for students of all ages and provide learning opportunities with public health guidelines.

Several studies have been conducted to investigate the impact of COVID-19 on school-closure and the well-being of children and adolescents (Okuyama et al., 2021; Rundle et al., 2020; Stanistreet et al., 2021; Velde et al., 2021). These studies have consistently found that the COVID-19 pandemic drastically reduced many people's physical activity behaviours and affected how PE was delivered in schools. However, little focus has been directed towards teachers' professional development and training in online learning in the Fijian context. Therefore, it is important to understand the perspective of teachers and plan for the future. Consequently, the purpose of this study was threefold. First, the study investigated teachers' experiences in online physical education (OLPE) teaching during the COVID-19 lockdown. Second, it examined the effect of teachers' professional development in online physical education delivery during the lockdown. Finally, the study explored teachers' views on offering OLPE in the future.

Literature Review

Integrating PE into the online teaching landscape has introduced a distinctive and complex shift in perspective for educators worldwide. Amidst the COVID-19 pandemic, the sudden closure of educational institutions and the need to maintain social distance necessitated that physical education teachers (PETs) promptly readjust their pedagogical approaches (Bozkurt et al., 2020). The fundamental essence of physical education, deeply rooted in physical activity, team sports, and interactive games, presented an immediate challenge in an online learning environment (Pangrazi & Beighle, 2019). However, educators sought innovative approaches, leveraging technology to overcome the divide (Tan et al., 2021). According to Ersöz and Yenilmez (2022), the use of virtual sessions, live-streamed workouts, and curated fitness apps played a crucial role in facilitating the participation of students in physical activities while confined to their homes.

The limitations and low priority of PE in the educational system at this time were particularly difficult for PETs. PE remained marginalized "because there was no exam" (Bacchus, 2000, p. 54). According to Dorovolomo and Hammond (2005), certain schools actively teach PE and organize intramural and

interscholastic sports. However, some schools continue to disregard PE. The top five barriers to teaching PE in schools were “lack of equipment and facilities, improper attire, a poor attitude towards PE by the school, and large class size” (Dorovolomo & Hammond, 2005, pp. 39–40). Richards et al. (2018) also agreed that PE was a traditionally marginalized subject. Hardman (2005) stated that school PE was at risk worldwide because of the decreased importance of timetabled classes, decreased funding, and lowered subject status. As a result, authorities have continually undervalued and marginalized the subject. Stirling and Belk (2002) and Wright et al. (2005) expressed similar sentiments. Other challenges faced by traditional PE classes, according to Lawson (2018); as cited in Webster et al. (2021), were “equity and access, such as language barriers, funding limitations, and inadequate physical spaces for participation” (p. 328). Promoting movement, encouraging organized thinking, expressing feelings, and expanding understanding—all these are enhanced by participation in a quality physical education (QPE) program, which is essential to childrens’ overall development (Nancy & Jannine, 2015). However, the pandemic has impacted equally to a well-rounded and inclusive curriculum, which is the foundation of QPE (Aguinaldo et al., 2022).

Stanistreet et al. (2021) asserted that researchers have discovered similar significant effects of school closures and restrictions on learners, where the sudden shift to online learning interrupted education worldwide. The MOE in Fiji responded constructively to these challenges. Unfortunately, the lack of financial and technological assistance, remoteness, connectivity, devices, and pedagogical resources hindered the continuity of the learning process (Chand et al., 2022). The pandemic disproportionately affected populations with fewer resources and has prompted long overdue reflection on structural inequality and how it affects educational opportunities (Stanistreet et al., 2021), for small island states like Fiji in particular. Understanding the existing scenario of lockdowns and limited mobility, and contemplating the adverse effects of the virus, have generated significant thought and discussion, much of it directed at how PE programmes can improve students’ health and well-being. Consequently, this virus presented educators worldwide with new and unanticipated issues in teaching PE.

Technology is the only way to connect students to PE and physical activity (PA) during times like these. According to Hanski (2016, cited in Gallagher, 2020) “technology helps students become physically active and fit by transforming their sedentary lifestyles into more active lifestyles” (p. 4). A substantial body of evidence suggests that, when combined with appropriate pedagogical practices, digital technologies can be effectively integrated to improve the learning process for PE students (Bodsworth & Goodyear, 2017; Casey et al., 2017). Moreover, a recent study has shown that high school students had a more positive outlook on their online learning experience when compared to face-to-face programs (Williams et al., 2020). However, more data regarding student retention and attrition rates in OLPE is required. Examining barriers to students’ online learning will assist in foreseeing the early warning signs for OLPE programs (Goad et al., 2021).

As emphasized by the United Nations’ sustainable development goals, OLPE is one example of how quality mass education (QME) must be produced and delivered in a variety of settings and contexts (UNESCO, 2016). Online education has evolved as a feasible way to achieve QME, support quality student learning, and provide increased access to students who previously struggled in traditional face-to-face schooling (Sun & Chen, 2016). However, recent studies have illuminated the need for effective teaching strategies and

pedagogies to help teachers cope with online learning (Backman & Barker, 2020; Ferdig et al., 2020; Filiz & Konukman, 2020; Varea & González-Calvo, 2021).

Despite concerted efforts, online PE has encountered multiple obstacles. A significant challenge was unequal distribution of technology and insufficient space in students' homes for PE. The lack of face-to-face supervision made it more challenging to offer tailored advice and criticism, which affected motivation and skill development (Wong et al., 2021). Moreover, the shift towards OLPE teaching highlighted the need for educators to enhance their skills and engage in ongoing professional development (Johnson & Norris, 2021). Educators actively participated in training programs that prioritized integrating technology, digital pedagogy, and innovative teaching methodologies. According to Ohara (2023), using collaborative networks and platforms significantly facilitated knowledge exchange among instructors.

OLPE has become a high priority (Daum & Buschner, 2012). With sedentary practices imposed by COVID-19 restrictions, OLPE offered an ideal setting for addressing public health issues (Sallis et al., 2012; Sallis & McKenzie, 1991). The closure of recreational centres and gyms, and the two-metre physical distance requirement, created unique challenges for students who needed to be physically active and gain health-related fitness benefits (Dunton et al., 2020). With these challenges defined as the new normal, emphasis shifted to the capacity of PE and PA to save lives.

Theoretical Framework

Transformative learning and self-determination theories formed the theoretical framework for this study. Transformative learning theory has suggested that one's worldview and perspectives change over time due to critical reflection, experience, and development (Mezirow, 1997). "Transformational learning involves evaluating, questioning, validating, and modifying one's worldview" (Cranton, 2006, p. 23). Engaging with PE teachers who were forced to learn on the job during the pandemic was crucial for understanding (a) how the pandemic created a new normal situation and (b) teachers' initial experiences in transitioning to OLPE teaching. Transformational learning involves actively constructing new perspectives after critically reflecting on prior beliefs, values, or feelings (Zull, 2006). Many studies have used this theory to investigate how online teaching can alter traditional pedagogical models, modify interaction dynamics between teachers and students, and encourage greater student participation (Baran et al., 2013; Macdonald, 2002).

Self-determination theory has emphasized intrinsic motivation, extrinsic motivation, and amotivation in students and teachers in learning (Ryan & Deci, 2017). Students' motivation has been significantly impacted by the desire for autonomy, competence, and relatedness, especially in the demanding online setting with constrained resources, diversions at home, and diminished interpersonal interactions (Murcia et al., 2009). Teachers' motivation has been subject to factors such as student engagement, obstacles to using technology, and the need for ongoing training and support. To tackle these challenges, practical strategies based on self-determination theory can be implemented, prioritizing student autonomy, enhancing competence, and promoting social connectedness through interactive virtual platforms and collaborative activities. By integrating these strategies, it has become possible to stimulate motivation in both students and teachers, creating an environment conducive to meaningful engagement and sustained participation in OLPE.

Research Questions

The following research questions guided this study:

1. What were teachers' experiences in online physical education (OLPE) teaching during the COVID-19 lockdown?
2. How did professional development or training sessions assist teachers with OLPE teaching during the lockdown?
3. What were the teachers' perceptions of OLPE teaching in the future?

Methodology

Participants

The study focused on 35 secondary school PE teachers in Fiji who were actively engaged in online teaching during the COVID-19 lockdowns in 2020 and 2021. The participants were invited through professional and social networks using convenience sampling and snowballing techniques. The snowballing method allowed for a more diverse sample. The study ensured the inclusion of participants from various school settings across Fiji through a randomized selection process. A consent form was included with the survey, detailing inclusion criteria, purpose of the study, time required, and participants' right to withdraw. PETs employed in Fijian secondary or high schools were included. Participants answered open-ended and online survey questions.

Instrumentation

This mixed-methods study collected quantitative data using an integrated Web application (Google Forms) designed to gather demographic information and responses to closed-ended questions on teachers' experiences in OLPE during the COVID-19 school lockdowns. Complementing the quantitative data, qualitative insights were obtained through in-depth participant interviews. The interviews incorporated open-ended questions, such as What are your views on OLPE teaching? And How did the professional development sessions enhance OLPE teaching methods? Additionally, participants were encouraged to reflect on what they learned from the experience and how it will help them improve OLPE teaching in the future.

Data Analysis

The study used IBM SPSS (Version 25) for statistical analysis of demographic variables and participant feedback; NVivo 14 was used for qualitative data analysis of interview transcripts. This method preserved data integrity and transparency while identifying key themes and patterns (Morison & Moir, 1998; Richards & Richards, 1994). The analysis allowed for a systematic exploration of participants' perspectives and experiences regarding OLPE teaching during COVID-19 school lockdowns, leading to a comprehensive understanding of teachers' experiences.

Results and Discussion

The purpose of the study was to find out (a) how PE teachers used OLPE during the COVID-19 lockdown; (b) what opportunities there were for professional development (PD) and online skill-building workshops; and (c) how PE teachers feel about OLPE in the future and how they would share what they had learned.

Demographics

The sample comprised 22 (62.9%) males and 13 (37.1%) females. Participants represented diverse demographics (Table 1). The largest proportion of the participants were between 31 and 40 years of age (37.1%), while the smallest percentage was between the ages of 51 to 60 (11.4%). School settings ranged from urban (60%), suburban (14.3%), rural (20%), and maritime (5.7%) schools. All the teachers were qualified to teach PE, and most had more than 15 years of teaching experience.

Table 1

Frequencies for Demographic Variables

Category	Variable	Frequency	Percent	Cumulative percent
Gender	Male	22	62.9	62.9
	Female	13	37.1	100.0
Age	21–30	8	22.9	22.9
	31–40	13	37.1	60.0
	41–50	10	28.6	88.6
	51–60	4	11.4	100.0
School setting	Urban	14	40.0	40.0
	Suburban	8	22.9	62.9
	Rural	8	22.9	85.7
	Maritime	5	14.3	100.0
Qualification in PE	Diploma	14	40.0	40.0
	Bachelor	17	48.6	88.6
	Postgraduate	4	11.4	100.0
Teaching experience	1–5 years	10	28.6	28.6
	6–10 years	6	17.1	45.7
	11–15 years	6	17.1	62.9
	Over 15 years	13	37.1	100.0

Teachers' Experiences in OLPE Teaching During Lockdown

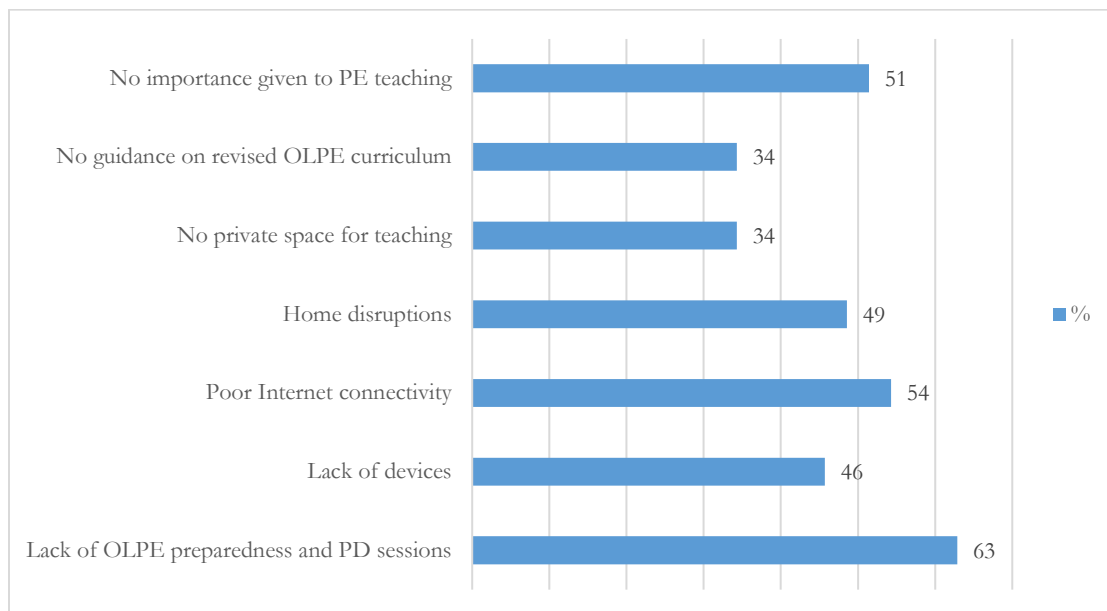
Teacher experiences in online teaching were no different to those apparent in other research (Stanistreet et al., 2021); however, this study also analysed perspectives on OLPE teaching during lockdowns by teachers' gender, age, school setting, qualifications, and teaching experience. Participant's OLPE teaching experiences included (a) challenges faced by teachers; (b) their readiness to teach online; (c) teacher-student online engagement; (d) teacher-parent consultation on OLPE; (e) assignments and feedback; and (f) teacher OLPE effectiveness. Similar findings have been shared by Daum (2012), Daum and Buschner (2014) and Williams (2013) focusing on various aspects of OLPE and teacher experiences.

Challenges Faced in OLPE Teaching

As shown in Figure 1, there were no significant differences in the challenges teachers faced according to their age, gender, school setting, and qualifications. However, the collective list of challenges indicated that a lack of OLPE preparation and professional development sessions was the most significant challenge (63%) faced by PE teachers, followed by poor Internet connectivity (54%), no importance given to PE teaching (51%), and home disruptions (49%). Other challenges included the lack of devices (46%), no private space for teaching (34%), and the failure of curriculum advisors to guide the revised OLPE curriculum (34%). Chand et al. (2022) discussed similar challenges in the Fijian context. Konukman et al. (2022) also raised similar opinions on the difficulties of OLPE teaching by school type regarding the lack of proper home equipment and the absence of digital resources.

Figure 1

Challenges Faced in OLPE Teaching



Most participants (69.7%) indicated they were prepared to teach PE online, which mirrored Konukman et al. (2022) who found that many teachers were not worried about this. Even so, the challenges they experienced hindered their teaching. It has been suggested that technology assists students by providing

meaningful PE and PA learning experiences, despite most PE teachers finding it difficult to implement (SHAPE America, 2020). The findings of this study were consistent with Hill and Valdez-Garcia (2020), who identified that students' behaviour and learning progress could be tracked through new applications. PE teachers must focus on technologies specific to their subject.

With PE being a marginalized subject, its teachers were left alone to figure out how to implement quality PE without support (Richards et al., 2018). It was reasonable to assume that the pandemic further isolated PE teachers and forced them to make decisions influencing student learning outcomes. It was important to understanding the role of technology and the support it offered to make OLPE teaching possible during this time so that technology did not become more of a "distraction but rather a support or resource" (Gallagher, 2020, p. 4). For example, as one of the participants remarked, "understanding the possibilities and challenges helps us make a difference in students' learning experiences" (participant 13).

Consistent with the findings of earlier studies, this study found several barriers teachers encountered. These included fear of the unknown, and teaching in a physically and socially distanced manner where student participation could not be forced; teachers were unsure if the needs of learners were met (Centeio et al., 2021). Furthermore, a lack of awareness of how to integrate technology, few incentives to use technology, insufficient time due to high-stakes testing, difficulties managing a classroom when students were using computers, and lack of technical support were other barriers to integrating technology in the classroom (Hill & Valdez-Garcia, 2020). Despite the many calls for integrating technology in the teaching and learning process with the widespread Internet access in schools, technology integration has not kept pace with developments outside classrooms and schools (Jones et al., 2017). According to Wyant et al. (2015), teacher reluctance was due to their belief that technology cannot enhance PE teaching when it is already a marginalized subject and not worth their time and associated costs.

Readiness to Teach Online

The readiness and acceptance of online learning are predicated on the belief that computer technology will improve student performance (Davis et al., 1989). In evaluating teachers' readiness to teach online, Table 2 shows that males were slightly better prepared to teach OLPE than were females. Age, school experience, and qualifications were also indicators of online teaching readiness. However, it was clear that teachers in urban (85.7%) and suburban (62.5%) settings were more prepared to teach online than were those in rural (37.5%) and maritime (40%) settings. This finding was supported by Chand et al. (2022) and Mercier et al. (2021), who found that rural teachers (including maritime teachers) in particular faced more technological challenges, which hindered their preparedness to teach online. Konukman et al. (2022) also shared that the difficulties of OLPE teaching depended on the type of school. Some lacked proper equipment, had limited Internet access, and had connectivity issues with devices. Similar results in terms of OLPE teaching by gender were noted wherein female PETs were less concerned with OLPE teaching compared to males.

Table 2

Teacher Readiness for OLPE Teaching During COVID-19 Lockdown

Category	Variable	Yes	No	Total
Gender	Male	16 (72.7%)	6 (27.3%)	22
	Female	9 (69.2%)	4 (30.8%)	13
Age	21–30	6 (75%)	2 (25%)	8
	31–40	9 (69.2%)	4 (30.8%)	13
	41–50	7 (70%)	3 ((30%)	10
	51–60	3 (75%)	1 (25%)	4
School setting	Urban	12 (85.7%)	2 (14.3%)	14
	Suburban	5 (62.5%)	3 (37.5%)	8
	Rural	3 (37.5%)	5 (62.5%)	8
	Maritime	2 (40%)	3 (60%)	5
Teaching Experience	1–5 years	7 (70%)	3 (30%)	10
	6–10 years	3 (50%)	3 (50%)	6
	11–15 years	6 (100%)	0 (0%)	6
	Over 15 years	9 (69.2%)	4 (30.8%)	13
Qualification in PE	Diploma	11 (78.6)	3 (21.4%)	14
	Bachelor	12 (70.6)	5 (29.4%)	17
	Postgraduate	2 (50%)	2 (50%)	4

Teacher-Student Online Engagement

Table 3 provides an overview of the consistency of teacher-student interaction in online classes. Our study revealed that OLPE was effective in fostering student independence, but it also required more teacher-student interaction. Consistent with Daum and Buschner (2012) and Williams (2013), female teachers preferred a one-to-one approach, while male PETs believed OLPE instruction was better suited for fostering independence. Younger age groups showed no consistent involvement, but all those aged 51 to 60 engaged with their students. Urban schools had more consistent engagement than did suburban, rural, and maritime schools. Higher qualifications had little effect on teacher and student engagement (Table 2). However, teachers with over 15 years of experience engaged with their students online more effectively. Similar to Bryan and Solmon (2012), these findings suggested that OLPE teaching encourages independent study, but students must be able to practice using technological tools and platforms.

Table 3

Teacher-Student Online Engagement

Category	Variable	Yes	No	Total
Gender	Male	11	11	22
	Female	5	8	13
Age	21–30	2	6	8
	31–40	5	8	13
	41–50	5	5	10
	51–60	4	0	4
School setting	Urban	11	3	14
	Suburban	3	5	8
	Rural	1	7	8
	Maritime	1	4	5
Teaching experience	1–5 years	5	5	10
	6–10 years	1	5	6
	11–15 years	3	3	6
	Over 15 years	7	6	13
Qualification in PE	Diploma	8	6	14
	Bachelor	7	10	17
	Postgraduate	1	3	4

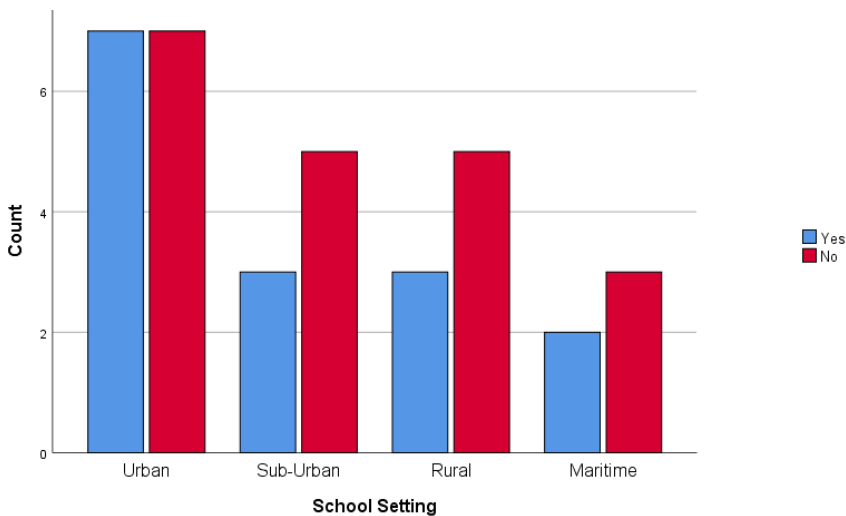
Teacher Consultation With Parents

Understanding and recognizing parental roles and support during home-based online learning was essential for teaching and acquiring knowledge. Among the participants in our study, 54.3% acknowledged that they did not consult with parents. Despite this, 45.7% of teachers could converse with parents or guardians about students' online activities.

Regarding age, it was evident that consultations with parents were more common among those aged 21 to 30 (62.5%) than in the three older age categories, which had higher percentages of no consultation. Parental consultation did not differ significantly by gender. However, males had a higher rate of teacher-parent consultation (45.5%) than did females (38.5%). PE teachers' qualifications and experience did not significantly influence parent consultation; however, a slightly greater proportion of those with a bachelor's degree consulted more frequently than those with 1 to 5 years of teaching experience. The analysis of school settings also revealed that some teachers were unable to consult with parents; teachers in urban schools (50%) engaged in more consultation hours than those in suburban (37.5%), rural (37.5%), and maritime (40%) schools.

Figure 2

Teacher-Parent Consultation



With students learning at home, parental involvement in their children's education became crucial. A two-way consultation was suggested, where parents could consult without waiting on teachers. As participant 12 shared:

Parents should monitor their children at home and determine if their child is attending the online class. In order for the child to be able to learn, parents and teachers must communicate so that a solution can be reached regarding the child's academic performance, attendance, and Internet connectivity.

Assignments and Feedback

Teachers selected a combination of online assignment submission and feedback platforms. Most teachers (80%) chose Zoom as their primary platform, preferring that students present their assignments online and receive immediate feedback. Moreover, 28.6% chose the Moodle platform. In addition, some teachers used e-mail (25.7%), Google Meet (14.3%), and Viber/Messenger (2.9%) for communication. Our findings disclosed that a few teachers attempted to explore additional online tools like Seesaw. However, some students still preferred delivering and collecting hard copies of their assignments.

Table 4

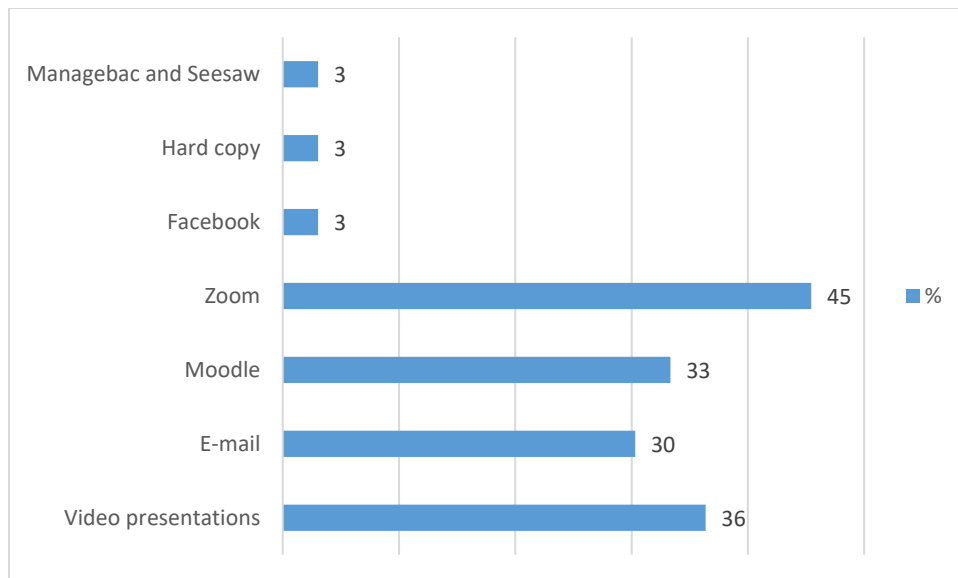
Teacher-Preferred OLPE Assignment and Feedback Platforms

Platform	Response	Frequency	Percent	Cumulative percent
E-mail	Yes	9	25.7	25.7
	No	26	74.3	100.0
Zoom	Yes	28	80.0	80.0
	No	7	20.0	100.0
Google Meet	Yes	5	14.3	14.3
	No	30	85.7	100.0
Viber/Messenger	Yes	1	2.9	2.9
	No	34	97.1	100.0
Moodle	Yes	10	28.6	28.6
	No	25	71.4	100.0

During the discussion, teachers also reflected on what online platforms their students preferred for assignment submissions and feedback. Regarding assignment presentations and receiving performance feedback, 45% of students still preferred synchronous online learning via Zoom. Additionally, students were enthusiastic to complete video assignments (36%). Some (33%) indicated they were familiar with and preferred the Moodle platform, while 30% indicated they were more comfortable with e-mail. Additionally, 3% of students mentioned Facebook, Managebac, and Seesaw as learning platforms. Surprisingly, 3% of students favoured paper-based (hard copy) assessments with feedback.

Figure 3

Teacher Audit of Students' Online Learning Platform Preferences



Over 81% of teachers were able to provide evaluation feedback to students who successfully submitted assignments. This was only possible for students with Internet-capable devices. Teachers also discussed the devices students used in online classes and for grading. Most students made calls using smartphones, laptops, desktop computers, and conventional cellphones.

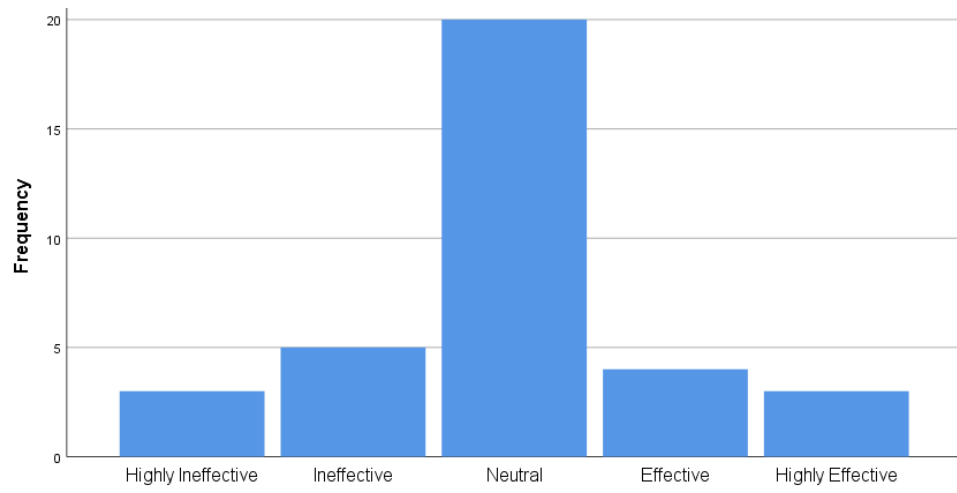
Most teachers also explored alternative OLPE teaching methodologies from other online sources. This indicated that teachers were aware of their students' learning and assignment submission limitations and attempted to assist them. User-friendly online platforms, such as Zoom, Blackboard, Canvas, and Google Meet (O'Brien et al., 2020; Quezada et al., 2020), Seesaw and Google Classrooms (Cruickshank et al., 2021), Flipgrid and YouTube, were easily accessed through a phone or tablet computer, allowing for quick engagement of students in learning new concepts and enhancing skills (Centeio et al., 2021). However, other researchers have suggested that effective use of these online platforms depends on PE teachers' ability to engage students creatively through effective implementation of synchronous online meetings, good time management skills, and the provision of ample real-world examples and meaningful feedback (Daum & Buschner, 2014; Oliver et al., 2009; Williams, 2013).

Teacher OLPE Effectiveness

Teachers were asked to evaluate their OLPE teaching effectiveness on a scale from one to five (Figure 4). Most teachers (57.1%) placed themselves in the middle of the scale, at three.

Figure 4

Teacher-Effectiveness Scale



Chan et al. (2021) shared similar sentiments: teachers perceived the effectiveness of their OLPE teaching to be low and challenging, and their workload increased as a result of lesson preparation and curriculum restructuring, as well as their efforts to meet parents' and principals' expectations. All this resulted in increased stress. On the other hand, an overwhelming majority of teachers (87.88%) indicated that they would be prepared to teach online if a repeat lockdown were imminent, provided they were assisted with Internet connectivity, devices, professional developments in the use of technology, and a PE curriculum that could be delivered online. However, some evidence has indicated that online education has reduced students' interest in learning (NASPE, 2007, as cited in Kooiman et al., 2017). In this case, it is imperative for PETs to enhance their students' socio-emotional development within the scope of OLPE teaching (Tison et al., 2020) due to the restrictions students face. Activities must be developed to improve interactions between teachers and students.

Professional Development Sessions

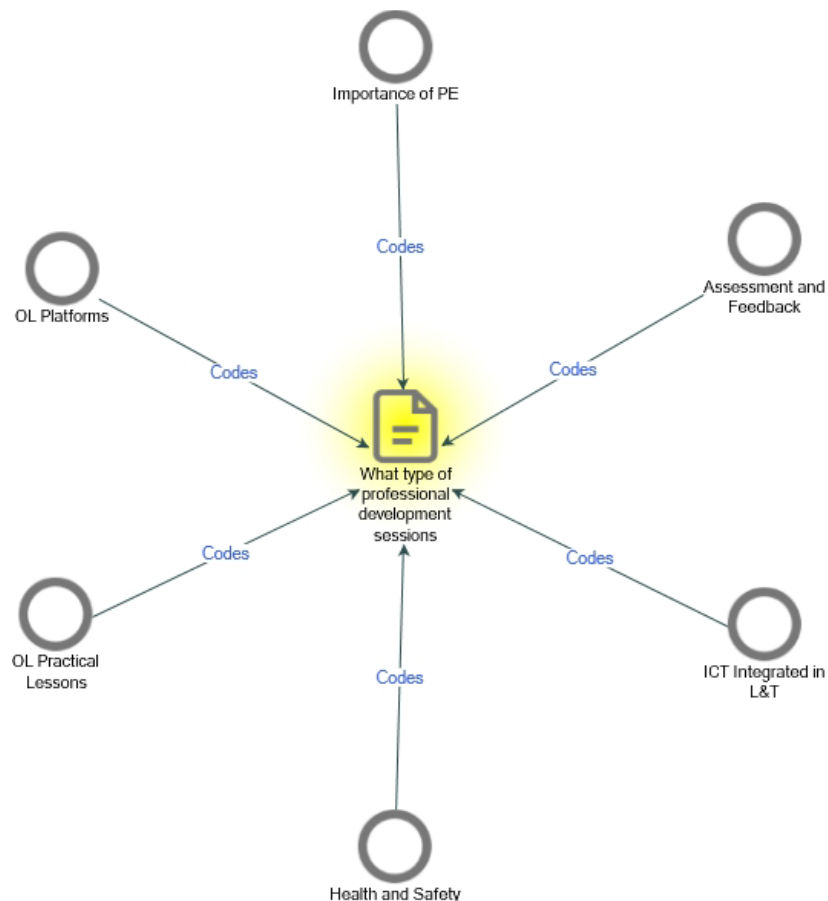
According to the teachers, their school leaders gave them opportunities to learn more about online learning, but these opportunities differed significantly from school to school. While most teachers (51.52%) stated that neither schools nor the MOE provided professional development sessions, 48.48% reported they were provided the opportunity to participate in PD sessions.

In addition, the interviews with teachers revealed that they required additional instruction and enhancement in OLPE. They believed the MOE and school principals would enhance PD sessions and offer workshops to help teachers improve their OLPE skills. Figure 5 illustrates the results of asking teachers about what types of professional development sessions or topics would help them teach better online. The highest demand for professional development centred on enhancing knowledge and skills in online platforms as well as ICT-integrated instruction and learning. PE, online assessment and feedback, and how to improve the online practical skills lesson were also seen as essential for enhancing health and safety-related knowledge and skills. To assist in this, the curriculum content delivered via OLPE teaching needed

to be efficient and exciting to improve students' interest in the lessons. It is, therefore, important for teachers that the MOE offer the necessary support to keep teachers from becoming exhausted and losing motivation (Konukman et al., 2022).

Figure 5

Types of Professional Development Sessions Needed (Coding)



To make remote learning possible, it is necessary to understand and evaluate the significance of technology. This can be accomplished via online webinars and hands-on training. This is also supported by SHAPE America's (2020) demand for more effective online training for PETs. Regarding the need to learn more about OLPE and what other ways and means I can use to teach, as well as what other online resources, apps, and tools are available to make teaching physical education relevant and enjoyable" (participant 9). "I believe computer literacy is essential. Students must be able to utilize applications and create their own YouTube, Canva, PowerPoint, and Google Slides" (participant 23).

Before the pandemic, prior studies indicated that PETs felt unprepared to use technology (Casey et al., 2017). Kim et al. (2021) discovered that PETs struggled due to a lack of access to technology, technological knowledge, training and time to learn, as well as a gap between knowing technology and applying it into

online teaching. The following response illustrated teachers' concerns regarding the use of ICT in the learning and teaching process. "It is crucial to conduct professional development on the effectiveness of technology in instruction and learning. I am aware of the available technologies, but I am unable to use them. Perhaps this will make my classes more engaging" (participant 4).

There has been much debate about the need for additional PD, so teachers must remain current with technological advancements. OLPE can make use of (a) cameras, active video games, and wearable devices that record and monitor movement; (b) sports-specific software and apps; (c) video analysis tools; and (d) health-related applications (Casey et al., 2017; McCaughtry et al., 2008). Two teachers reflected on this requirement:

Utilize alternative methods when physical presence is unattainable. Technology is here to stay, and numerous advances have been made over the years; however, physical education teachers are still struggling to keep up. We must learn more about the tools and applications that can help us teach what is pertinent (participant 19).

In addition, participant 14 noted that "technology, the Internet, and online services are indispensable. Most of my students are exposed to this, so teachers must collaborate with them to enhance student learning outcomes."

PETs require content-specific PD to provide their students with quality PE experiences. With the assistance of the government and school leaders, the MOE must provide the necessary support. These include providing online teaching kits and concrete teaching guides to PETs to develop innovative and interactive online lessons for their students to acquire motor skills and maintain their levels of physical activity (Chan et al., 2021). By fostering the use of smart apps designed to deliver content and receive feedback, educational bodies and their supporting organizations must take advantage of the opportunity to equip PE teachers better to promote OLPE instruction (Gobbi et al., 2020).

Lessons Learnt and Teachers' Perceptions of OLPE Teaching in the Future

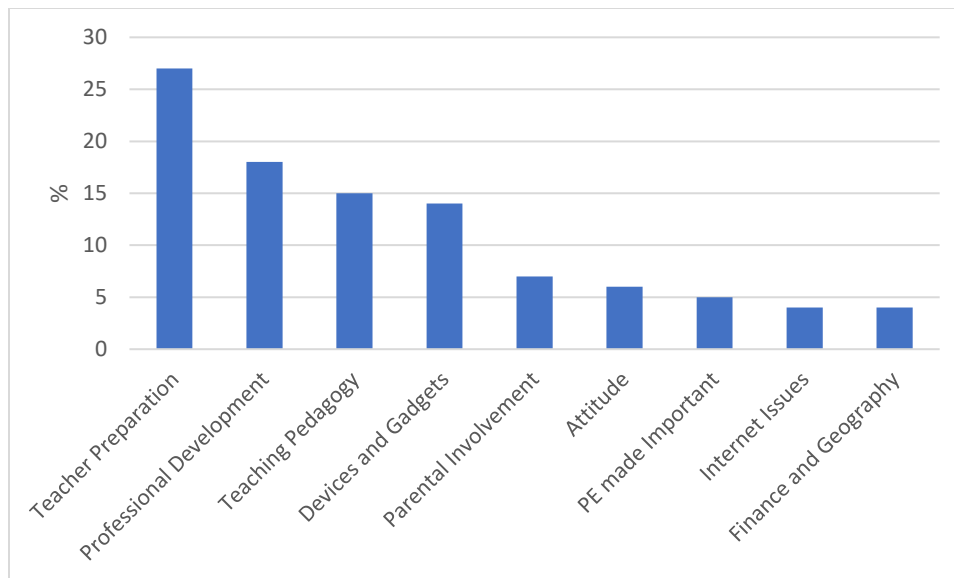
The pandemic forced the implementation of online education, and teachers could not avoid using ICT. The percentage coverage of the lessons learned is coded below (Figure 6). The most significant percentage of coverage of the lessons learned came from reflections on teachers' preparation (27%). Despite the mandatory implementation of online learning in their schools, participants reported that teaching students remains challenging. "Given the social context of our students, the year's notes must be disseminated in advance, with explanation and application if time permits. Otherwise, virtual learning is ineffective because not all students have access to technology" (participant 15). "Students are only interested in outdoor activities and have no interest in OLPE teaching" (participant 33).

As a result of COVID-19 pandemic lockdowns in the Pacific and the area's current state of vulnerability, the situation has "given us Pacific people new challenges to rethink, reimagine, and recreate lives and sustainable futures" (Nabobo-Baba, 2021, p. 3). Most teachers are optimistic about the role of ICT innovations in enhancing the learning and teaching process, as illustrated by participant 16. "Improvised techniques and methods must be developed and taught to teachers and students for learning to continue

during lockdowns. Professional development in OLPE is crucial and should be consistently pursued to prepare teachers.”

Figure 6

Lessons Learnt



The vast majority of teachers considered OLPE teaching strategies to be an enormous challenge. When coupled with technological challenges and a rapid shift away from the conventional mode of teaching towards a more virtual realm, ongoing professional development sessions on the efficient use of technology in the virtual PE classroom have been beneficial (Centeio et al., 2021). It is necessary to bring about a shift in attitudes and misconceptions towards PE. PETs must recognize that a person’s capacity to maintain physical, social, and mental health is the most crucial factor in living comfortably in their environment. Sadly, one teacher shared that “physical education is not as essential as it once was; PE classes are not taken seriously by school administrators or considered a core subject. Physical education classes are diminishing” (participant 1).

Despite this, the OLPE curriculum has emphasized the desire to continue working diligently so that the subject receives the attention it deserves through technological innovations.

Teach students engaging topics that spark their interest, particularly when the subject is insignificant in schools and communities. Utilize technology to create this distinction and use it to complement student abilities. TikTok videos are becoming the norm for sharing knowledge and emotions. Utilize social media to disseminate information and make an impact. Interesting apps are available to calculate physical movements and measure wellness; use them (participant 10).

Teaching PE beyond classroom walls and playgrounds reintroduces students to new learning spaces and, with new technologies, enables them to think and learn in innovative ways. However, as technology advances, the digital divide between those who have access and those who do not will persist, resulting in

children falling behind (Kang, 2016). “When integrating technology into lessons, it is necessary to be culturally aware and sensitive and to troubleshoot related issues” (Centeio, 2017, p. 12).

Conclusion

This study revealed that technological competence in OLPE teaching is independent of factors such as age, gender, qualifications, and teaching experience. However, due to technological accessibility, the school environment significantly influenced the efficacy of OLPE teaching. Teachers must acquire new skills and be familiar with online platforms to enhance OLPE teaching pedagogies. Prioritized workshops, upskilling opportunities, and teachers’ interests determine their readiness to teach OLPE. The Ministry of Education and schools must recognize the importance of online instruction in the post-pandemic period and the increasing technological dependence of learners.

Engagement between students and teachers, and consultations with parents, are essential for the success of OLPE. The ministry should (a) provide all schools and teachers with technology for effective online teaching and learning, (b) improve Internet connectivity, and (c) provide resources, PD, workshops, and an OLPE curriculum guide. Teacher training institutions also play a crucial role in providing online platforms and pedagogies for training and learning.

This study’s practical implications supported an emphasis on focused professional development efforts to improve technological proficiency in OLPE. Institutional support, lessons learned during the pandemic, and regular professional development sessions are essential. The mixed-methods strategy provided a comprehensive picture of OLPE teaching experiences, but the study’s small sample size and focus on Fiji limited generalizability. Future research should examine broader geographical contexts and long-term effects of professional development on OLPE practices.

References

- Aguinaldo, J., Cobar, A. G., & Dimarucot, H. (2022). Learning effectiveness and satisfaction self-report of college online physical education (OLPE) students in the Philippines in time of COVID-19 pandemic. *Sport Mont Journal*, 20. <https://doi.org/10.26773/smj.221011>
- Bacchus, K. (2000). The quality of education and future educational needs of Fiji. *Learning Together: Directions for Education in the Fiji Islands*, 48–57. Government of Fiji, Ministry of Education.
- Bacher-Hicks, A., Goodman, J., & Mulhern, C. (2021). Inequality in household adaptation to schooling shocks: Covid-induced online learning engagement in real time. *Journal of Public Economics*, 193, 104345. <http://www.nber.org/papers/w27555>
- Backman, E., & Barker, D. M. (2020). Re-thinking pedagogical content knowledge for physical education teachers—implications for physical education teacher education. *Physical Education and Sport Pedagogy*, 25(5), 451–463. <https://doi.org/10.1080/17408989.2020.1734554>
- Baran, E., Correia, A.-P., & Thompson, A. D. (2013). Tracing successful online teaching in higher education: Voices of exemplary online teachers. *Teachers College Record*, 115(3), 1–41. <https://doi.org/10.1177/01614681131150030>
- Bodsworth, H., & Goodyear, V. A. (2017). Barriers and facilitators to using digital technologies in the cooperative learning model in physical education. *Physical Education and Sport Pedagogy*, 22(6), 563–579. <https://doi.org/10.1080/17408989.2017.1294672>
- Bozkurt, A., Jung, I., Xiao, J., Vladimirsch, V., Schuwer, R., Egorov, G., Lambert, S., Al-Freih, M., Pete, J., Don Olcott, J., Rodes, V., Aranciaga, I., Bali, M., Alvarez, A. J., Roberts, J., Pazurek, A., Raffaghelli, J. E., Panagiotou, N., Coëtlogon, P. de, & Shahadu, S. (2020). A global outlook to the interruption of education due to COVID-19 pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education*, 15(1), 1–126. <https://www.asianjde.com/ojs/index.php/AsianJDE/article/view/462>
- Bryan, C. L., & Solmon, M. A. (2012). Student motivation in physical education and engagement in physical activity. *Journal of Sport Behavior*, 35(3), 267. <https://search.proquest.com/openview/91c56672baa00e97443bb525baa6a964/1?pq-origsite=gscholar&cbl=30153>
- Casey, A., Goodyear, V. A., & Armour, K. M. (2017). Rethinking the relationship between pedagogy, technology and learning in health and physical education. *Sport, Education and Society*, 22(2), 288–304. https://repository.lboro.ac.uk/articles/journal_contribution/Rethinking_the_relationship_between_pedagogy_technology_and_learning_in_health_and_physical_education/9619475/files/17267168.pdf
- Centeio, E. E. (2017). The have and have nots: An ever-present digital divide. *Journal of Physical*

- Education, Recreation & Dance*, 88(6), 11–12. <https://doi.org/10.1080/07303084.2017.1331643>
- Centeio, E., Mercier, K., Garn, A., Erwin, H., Marttinen, R., & Foley, J. (2021). The success and struggles of physical education teachers while teaching online during the COVID-19 pandemic. *Journal of Teaching in Physical Education*, 40(4), 667–673. <https://doi.org/10.1123/jtpe.2020-0295>
- Chan, W. K., Leung, K. I., Ho, C. C., Wu, C. W., Lam, K. Y., Wong, N. L., Chan, C. Y. R., LEUNG, K. M., & Tse, A. C. Y. (2021). Effectiveness of online teaching in physical education during COVID-19 school closures: A survey study of frontline physical education teachers in Hong Kong. *Journal of Physical Education & Sport*, 21(4).
- Chand, S. P., Devi, R., & Tagimaucia, V. (2022). Fijian students' reactions to required fully online courses during COVID-19. *International Journal of Instruction*, 15(2), 847–860. <https://doi.org/10.29333/iji.2022.15246a>
- Cranton, P. (2006). *Understanding and promoting transformative learning: A guide for educators of adults*. <https://scholar.archive.org/work/nblwgtkktfdnti66jn4uap7oxa/access/wayback/https://journals.library.ualberta.ca/cjuce-rcepu/index.php/cjuce-rcepu/article/download/8516/6874>
- Daum, D. N., & Buschner, C. (2012). The status of high school online physical education in the United States. *Journal of Teaching in Physical Education*, 31(1), 86–100. <https://doi.org/10.1123/jtpe.31.1.86>
- Daum, D. N. (2012). *Physical education teacher educator's attitudes toward and understanding of online physical education*. University of Illinois at Urbana-Champaign.
- Daum, D. N., & Buschner, C. (2014). Research on teaching blended and online physical education. *Handbook of Research on K-12 Online and Blended Learning*, 201–222.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982–1003. <https://doi.org/10.1287/mnsc.35.8.982>
- Dorovolomo, J., & Hammond, J. (2005). The Fiji secondary school sport and physical education status quo and its importance to tertiary curriculum development. *Directions: Journal of Educational Studies*, 27(2), 46.
- Dunton, G. F., Do, B., & Wang, S. D. (2020). Early effects of the COVID-19 pandemic on physical activity and sedentary behavior in children living in the US. *BMC Public Health*, 20(1), 1–13. <https://doi.org/10.1186/s12889-020-09429-3>
- Ersöz, G., & Yenilmez, M. I. (Eds.). (2022). *Sport management, innovation and the COVID-19 crisis*. Routledge. <https://doi.org/10.4324/978100325891>

- Ferdig, R. E., Baumgartner, E., Hartshorne, R., Kaplan-Rakowski, R., & Mouza, C. (2020). *Teaching, technology, and teacher education during the COVID-19 pandemic: Stories from the field*. Association for the Advancement of Computing in Education Waynesville, NC.
<https://www.learntechlib.org/p/216903/>
- Filiz, B., & Konukman, F. (2020). Teaching strategies for physical education during the COVID-19 pandemic: Editor: Ferman Konukman. *Journal of Physical Education, Recreation & Dance*, 91(9), 48–50. <https://doi.org/10.1080/07303084.2020.1816099>
- Gallagher, K. (2020). *Technology and its impact on physical education* [Master's thesis, Northwestern College].
https://nwcommons.nwciowa.edu/cgi/viewcontent.cgi?article=1201&context=education_master_s
- Goad, T., Jones, E., Bulger, S., Daum, D., Hollett, N., & Elliott, E. (2021). Predicting student success in online physical education. *American Journal of Distance Education*, 35(1), 17–32.
<https://doi.org/10.1080/08923647.2020.1829254>
- Gobbi, E., Maltagliati, S., Sarrazin, P., di Fronso, S., Colangelo, A., Cheval, B., Escrive-Boulley, G., Tessier, D., Demirhan, G., Erturan, G., Yüksel, Y., Papaioannou, A., Bertollo, M., & Carraro, A. (2020). Promoting physical activity during school closures imposed by the first wave of the COVID-19 pandemic: Physical education teachers' behaviors in France, Italy and Turkey. *International Journal of Environmental Research and Public Health*, 17(24), 9431.
<https://doi.org/10.3390/ijerph17249431>
- Hardman, K. (2005). Trends in physical education and society: Challenges for the physical education profession. *Proceedings, 'Science and Profession—Challenge for the Future'. 4th International Scientific Conference on Kinesiology, Opatija, Croatia*, 9–17.
<https://urn.nsk.hr/urn:nbn:hr:117:272767>
- Hill, G. M., & Valdez-Garcia, A. (2020). Perceptions of physical education teachers regarding the use of technology in their classrooms. *Physical Educator*, 77(1), 29–41. <https://doi.org/10.18666/TPE-2020-V77-I1-9148>
- Johnson, J., Daum, D., & Norris, J. (2021). I need help! physical educators transition to distance learning during COVID-19. *Physical Educator*, 78(2), 119–137.
<http://ezproxy.usp.ac.fj/login?url=https://www.proquest.com/scholarly-journals/i-need-help-physical-educators-transition/docview/2512118783/se-2>
- Jones, E. M., Baek, J., & Wyant, J. D. (2017). Exploring pre-service physical education teacher technology use during student teaching. *Journal of Teaching in Physical Education*, 36(2), 173–184.
<https://doi.org/10.1123/jtpe.2015-0176>
- Kang, C. (2016). Bridging a digital divide that leaves schoolchildren behind. *The New York Times*, A1.
<https://link.gale.com/apps/doc/A444233154/AONE?u=anon~33684f23&sid=googleScholar&xid>

[=94afbaff](#)

- Kim, M., Yu, H., Park, C. W., Ha, T., & Baek, J.-H. (2021). Physical education teachers' online teaching experiences and perceptions during the COVID-19 pandemic. *Journal of Physical Education and Sport*, 21, 2049–2056. <https://doi.org/DOI:10.7752/jpes.2021.s3261>
- Konukman, F., Filiz, B., & Ünlü, H. (2022). Teachers' perceptions of teaching physical education using online learning during the COVID-19: A quantitative study in Turkey. *Plos One*, 17(6), e0269377. <https://doi.org/10.1371/journal.pone.0269377>
- Kooiman, B. J., Sheehan, D. P., Wesolek, M., & Retegui, E. (2017). Moving online physical education from oxymoron to efficacy. *Sport, Education and Society*, 22(2), 230–246. <https://doi.org/10.1080/13573322.2015.1015978>
- Macdonald, G. (2002). Transformative unlearning: Safety, discernment and communities of learning. *Nursing Inquiry*, 9(3), 170–178. <https://doi.org/10.1046/j.1440-1800.2002.00150.x>
- McCaughy, N., Oliver, K. L., Dillon, S. R., & Martin, J. J. (2008). Teachers' perspectives on the use of pedometers as instructional technology in physical education: A cautionary tale. *Journal of Teaching in Physical Education*, 27(1), 83–99. <https://doi.org/10.1123/jtpe.27.1.83>
- Mercier, K., Centeio, E., Garn, A., Erwin, H., Marttinen, R., & Foley, J. (2021). Physical education teachers' experiences with remote instruction during the initial phase of the COVID-19 pandemic. *Journal of Teaching in Physical Education*, 40(2), 337–342. <https://doi.org/10.1123/jtpe.2020-0272>
- Mezirow, J. (1997). Transformative learning: Theory to practice. *New Directions for Adult and Continuing Education*, 1997(74), 5–12. <https://www.ecolas.eu/eng/wp-content/uploads/2015/10/Mezirow-Transformative-Learning.pdf>
- Morison, M., & Moir, J. (1998). The role of computer software in the analysis of qualitative data: Efficient clerk, research assistant or Trojan horse? *Journal of Advanced Nursing*, 28(1), 106–116. <https://doi.org/10.1046/j.1365-2648.1998.00768.x>
- Murcia, J., González-Cutre, D., & Ruiz, L. (2009). Self-Determined motivation and physical education importance. *Human Movement*, 10, 5–11. <https://doi.org/10.2478/v10038-008-0022-7>
- Nabobo_Baba, U. (2021). Dei! Me da dei ena noda yavu ni bula (Strong! Let us be firm on our foundational values and philosophies of life). *Waikato Journal of Education*, 26, 3–4. <https://doi.org/10.15663/wje.v26i1.839>
- Nancy, M., & Jannine, T. (2015). *Quality physical education (QPE): Guidelines for policy makers*. UNESCO Publishing.
- O'Brien, W., Adamakis, M., O'Brien, N., Onofre, M., Martins, J., Dania, A., Makopoulou, K., Herold, F.,

- Ng, K., & Costa, J. (2020). Implications for European physical education teacher education during the COVID-19 pandemic: A cross-institutional SWOT analysis. *European Journal of Teacher Education*, 43(4), 503–522. <https://doi.org/10.1080/02619768.2020.1823963>
- Ohara, M. R. (2023). The role of social media in educational communication management. *Journal of Contemporary Administration and Management*, 1(2), 70–76. <https://doi.org/10.61100/adman.v1i2.25>
- Okuyama, J., Seto, S., Fukuda, Y., Funakoshi, S., Amae, S., Onobe, J., Izumi, S., Ito, K., & Imamura, F. (2021). Mental health and physical activity among children and adolescents during the COVID-19 pandemic. *The Tohoku Journal of Experimental Medicine*, 253(3), 203–215. <https://doi.org/10.1620/tjem.253.203>
- Pangrazi, R. P., & Beighle, A. (2019). *Dynamic physical education for elementary school children* (19th ed.). Human Kinetics.
- Pokhrel, S., & Chhetri, R. (2021). A literature review on impact of COVID-19 pandemic on teaching and learning. *Higher Education for the Future*, 8(1), 133–141. <https://doi.org/10.1177/2347631120983481>
- Quezada, R. L., Talbot, C., & Quezada-Parker, K. B. (2020). From bricks and mortar to remote teaching: A teacher education program's response to COVID-19. *Journal of Education for Teaching*, 46(4), 472–483. <https://doi.org/10.1080/02607476.2020.1801330>
- Raaper, R., & Brown, C. (2020). The Covid-19 pandemic and the dissolution of the university campus: Implications for student support practice. *Journal of Professional Capital and Community*, 5(3/4), 343–349. <https://doi.org/10.1108/JPCC-06-2020-0032>
- Richards, T. J., & Richards, L. (1994). Using computers in qualitative research. *Handbook of Qualitative Research*, 2(1), 445–462. https://www.depts.ttu.edu/education/our-people/Faculty/additional_pages/duemer/epsy_6304_class_materials/Using-computers-in-qualitative-research.pdf
- Richards, K. A. R., Gaudreault, K. L., Starck, J. R., & Mays Woods, A. (2018). Physical education teachers' perceptions of perceived mattering and marginalization. *Physical Education and Sport Pedagogy*, 23(4), 445–459. <https://doi.org/10.1080/17408989.2018.1455820>
- Rundle, A. G., Park, Y., Herbstman, J. B., Kinsey, E. W., & Wang, Y. C. (2020). COVID-19 related school closings and risk of weight gain among children. *Obesity*, 28(6). <https://doi.org/10.1002/oby.22813>
- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory. Basic psychological needs in motivation, development, and wellness*. Guilford publications

- SHAPE America. (2020). *School reentry considerations: K-12 physical education, health education, and physical activity*. https://www.shapeamerica.org/MemberPortal/advocacy/Rentry/K-12_School_Re-entry_Considerations.aspx
- Sallis, J. F., Floyd, M. F., Rodríguez, D. A., & Saelens, B. E. (2012). Role of built environments in physical activity, obesity, and cardiovascular disease. *Circulation*, 125(5), 729–737. <https://doi.org/10.1161/CIRCULATIONAHA.110.969022>
- Sallis, J. F., & McKenzie, T. L. (1991). Physical education's role in public health. *Research Quarterly for Exercise and Sport*, 62(2), 124–137. <https://doi.org/10.1080/02701367.2012.10599842>
- Stanistreet, P., Elfert, M., & Atchoarena, D. (2021). Education in the age of COVID-19: Implications for the future. *International Review of Education*, 67(1–2), 1–8. <https://doi.org/10.1007/s11159-021-09904-y>
- Stirling, J., & Belk, L. (2002). Effective teaching, quality physical education and the New Zealand curriculum. *New Zealand Physical Educator*, 35(1), 69.
- Sun, A., & Chen, X. (2016). Online Education and Its Effective Practice: A Research Review. *Journal of Information Technology Education: Research*, 15, 157–190. <https://doi.org/10.28945/3502>
- Tan, S. C., Chan, C., Bielaczyc, K., Ma, L., Scardamalia, M., & Bereiter, C. (2021). Knowledge building: Aligning education with needs for knowledge creation in the digital age. *Educational Technology Research and Development*. <https://doi.org/10.1007/s11423-020-09914-x>
- Tison, G. H., Avram, R., Kuhar, P., Abreau, S., Marcus, G. M., Pletcher, M. J., & Olgin, J. E. (2020). Worldwide effect of COVID-19 on physical activity: A descriptive study. *Annals of Internal Medicine*, 173(9), 767–770. <https://doi.org/10.7326/M20-2665>
- UNESCO. (2016, November 27). *Fiji*. Education and Literacy <https://uis.unesco.org/en/country/fj>
- Varea, V., & González-Calvo, G. (2021). Touchless classes and absent bodies: Teaching physical education in times of Covid-19. *Sport, Education and Society*, 26(8), 831–845. <https://doi.org/10.1080/13573322.2020.1791814>
- Velde, G., Lubrecht, J., Arayess, L., van Loo, C., Hesselink, M., Reijnders, D., & Vreugdenhil, A. (2021). Physical activity behaviour and screen time in Dutch children during the COVID-19 pandemic: Pre-, during- and post-school closures. *Pediatric Obesity*, 16(9), e12779. <https://doi.org/10.1111/ijpo.12779>
- Wargadinata, W., Maimunah, I., Eva, D., & Rofiq, Z. (2020). Student's responses on learning in the early COVID-19 pandemic. *Tadris: Journal of Education and Teacher Training*, 5(1), 141–153. <http://ejournal.radenintan.ac.id/index.php/tadris/article/view/6153/pdf>
- Webster, C. A., D'Agostino, E., Urtel, M., McMullen, J., Culp, B., Loiacono, C. A. E., & Killian, C. (2021).

- Physical education in the COVID era: Considerations for online program delivery using the comprehensive school physical activity program framework. *Journal of Teaching in Physical Education*, 40(2), 327–336. <https://doi.org/10.1123/jtpe.2020-0182>
- Williams, L. (2013). *A case study of virtual physical education teachers' experiences in and perspectives of online teaching* [Doctoral dissertation, University of South Florida]. <https://digitalcommons.usf.edu/etd/4962/>
- Wong, M. M. L., Lau, K. H., & Chan, C. W. F. (2021). The impacts and success factors of a work-from-home service-learning internship during COVID-19. *Journal of Work-Applied Management*, 13(2). <https://doi.org/10.1108/jwam-01-2021-0003>
- Wyant, J. D., Jones, E. M., & Bulger, S. M. (2015). A mixed methods analysis of a single-course strategy to integrate technology into PETE. *Journal of Teaching in Physical Education*, 34(1), 131–151. <http://dx.doi.org/10.1123/jtpe.2013-0114>
- Wright, S. C., McNeill, M. C., & Schempp, P. G. (2005). Standards and Practice in Asian Physical Education: Standards and Practice for K-12 Physical Education in Singapore. *Journal of Physical Education, Recreation & Dance*, 76(7), 23–27. <https://doi.org/10.1080/07303084.2005.10609308>
- Zull, J. E. (2006). Key aspects of how the brain learns. *New Directions for Adult and Continuing Education*, 110, 3. <https://doi.org/10.1002/ace.213>

