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Workplace-based continuing professional development program for physically active learning: designing a framework and prospective directions

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In 2018, the Centre for Physical Active Learning (SEFAL) designed a comprehensive one-year workplace-based continuous professional development (CPD) program for in-service teachers in Norway. The CPD program aimed to enhance the pedagogical feasibility of integrating physically active learning (PAL) within all theoretical subjects by advancing teachers' competence. This article provides an overview of the SEFAL CPD program's conceptual framework and design. Although the article does not provide an independent evaluation of the framework, we discuss it based on our continual development during the period from 2018 to 2023, during which 1,363 teachers from 77 schools participated. As the framework continues to inform the SEFAL CPD, the article concludes by identifying prospective directions and potential avenues for further refinement and utilisation of this and similar programs.

KEYWORDS

teaching, physically active learning, continuous professional development, workplace-based, teacher learning

Introduction

One innovation that has received increased interest is physically active learning (PAL), which is the integration of movement in the delivery of academic content (Daly-Smith et al., 2021a). This innovation has gathered momentum as evidence indicates the supposed role of physical activity in cognitive processes (Lubans et al., 2016; Hillman et al., 2019), improved academic performance, and time-on-task (Norris et al., 2018; Singh et al., 2018). In this vein,

PAL can be one promising way to address core educational goals while also facilitating physical activity among pupils in school (Bartholomew and Jowers, 2011; Watson et al., 2017).

Regardless of its increased interest and promise, integrating PAL in schools has been challenging as it has primarily been researcher-driven, had a considerable focus on predefined health parameters, and less attention on educational processes and outcomes (Vazou and Skrade, 2017; Vazou et al., 2020; Daly-Smith et al., 2021a). These challenges may undermine teacher's daily practices in schools and broader educational contexts (Vazou et al., 2020). As a result, there has been a conceptual shift from health toward situating PAL in an educational context (Chalkley et al., 2023; Mandelid, 2023). As PAL is still relatively new in an educational context, research indicates that teachers relate issues of integrating PAL to time, the availability of resources and a supportive school climate (Routen et al., 2018). Additionally, teachers report not having the necessary competence to enact PAL (Daly-Smith et al., 2021a,b). In the examples where PAL is integrated, it tends to be dependent on individual teachers' engagement, is short-lived, and does not cement itself as a sustainable alternative within teachers' pedagogical practice (Routen et al., 2018; Lerum et al., 2021).

By considering the multitude of challenges pertaining to the integration and sustainability of PAL in schools, the Centre for Physical Active Learning (SEFAL) at the Western Norway University of Applied Sciences designed a continuous professional development (CPD) program as one strategy for advancing in-service teachers' competence and sustaining PAL in practice (Lerum et al., 2021; Daly-Smith et al., 2021b; Teslo et al., 2023a). The CPD program was designed with the overall purpose of enhancing the pedagogical feasibility of integrating PAL into all theoretical subjects by (1) empowering teachers' agency and advancing their competence, (2) adapting to the Norwegian educational context, policy and national curriculum objectives, and (3) integrating theoretical and experiential knowledge. Against this backdrop, this article aims to provide a research-informed framework for a workplace-based continuing professional development program in physically active learning, discuss the program structure and identify prospective directions.

Pedagogical framework

In this section, we will present the pedagogical framework of the SEFAL CPD, which we have developed continuously throughout five years of SEFAL. The framework builds on three pedagogical principles anchored in CPD literature: (1) structuring the SEFAL CPD, (2) Whole school approaches and school culture in the SEFAL CPD, and (3) locating the SEFAL CPD between academic and experiential knowledge.

Structuring the SEFAL CPD

As society requires constant educational change, pre-service teacher education is insufficient for long-term professional competencies (LaCroix, 2020). As a result, CPD programs have been identified as one approach for continuing to qualify and improve in-service teachers' practices and competencies (Hoekstra et al., 2009; Luneta, 2012; Korthagen, 2017). However, CPD programs have also been criticised for being a practice done to teachers, as opposed to a developmental journey done together with them (Armour and Yelling, 2004). Often characterised by a "one-size-fits-all" ideology (Avalos,

2011; Biesta, 2015), the content of CPD programs has primarily been overgeneralised and standardised without taking into consideration teachers' various contexts, opportunities and needs (Patton et al., 2012). Challenges such as spanning short periods, being research-led, and content being too generic appear in literature both concerning CPDs in general as well as those concerning PAL specifically (Vazou et al., 2020; Teslo et al., 2023a).

Although there are various CPD program designs, the SEFAL CPD builds on Korthagen's (2001, 2017) professional development 3.0, which uses teachers' potential, concerns, personal strengths, and goals within the context of their work as a starting point for actions and reflections about the experience. To support teachers in this process, the SEFAL CPD is guided by Korthagen's (2001) five phases of reflection called the ALACT model: (1) Action, (2) Looking back on the action, (3) Awareness of essential aspects, (4) Creating alternative methods of action, and (5) Trial. As these five phases build on reflection and learning from experience as indispensable elements, the SEFAL CPD focuses on giving teachers time to create first-hand experiences with the process of enactment. In line with previous PAL research, this means starting with what teachers are already doing, supporting them with concrete PAL examples, helping them plan PAL as part of their teaching, and supporting their enactment (Daly-Smith et al., 2021a,b). To support teachers in the process of creating awareness of their competencies and capabilities to enact PAL, reflective portfolios with questions about their planning, actions and essential aspects are used to direct attention to their professional development (Klenowski et al., 2006; Mansvelter-Longayroux et al., 2007; Hoekstra et al., 2009).

Structuring the CPD program by employing professional development 3.0 also means that there is no one standardised strategy for enacting PAL in teaching (Korthagen, 2017). The reason for this is that the CPD actualises PAL based on teachers' concerns and gives them the agency to utilise their professional knowledge to enact and adapt PAL to their teaching. In this way, the SEFAL CPD allows teachers to explore their already existing teaching methods to find common ground for new trajectories. In these contexts, where teachers not only describe and share experiences but also enact PAL and question the established methods, the CPD promotes teachers' professional development (Korthagen, 2017). As professional development 3.0 entails that outcomes of the CPD cannot be predicted, the teachers' competencies and capabilities to enact PAL may take different forms (Korthagen, 2017). Considering that professional development is time-consuming, the SEFAL CPD spans one school year to provide teachers with sufficient time to meet the often unconscious and multi-dimensional nature of learning (Korthagen, 2017).

Whole-school approaches and school culture in the SEFAL CPD

Although much focus has been on individual teachers' responsibility for improving their competencies, a central shift in some CPD literature is an emphasis on collaborative development (Klenowski et al., 2006). For this reason, whole-school approaches have been given increased attention, as they include principals, teachers, and other stakeholders such as social workers (Hargreaves, 2008; Mogren et al., 2019). These approaches aim to ensure that everyone can contribute to pupils reaching their potential irrespective of individual and family-related factors such as social and economic status (European Commission, 2020).

Whole-school approaches corresponds with what is termed as *the professional environment* in Norway, where “teachers, leaders and other employees reflect on their common values and are to assess and develop all practices in school” ([The Norwegian Directorate for Education and Training and Ministry of Education and Research, 2019](#), p. 18). The professional environment gives teachers, principals, and other stakeholders in school a role to reflect on the subject, pedagogy, and didactics and contribute new knowledge to practices. As opposed to the “top-down” and “bottom-up” dichotomy of educational change ([Fullan, 1994](#)), the professional environment encourages teachers to take an active role in contributing to professional development and, ultimately, educational change from within.

The SEFAL CPD emphasises the involvement of the professional environment by giving principals, teachers, assistants, and social workers an active role in contributing to the development. Enabling all stakeholders to play an active role in the CPD program often requires a deep cultural change ([Fullan, 2006](#)). The notion of deep cultural change means that there is no quick fix to any problem and that teachers and principals must be willing to make time for a cultural change. For this reason, the SEFAL CPD facilitates a process where the professional environment must define their school culture as the starting point for development ([Kemmis, 2009](#); [Korthagen, 2017](#)). This means that everyone in the professional environment must define their culture through the semantic, physical and social space ([Kemmis et al., 2014](#); [Mahon et al., 2017](#)). Specifically, the professional environment must reflect upon (1) the way PAL is rooted in their language (semantic), (2) the way PAL exists in their activities and work (physical), and (3) the way PAL can contribute to their developmental work at school (Social space).

Locating the SEFAL CPD between academic and experiential knowledge

A central question for all CPD programs is what knowledge that is available to underpin the process of continuously qualifying teachers’ practices. Traditionally, there has been an emphasis on how teachers’ practices can become better linked to theories, implying that academic knowledge is more valued than experiential knowledge ([Zeichner, 2010](#)). A large number of research studies illustrate this gap between theory and practice ([Bakkenes et al., 2010](#); [Zeichner, 2010](#)). Reflecting upon what knowledge underpins CPD programs resulted in two questions for the development of the SEFAL CPD: (1) what knowledge is valued for teachers’ competencies, and (2) what is the optimal context to promote such knowledge?

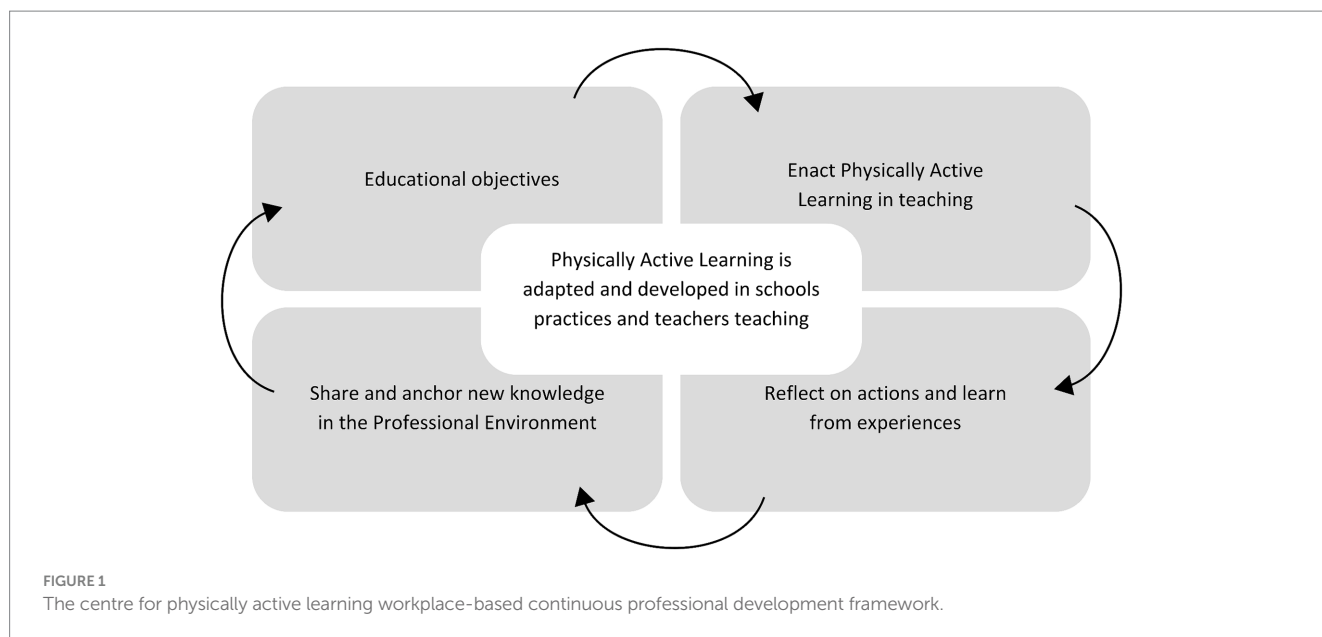
Considering the first question, [Vazou et al. \(2020\)](#) found that the majority of strategies that promote PAL are achieved by researchers designing PAL opportunities and then allowing teachers to adapt these activities to their context. In combination with strategies that focus on how teachers’ practice can become better linked to theories, the SEFAL CPD links theory to practice by emphasising that PAL is not only a theoretical phenomenon but enacted in practices that are constituted by teachers ([Mandelid et al., 2023](#)). In this way, PAL is not a static innovation but a teaching method with various educational purposes ([Mandelid et al., 2022](#)). Starting with experiential knowledge, that is, teachers’ experiences and practices, shifts the focus towards how teachers learn and adapt their practice. This creates a context where teachers can experience how practice is essential for their learning by demonstrating and applying new perspectives ([Zeichner et al., 2015](#)).

For this reason, the SEFAL CPD presents a rupture in the current knowledge hegemony in that teachers are not only supposed to try out practices provided by the university but also create their own experience with PAL and further develop it in their practice. For this reason, the literature used in the SEFAL CPD program revolves around teaching and learning as perspectives to enact PAL.

For the second question, there have been many attempts to strengthen the connections between campus courses and field experiences in CPD programs ([Ball and Forzani, 2009](#); [Zeichner, 2010](#)). Many of these instances have attempted to utilise experiences throughout the curriculum and carefully plan campus-based courses where teachers must connect theory and practice ([Darling-Hammond, 2010](#)). These approaches are characterised as formal learning contexts ([Hoekstra et al., 2009](#); [Hoekstra and Korthagen, 2011](#)). As the SEFAL CPD program seeks to bridge academic and experiential knowledge, an informal learning context was chosen. Informal learning contexts refer to learning in the workplace and entail not “controlling” teachers’ learning, accepting that not all will learn the same, and encouraging the professional environment to discuss and reflect on the subject matter ([Hoekstra et al., 2009](#)). In alignment with these tenets, the SEFAL CPD program is characterised as workplace-based ([Avalos, 2011](#); [Korthagen, 2017](#)). Unlike campus courses, the notion of a workplace-based CPD program represents a shift toward acknowledging that teachers’ learning is interconnected with their work in schools. Such an approach builds partnerships where cooperation takes place between universities and schools ([Martin et al., 2011](#)). In designing the workplace-based CPD program, schools present an optimal context for providing teachers with real-world experiences with PAL. Therefore, the SEFAL workplace-based CPD program starts with teachers enacting PAL in real-world practices and then reflecting on their experiences both individually and collectively at their schools. Such an approach means that all aspects of the program take place in the practices of participating teachers.

Considering the three aforementioned pedagogical principles, the SEFAL framework seeks to build a bridge between academia and the practice field. Furthermore, the framework lays the foundation for a workplace-based CPD that allows teachers to enact PAL in their practice and explore its possibilities. As illustrated in [Figure 1](#). The SEFAL framework is designed with attention to the educational context by emphasising educational objectives. The top left box emphasises that teachers, especially in Norway, have autonomy to decide how to conduct their teaching ([Mausethagen and Mølsted, 2014](#)). Therefore, teachers are given the freedom to choose how PAL can contribute to the curriculum. Secondly, teachers are given time to enact PAL in teaching to try it out as one potential method that can be used alongside other teaching methods. Thirdly, as illustrated in the bottom right box, experiences from planning and enacting PAL are elevated by reflecting on their teaching and learning from their experiences. The second and third boxes build on the ALACT model ([Korthagen, 2001](#)). The fourth box underpins teachers sharing new experiential knowledge with their professional environment, which entails anchoring and challenging new ideas about PAL in the school culture.

The focus on practice and experiential knowledge is accompanied and strengthened with the aid of portfolios that connect experiential knowledge to theories ([Furlong, 2013](#)). As part of the SEFAL CPD, the portfolios are designed to create awareness of the core aspects of their PAL enactment ([Klenowski et al., 2006](#)). This gives the teacher an active role in their professional environment and a role in developing a new practice at the school. The SEFAL workplace-based CPD



framework underpins all the modules which we present below. This means that the framework is iterative in that its process is repeated through the modules and the way they are formatted.

The learning environment and pedagogical format

In this section, we present the onboarding phase, the three modules and the voluntary exam. As the SEFAL framework is characterised as workplace-based, all modules occur at the participants' respective schools. This means that all modules of the CPD take place as part of teachers' daily practices, where they are to plan PAL as part of their broader teaching. Since the structure of the CPD requires the professional environment's active participation, principals are especially important in facilitating time for the modules. Each module starts with an online webinar that introduces the module's theme and relevant literature. The webinar also gives teachers opportunities to share their experiences. Although most of the time is dedicated to working hours, some time is required to write portfolios, have meetings in a professional environment and attend webinars. Portfolios are a mandatory part of each module, and teachers can choose to write them individually, in pairs or in groups. Each module lasts between one and two months to ensure enough time to plan, try, and reflect on PAL enactment.

Onboarding

The selection of schools in the CPD is based on mutual interest in PAL. Schools are continuously encouraged to contact SEFAL if they are interested in participating. After initial contact, the principal is invited to investigate potential collaboration with the aim of establishing an equal partnership. The criteria for participation is that schools can document their dedication to the program by setting aside time for teachers to work with the program during working hours. Additionally, principals are informed that all employees are encouraged to participate in some form of the CPD program. Although all employees were

invited to participate in the CPD program, Norwegian University regulations required them to have a bachelor's degree to be able to take the exam. In other words, all employees could follow the steps of the modules. However, only those with the necessary qualifications could take the exam. During onboarding, it is also central to actualise PAL among teachers for their ownership and engagement. Schools are, therefore, introduced to PAL via an introductory lecture that aims to identify PAL in the school's existing practice, provide opportunities for teachers to try practical PAL activities, and reflect on how PAL is applied to curriculum objectives and their practice.

Module 1) physically active learning in various learning environments

The first module is PAL in different learning environments, which refers to various places to enact PAL for educational goals. The module focuses attention on how various local learning environments afford different learning and movement opportunities. Indoor learning environments may be classrooms, corridors, halls, and stairs. Outdoor learning environments may, for instance, be football fields, schoolyards, local forests, or other green spaces. In module 1, the portfolios focus on teachers enacting PAL in environments beyond their traditional classrooms.

Module 2) approaches to physically active learning

The second module revolves around how teaching and learning can include different forms of movement and physical activity. In this module, teachers are presented with five approaches to PAL: (1) play activities, (2) structuring teaching, (3) embodiment, (4) situational exercises and (5) creative and aesthetic learning activities (Ottesen, 2017). The module focuses on a practical dimension where teachers are expected to enact the different approaches to PAL and reflect on various types of learning. As a part of the portfolio for the second

module, teachers are invited to reflect on and familiarise themselves with how physical activity and movement can contribute to pupils' learning processes. Teachers are also introduced to theoretical perspectives from PAL research, curriculum and broader educational literature that they are encouraged to use to support their reflections.

Module 3) physically active learning in the professional environment

The third module is the professional environment, which focuses on giving teachers tools to develop PAL as part of their school culture. The module introduces the research-methodology Lesson Study, where teachers collaborate to find a problem area, for example, a topic that is challenging or interesting for their experiences with enacting PAL, and explore it to create new experiential knowledge (Munthe et al., 2015). In this way, the module focuses on supporting teachers to reflect upon their current practice, their learning while participating in the CPD, and how to further develop their individual and collective practice at the schools. For this reason, the module aims to give teachers new insights into the enactment and sustainability of PAL.

Exam

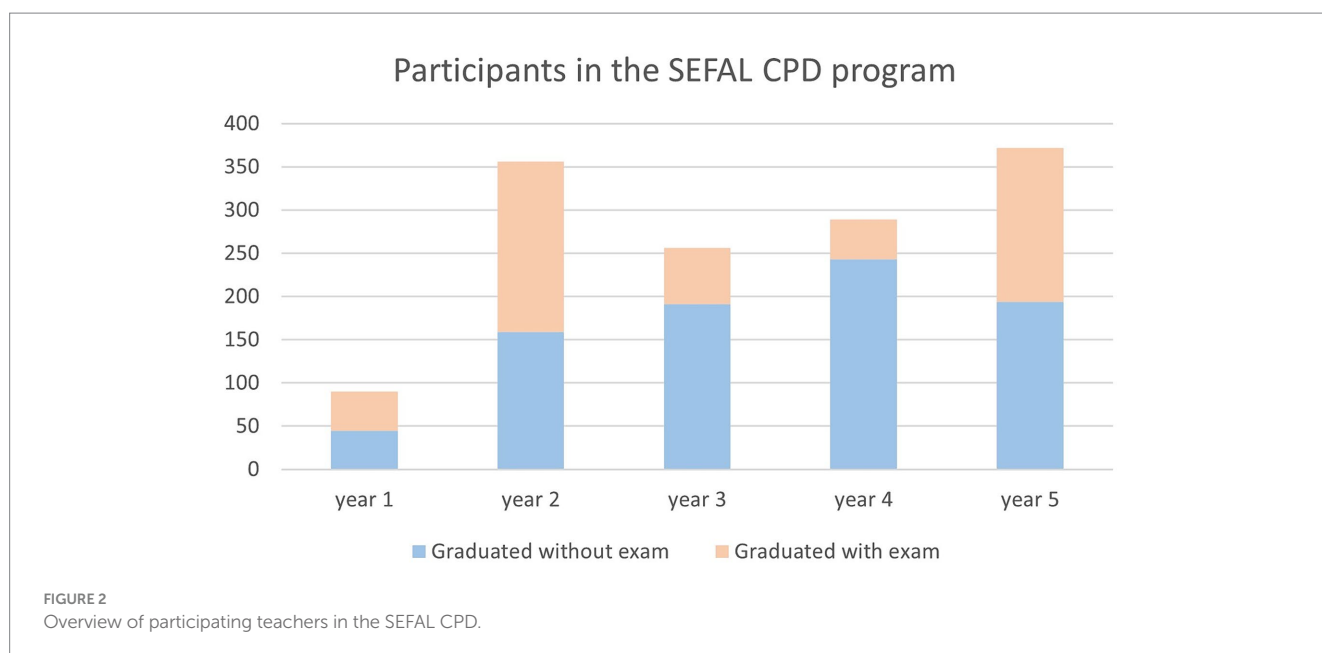
For those who meet the formal requirements, the final step in the CPD is an exam, which has a twofold purpose. First, it is formally structured to credit all teachers who voluntarily chose to take the exam with 15 ECTS at the master's level. Secondly, the exam is structured to support teachers in sustaining PAL in their teaching and the school culture. The exam consists of (1) writing a plan for how to sustain PAL at the schools and (2) organising a PAL activity and anchoring it in relevant research. The starting point for the exams is the portfolios of each module. The exam spans four weeks to ensure that teachers have enough time.

Results to date

Between 2018 and 2023, a total of 77 schools from 38 municipalities across Norway participated in the SEFAL CPD program (see Figure 2 for yearly distribution). In terms of location, 51 schools were suburban schools on the outskirts of cities, 16 were urban schools, and 10 were rural schools. Moreover, 63 schools were primary schools (grades 1–7), 4 were lower secondary schools (grades 8–10), and 10 were combined schools, i.e., both primary and lower-secondary schools. The vast majority (74) were public schools. With regards to the teachers, we can assume that the participants in the CPD represent a broad population of teachers in Norway with regard to gender, age, years of experience, and more. Our reasoning behind this is twofold: Firstly, our emphasis on whole-school participation in the CPD entails that our data is not solely comprised of individuals who would seek out CPD programs on their own. Secondly, the schools were spread out across the country. For more details about the participating schools, see Appendix 1. Below, we present some initial insights into participation.

As illustrated in Figure 2, a total of 90 participants from 10 schools completed the CPD in year one (2018–2019), where 45 participants completed the exam. In year two (2019–2020), a total of 365 participants from 27 schools completed the CPD, where 197 participants completed the exam. In year three (2020–2021), a total of 256 participants from 18 schools completed the CPD, where 65 participants completed the exam. In year four (2021–2022), 289 participants from 7 schools completed the CPD, where 46 participants completed the exam. In year five (2022–2023), 372 participants from 15 schools completed the CPD, where 178 participants completed the exam. It is worth mentioning that year one was a trial of the CPD and had fewer participants. In years three and four, participation was affected by the COVID-19 pandemic, which challenged all developmental work in schools. Based on years one, two, and five, we can indicate that approximately half of the participants were interested in taking an exam.

During years two and three, we conducted follow-up research on some teachers' engagement with the SEFAL CPD program (Teslo



et al., 2023a,b). The in-depth explorations of teachers' participation indicate that the relevance of PAL is related to pedagogy rather than health. Given that the SEFAL CPD program aims to align PAL in the Norwegian context, this is particularly interesting as teachers seem to actualise PAL in their daily practice. Another finding is that teachers find the CPD to create ownership towards their continuous development because it facilitates professional autonomy. This is interesting due to the informal learning context of the SEFAL CPD, where it seems that autonomy may be a prerequisite for facilitating change (Teslo et al., 2023a). Teachers also emphasise that PAL diversifies teaching practices and stimulates critical reflectiveness and collaborative learning. Furthermore, a particular emphasis is directed towards remaining sensitive towards contextual consideration as this may support the process of lifelong learning and professional growth within teachers participating in the CPD.

As the mentioned follow-up research was only conducted on a few participating teachers in years two and three and, therefore, cannot be generalised or concluded upon, there is a need to evaluate the current SEFAL CPD. We are, thus, in the process of developing an evaluation of the program. The evaluation will inform how teachers and principals engage in workplace-based CPD. Due to the open-ended nature of the SEFAL CPD, we will also examine the perceived outcomes and cultural change at schools. We plan to produce both qualitative and quantitative data, in which all participants from year five are invited to answer a questionnaire, and some are invited into semi-structured interviews/focus groups.

Discussion

In this article, we have provided a conceptual framework for the SEFAL workplace-based CPD program for PAL. This framework was developed in response to the multitude of challenges pertaining to the integration and sustainability of PAL in schools. The SEFAL framework was designed between 2018 and 2023, during which 1,363 teachers across 77 schools across Norway participated. As this article was prepared after five years of evolving the CPD, we will further discuss the program and identify prospective directions for further refinement and utilisation.

As mentioned, previous literature on CPD programs has traditionally consisted of predefined outcomes to train teachers in creating educational change (Darling-Hammond and Richardson, 2009). In line with the tenets of professional development 3.0, the SEFAL framework applies a more realistic approach because it does not start with defined outcomes but with teachers' values within the context of their work as a starting point for the modules (Korthagen, 2001). For this reason, the SEFAL framework implies and supports the notion that PAL cannot be understood as a static innovation that can be implemented directly into practices (Mandelid et al., 2022). Instead, PAL is adapted and developed against the school's practices and teachers' teaching from which it emerges. In this vein, a critical perspective on the SEFAL framework is that there are no easily defined demarcated levels of PAL competency.

Although there is an increasing amount of literature that seeks to define PAL competencies (Daly-Smith et al., 2021a; Mandelid et al., 2022, 2023; Schmidt et al., 2022; Madsen, 2023), it can be argued that PAL is still under development in schools. Based on the SEFAL CPD program, indications are that defining PAL

competencies strictly may hinder constructive development in educational contexts and further conceptual work. Therefore, the SEFAL CPD presents a context to explore and define competencies together with teachers. As PAL is relatively young, this suggests that PAL cannot only be introduced by applying previous PAL literature but also must be combined with broader teaching and learning literature. Such a perspective resonates well with recent conceptions about PAL, where a key point to sustain it in schools is to reorient the focus and purpose of PAL to align with the educational policy context (Chalkley et al., 2022, 2024). In line with teachers' autonomy to decide how and why to teach, this includes aligning PAL with the educational values of the curriculum. Adaption to the educational context can enable the field to move beyond the discursive boundaries and disciplinary limitations toward a real-world continual adaptation of PAL practice (Mandelid, 2023).

Moreover, the SEFAL CPD can be characterised as value-based (Biesta, 2010) as it actualises PAL from teachers' concerns and experiences to promote new insight into the opportunities of PAL through their actions and reflections.

Through emphasising teachers' values, the SEFAL CPD is novel considering that previous PAL programs have often been behavior-oriented (e.g., Daly-Smith et al., 2021a). As opposed to behavior-oriented programs that focus on predefined outcomes, the SEFAL CPD is more open-ended and unpredictable (Korthagen, 2017). Being open and unpredictable may warrant concerns because value-based professional development requires more time, is difficult to control, and often requires profound cultural change (Fullan, 2006). To deal with these difficulties, the SEFAL CPD emphasises the role of the professional environment in developing new experimental knowledge and rooting it in their school culture. Such an approach moves beyond the dichotomy of bottom-up and top-down perspectives and seeks to develop understanding from within by getting acquainted with new views of learning (Munthe et al., 2015; Korthagen, 2017). CPD programs where the whole school attends and works together are also shown to have stronger social influences than other, often traditional, formal CPD programs (Korthagen, 2017). Moreover, value-based learning also has the potential to become more integrated because it facilitates direct engagement with the content and more autonomy to decide participation in the program (Attema-Noordwier et al., 2011).

A final remark on the SEFAL CPD is that its value-based nature also warrants consideration as it does not have a one-sided focus on reciting factual knowledge but rather on combining theory and experiential knowledge through experiences and reflection. In this vein, it might be more challenging to evaluate the actual change of teachers who participate and graduate from the program (Teslo et al., 2023a). The challenges of evaluation are related to the fact that teachers' values are more challenging to evaluate than behavior change (Korthagen, 2001; Biesta, 2010). For example, while it might be easy to observe whether teachers are doing more PAL—it is more challenging to measure how they understand the purposes of PAL and how it might have changed their perspectives on learning (Hoekstra and Korthagen, 2011; Korthagen, 2017). These issues relate to the teachers' efforts to bring about change, which can lead to reframing limiting values and beliefs about what physical activity and movement might contribute to learning (Korthagen,

2017). Moreover, the challenge of evaluating the SEFAL CPD's actual impact is also related to the less definite goals, which may lead to different teachers having various perspectives about what they have learnt. This means that researchers/teacher educators must be more open to recognising that teachers' learning journeys might take many paths and be open to new trajectories that open along the way (Teslo et al., 2023a).

Conclusion

The authors of this article acknowledge the conceptual nature of this framework. As is deducible from the twofold aims, this article refrains from serving as a standalone evaluation of the SEFAL CPD. Instead, we aimed to unpack the design of our conceptual apparatus, theoretical framework and principles that underpin the SEFAL CPD. Based on the five-year design and operation of the CPD, the authors conclude this article with prospective trajectories of workplace-based CPD programs for PAL. Firstly, we argue that future PAL CPD programs should acknowledge the already existing physical activity and movement practices in school and take into account teachers' values, personal strengths and goals as a starting point for professional development. This also entails that PAL cannot be understood as a strictly defined strategy but is open to various developments. Secondly, we argue that future CPD programs should be conducted in partnership with all participants in the professional environment to make a cultural change. Central to this perspective is that the CPD is not dependent on individual teachers' engagement but on broad participation in school. Lastly, we argue that future PAL CPD programs should focus not only on giving teachers the opportunity to try out practices provided by universities but also on creating their own experiences with PAL to develop it further in their practice. In this way, theoretical and practical perspectives about PAL should be combined for the complex process of enacting PAL in teaching. Collectively, these final remarks about prospective directions are novel as they provide suggestions for designing programs that address the challenges pertaining to integrating PAL and the challenges that have been highlighted in previous research on CPD programs.

Data availability statement

The original contributions presented in the study are included in the article/[Supplementary material](#), further inquiries can be directed to the corresponding author.

Author contributions

MM: Conceptualization, Project administration, Writing – original draft, Writing – review & editing, Methodology, Visualization. ED: Conceptualization, Investigation, Methodology, Writing – original draft, Writing – review & editing, Validation. ST: Conceptualization, Methodology, Writing – review & editing, Investigation. ØL: Conceptualization, Methodology, Visualization, Writing – review & editing, Validation. HT: Conceptualization,

Writing – review & editing, Validation, Supervision. EJ: Conceptualization, Visualization, Writing – review & editing, Supervision, Methodology. PE: Conceptualization, Visualization, Writing – review & editing, Methodology. TW: Conceptualization, Writing – review & editing, Investigation. MS: Conceptualization, Writing – review & editing, Investigation, Visualization. HeS: Conceptualization, Visualization, Writing – review & editing, Formal analysis. HiS: Writing – review & editing, Conceptualization. RS: Writing – review & editing, Visualization, Project administration, Supervision, Validation. KE: Writing – review & editing, Methodology, Project administration. SA: Writing – review & editing, Project administration, Supervision. NT: Investigation, Methodology, Writing – review & editing, Project administration. GR: Investigation, Writing – original draft, Writing – review & editing, Funding acquisition, Project administration, Supervision, Validation.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/feduc.2024.1407542/full#supplementary-material>

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