Abstract

This paper explores why teachers adopt physically active learning (PAL). Data were collected through 'go-alongs' supplemented by individual interviews with 13 teachers in seven Norwegian lower secondary schools. Data were then analysed thematically. Results indicated that as well as to enhance their teaching and pupils' learning, teachers adopt PAL to adhere to school policy (The Conforming Teacher), to be an innovative educator (The Innovating Teacher), and, because it matches past positive personal experiences (The Connecting Teacher). The findings can be used to shape PAL teacher training programs to increase the likelihood of adoption.

Key words

Movement integration; school-based physical activity; classroom-based physical activity;

Abbreviations

PA, physical activity; PAL, physically active learning; TA, thematic analysis

1. **Introduction**

Physically active learning (PAL) is defined as "the integration of physical activity (PA) into lessons in key learning areas other than physical education (e.g. science, mathematics)" (Watson et al., 2017, p. 3). Teachers report that adopting PAL is challenging, leading to high variability in rates of implementation (Donnelly et al., 2017). Given this challenge, it is also likely that individual and contextual characteristics contribute to these efforts. Yet, a detailed understanding of these issues is lacking as most PAL-related research focuses on pupil PA and academic outcomes (Author et al., 2019; McMullen et al., 2016). In response, the present

study was designed to provide insight into an area with a surprising lack of research - the teacher perspective on implementing PAL and why teachers in lower secondary school decide to integrate PAL into their teaching.

1.1. Physically active learning - the emperor's new clothes?

In the literature, the term PAL is used interchangeably with physically active lessons (Norris et al., 2019) and physically active academic lessons (Author et al., 2011). Regardless of the terms, all fit under the larger umbrella term - movement integration - which involves "infusing PA, at any level of intensity, within general education classrooms during normal classroom time" (Webster, et al., 2015, p. 691). Movement integration houses three different approaches: (1) PA *integrated* into academic content (e.g. pupils explore time and space through movement, in other words, pupils do the subject (Madsen & Aggerholm, 2020), (2) PA *combined* with academic content (e.g. pupils work together to solve social science tasks in a star orientation activity in the schoolyard) and (3) PA *separated* from academic content (e.g. pupils mimic a dance video in the classroom). Given this framework, the definition of PAL in this paper is consistent with the last two approaches to movement integration.

PAL can represent "a key paradigm shift in current educational practice" (Author et al., 2019, p. 309) since the learning activities are based on a more constructivist and problem-based learning approach, and hence related to other active methods in teaching and learning that emphasize the learner's activity (Niemi, 2002). Interest in PAL has grown in Norway, and elsewhere (Author et al., 2019), for two main reasons. First, children and adolescents are not meeting current PA guidelines (Guthold et al., 2020; Hallal et al., 2012). Schools, and classrooms in particular, are an important setting for PA interventions because they ensure universal exposure, irrespective of social background, and for long periods (Kriemler et al., 2011; Naylor & McKay, 2009). To this end, PAL represents a promising way of overcoming

the "complication where teachers must choose between time spent on academics and on health interventions" (Author et al., 2011, p. 51). Second, a growing body of evidence shows that PAL and/or PA has the potential to positively influence pupils' cognitive function (Donnelly et al., 2016; Erickson et al., 2019) and on-task behaviour (Author et al., 2018; Norris et al., 2019). While improved general academic performance is another attractive feature, its distinctive influence on mathematics performance is likely to make PAL particularly appealing (Author et al., 2018; Martin & Murtagh, 2017a; Norris et al., 2015; Norris et al., 2019; Singh et al., 2019; Sneck et al., 2019).

1.2. Teachers perceptions of physically active learning

Previous studies have explored teacher perceptions of using specific PAL programs; Norway, (Dyrstad et al., 2018; Author et al., 2019), UK (Author et al., 2019; Mwaanga et al., 2018; Author et al., 2019; Routen et al., 2018), Ireland (Martin & Murtagh, 2015, 2017b; McMullen et al., 2016), Australia (Riley et al., 2017) and the US (Finn & McInnis, 2014). Teachers predominantly have a positive perception of PAL programs, emphasizing pupil enjoyment as a beneficial outcome. Furthermore, these studies have offered insight into the factors influencing teachers' delivery and implementation of PAL, i.e. interpersonal level factors (i.e. beliefs, confidence, competence) and institutional level factors (i.e. administrative support, resources, time). A commonly reported barrier to PAL across studies is the lack of time. In a study by Martin and Muragh (2017), teachers reported time as "the only barrier".

To date, however, these studies are largely limited to bespoke PAL programs. That is, each study was based on an intervention with its own set of lessons and teacher support, with teacher-level data collected as part of the process evaluation. Thus, to provide greater insight into how and why teachers integrate PAL into teaching, there is a distinct need to collect context-specific information from teachers who are engaged in real-world implementation of

PAL (Author al., 2019; Routen et al., 2018). While there are clear suggestions for future research that includes teachers' beliefs about the value of PA (McMullen et al., 2016), we also argue that such inquiry should include an in-depth investigation of teachers' cognitions, emotions, motivations and actual behaviours in relation to PAL. In addition, there is scarce evidence in relation to PAL in the lower secondary schools, with only two studies – to the best of our knowledge. One UK study examined the feasibility, acceptability and cost of a PAL training program (Author et al., 2019). The other, Danish, study investigated a 12-week PAL intervention (Ottesen & von Seelen, 2019).

1.3. The purpose of the present study

To this end, this study explores why teachers in Norwegian lower secondary schools (i.e. grades 8-10, pupils 13-16 years) adopt PAL.

1.4. Theoretical framework

1.4.1. The complexity of teaching

In the broader educational change literature, many reasons are used to explain why attempts to implement innovations in education have failed (Hargreaves et al., 2014). For instance, interventions developed by researchers or policy makers often fail to consider the needs and concerns of the teachers and/or their working circumstances. This top-down thinking mirrors what Schön (1987) called the "technical-rationality model", which ignores the experience of teachers relative to the research and teachers' ontological and epistemic priorities. Likewise, efforts to modify teachers' behaviour often fall short by limiting their attention on teachers' cognitions, while overlooking their working context (Korthagen et al., 2001).

Feelings and emotions play an essential role in teaching (Hargreaves, 1998; Nias, 1996); day-to-day teachers make a large number of intuitive, reactive decisions with little overt, conscious thought (Korthagen, 2004). For instance, when a teacher is faced with a pupil lying with his head on the desk, he or she perceive, interpret and react in a split second. The sensory perception of the pupil directs behaviour in an unconscious way. This is similar to System 1 thinking as laid out by Kahneman (2011) in his Dual-Process Model. These actions are driven cohesive wholes of earlier experiences, role models, needs, values, feelings, images and routines, which are often unconsciously evoked by concrete situations, and are referred to as gestalts (Korthagen & Lagerwerf, 1996; Korthagen et al., 2001). As such, when aiming to understand teacher behaviour, it is imperative to take teacher's interwoven cognitive, emotional and motivational dimensions, even though they may remain partly implicit and rarely reflected upon by teachers (Korthagen, 2017). In sum, the teacher's behaviour is guided by sources found in cell #1, #2, #3 and #4 in Fig. 1.

|	Rational	Non-rational
Conscious	1	2
Subconscious	3	4

Fig. 1. The sources of behaviour. Adapted from Korthagen (2017)

1.4.2. Teacher level of change

This study will use a theoretical framework inspired by a model of levels of change (Fig. 2, Korthagen, 2004). The so-called 'onion model' encounters the personal and the professional aspects of teaching and shows various levels that can influence teacher

functioning. The interrelatedness of cognitive, emotional, and motivational influence on behaviour is essential to the model. That is, the inner and outer levels are reciprocal. A brief description of the levels follows (for an elaboration of the concepts and levels, see Korthagen, 2004). From a training perspective, this Korthagen's model highlights many areas in which interventions may gain, or lose, traction.

In the outermost level *environment* refers to the broader context the person encounters (Korthagen & Nuijten, 2018). For teachers, this involves the whole classroom setting, the subject matter, the school culture with all its implicit and explicit norms, and so forth. The level of *behaviour* refers to what the person does in relation to the environment, which is often determined by routines and habits. The level of *competencies* encompasses an integrated body of knowledge, skills, and attitudes. As such, they represent a potential for behaviour, and not the behaviour itself (Korthagen, 2004).
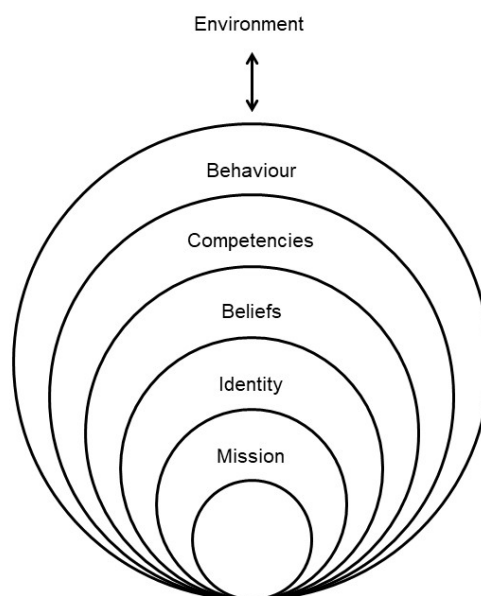
Fig. 2. The model of levels of change (the onion model). Adapted from Korthagen (2004)

The level of *beliefs* refers to the assumptions about the situation and the environment, which are often unconscious (Korthagen & Nuijten, 2018). The *identity* level refers to

teachers' assumptions about themselves, their self-concepts and the role they perceive in the given environment. This can be thought of as "who or what someone is, the various meanings people can attach to themselves, or the meanings attributed by others" (Beijaard, 1995).

The level of *mission* represents ideals and important values - what inspires the person, gives meaning and significance to life (or work) (Korthagen & Nuijten, 2018). These are deeply felt, personal values that are inextricably bound up with his or her existence (Korthagen, 2004). Lastly, in the centre, are personal or core qualities, such as enthusiasm, trust, care, sensitivity, spontaneity, curiosity, courage, openness, and so forth (Korthagen & Nuijten, 2018). These core qualities are linked to positive psychology, emphasizing the importance of positive traits in individuals (Seligman & Csikszentmihalyi, 2000).

The model has previously been used as part of the so-called core reflection approach, which has a central goal of overcoming habitual patterns that impede deep learning and personal growth (Korthagen, 2017; Korthagen, 2004; Korthagen & Nuijten, 2018). As such, the model can be applied to any shift in pedagogical approach for teachers – in this case, understanding why teachers adopt PAL.

2. Methodology

2.1. Recruitment and participants

In the current study, we used purposive sampling. We recruited teachers in lower secondary school who: (1) identified themselves as experienced with PAL, and (2) adopt PAL and taught (this year) in subjects outside of physical education. Furthermore, we sought to recruit teachers according to principles of diversity, including, gender, teaching experience, teaching subjects, geographical location and school characteristics (i.e. rural/urban location and small/large size). The assumption underlying this strategy was that this would provide a rich set of experience to study with regard to adopting and implementing PAL. Teachers were

recruited through acquaintances, collegial contacts and snowballing. First, we contacted one school that reported maintained adopting PAL from a previous study (Author et al., 2019). Second, based on the author's acquaintances, four persons in the field were contacted for potential snowball effects, including a principal, a municipality PAL coordinator, a former director of education and a county public health adviser. Last, participants were asked to suggest potential participants (e.g. colleagues or acquaintances) after signing consent.

As a result, seventeen teachers in lower secondary school were invited to take part in 'go-alongs' and individual semi-structured interviews. Of these, one teacher declined to participate due to perceived workload; a further three were excluded based on the criterion strategy (i.e. one was currently working in school administration, whereas two taught only in physical education). In total, 13 teachers (11 females and 2 males) were recruited from seven lower secondary schools across Norway. Further description of the teachers and their respective schools are provided in Table 1. Before data generation, the participants' gatekeepers, i.e. the school principals, were given written information about the study and asked for consent/permission to invite his/her employee/s to the study. All participants provided written informed consent and were informed they could withdraw from the research at any time. Ethical approval was granted by the Norwegian Centre for Research Data (reference number 795631). Data collection was conducted between September 2019 and December 2019.

Table 1. Characteristics of participants and their respective schools.

Pseudonym	Gender	Age	YE	School	School characteristics	School PA initiatives
Teacher 1	F	50	25 y	A	Western rurally located, small-sized combined primary and lower secondary school (1st–10th grade), around 90 pupils and 40 teachers.	Participated in a multicomponent PA intervention study in intervention group. Since 2015, PAL has been implemented three times a week on the timetable schedule for all pupils (1st – 10th grade)
Teacher 2	F	44	20 y			
Teacher 3	M	37	11 y			
Teacher 4	F	33	9 y	B	Southern rurally located, small-sized lower secondary school (8th–10th grade), around 160 pupils and 30 teachers	Part of a county health-promotion program
Teacher 5	F	33	9 y			
Teacher 6	F	36	12 y	C	Western suburban located, middle-sized lower secondary school (8th–10th grade), around 320 pupils and 40 teachers	Participated in a multicomponent PA intervention study in intervention group
Teacher 7	F	32	3 y			
Teacher 8	F	46	16 y	D	Eastern urban located, large-sized lower secondary school (8th–10th grade), around 620 pupils and 60 teachers	Located in a municipality where the city council have decided that all pupils (1st–10th grade) should have 60 min daily PA
Teacher 9	F	28	5 y	E	Eastern urban located, middle-sized lower secondary school (8th–10th grade), around 350 pupils and 30 teachers	Located in a municipality where the city council have decided that all pupils (1st–10th grade) should have 60 min daily PA
Teacher 10	F	63	32 y	F	Eastern rurally located, small-sized lower secondary school (8th–10th grade), around 150 pupils and 20 teachers	Part of a county health-promotion program
Teacher 11	M	39	13 y			
Teacher 12	F	49	14 y	G	Northern rurally located, small-sized combined primary and lower secondary school (1st–10th grade), around 200 pupils and 30 teachers	N/A
Teacher 13	F	50	26 y			

*Data retrieved from the The Norwegian Directorate for Education and Training (https://skoleporten.udir.no/)
Abbreviations: N/A = not applicable; YT = Years of experience; PA = physical activity; PAL = physically active learning

2.2. Data collection procedures and measures

To move beyond the kind of positivist/post-positivist paradigm of understanding that has dominated the field (Finn & McInnis, 2014; McMullen et al., 2016; Stylianou et al., 2016) a newer approach was needed. As previously stated, to understand teacher behaviour, i.e. why teachers adopt PAL, a close engagement is needed with their complex nest of cognitive, emotional and motivational dimensions. Besides, some may hold these sources unconsciously or do not know how to describe them. As these are often unconscious influences, it is important to include an assessment of both teacher dialog and descriptions of their approach with a passive observation of their actions (Kagan, 1990; Kane et al., 2002; Pajares, 1992). Following this suggestion, we used qualitative methods to collect data from multiple sources (Creswell & Creswell, 2017).

2.2.1. Go-alongs

In the go-alongs, the first author accompanied the teacher as they moved through the normal activities of their school day asking questions, i.e. informal conversations, and observing processes as they happened (Kusenbach, 2003). The go-alongs gave a unique contextual insight and rich sensory information of teacher's actions and emotions, including how teachers carried out their daily routines and interactions. Importantly, the go-along included accompanying the teacher in one or more PAL lesson/s. During these lessons, the first author moved between observer-as-participant (i.e. being "outside the activity" observing) to participant-as-observer (i.e. being "inside the activity" interacting with pupils/teacher) (Sparkes & Smith, 2013, p.101-102). Taken together, the go-along provided an opportunity for the first author and the participant to build rapport and provide joint experiences that could be used to stimulate discussion. Furthermore, specific situations, actions, or comments from the go-alongs acted as prompts to stimulate the teacher's reflection

in the interviews in order to gain a profound understanding of teacher practice. Go-alongs were collected by the first author between September 2019 and December 2019, lasting approximately one school day (5-6 hours) in each participant's school. The go-alongs were recorded through field notes and further synthesized and documented in a field log including special events, interesting actions or phrases and descriptive and analytical descriptions of PAL lesson/s (i.e. what, how, where and why).

2.2.2. Semi-structured interviews

Individual interviews were conducted to gain in-depth insight into teachers' beliefs, attitudes, ideals, missions, and justifications for PAL. A semi-structured interview guide (Appendix A) was developed following two video-recorded pilot interviews and one go-along. The guide consisted of three main themes: (1) teacher's reflections (e.g. experience, justification and assessment) on the accompanying PAL lesson, (2) teacher's beliefs on learning, teaching and PAL, and (3) teacher's considerations on adopting PAL in past, present and future perspective. All interviews were conducted by the first author following the go-along, in a meeting room or classroom at the school. Interviews were audio-recorded (Olympus WS-853 Digital Voice Recorder) and transcribed verbatim into NVivo (QSR Version 12.6). The researcher took field notes following each interview to supplement and, where necessary, improve the accuracy of the transcripts. The interviews lasted between 31 to 77 minutes (with an average of 49 minutes).

2.3. Data analysis

Data gathered through go-alongs and interviews were thematically analysed (Braun & Clarke, 2006, 2019). Thematic analysis (TA) is defined as "identifying, analyzing, and reporting patterns (themes) within the data" (Braun & Clarke, 2006, p. 79). An inductive

(bottom-up) approach to TA was taken as themes were developed directly linked to the data being analyzed (Patton, 1990). NVivo (QSR Version 12.6) was used as a data storage tool throughout the data analysis process. The data analysis process was led by the first author and was guided by the six phases of TA outlined by Braun and Clarke (Braun & Clarke, 2006).

1. Familiarization: the first author immersed himself in the data corpus by conducting the data collection and transcribing the interviews into written verbatim and repeated reading and listening of the interviews. Initial notes were written, including thoughts about the data and "codable moments" (e.g. interesting phrases or quotes from participants). For instance, one participant repeatedly used "driving a bus" as a metaphor for lecturing and blackboard approach to teaching.

2. Coding: the formal coding phase started with the first author repeatedly reading the text and openly generated codes, i.e. "the most basic segment, or element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon" (Boyatzis, 1998, p.63), by exclusively focusing on "what is being said". Data were collected under similar codes to examine all of the data across the dataset associated with that initial code, for example, "retaining pupils' concentration". After coding the entire dataset, the codes were reviewed with the second, the third and the ninth author, a process including splitting and merging some codes.

3. Generating initial themes: in the next phase, the first author used visual representation (i.e. mind map) to help sort codes and categories into themes. Four semantic and latent themes were generated: teacher's learning theories (e.g. constructivist approach), teacher's purposes (e.g. provide varied teaching), teacher's interests (e.g. PA) and school policy (e.g. PAL is part of school's practice and ethos).

4. Reviewing themes: the analysis then took a cyclical approach with several iterations of theme review. This phase included a repeated reading of full transcripts and notes to gain a sense of the entirety of data and refining and discussing themes with co-authors. From this process, three themes "The Follower", "The Explorer" and "The Flag Carrier" were developed. Each theme represents a persona, i.e. a fictional personalization of a typical teacher, who has been crafted based on a pattern of data drawn together from multiple contexts, not just summarizing what participants said concerning a particular data collection question.

5. Defining and naming themes: in the penultimate phase, the themes were thoroughly discussed with all co-authors. Two redefinitions were proposed: (1) make them more specific and simplified so that they standalone as answers to the research aim, and (2) avoid one theme being portrayed, and possibly interpreted, more positively than the others. Taking this into account, the following three themes were generated; "The Conforming Teacher", "The Innovating Teacher" and "The Connecting Teacher". The themes are presented in verbs (i.e. doing words) to underline how the teacher persona often act in relation to PAL.

6. Writing up: the last phase included writing up, selecting vivid and compelling examples. The six described phases are outlined in Fig. 3. As shown in Fig. 3 surrounding the six-phase, the sincerity and credibility of the findings were facilitated by two methods (Tracy, 2010). *A. Reflective diary:* a reflective diary was maintained throughout the process by the first author in order to acknowledge his impact (e.g. values, biases and inclinations). *B. Peer-debriefs*: all authors served in the capacity of peer-debriefs or "critical friends" (Lincoln & Guba, 1985) in different phases of the TA by critically probing for explanations of certain decisions made by the first author.

Before presenting the findings, some clarifications are needed. First, the intention of the themes is to provide drawn-out simplifications of why teachers adopt PAL. The themes

are based on data from a particular time and context, therefore, are dynamic and overlapping. Second, to prevent any unintentional application of the findings, e.g. to categorize or label teachers, we have chosen to use numbers instead of a fictitious name for the participants.
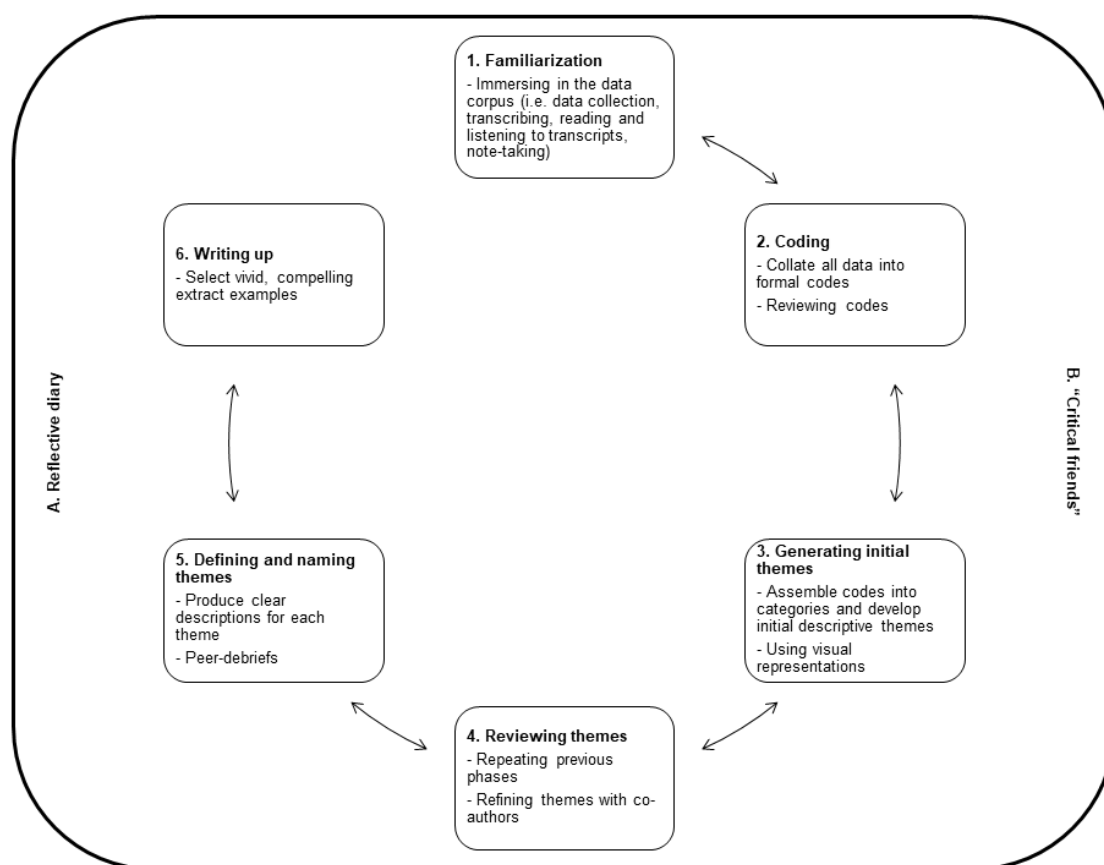
Fig. 3. The iterative process of thematic analysis. Adapted from Braun and Clarke (2006)

3.0. Findings

The findings are presented under an overarching level and as three developed themes that represent teacher persona including The Conforming Teacher, The Innovating Teacher, and The Connecting Teacher. At an overarching level, the teachers adopt PAL to enhance their teaching and pupils' learning. This was achieved because of variation, improved concentration, motivation and engagement, and interactions and collaboration between both pupils and teacher. Notably, the teachers explicitly stated that their adoption of PAL was not

to increase pupil's PA levels. One teacher said "no intention that we should have one hour of physical activity every day" (Teacher 8) (extracts presented as translated into English).

PAL was seen as improving their teaching by adding variety "I think variety in teaching is worth its weight in gold, and this [PAL] is a wonderful way to vary [teaching]" (Teacher 3). The teachers valued variety, in particular in lower secondary schools where lessons were mainly sedentary and lecture-based, described as "monotonous" (Teacher 6), "theory-heavy" (Teacher 7) and "textbook dependent" (Teacher 12). In this context, the teachers reported that PAL brings smiles, laughter, engagement and joy to pupils, and these positive expressions of emotion contributed to the pupils' motivation and engagement in the learning within PAL. Connecting the small groups that PAL often uses, pupil-to-pupil collaboration was enhanced and contrasted to the norms of the restricted and monitored classroom. Hence, one teacher noted that more pupils took the risk of engaging – expressed as 'dared to participate' - with tasks introduced around PAL, compared to traditional lecture-based teaching:

> There are some of these pupils who are quiet and calm and hide away in the classroom. Then, if you throw them into the schoolyard to answer questions about ethics and morality, they have full control! Because, it's not the same context, it's not that scary, they come to me in groups of three, and they get to discuss the answers in advance. (Teacher 7)

The teachers also appraised PAL with regard to pupils' learning and to learning activators, including concentration. Like any other form of variation, PAL helped prolong pupil concentration throughout the lesson. One teacher stated, "I think the pupils get a lot in return for PAL. Both during the activity, but also afterwards, in relation to concentration" (Teacher 5). In addition, the teachers frequently noted that children and young people learn in different ways. To this end, PAL provided pupils another access point for academic content,

compared with traditional lecture-based teaching. One teacher stated, "One meets another type of pupils… not just the ideal book smart girls" (Teacher 2). Another teacher highlighted that PAL provided pupils with experimental or hands-on approaches to the academic content: "They do not just read or write the words, they do something with them. They touch the words physically" (Teacher 9). Lastly, teachers highlighted that PAL enhanced pupils' learning by introducing social interactions and collaborative learning;

> In these learning sessions, something happens between the pupils. Integrating physical activity into learning fulfils the social curriculum wonderfully! Social learning happens all the time when you are doing physical activity that does not even happen in group work, where the pupils sit in their respective places (Teacher 13).

On the surface, it may look quite similar why the teachers adopt PAL. However, following deeper analysis, it was clear that the teachers' motives were different and could be grouped into broad categories.

3.1. The Conforming Teacher

The first theme represents a teacher persona who adopt PAL as a result of being conscientious in pursuing the school's widest pupil-based outcomes, despite having initial negative attitudes about PAL. Initially, The Conforming Teacher was "dragged along" or "pressured" (Teacher 7) to adopt PAL because school leaders had decided to participate in a research project or introduce it as part of the school's mission. Initially, The Conforming Teacher held mixed preconceptions about PAL: "I was [probably] a little scared and bit sceptical and couldn't quite see… is there any point in this, it's really just some extra work" (Teacher 7). At the same time, being doubtful of their competence for delivering PAL: "felt like you almost had to be a physical education teacher to join, in the first place" (Teacher 1). This uncertainty was also rooted in The Conforming Teacher's view of how to deliver this

approach in a structured and orderly way and of the knock-on implications for professional self-image:

> We have no role models as a teacher who has acted in this way. If I think of myself [and] whom I have had as teacher ideals, there is no one who has done it. I have to go my own way. I have to redefine how to be a teacher. (Teacher 11)

Despite this ambiguity, The Conforming Teacher faced this unknown territory in a professional way, recognizing the importance of committing to this teaching to engage pupils: "Okay, if the students are to be motivated, then at least the teachers must be a little motivated." (Teacher 1).

The Conforming Teacher described the effect as a process of "twisting brain and not just do things on autopilot" (Teacher 11). However, after persisting with PAL, The Conforming Teacher revised initial preconceptions about PAL "[I] have probably gone from skeptical to be a follower" (Teacher 8). In addition, The Conforming Teacher no longer perceived a lack of competence. Nevertheless, true to form, The Conforming Teacher continued to question the appropriateness of PAL in learning situations beyond the repetition of academic content: "to actively learn [new] material that they haven't know from before and somehow expect that the active learning session, if I spend 45 minutes on it, have the same learning outcome as in a 45 minutes classroom hour, that is for me difficult to understand" (Teacher 7).

While The Conforming Teacher has a belief, or "idea or knows deep inside that the pupils benefit from being a little more active than they are" (Teacher 7), the immediate features of the school context mean they still need a frequent "kick in the ass" (Teacher 1) to continue using PAL. Without external prompting - "nagging" (Teacher 1) or pupils, colleagues and/or principles who "constantly push" (Teacher 11) PAL "somehow slips away" (Teacher 11) and is lost from The Conforming Teacher's repertoire. For The Conforming

Teacher PAL sits alongside other priorities: "[PAL] is nothing I am going to be remembered for. It is not those marks I will leave…" (Teacher 1); instead, they see it as the responsibility of school managers to support the on-going adoption of PAL.

In sum, the heart of The Conforming Teacher persona aligns with this excerpt: "one thing is not to have objections, but to actually integrate it [PAL], that's a big step" (Teacher 11).

3.2. The Innovating Teacher

The second theme represents a teacher persona who adopts PAL because they have a strong desire to be contemporary as a teacher and try new educational ideas and practices. The Innovating Teacher is motivated to be an innovative educator. This is expressed, among other things, by wondering about, and partly doubting, to what extent their colleagues and other teachers, in general, reflect on and update their practice: "You [as a teacher] may not have enough time to reflect on your own practice and what works. It probably works. So then we just continue. But is it really the best way to do it?" (Teacher 3). The Innovating Teacher believes that textbooks govern many teachers' practices, seeing this as the reason why many teachers do not develop their practice.

In contrast, The Innovating Teacher claims to be constantly looking for new ways of doing things, "I have always enjoyed doing a little different [things] in teaching" (Teacher 6); they are responsive to tips and ideas from friends, colleagues or training courses,

> I try to update myself, like I said, attend courses, get new ideas, because you need that, where you get to stop and think through your own practice and get ideas so that you are inspired to think new and apply it to your own teaching. So, I am very concerned that you do not get stuck and doing the same as you always have." (Teacher 10)

Furthermore, The Innovating Teacher volunteers to participate in teacher networks for professional replenishment and to exchange experience. In this vein, PAL helps The Innovating Teacher to develop professionally, while also offering an opportunity to be a creative and exploratory professional: "I want to develop as a teacher in general, and I think [physically] active learning can be a way to do that." (Teacher 7).

Unsurprisingly, The Innovating Teacher has a detailed overview of the latest evidence on PAL. They argue convincingly for using PAL, often referring to neurobiological evidence: "if you are physically active, it is not only what we already know, that it is good for your mental health, but it is also that you develop stronger connections between the halves of the brain… the frontal lobe and the occipital lobe" (Teacher 12). Again, The Innovating Teacher doubts whether other teachers work in this way: "I think teachers may not be good enough at using the latest research for how pupils learn best" (Teacher 3). They give clear encouragement to other teachers: "We who work here must change. We must understand the consequence of knowing. We actually have to change the teaching and it costs energy. We're paid for it!" (Teacher 12). In this sense, The Innovating Teacher regards the costs of PAL as equivalent to any other forms of varied teaching: "everything is more, I have to plan a lesson [anyway], and if I want varied teaching, then I sometimes have to plan a little more than other times." (Teacher 5)

The Innovating Teacher's innovativeness is also seen as being out-of-step with the rest of the school. The Innovating Teacher, described as a driving force among colleagues, fights and works to apply "force" (Teacher 11) to pave the way for PAL by providing lesson examples, squeezing it into staff meeting discussions, ensuring its position on the timetable. The Innovating Teacher acts as missionary for supporting a PAL-positive environment for pupils, teachers, parents and principal.

Taken together, The Innovating Teacher adopts PAL because it fits with their mission to be an innovative educator.

3.3. The Connecting Teacher

The last theme represents a teacher persona who adopts PAL because they have past positive, personal experiences matching the cornerstones of PAL. First, The Connecting Teacher reports enjoying being physically active in private life. They attribute PA to be an important and lifelong part of their life:

I have always thought that using the body is an important part of life. I'm probably educated from mom and dad. We go hiking, are active on skis ... We have always done active things! Cycled a lot and jogged from when I was young. So that [physical activity] I think, is an important part of my own life. Being physically active because then you function better in many ways. So, being physically active is very important to me. (Teacher 12).

The Connecting Teacher believes that their enthusiasm for PAL relies on their personal interest in physical activities, along with their experience in physical education: "I have always been active myself and have always taught physical education. I am very concerned that you must have activities that meet all [pupils]" (Teacher 9). By being self-descriptive, The Connecting Teacher empathizes with, and understands, pupils who become restless in lecture-based lessons: "they need [to] move, [they] sit still a lot ... we become impatient [and] restless ourselves when we have to sit still for a long time" (Teacher 2).

Second, The Connecting Teacher links to moments from their own schooling or in-service trainings. Often, The Connecting Teacher had learned well through the opportunity to use experimental or hands-on approaches. They state "[I have] felt on my body that it is important; I learn more when I get to do [something]" (Teacher 12), including learning the

height of the school flagpole: "I remember when we went out to find out how high the flagpole was… Because then we did something other than just sit and read" (Teacher 10).

The Connecting Teacher was disappointed with current practice in lower secondary schools, which increasingly suppress practical and esthetic approaches to teaching: "[it has] always been talked about learning by doing, so you are kind of disappointed about that one [in lower secondary school] is so sedentary when you know that there are many who learn better through practical work" (Teacher 10). By being self-describing, The Connecting Teacher argues for more experimental or hands-on approaches to teaching: "If I hammer on with theory, then you just have to realize that there is not much they remember. It is completely understandable. I am like that myself. If you get to do something with it, then you often remember better." (Teacher 4). The Connecting Teacher's strong personal connection to PAL could cause negative consequences, for instance, a feeling of loneliness when colleagues do not care about PAL, or anger and frustration when other stakeholders are condescending about PAL, e.g. calling it a "jump and bounce pedagogy" (Teacher 4).

Taken together, the essence of the Connecting Teacher's story is about PAL being "...an integral part of who you are as a teacher" (Teacher 11).

4.0. Discussion

The purpose of this study was to explore why teachers adopt PAL. To the best of our knowledge, this is the first study to explore why teachers in lower secondary schools adopt PAL. At an overarching level, our findings indicate that teachers adopt PAL to enhance both teaching and learning. PAL provided variation for instructional mode and improved pupil concentration, motivation, engagement and collaboration, as well as providing experiential approach for learning academic content. These benefits are synonymous with findings from other teacher-oriented PAL studies (McMullen et al., 2016; Martin & Murtagh, 2017b).

However, this study contributes deeper insights into levels of influence guiding teachers'
engagement with PAL. Given that their "whys" are based on interconnections between
cognitive, emotional, and motivational sources embedded in a social context, we developed
three teacher personas (themes) to simplify key messages about the key drivers for
engagement with PAL. The Conforming Teacher adopts PAL because it was part of
complying with school policy. The Innovating Teacher adopts PAL to be seen as an
innovative educator. The Connecting Teacher adopts PAL because they valued PA and
learning-by-doing in their own developmental trajectories. However, the teacher personas can
overlap and are not exclusive.

4.1. Positive presses and experiences

The Conforming Teacher's adoption of PAL is strongly shaped by the stakeholders in
the school environment. In contrast to the positive drives from school leaders, colleagues, and
pupils shown in this study, other studies (Author et al., 2019) identified parents as particularly
negative influencers on teachers' implementation of PAL. For instance, parents expected
traditional lecture-based teaching; "…anything other than being seated, with information
drilled into them, would negatively impact their learning and chance of progressing" (p. 317).
Our findings indicate ongoing support from proximal stakeholders – especially principals – is
central to sustaining teachers' engagement, regardless of their personal investments in PAL.
This is supported by findings showing that teachers who implement PAL or movement
integration within supportive school social environments experience fewer implementation
barriers (Author et al., 2019; Michael et al., 2019; Routen et al., 2018; Author et al., 2019,
Webster et al., 2017).

Furthermore, using the model of levels of change as a lens (Korthagen, 2004), The
Conforming Teacher illustrates how the outer levels in the model can influence the inner

levels. The environment influences The Conforming Teacher's behaviour (i.e. what the person does in relation to the environment) and helped to refine competencies (i.e. skills and attitudes) and beliefs (i.e. assumptions about the situation) regarding PAL. These findings correspond with the realistic teacher education framework by Korthagen et al. (2001). The underpinning idea in this framework is that change is fundamentally an experientially-based learning process. Related studies (Mulhearn et al., 2020; Stylianou et al., 2016) have applied Guskey's Model of Teacher Change (2002). However, similar to Korthagen et al.'s framework (2001), the key idea in this model is that teachers need to see and experience success in order to change their attitudes and beliefs about new practices. Consistent with this model, previous studies have showed that teachers reported pupils' benefits as a key factor for their decision to implement movement integration (McMullen et al., 2016; Stylianou et al., 2016).

Changes in teachers' beliefs and attitudes, therefore, do not occur by following a course or professional development, but because of the teachers' positive experiences with the new knowledge and strategies when put in practice. This is consistent with the growing acceptance that behaviour drives motivation, more than the other way round. Previous studies have suggested that PAL teaching training programs should include equipment and material, and knowledge and information about the possible beneficial effects of PAL on pupils' academic-related outcomes (Martin & Murtagh, 2017b; McMullen et al., 2016; Author et al., 2019; Routen at al., 2018). However, following the realistic teacher education framework (Korthagen et al., 2001), we suggest that the pedagogy of professional development on PAL should expand beyond an exclusive focus on theory-based strategies. Instead "combine(s) fruitful practical experiences – i.e. experiences that help form the type of gestalts we wish to develop – with the subsequent promotion of reflection in teachers aiming at the development of adequate schemata" (Korthagen, 2010, p.103-104). Using The Conforming Teacher as an

example, it will be wise to offer realistic opportunities to confront existing gestalts. This process will ensure that teachers can discover deeply ingrained limiting beliefs about their competencies, beliefs, identity, and mission, thus promoting a process of reframing (Schön, 1987).

4.2. The personal-professional link

Even though The Conforming Teacher had changed competencies and beliefs, in addition to having ongoing support from pupils, colleagues and school leaders and PAL embedded in their teaching routines, PAL remained fragile in their repertoires. This highlights the importance of on-going PAL support from senior figures in the school. For instance, the statement "[PAL] is nothing I am going to be remembered for… it is not those marks I will leave…" suggest friction between PAL and The Conforming Teacher's mission (i.e. values, ideals, calling or inspiration). In addition, it is clear that PAL is in conflict with their identity (i.e. self-concept and role): "…I have to redefine how to be a teacher ...". Thus, The Conforming Teacher shows discrepancies amongst the levels that can be problematic for them (in the form of inner tensions), for others in their environment (if they do not show adequate behaviour), or both. Ideally, there is an alignment across the levels making it a coherent whole (Korthagen, 2004). One possible explanation for some of the friction may lie in perceiving PAL as a predominantly PA-oriented initiative. After all, PAL was introduced and theoretically grounded in the ideas of public health in several contributing schools. In this case, previous research shows that few teachers consider the promotion of PA as their primary responsibility nor core mission (Cale et al., 2016; Jørgensen et al., 2019).

In contrast, The Innovating Teacher and The Connecting Teacher reported strong alignment between PAL and the more personal levels of change. The Innovating Teacher implies that PAL aligns both with their self-concept as being up-to-date and development-

oriented (i.e. identity) and gives personal meaning and significance to their work (i.e. mission). Likewise, for The Connecting Teacher, PAL is being both an effective response to the demands of restless pupils (i.e. environment), and personally fulfilling the deeply felt existential value about being physically active (i.e. mission). The overlap of the personal interests of The Innovating Teacher and The Connecting Teacher with the mission of PAL relates to a larger body of literature (Cothran et al., 2010; Routen et al., 2018; Stylianou et al., 2016; Webster et al., 2015; Webster et al., 2013).

First, primary school teachers who view themselves as innovative educators were more likely to adopt PA in the academic classroom (Webster et al., 2013). Furthermore, earlier studies linked teachers' engagement in a curricular change project designed to increase pupils' PA and their personal interest in exercise and wellness (Cothran et al., 2010). Another study (Webster et al., 2015) examined elementary teachers' PA history and self-reported movement integration implementation. This correlational study found that self-reported PA predicted perceived movement integration competence, which in turn predicted self-reported movement integration. These findings suggested that teachers' interest or background in PA participation predisposed them to valuing PAL.

Considering this, professional development activities may be improved by aligning with participants' personal learning objectives, problems experienced in practice, and personal interests (Korthagen, 2017). This allows participants to become co-owners of the process (Guskey, 2002). According to Day (2002, p. 97-98), professional development is not something that is forced. The teacher develops – as an active agent – rather than the teacher who is developed passively (Day, 2002). Furthermore, if change is not internalized, it is likely to be cosmetic, token, and temporary. Therefore, it may be important to ensure that professional development processes are directed by the teacher and that interventionists

"recognize teachers as innovative and creative chefs rather than short-order cooks who merely follow set recipes" (Author et al., 2019, p. 149).

Taken together, teachers adopt PAL (1) to enhance their teaching and pupils' learning, (2) to adhere to school policy (The Conforming Teacher), (3) to be an innovative educator (The Innovating Teacher), and, (4) because it matches past positive personal experiences (The Connecting Teacher). Thus, it is clear from our analysis that teachers' adoption of PAL is not solely based on rational approaches to enhance their teaching and pupils' learning, but also related to the person of the teacher. Hence, to extend the adoption of PAL in lower secondary schools, the current findings justify professional development processes giving the personal aspects of the teacher a more central place.

The data analysis, produced as a radar chart (Fig. 4; Appendix B), can in different ways be utilized in professional development processes with in-service or pre-service teachers. First, utilized as a mapping tool, the radar chart can help educators tailor professional development programs towards the teacher's motivations for PAL. Second, it could serve as a self-reflection tool for teachers to help them become conscious of their PAL actions. Nevertheless, this is first and foremost an invitation to a foundation on which to build- upon, e.g. include more lines on the radar chart, as new empirical studies in the field emerge.
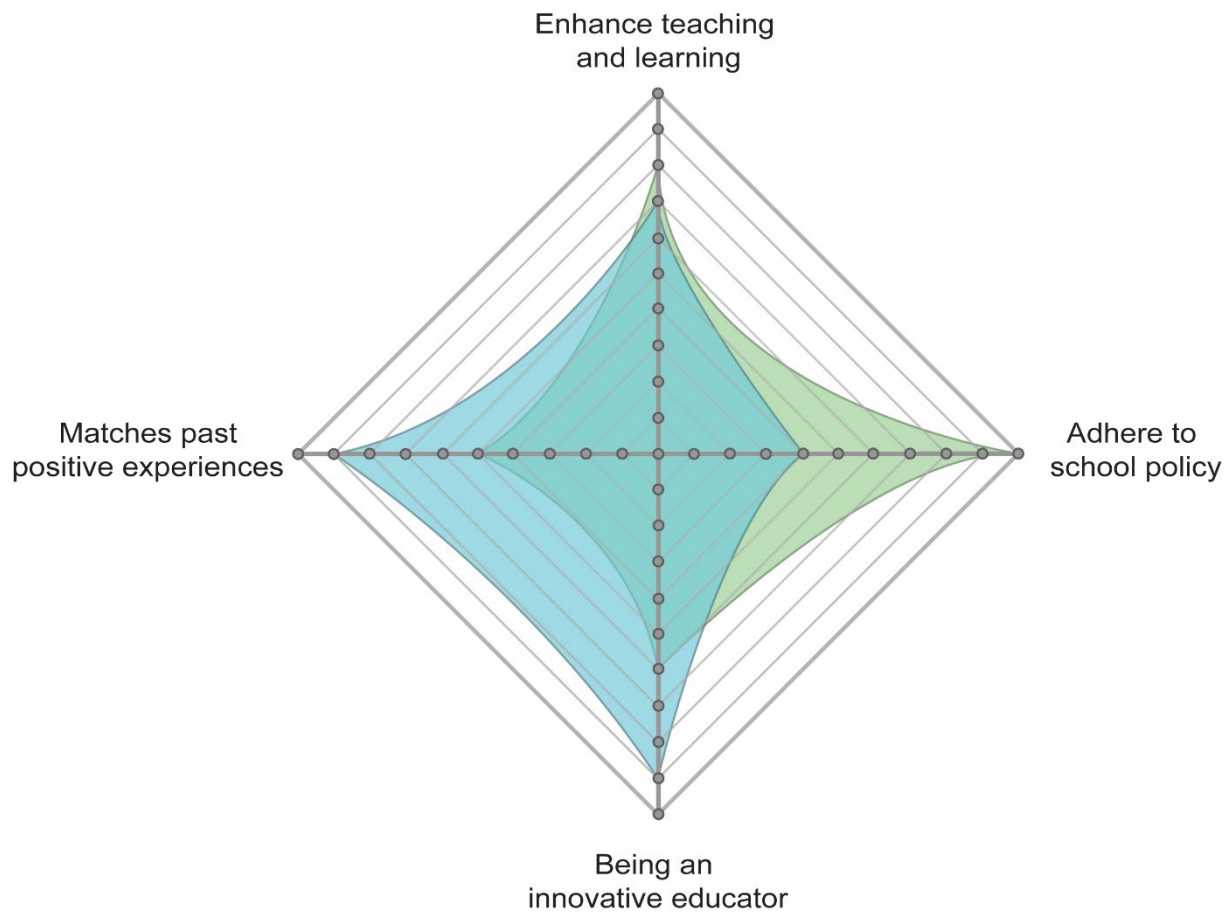
Fig. 4. A radar chart displaying four reasons relative to adopting PAL: to enhance teaching and learning, to adhere to school policy, to be an innovative educator, and, because it matches past positive experiences. The marked areas, i.e. blue and green, show two arbitrary teachers who have evaluated their motives for PAL on a scale from one to ten.

4.3. Strengths and limitations

This study has limitations that warrant attention. Go-alongs were limited to one school day (5-6 hours) in each participant's school. To enhance the interpretation of data, the go-alongs would ideally expand over a longer period to capture a greater range of contextual factors and the dynamic nature of teaching. However, go-alongs are also considered one of the strengths in the study providing unique contextual multisensory data. Go-alongs or formal observational data collection techniques are rarely conducted within this research field (Jørgensen et al., 2019; Madsen et al., 2020; Stylianou et al., 2016). Furthermore, supplementing the go-along with a follow-on interview allowed teachers to reflection in and

on real world actions and events (Schön, 1987). Last, the generation of themes needs to be addressed. The teacher personas (themes) were developed to simplify deeper reasons for why teachers adopt PAL. It is important to emphasize that these teacher personas overlap and are not exclusive. Hence, teachers' adoption of PAL blended features from these personas, in addition to the reasons at the overarching level presented initially in the findings. Thus, the personas are not an attempt to categorize teachers. Finally, our purposeful sample aimed to ensure a broad sample with sufficient experience with PAL to provide a deep source of data. In the future, it would be useful to engage teachers with negative experiences with PAL and who are no longer incorporating it into their teaching. There is likely much to learn from this population.

5.0. Conclusion

This study provides unique knowledge about why teachers in lower secondary school adopt PAL. Taken together the findings suggest that PAL is adopted to enhance teaching and learning, to adhere to school policy, to be an innovative educator, and because it matches past positive personal experiences with PA and practical approaches to teaching. Therefore, this study supports the notion that teaching is guided by a complex interaction of cognition, affective and motivational dimensions. These findings provide valuable insight into teachers' motivations for PAL and can shape how we structure PAL teacher training programs. Therefore, we can tailor the messages and approaches to meet their differing needs. We suggest that PAL teacher training programs encompass the personal and the professional aspects of teaching and at the same time facilitate an experientially based learning process.

Appendix A. Interview guide

Appendix B. Radar chart
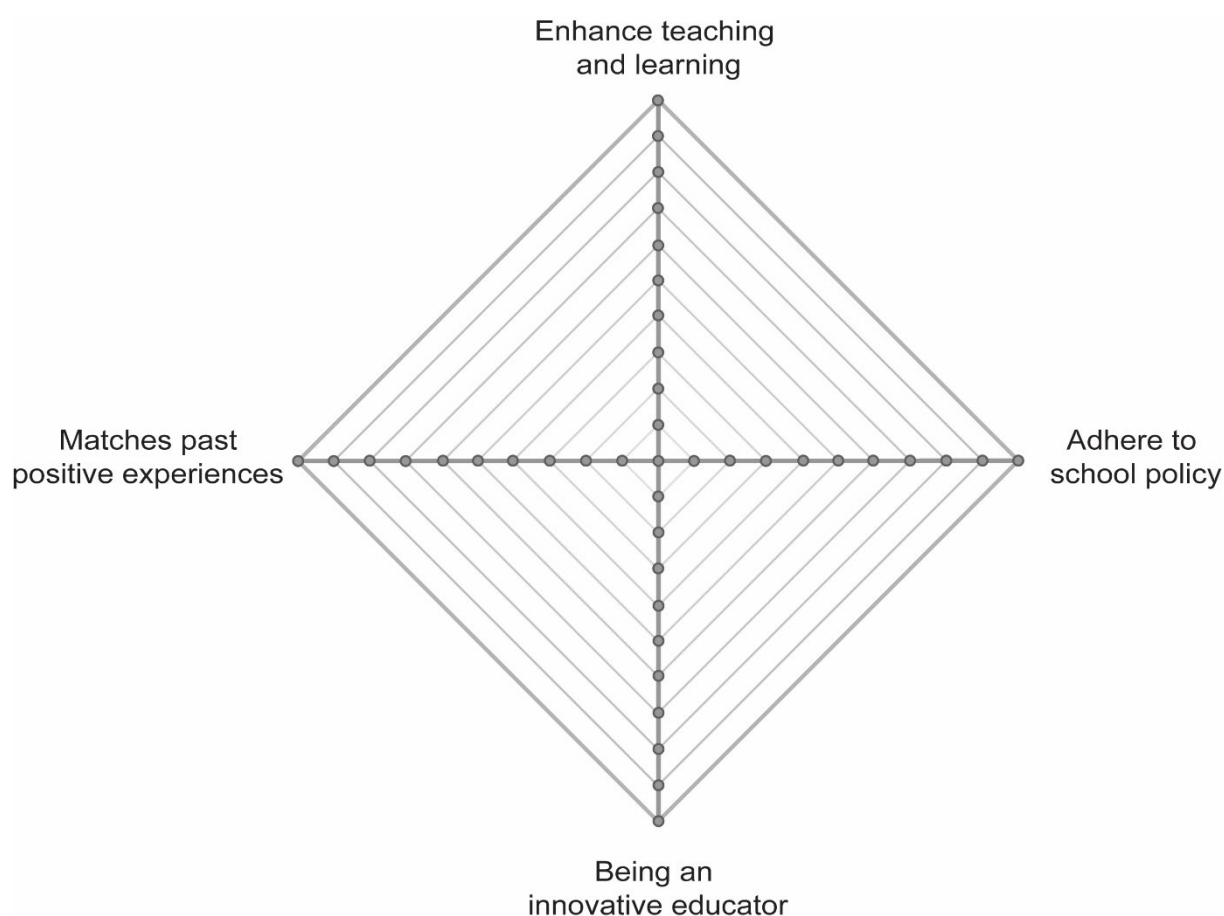
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