Social Sciences & Humanities Open 14 (2026) 103163



Contents lists available at ScienceDirect

Social Sciences & Humanities Open

journal homepage: www.sciencedirect.com/journal/social-sciences-and-humanities-open



Regular Article

Non-PE teachers' perceptions of Physical Education status: Curriculum content as a moderator of whole-school active lifestyles

Lúcia Gomes [a,*], Helena Carvalho [b], Francisco Carreiro da Costa [a]

[a] CIDEFES, Universidade Lusófona, Lisboa, Portugal
[b] Iscte-Instituto Universitário de Lisboa, CIES-IUL, Lisboa, Portugal

ARTICLE INFO

Keywords:
Physical education
Teachers' experiences
Curriculum development
Whole-school approach
Moderation of the content

ABSTRACT

This study explores the prior experiences and perceptions of non-Physical Education (PE) teachers regarding the role and value of PE within the school curriculum. Specifically, it aims to identify the key factors that shape these teachers' attitudes toward PE and to examine how their perspectives may be associated with students' access to and participation in physical activity (PA) and sport in the school context. To address these objectives, a structured questionnaire was administered to a sample of 285 teachers from various subject areas across two public schools in Portugal.

The findings suggest that teachers with more positive experiences with PE were significantly associated with a higher perceived status of the subject. Furthermore, the perceived importance of PE content moderated this relationship: as the importance attributed to PE content increased, the association between prior PE experiences and perceived PE status became weaker.

These results emphasise the critical role of meaningful engagement in PE and the presence of a coherent, well-structured curriculum in fostering favourable attitudes toward the subject. The study highlights the need for comprehensive, school-wide strategies that support a holistic approach to PE, including ongoing professional development and the creation of supportive institutional environments.

Future research should aim to identify specific curricular components that contribute to positive PE experiences and explore the long-term implications of early PE exposure on individuals' attitudes toward PA and sport participation.

1. Background

Although many educational institutions (UNESCO, 2015; WHO, 2018) and professionals (Bailey et al., 2009) acknowledge PE as a fundamental pillar of the school curriculum - moving beyond the traditional view of it as merely a break between academic subjects to recognise its vital role in students' holistic development - its full educational potential remains frequently underestimated. Too often, PE is relegated to a peripheral position within educational settings (Institute of Medicine, 2013; Hardman et al., 2014). Moreover, the educational dimension of PE is sometimes overlooked even by its own practitioners, with long-standing ideologies and practices persisting that position PE primarily as a vehicle for developing sports skills or promoting PA for health and enjoyment (Crum, 2017). This narrow focus risks neglecting PE's pedagogical and formative roles (Brown, 2013; Quennerstedt, 2019), contributing to a broader misunderstanding among teachers, parents, and policymakers about PE's true educational aims (Penney & Chandler, 2000).

Conversely, many school leaders and teachers - under pressure from the outcomes of international student assessment programmes such as PISA (Programme for International Student Assessment) (OECD, 2023), TIMSS (Trends in International Mathematics and Science Study, IEA) (Guhn et al., 2014), and PIRLS (Progress in International Reading Literacy Study, IEA) (vonDavier & Kennedy, 2024) - attempt to improve their schools' rankings and students' academic performance by reducing the time allocated to PE. In doing so, they prioritise so-called "core academic" subjects, driven by the belief that increasing classroom time for these subjects will enhance student learning outcomes and boost statistical indicators of academic achievement. This is despite numerous large-scale studies having shown that increasing the time allocated to PE and PA leads to significant improvements in academic performance, or at the very least, no detrimental effects (Bedard et al., 2019;

* Corresponding author.
E-mail address: p2156@ulusofona.pt (L. Gomes).

https://doi.org/10.1016/j.ssaho.2026.103163
Received 12 August 2025; Received in revised form 1 June 2026; Accepted 23 June 2026
Available online 26 June 2026
2590-2911/© 2026 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).

García-Hermoso et al., 2021; Ren, 2024).

In this context, given that students spend a considerable proportion of their school day in sedentary activities (Pate et al., 2011; WHO, 2022), PE has been recognised as a vital educational initiative to counter sedentary behaviour within schools (Silva et al., 2018) while promoting students' overall well-being and contributing to their academic success (Bull et al., 2020; Guthold et al., 2020). It is equally essential to ensure access to safe, inclusive, and supportive environments for PA and sport, facilitated by the presence of qualified PE specialists (McLennan & Thompson, 2015; UNESCO, 2015, 2021). Schools play a particularly important role in providing these opportunities to marginalised students who might otherwise be excluded from such experiences. These opportunities are vital not only for fostering physical health but also for contributing to students' broader educational development, social integration, and personal development (Azzarito et al., 2016).

Ensuring equity in PE means providing all students – regardless of socioeconomic background, gender, or individual ability – with equal access to meaningful, inclusive, and enriching learning experiences. Such efforts are crucial to realising the full potential of PE as a vehicle for holistic student development and lifelong participation in the movement culture (OECD, 2009). In this context, several scholars have emphasised the importance of deepening our understanding of, and critical reflection on, the lived experiences of individuals as they engage in PA, sport, and PE (Beni et al., 2021; O'Connor, Alfrey, & Payne, 2019). These experiences extend beyond mere physical acts; they are shaped by embodied, ecological, and meaning-making processes, expressed through intentional action - a core principle within phenomenological approaches to education (Whitehead, 2001).

For schools to create the conditions necessary for PE to fulfil all its objectives - particularly the promotion of active and healthy lifestyles among students - it is essential to carefully consider the overall environment in which these activities take place (McLennan & Thompson, 2015; UNESCO, 2021). Increasingly, a Whole School Approach (WSA) (Mathie, 2024) has been recognised as the most effective strategy for enhancing the educational impact of PE and sport on student populations (Colabianchi et al., 2015; Jones et al., 2022). This approach involves implementing multiple, interconnected interventions that extend from the classroom to extracurricular settings, while actively engaging students, staff, families, and the wider community in fostering supportive, inclusive, and sustainable learning environments (ASCD & Centers for Disease Control and Prevention, 2014). Key components of such interventions include the adoption of inclusive policies, the development of contextually relevant curricula and engaging pedagogical practices, and the provision of adequate facilities and learning resources. Within this integrated perspective, equity, inclusion, and student voice are not peripheral concerns but central pillars in the pursuit of quality PE. The challenge lies not only in teaching about movement but in ensuring that all students are meaningfully engaged through movement within the context of a supportive, inclusive, and critically reflective school culture. It is important to recognise that education and its practices, whether implicitly or explicitly, convey moral, social, and political values (Gomes & Carreiro da Costa, 2025).

In 2015, the 2030 Agenda for Sustainable Development replaced the Millennium Development Goals (WHO, 2018), establishing a global commitment to fostering inclusive, equitable societies and improving the lives of people worldwide (UNESCO, 2015). Within this agenda, education has been recognised as a key driver of sustainable development, with PE potentially supporting this broader vision (WHO, 2018). This strategic framework highlights the importance of adopting a holistic approach to promoting PA and sport among students (Kretchmar, 2006). However, the success of such a comprehensive intervention fundamentally relies on the commitment and active engagement of the school headmaster, teachers, and all staff members (Gomes et al., 2023; Mathie, 2024). The collaboration of these educational stakeholders is essential for fostering a school environment that consistently values, prioritises, and integrates PA and sport into students' daily routines. Without their full support and involvement, efforts to value PE and encourage active lifestyles risk encountering significant obstacles (WHO, 2020a).

Adopting a holistic approach to PA in schools enables the creation of meaningful, developmentally appropriate learning experiences that support students' physical, psychological, and socio-emotional development (UNESCO, 2015, 2021). In this context, the quality of students' experiences in PE is particularly important, as these experiences shape their perceptions, beliefs, values, and attitudes toward PA, sport, and PE itself (Crum, 2017; Kirk, 2005).

To exert a lasting, positive influence on students' perspectives on PA and sport, these experiences must transcend a narrow focus on enhancing physical abilities or acquiring technomotor skills. They should be situated within pedagogical frameworks that prioritise the development of sociomotor competencies, understood as the ability to interact effectively with others through movement in contexts of cooperation, opposition, and communication (Kirk, 2010). Such competencies include teamwork, decision-making in interactive environments, and the capacity to adapt behaviour in response to others' actions, which are central to meaningful participation in PE (Beni et al., 2017).

A growing body of evidence highlights that students' experiences in PE are shaped by a constellation of interconnected dimensions, including teacher competencies, perceived benefits of participation, curricular relevance, the availability and quality of physical resources, and the organisational management of both the school and classroom environments (Silverman, 2017). Among these dimensions, teacher competence has been repeatedly identified as a decisive influence on students' engagement and attitudes toward PE and PA more broadly. As emphasised by previous research, PE teachers' capacity to establish supportive, inclusive, and motivationally enriching learning environments is essential for fostering positive learning experiences and sustained participation in PA (Gråstén et al., 2021). Importantly, these findings underscore that teacher competencies must extend beyond subject-specific expertise to include pedagogical, relational, and motivational proficiencies that facilitate positive cognitive, affective, and social learning outcomes.

Moreover, the availability of facilities and resources significantly shapes students' experiences in PE classes (McMullen et al., 2015). Access to adequate equipment, appropriate spaces, and effective safety measures contributes to creating a positive and supportive learning environment. Schools with well-maintained facilities and outdoor areas offer students greater opportunities for engaging and enriching PE experiences. Furthermore, adequate physical infrastructure and educational services are essential to ensure the basic conditions for fostering inclusive and sustainable development, enhancing the quality and reach of education, and establishing timely, indicator-based mechanisms for monitoring outcomes (UNESCO, 2016). Furthermore, the management of the school and classroom environment significantly influences students' experiences. A supportive school culture that values PE and offers opportunities to participate in extracurricular sports and events can positively shape students' overall perceptions of PE (Guthold et al., 2020).

Given that the 'whole school' intervention approach emphasises the importance of involving the entire school community in creating a supportive environment for PE, PA and sport, a key factor in ensuring its success is addressing the perceptions and attitudes of teachers from other subject areas toward PE and PA. Importantly, teachers across all curricular areas hold subjective views about PE and PA, often rooted in their own experiences as primary and secondary school students (Carreiro da Costa & Marques, 2011; Gomes et al., 2023). These experiences - whether positive or negative - can significantly influence their beliefs about the value and purpose of PE, ultimately affecting how they support or undermine health promotion initiatives, PA and sport within schools. As a result, teachers, particularly at the primary and secondary levels, can serve as either key facilitators or barriers to encouraging

active, healthy lifestyles among students.

Understanding the experiences of non-PE teachers and the factors that have shaped their views on PE is crucial for developing an effective, school-wide strategy to promote PA and healthy lifestyles. Gaining this insight will enable the design of targeted, responsive initiatives that address specific needs and preferences within the school community. Ultimately, this approach can help create a supportive environment where PE, PA and sport are recognised and championed as essential elements of students' overall well-being and lifestyle choices.

Building on these perspectives, the present study conceptualises perceived quality of prior experience in PE as a multidimensional, retrospective construct. This construct refers to individuals' subjective evaluation of their past experiences in PE, emerging from the interaction of pedagogical, social, organisational, and material factors within the educational context. Its conceptualisation is grounded in established theoretical frameworks. From a Self-Determination Theory perspective (Deci & Ryan, 2008), the quality of experiences is shaped by the extent to which PE environments support students' basic psychological needs for competence, autonomy, and relatedness. Similarly, Achievement Goal Theory (Ames, 1992; Nicholls, 1984) highlights the role of motivational climate in shaping how individuals interpret and value their experiences in PE. Finally, the socio-ecological perspective emphasises that these experiences are constructed through the dynamic interaction between individual characteristics and contextual factors across multiple levels of the school environment (O'Connor, Alfrey, & Payne, 2012).

In this sense, the perceived quality of prior experience in PE is not reducible to a single dimension but reflects a composite evaluation of multiple interrelated elements that together shape individuals' long-term perceptions, attitudes, and behaviours toward PE and PA.

The socio-ecological paradigm (Bronfenbrenner & Vasta, 1989) offers a comprehensive framework for analysing how individual experiences and attitudes are both shaped by and contribute to the multiple, interconnected systems within educational settings. In the context of PE, this approach underscores the dynamic interplay between teachers' personal histories, school culture, institutional structures, and wider societal values. By positioning teachers' experiences within this multi-layered framework, the study moves beyond a purely individualistic interpretation of their attitudes toward PE. It acknowledges that these attitudes are shaped by direct interactions within the microsystem (such as classroom experiences with PE), by institutional expectations and support mechanisms within the mesosystem, by broader school policies and leadership structures within the exosystem, and by prevailing educational and cultural narratives at the macrosystem level. This perspective provides valuable insight into how teachers from other disciplines can function as facilitators or barriers to the promotion of PE, PA, and active lifestyles within schools.

Importantly, this socio-ecological perspective reinforces the rationale for adopting whole-school approaches to promoting active and healthy lifestyles at school. It highlights the need to engage not only PE teachers but the entire school staff in cultivating a culture where PE, sport, and PA are valued, prioritised, and meaningfully integrated into everyday school life.

In this study, PE status refers to the extent to which the subject is perceived as a legitimate and valued component of the formal school curriculum. This includes whether PE is considered a mandatory and assessed subject or a peripheral activity within the educational programme. Perceptions of curricular status are important because they influence institutional support, time allocation, and the integration of PA within whole-school health promotion strategies.

Building on the socio-ecological model of school (Allen et al., 2016) and PE (O'Connor et al., 2012; Wang, Casteli, Liu, Bian, & Tan, 2010), the present study aims to investigate the prior experiences and perceptions of non-PE subject teachers regarding the role and value of PE within the school curriculum. In particular, the study examines whether teachers' experiences in PE are associated with their perceptions of PE's curricular status, and whether this relationship varies according to the perceived quality of those experiences. From a theoretical perspective, not all experiences in PE are equally meaningful. Research suggests that the extent to which experiences are related to individuals' beliefs and attitudes depends on how they are perceived and interpreted (Beni et al., 2017). In this sense, the perceived quality of experiences may play a relevant role in shaping the strength and direction of this relationship. Experiences perceived as more meaningful are likely to be more strongly associated with favourable perceptions, whereas less meaningful experiences may be more weakly related. Therefore, it is plausible to assume that the perceived quality of PE experiences moderates the relationship between teachers' experiences and their perceptions of PE's status within the school context.

The study was guided by the following research questions (RQ) (Fig. 1):

RQ1 – Are teachers' PE experiences positively associated with their perceptions of PE's status within the school?
RQ2 – Does perceived quality of prior experience in PE moderate the relationship between teachers' PE experiences and perceptions of PE's status within the school?

2. Method

2.1. Research context

The current study was conducted in Portuguese public schools. These schools are commonly organised into school clusters (*agrupamentos de escolas*), which integrate several school units under a single administrative structure and span multiple educational levels, from primary to secondary education. The two clusters in this study are located in the Lisbon metropolitan area, in urban settings, and serve relatively large school communities. These schools generally serve students from predominantly lower-to middle-income backgrounds. This contextual information is provided to situate the sample; however, these contextual characteristics were not examined as analytical variables in the present study. Following established recommendations in educational research, the study adopts a context-sensitive approach, allowing readers to assess the potential applicability of the results to similar settings (Firestone, 1993; Polit & Beck, 2010).

2.2. Participants

The sample comprised 285 teachers from two public secondary schools in Portugal, of whom the majority were female (81.1%). Participants ranged in age from 31 to 65 years ($M = 49.5$, $SD = 7.4$).

Teachers represented a range of disciplinary areas: Portuguese Language (n = 56, 19.6%), Mathematics (n = 60, 21.1%), Expressions which includes Arts, Technology, ICT, Music, and Design (n = 51, 17.9%), Social Sciences, including Philosophy, Sociology, Psychology, Geography, and History (n = 45, 15.8%), Foreign Languages, such as

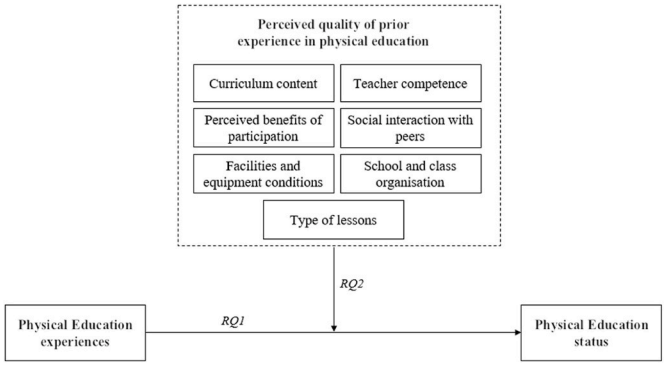


Fig. 1. Conceptual model.

English, French, and Spanish (n = 26, 9.1%), and Sciences, including Physical Chemistry, Natural Sciences, and Biochemistry (n = 47, 16.5%).

2.3. Measures

2.3.1. Instrument

The questionnaire used in this study is part of a larger mixed-methods investigation aimed at analysing the perceptions of non-PE subject teachers regarding PE, as well as perceived barriers and opportunities for promoting PA within the school context. The instrument was informed by previous research (Marques and Carreiro da Costa, 2011) and administered to a sample of teachers from Portuguese public secondary schools.

2.3.2. Physical Education status

Despite its recognised importance, PE is not consistently valued within educational systems and is frequently perceived as a recreational rather than an academic subject, contributing to its marginalisation within the school curriculum and potentially undermining its role in promoting meaningful learning outcomes and lifelong engagement in physical activity (WHO, 2020b).

Previous international research has highlighted discrepancies between PE's formal (legal) status and its perceived status among educators, with evidence indicating that, despite being mandated in most countries, PE is often considered to have lower status than other academic subjects (Hardman et al., 2014). Importantly, these findings are largely based on stakeholders' perceptions of PE within educational systems, reinforcing the relevance of examining perceived curricular status. In the Portuguese context, this issue was particularly salient during the data collection period. Although PE was formally a compulsory subject within the national curriculum (Decreto-Lei n.° 139/2012, de 5 de julho), its grade was not considered in the calculation of students' access to higher education, which may have reinforced perceptions of reduced academic importance.

Consistent with international survey-based research on the institutional and perceived status of PE (Hardman et al., 2014), participants were asked to evaluate PE's position within the school curriculum. Four categories were presented: optional, mandatory without evaluation, mandatory with evaluation that does not count toward students' grade point average, and mandatory with evaluation that counts toward students' grade point average. For analytical purposes, the categories were ordered to reflect increasing levels of curricular status, with higher scores indicating stronger endorsement of PE as a compulsory subject and of formal academic evaluation contributing to students' overall achievement.

Given the nature of the construct, PE status was assessed using a single item. This methodological approach is suitable, as it captures a one-dimensional characteristic of the curriculum rather than a latent construct that requires multiple indicators. Moreover, the response categories directly reflect politically relevant distinctions in the curricular classification of PE, thereby reinforcing the measure's content validity.

2.3.3. Physical Education experiences

In PE research, experiences are often operationalised not only as the sum of discrete dimensions (e.g., enjoyment or boredom), but also as global and meaningful perceptions shaped through participation. From this perspective, individuals tend to construct an integrated evaluation of their experiences, reflecting how they interpret and give meaning to their engagement in PE (Beni et al., 2017). This perspective is further supported by research showing that teachers' retrospective evaluations of their experiences in PE can be meaningfully captured through global categorisations (e.g., positive, neutral, negative), which are associated with their perceptions and attitudes toward PE and PA (Gomes et al., 2023). In line with this approach, the present study assessed participants' overall perception of their PE experiences using a single-item measure. Participants were asked to retrospectively evaluate their experiences with PE during their schooling by answering the following question: *How do you rate PE at the school you attended?* Responses were measured on a five-point Likert-type scale ranging from 1 (very poor) to 5 (very good). This operationalisation captures a global, directly interpretable evaluation of PE experiences rather than multiple underlying dimensions. Given the construct's integrative and unidimensional nature, a single-item measure is appropriate, particularly in survey-based research contexts (Allen et al., 2016).

2.3.4. Perceived quality of prior experience in Physical Education

Perceived quality of prior experience in PE is conceptualised as a multidimensional and retrospective assessment resulting from the interrelation between pedagogical, social, organisational, and material dimensions.

The construct was operationalised through seven indicators reflecting key dimensions of PE experiences: teacher competence, perceived benefits of participation, social interaction with peers, facilities and equipment conditions, curriculum content, school and class organisation, and characteristics of lessons (Silverman, 2017).

Participants were asked to rate the importance of each indicator on a 5-point Likert scale from 1 (Not important) to 5 (Extremely important). The seven items exhibited high internal consistency ($\alpha = 0.865$), in line with Kline's (2016) guidelines supporting their use as a composite measure of the perceived quality of prior PE experiences (Kline, 2016).

2.3.5. Control variables

While some studies (Kurga, 2014; OECD, 2009) suggest that teachers' background characteristics – such as gender – can influence their beliefs, instructional practices, and pedagogical approaches, findings across the literature remain mixed. Gender-related differences in teaching methodologies have been reported, particularly in relation to classroom management, instructional style, and strategies for engaging pupils. However, other researchers (Kavita & Hassan, 2018) present contrasting views, emphasising the complexity of attributing pedagogical differences solely to gender.

Data from the Teaching and Learning International Survey (TALIS) (Ainley & Carstens, 2018; OECD, 2009) indicate that instructional practices vary considerably across subject areas. While certain disciplines tend to favour structured, teacher-directed approaches, others are more inclined towards student-centred methodologies. This disciplinary variation highlights the importance of considering subject-specific contexts when examining teachers' beliefs and practices. In particular, it highlights the unique values, objectives, and pedagogical priorities that shape teachers' perceptions of PE. These differences reveal the nuanced nature of teaching across diverse curricular domains and underscore the influence of disciplinary culture on educational practices.

In many countries, teachers are not only trained within specific subject areas but also operate within discipline-based professional communities, which may further reinforce divergent perspectives on teaching and learning (OECD, 2009).

2.3.6. Data analysis

Descriptive statistics, including the median, mean, and standard deviation, were computed to characterise study variables. To examine relationships between the variables, Spearman's rho was used for ordinal variables and Cramer's V for categorical variables. The research questions were tested using bootstrap methods appropriate for ordinal variables, thereby avoiding parametric assumptions. Accordingly, regression analyses were conducted using the bootstrap estimation method to test the main effect (RQ1) and the moderation effect (RQ2). Interaction effects between the predictor and the moderator on the outcome variable were examined using the PROCESS macro for SPSS (version 5.0, Hayes, 2024), which supports bootstrap procedures and provides robust estimates without relying on parametric assumptions.

Bootstrap estimates were based on 10,000 resamples, and 95% bias-corrected confidence intervals were computed to assess the statistical significance of the effects.

2.3.7. Ethical considerations

The study was formally approved by the National Data Protection Commission in Portugal (Comissão Nacional de Proteção de Dados - CNPD; Ref. No. 4939/2015), in accordance with the academic procedures in place at Lusófona University at the time. Prior to participation, all individuals were provided with detailed information regarding the study's objectives, procedures, and their right to withdraw at any time without penalty. Informed consent was obtained from all participants. Anonymity and confidentiality were assured throughout the research process.

3. Results

The descriptive statistics and the associations between the study variables are detailed in Table 1.

All the results were estimated after controlling for sex and disciplinary area. Concerning research question 1 (RQ1) – *Are teachers' PE experiences positively associated with their perceptions of PE's status within the school?* – The findings showed a positive and significant relationship between PE experiences and perceived PE status ($B = 0.10$, Boot 95% CI [0.03, 0.17]). Thus, more positive experiences with PE were associated with higher endorsement of PE as a compulsory subject, with formal academic evaluation contributing to students' overall achievement.

Regarding research question 2 (RQ2) – *Does perceived quality of prior experience in PE moderate the relationship between teachers' PE experiences and perceptions of PE's status within the school?* – Several moderation models were tested. First, a model including the composite measure reflecting the perceived quality of prior PE experiences was estimated. Subsequently, individual items were examined as potential moderators, including perceived competencies, perceived benefits, curriculum content, facilities, school and classroom organisation, and lesson type. Among these, only the interaction involving the importance attributed to curriculum content showed a significant effect. Specifically, the interaction between PE experiences and the importance attributed to curriculum content was significantly associated with perceptions of PE status ($B = -0.07$, Boot 95% CI [−0.13, −0.02], Table 2). The effect size was small, with ΔR^2 for the interaction term equal to 0.02 (Cohen, 2016).

To further interpret this interaction, probing and plotting procedures were conducted. As shown in Fig. 2, at low levels of perceived importance of curriculum content, the relationship between PE experiences and PE status was positive, indicating that more positive experiences were associated with higher endorsement of PE as a compulsory subject with formal academic evaluation. The relationship was significant ($B = 0.17$, Boot 95% CI [0.06, 0.21]). At high levels of perceived importance of curriculum content, the relationship remained positive but was weaker (Fig. 2). However, this association was not significant ($B = 0.06$, Boot 95% CI [−0.12, 0.14]).

Table 1
– Descriptive statistics and associations between study variables.

	Median	*Mean*	*SD*	1	2	3	4
1. Sex [a]	—	0.81	—				
2. Disciplinary area [b]	—	—	—	0.35*			
3. Physical education experiences	2.00	2.74	1.18	0.03	0.08		
4. Importance attributed to the content	4.00	3.53	1.02	0.09	0.06	0.08	
5. Physical education status	3.00	3.20	0.72	0.05	0.02	0.18*	0.08

Note. $N = 285$. Cramer's V is reported for categorical variables (sex and disciplinary area. Spearman's rho is reported for ordinal variables. Median, mean and standard deviation (SD) were estimated by bootstrap, based on 10,000 bootstrap samples.
*$p < 0.001$.
[a] Sex coded 1 = female and 0 = male; the proportion of females is reported.
[b] It is a categorical variable. Portuguese language and Mathematics were the two more frequent disciplinary departments.

Table 2
– Regression results for moderation.

	Physical education status			
	Coeff.	*Boot SE*	Boot 95% CI	
			Lower	Upper
Constant	3.05	0.14	2.77	3.32
Control variables				
Sex (female) [a]	0.15	0.12	−0.09	0.40
Disciplinary area	0.01	0.03	−0.04	0.06
Predictor				
PE experiences	0.09	0.04	0.03	0.16
Moderator				
Importance attributed to the content	0.03	0.04	−0.05	0.12
PE experiences * Importance attributed to the content	−0.07	0.03	−0.13	−0.02

Note. $N = 297$. Unstandardized results are reported. Boot = Bootstrap. CI = Confidence interval. Bootstrap analyses were conducted using 10,000 samples.
[a] Sex coded 1 = female and 0 = male.

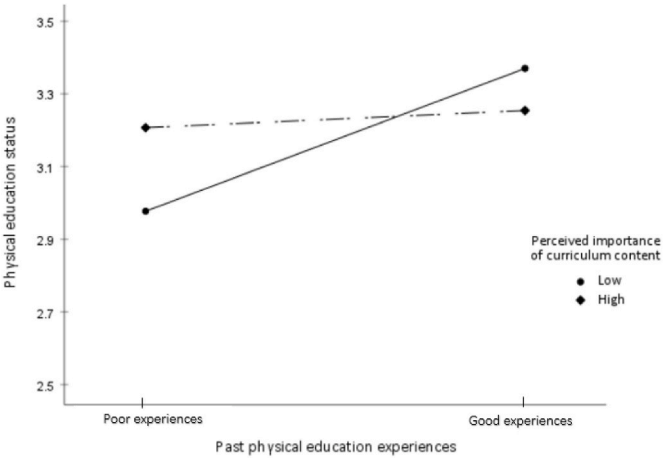


Fig. 2. The moderating effect of the importance attributed to the curriculum content on the relationship between PE experiences and the status of the PE.

4. Discussion

This study explored whether teachers' experiences in PE are associated with how they perceive the subject's status within the school context, and whether the perceived quality of prior PE experience influences this relationship. The findings indicate a significant positive association between PE experiences and the perceived curricular status of PE. In addition, a moderating effect was observed for the importance attributed to curriculum content, one of the dimensions underlying the perceived quality of prior PE experiences. These results underscore the key role of meaningful PE experiences in shaping attitudes toward the subject and reinforce the need to consider experiential and curricular dimensions when assessing how PE is valued in schools.

4.1. Association between PE experiences and PE status

The results confirm a significant positive relationship between PE

experiences and perceived PE status, consistent with previous findings (Gråstén et al., 2021; Phillips & Silverman, 2015). These findings reinforce the idea that experiences in PE are closely associated with how the subject is valued within the school curriculum. In this sense, the results highlight that teachers' prior experiences in PE are not neutral but are meaningfully related to their current perceptions of the subject's relevance and legitimacy within the school context (UNESCO, 2015).

Although the present study did not directly examine the phenomenological dimensions of learning, the findings highlight the importance of meaningful experiences in PE (Beni et al., 2021). From a phenomenological perspective, experiences in movement are understood as embodied and socially situated, shaping how individuals construct meaning and value physical activity (Merleau-Ponty, 2012).

In this sense, the positive association between PE experiences and perceived status in PE reinforces the idea that lived experiences in movement contexts are closely associated with how the subject is valued within the school curriculum. These findings support the argument that the quality and meaning attributed to experiences in PE play a central role in shaping how the subject is positioned within educational settings.

4.2. Curriculum content as a moderator

In addition to this association, the findings also address RQ2 by demonstrating that the perceived quality of prior experience in PE moderates the relationship between PE experiences and the perceived status of PE. In particular, the importance attributed to curriculum content, as one of the indicators of the perceived quality of prior experience in PE, is associated with variations in this relationship.

Specifically, the positive relationship between PE experiences and perceived PE status was significant only at lower levels of perceived importance of curriculum content. This finding suggests that the association between experiences and perceptions is not uniform, but depends on how individuals evaluate specific aspects of their prior experiences.

Although the magnitude of this moderating effect was relatively small, it is substantively meaningful. It highlights that curriculum content stands out among the different indicators of the perceived quality of prior experience in PE in explaining how PE experiences are associated with perceptions of PE status. In applied educational contexts, even small effects can be relevant, particularly when they concern factors that are consistently present across learning environments, such as curriculum content. The findings suggest that the importance attributed to curriculum content differentiates how PE experiences are associated with perceptions of the subject's status.

From a practical perspective, this indicates that improving the perceived relevance and quality of curriculum content may contribute to more favourable perceptions of PE, even if the statistical effect size is modest. Therefore, curriculum design should not be overlooked, as small but consistent effects may have meaningful implications for how PE is valued within the school context.

This moderation effect seems to indicate a levelling-off pattern, whereby the marginal association between PE experiences and the perceived status of the subject becomes weaker (although not negative) as students already attribute high value to its content, as shown in Fig. 2 (Azzarito et al., 2016). This suggests that, in contexts where curriculum content is already considered highly important, other factors, such as teacher effectiveness or the broader school environment, may be more relevant in shaping how PE's curricular status is perceived (UNESCO, 2015).

While acknowledging the importance of health-related objectives in PE, the findings highlight the limitations of focusing exclusively on health outcomes. Empirical evidence indicates that health-related motivations in isolation may not sustain long-term engagement, particularly among children who perceive themselves as relatively invulnerable to health problems (Kretchmar, 2006). Instead, the essence of a meaningful PE experience lies in social interaction, challenge, motor competence, enjoyment, and personally relevant learning (Beni et al., 2017, 2021). Accordingly, PE should move beyond a sole focus on health outcomes and instead prioritise meaningful learning experiences that foster intrinsic motivation and sustained engagement.

Furthermore, for students whose engagement with PE depends on the nature of the content offered, the quality and relevance of the curriculum are of paramount importance. For these students, the curriculum directly influences the development of their interests and significantly shapes their perception of PE's importance and status (Beni et al., 2017, 2021).

Taken together, these findings contribute to a clearer interpretation of the moderation effect and its practical implications, addressing previous concerns regarding the interpretation of coefficients and the meaning of the moderation pattern. They suggest that specific indicators of the perceived quality of prior experience in PE - particularly curriculum content - play a critical role in understanding how PE experiences are associated with perceptions of the subject's status within the school context.

4.3. Curriculum development in PE

These insights have important implications for curriculum development and teaching practices. The pivotal role of teachers in shaping positive PE experiences is widely acknowledged (Daw-as & Pelila, 2024), and continuous professional development, alongside a supportive school culture that values teacher empowerment, is essential for maintaining the quality of PE teaching (Zhou, 2024).

Well-structured PE lessons are associated with a range of benefits that enhance students' experiences, including improvements in physical fitness and motor competence, as well as the development of key social skills such as teamwork and leadership. These outcomes, in turn, are associated with more positive attitudes toward PE, sport, and PA (Phillips & Silverman, 2015; Subramaniam & Mercier, 2017).

Curriculum planning plays a central role in this process. Offering a wide variety of activities (e.g., team sports, gymnastics, dance, racquet sports, and fitness) helps engage diverse interests and abilities, fostering motivation and inclusion. Such diversity enables students to find activities that resonate with their preferences and perceived competence (Silverman & Subramaniam, 1999).

Although the AEHESIS Project-Aligning a European Higher Education Structure in Sport Science (Hardman et al., 2008) - was not directly examined in this study, its emphasis on aligning educational outcomes with professional competencies is consistent with the present findings. The results support the idea that coherent curricular frameworks and targeted teacher training are important for promoting more favourable perceptions of PE.

Aligning curricula with student needs and teacher training standards is essential for delivering meaningful PE experiences that support holistic development. Furthermore, fostering interdisciplinary collaboration, for example, integrating scientific knowledge into PE or exploring social values such as teamwork across subjects, may strengthen a whole-school approach to physical activity promotion and enrich students' educational experiences (Mathie, 2024).

4.4. The Whole School Approach and holistic education

The results, particularly the moderation effect, indicate that when students already attribute high importance to PE content, the contribution of their lived experiences in PE to the subject's perceived status becomes less prominent. As shown in Fig. 2, the relationship flattens and becomes statistically non-significant, though it remains slightly positive. In such cases, individual experiences alone may not be sufficient to elevate PE's status further. Broader, systemic strategies may be required. These strategies align with the principles of a WSA, which emphasises the integration of PA across multiple levels of the school environment. Key components include developing supportive school policies,

promoting a school culture that values PA, fostering interdisciplinary collaboration among teachers, integrating movement into non-PE subjects, and providing opportunities for PA throughout the school day, including extracurricular contexts (UNESCO, 2015, 2021). Schools that successfully implement the principles of WSA are more likely to observe stronger and more sustainable impacts of PE on students' lifestyles (Mathie, 2024; UNESCO, 2015, 2021). A supportive school culture that values movement and cross-sector collaboration can enhance the impact of PE. For instance, non-PE teachers can contribute by incorporating movement breaks or physically active learning strategies into non-PE subjects, such as integrating movement into mathematics tasks (e.g., solving problems through physically active games), using role-play and movement-based activities in language learning, or implementing short active breaks to reduce sedentary time during lessons.

Collaborative efforts between PE and non-PE staff can also create inclusive PA initiatives that address a wider range of student needs, interests, and abilities. By offering diverse opportunities for participation - both within and beyond the PE setting - schools can ensure that all students feel included, motivated, and valued. Moreover, the development of whole-school wellness policies, designed collaboratively with teachers, principals, students, and families, can further institutionalise a culture of movement (Gomes et al., 2023). These policies may include strategies such as integrating PA into daily routines, encouraging active transport, and providing access to sports facilities during and after school hours. Together, these structural and cultural approaches can amplify PE's contribution to students' overall well-being and help sustain lifelong healthy behaviours. The findings also highlight why the perceptions of non-PE teachers are important within a whole-school approach to PA promotion. As teachers from other subject areas are key members of the school community, their beliefs about the value and role of PE may influence the level of institutional support for PE and related initiatives. Positive perceptions among non-PE teachers may facilitate interdisciplinary collaboration and the integration of PA opportunities across the school day. Understanding teachers' experiences with PE may therefore help inform intervention strategies, such as professional development programmes or school-wide initiatives aimed at strengthening a shared commitment to active and healthy school environments.

4.5. Policy implications and future research

Policymakers and school leaders may consider evidence suggesting that experiences in PE influence how the subject is valued within the school curriculum. The present findings also indicate that the perceptions of non-PE teachers may play an important role in shaping institutional support for PE and school-based PA initiatives. Strengthening teachers' understanding of the educational value of PE through professional development programmes and interdisciplinary collaboration may therefore support the implementation of whole-school approaches to active and healthy lifestyles. Future research should examine how professional development systems and school-level structures may further support these processes. In the context of education policy, exploring how various professional background factors influence teachers' beliefs, practices, and pedagogical orientations is essential. These may include the type of teaching and the underlying ideologies of the profession (Crum, 1993) as well as access to high-quality, sustained professional development. By understanding these dimensions, policymakers can design more effective training frameworks and institutional support mechanisms that enhance teachers' capacity to deliver high-quality PE experiences. Additionally, non-PE teachers play a critical role. As suggested by some authors (Lander et al., 2024), incorporating movement breaks or physically active learning strategies into non-PE subjects can reinforce the value of daily movement and highlight a shared commitment to student well-being. This interdisciplinary approach contributes to a school-wide culture in which all subjects and all educators promote PA as part of a holistic education model.

4.6. Limitations and future

This study presents several limitations that should be considered when interpreting the findings. First, the sample was drawn from two school clusters within a specific geographical context, which should be taken into account when considering the applicability of the findings to other educational settings. Second, the study relied on self-reported data, which may be subject to biases such as social desirability and recall bias. In addition, although experiences were assessed retrospectively, providing a temporal reference, the cross-sectional design does not allow for causal inferences or for examining changes in perceptions over time.

Another methodological limitation concerns the measurement approach. While some constructs were assessed using single-item indicators, which may limit the depth of measurement compared to multi-item scales, this approach was deemed appropriate given their clearly defined, unidimensional nature. In contrast, the perceived quality of prior experiences in PE was assessed using multiple items capturing different dimensions. To this end, the analytical strategy first conducted a global assessment and then analysed individual dimensions to identify potential moderating effects. Finally, although the data remain relevant to the research topic, they were collected several years ago and may not fully reflect current educational contexts or recent policy developments. Future research should address these limitations by including more diverse and representative samples, employing longitudinal designs, and incorporating qualitative approaches to gain a deeper understanding of teachers' perceptions and experiences related to PE. In particular, interviews or focus groups could provide richer insights into how teachers' experiences and beliefs about PE are formed and how these experiences and beliefs influence their support for school-based PA initiatives. Longitudinal designs would also be valuable for examining how teachers' perceptions of PE evolve and how these perceptions relate to the implementation and sustainability of whole-school approaches to PA promotion.

5. Conclusions

In conclusion, this study underscores the pivotal role of PE experiences and curriculum content in shaping the perception and status of PE within educational settings. It highlights the integral relationship between meaningful PE participation and students' attitudes towards PA, emphasising the need for a comprehensive approach that transcends mere skill development to foster holistic well-being. However, it is crucial to acknowledge the intricate balance between the significance of PE content and the contributions of teaching experiences, underscoring the need for a well-rounded curriculum and high-quality instructional methods. Developing robust curricula and continuous professional development for PE educators emerges as imperative.

Additionally, cultivating a school culture that champions PA and sports, with active involvement from all educators, is essential for amplifying the positive influence of PE experiences on students. Incorporating comprehensive wellness policies crafted in collaboration with stakeholders is indispensable for creating an environment conducive to promoting PA across the school community.

Looking to the future, further research is warranted to delve deeper into the specific components of the PE curriculum that exert the greatest influence and into the role of student-teacher interactions in shaping perceptions. Longitudinal studies can provide invaluable insights into the long-term impact of early PE engagement on lifestyle habits and overall health outcomes.

The holistic development of PE necessitates a whole-school approach, in which collaboration among all educators is recognised as a collective responsibility. Through the coordinated promotion of PE, sport, and PA, and by fostering an environment that actively supports students in adopting physically active lifestyles, schools can play a pivotal role in enabling future generations to lead healthier and more

fulfilling lives.

CRediT authorship contribution statement

Lúcia Gomes: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Helena Carvalho:** Writing – review & editing, Validation, Supervision, Methodology, Formal analysis. **Francisco Carreiro da Costa:** Writing – review & editing, Visualization, Supervision, Methodology, Conceptualization.

Compliance with ethical standards

The authors declare that all ethical and professional principles have been followed.

Statement for studies involving humans and/or animals

This study involved human participants.

The study was formally approved by the National Data Protection Commission in Portugal (*Comissão Nacional de Proteção de Dados* - CNPD; Ref. No. 4939/2015), in accordance with the academic procedures in place at Lusófona University at the time.

Prior to participation, all individuals were provided with detailed information regarding the study objectives, procedures, and their right to withdraw at any time without penalty. Informed consent was obtained from all participants. Participation was voluntary, and anonymity and confidentiality were assured throughout the research process.

This study did not involve animals.

Funding

The authors received no financial support for the research, authorship and/or publication of this article.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this manuscript.

References

Ainley, J., & Carstens, R. (2018). *Teaching and Learning International Survey (TALIS) 2018 Conceptual Framework*.

Allen, K.-A., Dianne, V.-B., & Waters, L. (2016). Fostering school belonging in secondary schools using a socio-ecological framework. *Educational and Developmental Psychologist, 33*(1), 97–121. https://doi.org/10.1017/edp.2016.5

Ames, C. (1992). Achievement goals, motivational climate, and motivational processes. In E. G. C. Roberts (Ed.), *Motivation in sport and exercise* (pp. 161–176). Human Kinetics.

ASCD, & Centers for Disease Control and Prevention. (2014). *Whole school, whole community, whole child: A collaborative approach to learning and health*. Issue: ASCD. https://www.ascd.org/learningandhealth.

Azzarito, L., Macdonald, D., Dagkas, S., & Walton-Fisette, J. (2016). Revitalizing the physical education social-justice agenda in the global era: Where do we Go from here? *Quest, 69*, 1–15. https://doi.org/10.1080/00336297.2016.1176935

Bailey, R., Kathleen, A., David, K., Mike, J., Ian, P., Rachel, S., and, B. P. E., & Sport Pedagogy Special Interest, G. (2009). The educational benefits claimed for physical education and school sport: An academic review. *Research Papers in Education, 24*(1), 1–27. https://doi.org/10.1080/02671520701809817

Bedard, C., St John, L., Bremer, E., Graham, J. D., & Cairney, J. (2019). A systematic review and meta-analysis on the effects of physically active classrooms on educational and enjoyment outcomes in school age children. *PLoS One, 14*(6), Article e0218633. https://doi.org/10.1371/journal.pone.0218633

Beni, S., Fletcher, T., & Ní Chróinín, D. (2017). Meaningful experiences in physical education and youth sport: A review of the literature. *Quest, 69*(3), 291–312. https://doi.org/10.1080/00336297.2016.1224192

Beni, Ní Chróinín, D., & Fletcher, T. (2021). 'It's how PE should be!': Classroom teachers' experiences of implementing Meaningful Physical Education. *European Physical Education Review, 27*(3), 666–683. https://doi.org/10.1177/1356336X20984188

Bronfenbrenner, U., & Vasta, R. (1989). Annals of child development. *Ecological systems theory*.

Brown, T. D. (2013). A vision lost? (Re)articulating an Arnoldian conception of education 'in' movement in physical education. *Sport, Education and Society, 18*(1), 21–37. https://doi.org/10.1080/13573322.2012.716758

Bull, F., Al-Ansari, S., Biddle, S., Borodulin, K., Buman, M., Cardon, G., Carty, C., Chaput, J., Chastin, S., Chou, R., Dempsey, P., DiPietro, L., Ekelund, U., Firth, J., Friedenreich, C., Garcia, L., Gichu, M., Jago, R., Katzmarzyk, P., … Willumsen, J. (2020). World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *British Journal of Sports Medicine, 54*(24), 1451–1462. https://doi.org/10.1136/bjsports-2020-102955

Carreiro da Costa, F., & Marques, A. (2011). Promoting active and healthy lifestyles at school: Views of students, teachers, and parents in Portugal. In K. Hardman, & K. Green (Eds.), *Contemporary issues in Physical Education: An international perspective. Mainhead.* Meyer & Meyer.

Cohen, J. (2016). A power primer. In A. Kazdin (Ed.), *Methodological issues and strategies in clinical research* (4th ed., pp. 279–284). American Psychological Association. https://doi.org/10.1037/14805-018.

Colabianchi, N., Griffin, J. L., Slater, S. J., O'Malley, P. M., & Johnston, L. D. (2015). The whole-of-school approach to physical activity: Findings from a national sample of U. S. secondary students. *American Journal of Preventive Medicine, 49*(3), 387–394. https://doi.org/10.1016/j.amepre.2015.02.012

Crum, B. (1993). Conventional thought and practice in physical education: Problems of teaching and implications for change. *Quest, 45*(3), 339–356. https://doi.org/10.1080/00336297.1993.10484092

Crum, B. (2017). How to win the battle for survival as a school subject? Reflections on justification, objectives, methods and organization of PE in schools of the 21st century. *31*, 238–244. https://doi.org/10.47197/retos.v0i31.53496

Daw-as, D., & Pelila, J. R. (2024). Navigating Covid-19 challenges – How physical education teachers skillfully applied their expertise. *International Journal of Physical Education, Fitness and Sports*, 9–21. https://doi.org/10.54392/ijpefs2412

Deci, E., & Ryan, R. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian Psychology/Psychologie Canadienne, 49*(3), 182–185. https://doi.org/10.1037/a0012801

Firestone, W. A. (1993). Alternative arguments for generalizing from data as applied to qualitative research. *Educational Researcher, 22*(4), 16–23. https://doi.org/10.3102/0013189X022004016

García-Hermoso, A., Ramírez-Vélez, R., Lubans, D. R., & Izquierdo, M. (2021). Effects of physical education interventions on cognition and academic performance outcomes in children and adolescents: A systematic review and meta-analysis. *British Journal of Sports Medicine, 55*(21), 1224–1232. https://doi.org/10.1136/bjsports-2021-104112

Gomes, L., & Carreiro da Costa, F. (2025). Enseñanza de calidad en Educación Física, deportes y actividades físicas. La necesidad de una visión humanista. *Retos, 66*, 428–438. https://doi.org/10.47197/retos.v66.107951

Gomes, L., Martins, J., Ramos, M., & Carreiro da Costa, F. (2023). The impact of non-physical education teachers; perceptions on the promotion of active and healthy lifestyles: A cross-sectional qualitative Study. *International Journal of Environmental Research and Public Health, 20*(3), 2026. https://www.mdpi.com/1660-4601/20/3/2026.

Gråstén, A., Yli-Piipari, S., Huhtiniemi, M., Salin, K., Hakonen, H., & Jaakkola, T. (2021). A one-year follow-up of basic psychological need satisfactions in physical education and associated in-class and total physical activity. *European Phisycal Education Review, 27*(3), 436–454. https://doi.org/10.1177/1356336x20957356

Guhn, M., Gadermann, A., & Wu, A. D. (2014). Trends in international mathematics and Science Study (TIMSS). In A. C. Michalos (Ed.), *Encyclopedia of quality of life and well-being research* (pp. 6737–6739). Netherlands: Springer. https://doi.org/10.1007/978-94-007-0753-5_3063.

Guthold, R., Stevens, G. A., Riley, L. M., & Bull, F. C. (2020). Global trends in insufficient physical activity among adolescents: A pooled analysis of 298 population-based surveys with 1·6 million participants. *The Lancet Child & Adolescent Health, 4*(1), 23–35. https://doi.org/10.1016/s2352-4642(19)30323-2

Hardman, K., Klein, G., Patriksson, G., Rychtecky, A., & Carreiro da Costa, F. (2008). Implementation of the Bologna process and model curriculum development in physical education. In K. K. Petry, Froberg, A. Madella, & W. Tokarski (Eds.), *Higher Education in Sport in Europe. From labour Market demand to Training Supply* (pp. 56–79). Meyer & Meyer Ltd.

Hardman, K., Routen, A., & Steven, T. (2014). *UNESCO-NWCPEA: World-wide survey of school physical education; final report.* UNESCO.

Institute of Medicine. (2013). In *Educating the student body: Taking physical activity and physical education to school.* National Academies Press. http://doi.org/10.17226/18314.

Jones, G., Longbon, K., & Williams, S. (2022). Exploring the acceptability and feasibility of a whole school approach to physical activity in UK primary schools: A qualitative approach. *BMC Public Health, 22*(1), 2236. https://doi.org/10.1186/s12889-022-14647-y

Kavita, K., & Hassan, N. C. (2018). Work stress among teachers: A comparison between primary and secondary school teachers. *International Journal of Academic Research in Progressive Education and Development*, (4), 60–66.

Kirk, D. (2005). Physical education, youth sport and lifelong participation: The importance of early learning experiences. *European Phisycal Education Review, 11*(3), 239–255. https://doi.org/10.1177/1356336X05056649

Kirk, D. (2010). *Physical education futures*. Routledge. https://doi.org/10.4324/9780203860993

Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). Guilford Press.

Kretchmar, R. (2006). Ten more reasons for quality physical education. *Journal of Physical Education, Recreation and Dance, 77*(9), 6–9. https://doi.org/10.1080/07303084.2006.10597932

Kurga, S. J. (2014). The influence of teachers' age, gender and level of training on attitudes towards the use of integrated e-learning approach to the teaching and learning of Business Studies in Kenyan secondary schools. *Journal of Emerging Trends in Educational Research and Policy Studies,* (2), 190–198.

Lander, N. J., Contardo Ayala, A. M., Mazzoli, E., Lai, S. K., Orr, J., & Salmon, J. (2024). Beyond "brain breaks": A new model for integrating classroom-based active breaks. *Journal of Physical Education, Recreation and Dance, 95*(4), 22–30. https://doi.org/10.1080/07303084.2024.2308253

Mathie, R. G. (2024). A whole school approach: A synthesis of interconnected Policy, practice, and research conceptualisations. In A. E. J. Wals, B. Bjønness, A. Sinnes, & I. Eikeland (Eds.), *Whole school approaches to sustainability: Education renewal in times of distress* (pp. 9–33). Springer International Publishing. https://doi.org/10.1007/978-3-031-56172-6_2.

McLennan, N., & Thompson, J. (2015). *Quality Physical Education (QPE): Guidelines for Policy makers*.

McMullen, J., Ní Chróinín, D., Tammelin, T., Pogorzelska, M., & van der Mars, H. (2015). International approaches to whole-of-school physical activity promotion. *Quest, 67*(4), 384–399. https://doi.org/10.1080/00336297.2015.1082920

Merleau-Ponty, M. (2012). *Phenomenology of perception.* Routledge.

Nicholls, J. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91*(3), 328–346. https://doi.org/10.1037/0033-295X.91.3.328

O'Connor, J., Alfrey, L., & Payne, P. (2012). Beyond games and sports: A socio-ecological approach to physical education. *Sport, Education and Society, 17*, 365–380. https://doi.org/10.1080/13573322.2011.608940

O'Connor, J., Alfrey, L., & Payne, P. (2019). Exploring a pedagogy for meaning-making in physical education. *European Phisycal Education Review, 25*(4), 1093–1109. https://doi.org/10.1177/1356336x18802286

OECD. (2009). *Creating effective teaching and learning environments: First results from TALIS*. OECD Publishing. https://www.oecd.org/education/school/43023606.pdf.

OECD. (2023). *PISA 2022 results (volume I): The State of Learning and Equity in Education.* OECD Publishing.

Pate, R. R., Mitchell, J. A., Byun, W., & Dowda, M. (2011). Sedentary behaviour in youth. *British Journal of Sports Medicine, 45*(11), 906. https://doi.org/10.1136/bjsports-2011-090192

Penney, D., & Chandler, T. (2000). Physical education: What Future(s)? *Sport, Education and Society, 5*(1), 71–87. https://doi.org/10.1080/135733200114442

Phillips, S. R., & Silverman, S. (2015). Upper elementary school student attitudes toward physical education. *Journal of Teaching in Physical Education, 34*(3), 461–473. https://doi.org/10.1123/jtpe.2014-0022

Polit, D. F., & Beck, C. T. (2010). Generalization in quantitative and qualitative research: Myths and strategies. *International Journal of Nursing Studies, 47*(11), 1451–1458. https://doi.org/10.1016/j.ijnurstu.2010.06.004

Quennerstedt, M. (2019). Physical education and the art of teaching: Transformative learning and teaching in physical education and sports pedagogy. *Sport, Education and Society, 24*(6), 611–623. https://doi.org/10.1080/13573322.2019.1574731

Ren, P. (2024). Meta-analysis of the effect of students' physical activity performance on academic achievement under smart physical education instruction. *Applied Mathematics and Nonlinear Sciences, 9*(1). https://doi.org/10.2478/amns-2024-1603

Silva, D. A. S., Chaput, J. P., Katzmarzyk, P. T., Fogelholm, M., Hu, G., Maher, C., Olds, T., Onywera, V., Sarmiento, O. L., Standage, M., Tudor-Locke, C., & Tremblay, M. S. (2018). Physical education classes, physical activity, and sedentary behavior in children. *Medicine & Science in Sports & Exercise, 50*(5), 995–1004. https://doi.org/10.1249/mss.0000000000001524

Silverman, S. (2017). Attitude research in physical education: A review. *Journal of Teaching in Physical Education, 36*, 303–312. https://doi.org/10.1123/jtpe.2017-0085

Silverman, S., & Subramaniam, P. R. (1999). Student attitude toward physical education and physical activity: A review of measurement issues and outcomes. *Journal of Teaching in Physical Education, 19*(1), 97–125. https://doi.org/10.1123/jtpe.19.1.97

Subramaniam, P., & Mercier, K. (2017). Attitudes matter in physical education. *International Journal of Physical Education, 54*(4), 22–30.

UNESCO. (2015). *Quality Physical Education Guidelines for policy-makers*. United Nations Educational, Scientific and Cultural Organization, 978-92-3-100059-1 https://en.unesco.org/inclusivepolicylab/sites/default/files/learning/document/2017/1/231101E.pdf.

UNESCO. (2016). Unpacking sustainable Development Goal 4: Education 2030; guide. https://unesdoc.unesco.org/ark:/48223/pf0000246300.

UNESCO. (2021). Quality physical education Policy Project: Analysis of process, content and impact. https://unesdoc.unesco.org/ark:/48223/pf0000376151.

von Davier, M., & Kennedy, A. M. (2024). PIRLS 2026 Assessment Frameworks. https://www.iea.nl/publications/assessment-framework/pirls-2026-assessment-frameworks.

Wang, J., Casteli, D., Liu, W., Bian, W., & Tan, J. (2010). Re-conceptualizing physical education programs from an ecological perspective. *The Asian Journal of Exercise & Sports Science, 7*(7), 43–53.

Whitehead, M. (2001). The concept of physical literacy. *European Journal of Physical Education, 6*(2), 127–138. https://doi.org/10.1080/1740898010060205

WHO. (2018). *Global action plan on physical activity 2018–2030: More active people for a healthier world*.

WHO. (2020a). WHO guidelines on physical activity and sedentary behaviour. https://www.who.int/publications/i/item/9789240015128.

WHO. (2020b). *WHO guidelines on physical activity and sedentary behaviour*.

WHO. (2022). *Promoting physical activity through schools: Policy brief*.

Zhou, T. (2024). The role of pre-service physical education teachers in physical education - A bibliometric and systematic review. *Heliyon, 10*(7), Article e28702. https://doi.org/10.1016/j.heliyon.2024.e28702