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Compatibility of physical education curricula with physical literacy across 40 European countries

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[a]Institute for Physical Activity and Nutrition, Deakin University, Geelong, VIC, Australia; [b]School of Health and Human Performance, Dublin City University, Dublin, Ireland; [c]Department of Food and Nutrition and Sport Science, University of Gothenburg, Gothenburg, Sweden; [d]Department of Theory and Methods of Physical Culture, Ivan Boberskyj Lviv State University of Physical Culture, Lviv, Ukraine; [e]Faculty of Physical Education and Sport, Department of Sport Sciences in Educology and Humanities, Comenius University in Bratislava, Bratislava, Slovakia; [f]School of Humanities, Social Sciences and Law, Division of Education and Society, University of Dundee, Dundee, Scotland; [g]Department of Primary and Secondary Teacher Education, Oslo Metropolitan University, Oslo, Norway; [h]Institute of Learning, Universitet of Greenland, Nuuk, Greenland; [i]Cardiff School of Education and Social Policy, Cardiff Metropolitan University, Cardiff, Wales, UK; [j]Faculty of Sport Sciences, University of Extremadura, Cáceres, Spain; [k]School of Sciences, University of Central Lancashire Cyprus, Larnaca, Cyprus; [l]Faculty of Social Sciences, Department of Initial Teacher Education, University of Stirling, Scotland; [m]Department of Physical Education Theory and Methodology, Hungarian University of Sports Science, Budapest, Hungary; [n]Department of Movement and Sport Sciences, Vrije Universiteit Brussel, Brussel, Belgium; [o]Department of Physical and Social Education, Lithuanian Sports University, Kaunas, Lithuania; [p]Department of Physical Education and Sports Teaching, Eskisehir Technical University, Eskisehir, Türkiye; [q]Department of Latvian Academy of Sport Education, Riga Stradiņš University, Riga, Latvia; [r]Research Institute for Sport and Exercise Sciences, Liverpool John Moores University, Liverpool, England; [s]Faculty of Kinesiology, University of Split, Split, Croatia; [t]School of Education, Research Center for Sport and Health Sciences, University of Iceland, Reykjavík, Iceland; [u]International Physical Literacy Association, Wigan, England; [v]Academy of Physical Education in Katowice, Institute of Sport Sciences, Katowice, Poland; [w]LUNEX International University of Health, Exercise and Sports, Luxembourg, Luxembourg; [x]Department of Movement, School & Sports, Windesheim University of Applied Sciences, Zwolle, Netherlands; [y]MOVE Research Institute Amsterdam, VU University Amsterdam, Amsterdam, the Netherlands; [z]Faculty of Sport and Health Sciences, University of Jyväskylä, Jyväskylä, Finland; [aa]Faculty of Physical Education and Sport, Dunarea de Jos University, Galati, Romania; [bb]Department of Human Movement Science, Sport and Health, University of Graz, Graz, Austria; [cc]Cardiff School of Sport & Health Sciences, Cardiff Metropolitan University, Cardiff, Wales; [dd]Faculty of Sport, University of Ljubljana, Ljubljana, Slovenia; [ee]Department of Health, Eastern Switzerland University of

CONTACT J. Carl j.carl@deakin.edu.au Institute for Physical Activity and Nutrition, Deakin University, 221 Burwood Highway, Burwood, VIC, 3125, Australia

*Present additional affiliation for S. Popovic is Korea University, Seongbuk-gu, Seoul, Republic of Korea

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Applied Sciences, St. Gallen, Switzerland; [ff]Institute of Sport Sciences and Physiotherapy, University of Tartu, Tartu, Estonia; [gg]Department of Physical Activity and Health Promotion Science, Poznan University of Physical Education, Poznan, Poland; [hh]Faculty of Human Kinetics and UIDEF, Institute of Education, University of Lisbon, Lisbon, Portugal; [ii]Faculty for Sport and Physical Education, University of Montenegro, Niksic, Montenegro; [jj]School of Education, Ulster University, Coleraine, Northern Ireland; [kk]Department of PE & Sport, Stranmillis University College, Belfast, Northern Ireland; [ll]Department of Sports Science and Clinical Biomechanics, University of Southern Denmark, Odense, Denmark; [mm]Department of Physical and Social Education, Lithuanian Sports University, Kauna, Lithuania; [nn]Faculty of Sport and Physical Education, University of Belgrade, Belgrade, Bulgaria; [oo]Department of Psychology, Pedagogy and Sociology, National Sports Academy Vasil Levski, Sofia, Bulgaria; [pp]Department of Physical Activity and Rehabilitation Sciences, Research Unit for a life-Course perspective on Health & Education (RUCHE), University of Liege, Liège, Belgium; [qq]Department of Sport, Exercise and Health, University of Basel, Basel, Switzerland; [rr]Institute of Sport Science and Physical Education, Department of Sports, University of Pècs, Pècs, Hungary; [ss]Physical Education, Sports Studies and Arts Programme, School of Education, Cork, University College Cork, Ireland; [tt]Department of Physical Education and Rehabilitation, Ternopil Volodymyr Hnatiuk National Pedagogical University, Ternopil, Ukraine; [uu]Faculty of Educational Sciences, Goce Delcev University, Stip, North Macedonia; [vv]Institute of Sport Didactics and Physical Education & Centre for PE Teacher Education, German Sport University Cologne, Cologne, Germany; [ww]Department of Educational Sciences and Early Childhood Education, University of Patras, Rio, Greece; [xx]Facultè des Sciences du sport de Strasbourg (F3S), University of Strasbourg, laboratoire E3S (UR1342), Strasbourg, France; [yy]Higher School of Art and Sports, Pavlodar Pedagogical University named after Alkey Margulan, Pavlodar, Kazakhstan; [zz]Mulier Institute, Utrecht, Netherlands; [aaa]Department of Latvian Academy of Sport Education, Riga Stradiņš University, Riga, Latvia; [bbb]University of Central Lancashire Cyprus, School of Sciences, Larnaca, Cyprus; [ccc]Institute of Sport Science, Friedrich Schiller University of Jena, Jena, Germany; [ddd]Faculty of Physical Culture, Palacký University Olomouc, Olomouc, Czech Republic; [eee]School of Physical Education and Sport Science, National and Kapodistrian University of Athens, Athens, Greece; [fff]Department of Sport Science and Physical Education, University of Agder, Kristiansand, Norway; [ggg]Capdi & LSM, Taranto, Italy; [hhh]Center for Clinical Research and Prevention, Copenhagen University Hospital – Bispebjerg and Frederiksberg, Frederiksberg, Denmark; [iii]Department of Psychology and Education, Pegaso University, Naples, Italy; [jjj]Institute of Sports Sciences, Goethe University Frankfurt, Frankfurt am Main, Germany

ABSTRACT

Although the student-centred concept of physical literacy (PL) has been emphasized by UNESCO, knowledge about its adoption/implementation into PE remains scant. Therefore, the goal of this study was to evaluate and compare the compatibility of PE curricula with PL in Europe. We collaboratively gathered a panel of experts encompassing 40 European countries. In the first step, the experts were invited to freely specify the compatibility of country's PE curricula with PL. The reports were subjected to six-step reflexive thematic analysis. In the second step, we theoretically derived, psychometrically explored, and descriptively analysed 15 curricular-didactical items, each containing a spectrum of statements with high versus no/insufficient PL compatibility. We synthesized both data sources following an explanatory sequential mixed-methods design. While few PE curricula explicitly adhered to PL in Europe, most documents exhibited content and aims marking elements of PL. However, we registered large differences in PL-compatibility between four European regions for the deep structure of the curricula (η^2=.27, p=.01). While the quantitative survey suggested no differences in PL compatibility between anglophone versus non-anglophone countries, the qualitative material revealed conceptual and terminological challenges across Europe. The European countries have hesitantly followed the UNESCO call to align PE with the holistic PL concept.

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1. Introduction

1.1. Physical education

Physical education (PE) marks a designated subject area of learning within school curricula. Diverse interests, traditions, philosophies, and perspectives have shaped international approaches to PE across all school levels. In line with this heterogeneity, commentators across research and practice have debated the purpose and focus of the discipline (Kirk, 2009; Quennerstedt, 2019). The United Nations Educational, Scientific and Cultural Organization (UNESCO) stated that Quality Physical Education (QPE) *'is the planned, progressive, inclusive learning experience that forms part of the curriculum in early years, primary and secondary education. In this respect, QPE acts as the foundation for a lifelong engagement in physical activity and sport'* (UNESCO, 2015, p. 9).

Schools, primarily through PE, play a vital role in supporting children and young people to learn and experience physical activity (PA) and movement (Bailey et al., 2009). The purported benefits of PE are contested, but engagement in QPE can be categorized as having an impact across physical, social, affective, and cognitive domains (Bailey et al., 2009). Despite this, the most recent Global Matrix 4.0 PA Report Card still called for the need to make PE a compulsory subject for all school levels (Aubert et al., 2022). Across Europe, previous literature has tracked the history, policies, challenges, engagement, and approaches in relation to PE (Hardman, 2008, Naul & Scheuer, 2020). These approaches include various concepts and pedagogical models that have influenced PE over the years, such as Sport Education, Teaching Games for Understanding, Cooperative Learning, Teaching for Personal and Social Responsibility, and corresponding hybrid models (Fernandez-Rio & Iglesias, 2024; Metzler, 2017). There is no doubt that these approaches have been praised for improving students' learning and have inspired PE teaching. However, at the same time pedagogical models have received critique for not adequately addressing low skilled children, girls, individuals with special needs, and individual preferences (Fernandez-Rio & Iglesias, 2024). According to MacPhail and Lawson (2020), teaching and learning PE remains a big challenge of our time and in need of a thoughtful redesign.

1.2. The concept of physical literacy

When identifying a concept that has been increasingly discussed inside and outside of PE (Bailey, 2022; Qian et al., 2025), tribute must be paid to physical literacy (PL). PL is assumed to support and drive quality PE (Dudley & Cairney, 2020; Houser & Kriellaars, 2023). Accordingly, UNESCO declared within their QPE Guidelines for Policymakers that 'participation in PE should support the development of PL' (UNESCO, 2015, p. 20). Combined, PL is mentioned repeatedly across the document and sets a standard on the global scale regarding the relevance of PL for PE. Despite the position taken and advocated by UNESCO, there is currently no universally accepted common definition of PL (Bailey et al., 2023; Martins et al., 2021). The International Physical Literacy Association (IPLA) describes the concept as the 'motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life' (International Physical Literacy Association, 2017). According to Sport Australia, PL

'reflects ongoing changes integrating physical, psychological, social and cognitive capabilities' (Australian Sports Commission, 2019). The 2023 consensus for England comprehends PL as 'our relationship with movement and PA throughout life' (Sport England, 2023) and specifies physical, cognitive, affective, and social aspects for purposeful physical activities. Irrespective of these slight nuances, the original PL descriptions place the individual in the focus of consideration, which qualifies the concept as a person-/student-centred approach (Santos et al., 2022), and demonstrate elaborate philosophical underpinnings (Whitehead, 2007, 2019). These underpinnings assumed that an individual's PA involves body and mind as an integrated unit (monism), provides unique and ever-changing experiences (phenomenology), and interacts with the environment and the surrounding world (existentialism).

Although it has sometimes been admonished that these complex assumptions impede practical translations (Jurbala, 2015), researchers have levelled suggestions on how to structure PE in line with PL, from more abstract principles and implications to concrete intervention studies (Durden Myers et al., 2018; Godbout, 2023; Murdoch & Whitehead, 2010; Stoddart et al., 2023). Indeed, the school, and PE specifically, has delivered the most extensive breadth of interventional experience (Carl et al., 2022). When specifying the role of PL in the intervention or experience enrichment process, PL is not a program per se but can be the outcome of PE (Wainwright et al., 2016, 2018). However, by adhering to ideas of intentionality, it is appropriate to consider the stance or spirit of a program when aiming to 'flourish' PL and achieve the desired effects of structured PE. Advocating for the *integration of body and mind*, practices in line with PL appreciate each student as a feeling, moving, and thinking person (Pot et al., 2018; Whitehead, 2010). Consequently, structured PE is advised to assign equal weight to psychosocial, physical, and cognitive aspects of human movement while not establishing any priority. Any PE in line with PL should deeply embody *student-centred acting* by placing the individual into the focus of interest and not external learning standards and norms (Durden Myers et al., 2018). Accordingly, the PE curriculum should provide *access for everyone* and cultivate a highly *inclusive atmosphere* without excluding learners with disabilities or special needs (Pushkarenko et al., 2021; Whitehead, 2010). Reward should be determined upon individual participation, effort, and progress, which favours *self-referenced evaluation* over norm-referenced evaluation (Dalbert et al., 2007). Figuratively spoken, the PE teacher should acknowledge the *unique journeys* by enabling personalized learning and providing tailored progression (Pot et al., 2018; Rudd et al., 2020; Schaerz & Balderson, 2020). *Charting and assessment methods*, when applied correctly, have the potential to illustrate this journey and actively support the learning progress (Goss et al., 2022; N. R. Green et al., 2018; Young et al., 2021). Importantly, these unique journeys do not end with the completion of school, implying that practices should transcend the current horizon through the initiation of *lifelong learning* in the context of physical activities and an anticipation of the time after structured PE (Lloyd, 2016; Pot et al., 2018). Pedagogical content should emphasize students to take *self-responsibility* for engagement in physical activities and attempt to find *purposeful activities* for themselves (i.e. through reflective tasks), ideally resulting in a *meaningful relationship* with movement and a successful navigation of the activity biography (Durden Myers et al., 2018; Pot et al., 2018). To help students gain insights into the movement options, PE teachers are advised to *offer variety and permit exploration* of activities, coupled with changing environments and *differing contexts* (Durden Myers et al., 2018;

Pot et al., 2018; Rudd et al., 2020). Students should be *actively involved* in decisions (including goal setting) and even be encouraged to demonstrate *creativity* and own problem solving (Houser & Kriellaars, 2023; Whitehead, 2010).

While there is reasonable didactical orientation and political support on the global level to align PE with PL (see again UNESCO, 2015), it remains largely unknown whether this 'stance' and 'spirit' of PL has permeated the European countries. A systematic review recently identified policy and international curriculum analyses as a major 'blank spot' within the PL literature (Carl, Jaunig, et al., 2023). Approximately 10 years after the publication of the UNESCO QPE guidelines, we question whether the PL orientation has successfully 'diffused' (L. W. Green et al., 2009) into the practices of the continent. One recent project has generated a broad report on the implementation of PL in research, practice, and policy in Europe (Carl, Bryant, et al., 2023). This study revealed that the PE curricula of most countries did not explicitly mention PL, although 'the main goals resonate well with the PL concept' (Carl, Bryant, et al., 2023, p. 172). However, listing the PE curriculum as only one out of 10 categories derived, this study only provided a rough examination of the alignment of PE with the prominent PL concept by not detailing *which* aspects and goals of PE more or less strongly harmonize with PL. Such knowledge would be essential to account for the complexity required to organize high-quality PE and didactically operationalize PL. Importantly, such knowledge would be crucial to demonstrate potential incompatibilities between current curricula and conceptual aspects (e.g. sport skill focus, teacher-centred pedagogy).

1.3. Goals and research questions of this study

The goal of the present study was to gain a comprehensive overview of PE in Europe by examining their alignment with PL across the continent. In line with the identified gaps on PE curriculum in the literature, we addressed the following research question: how well is current PE compatible with the PL concept? Given this focus, the following indirect question with policy relevance arose: do the existing formal PE curricula in Europe follow the call by UNESCO's QPE guidelines for policymakers from 2015 to align with PL? We aimed to answer these research question by directly examining the pedagogical goals, content, and learning outcomes and covering the implications for teaching, organizational strategies, and pedagogical methods that indirectly arise from the formal curriculum.

2. Materials and methods

2.1. Study design (overview)

We adopted a five-step research approach with a mixed-methods design. In the first step, we identified experts from 40 European countries and conceptualized the survey. In the second step, we held meetings with the representatives to introduce and cooperatively organize the survey. In the third step, the experts of the single countries were invited to (i) freely report the compatibility of PE with the PL concept in their countries and (ii) respond to pre-defined questions expressing the degree of PL compatibility. In the fourth step, we descriptively analysed all closed questions (quantitative part) and a group of two

researchers (JC, KS) subjected the free reports (treated as text documents) to reflexive thematic analysis (qualitative part). We then performed triangulation to synthesize the findings across the quantitative and qualitative data sources in the fifth step. Within our mixed-methods approach, we deliberately prioritized the quantitative survey among both data sources (for the STROBE statement, see Supplementary File 1), with the qualitative material providing complementary and more in-depth insights into the overall analysis. Therefore, we qualified our approach as an explanatory sequential design (Fetters et al., 2013). We presented the results in independent sections. The subsequent integration and synthesis process—often referred as to the 'point of interface' (Cameron, 2023)—was located within the discussion section. The current study adhered to the principles of plurality, comparability, contextuality, and scientific systematicity suggested for comparative research in PE (Vlček, 2019; see Supplementary File 2 for details and further explanations). This study met the ethical requirements of the included countries for scanning national documents (publicly available information) and transforming aggregated information into a cooperatively developed expert survey.

2.2. Expert identification

For inclusion in this study, we defined an 'expert' (for a summary of the corresponding discussion in PE, see Williams & Lee, 2021) as a person who simultaneously fulfiled three criteria: (a) member of an academic institution (e.g. university or scholarly society), (b) specialist in PE or physical activity promotion, and (c) knowledge and understanding of PL. In addition, at least one person per country had to be an expert in PE for school children to ensure pedagogical expertise (additional requirement for criterion b). For the sake of neutrality, we declare that no expert was part of the process for developing the UNESCO QPE guidelines for policymakers (UNESCO, 2015). The EUROPLIT network was established in 2022 in collaboration with IPLA to broadly monitor PL activities in Europe and initially comprised 25 countries (for a further description of the background, see Supplementary File 3): Austria, Belgium, Croatia, Cyprus, the Czech Republic, Denmark, England, Finland, France, Germany, Greece, Italy, Lithuania, the Netherlands, Norway, Poland, Portugal, Romania, Scotland, Wales, Spain, Sweden, Switzerland, Türkiye, and Ukraine (Carl, Bryant, et al., 2023). In this second endeavour, we invested increasing efforts in finding experts from smaller and Eastern European countries. Compared to the first part of the EUROPLIT study, we additionally included the following countries: Bulgaria, Estonia, Greenland, Hungary, Iceland, Ireland, Kazakhstan, Latvia, Luxemburg, Montenegro, North Macedonia, Northern Ireland, Serbia, Slovakia, Slovenia. Experts from Bosnia-Herzegovina and Moldova were invited to participate but withdrew from the process. The entire survey involved a total of 72 experts from 40 European countries.

2.3. Survey development

2.3.1. Validity and quality assurance process

Three members of this study (KS, JC, PE) conceptualized an online survey (Webropol Survey v3.0, Helsinki, Finland) for assessing the focus of the country's current curriculum and the consideration of PL. At the beginning of the process, the core team invited two experts (CdA, PV) with substantial experience in PE curriculum analyses to discuss the

theoretical background and structure of the planned analyses. The core team (JC, KS) developed and successively refined the survey. The survey was designed to contain questions regarding the general curriculum as well as the compatibility of the curriculum with the PL concept. After six reflection and revision cycles (iterative character), the two core members perceived internal quality saturation and asked three external PL experts for feedback on two levels (Figure 1). First, one expert (HG) was explicitly requested to concentrate on the deductively derived categories and check these questions for reflexive thematic relevance and comprehensiveness. The expert was invited to provide informal feedback via mail. Second, two experts (IP, SL) submitted the entire survey for general comprehensibility. With this step, the core team intended to avoid misinterpretations, prevent unnecessary linguistic difficulties, reduce the number of inquiries by the representatives, and improve the precision (validity) of the questions. We concluded the entire questionnaire with a free question in which participants could either specify the answer to an unclear question or give a general comment.

The core team explained the goals, procedure, and expected involvement of this study at two different meetings. As we aimed to further enhance the interpersonal validity of the responses, we asked all country contacts to meet, if possible, a four eyes principle when discussing and evaluating PE of their country. All representatives of the 40 participating countries provided consent to contribute to this expert-driven project and work together constructively. The experts were initially given four weeks to complete the survey and awarded additional extensions of three weeks and one week (final deadline: 26 January 2024), respectively.

2.3.2. Closed survey questions

The entire questionnaire began with the names, the contact data as well as the affiliation (country, university) of the country representatives. Given the decentralized organization of PE in some countries, we inquired whether the respective country held a national core curriculum or whether multiple regional (e.g. organization by states) curricula existed. Furthermore, we gathered information about the time point of the latest curriculum reform split by age group, uncovering that 65.8% of all curricula (i.e. the data basis) stemmed from a year after UNESCO's QPE release (≥2016). Without already connecting to the PL concept, the experts had to indicate whether the PE curriculum specified any of the following domains (multiple choice matrix): (a) affective, (b) behavioural, (c) cognitive, (d) physical, and (e) social. Each domain listed exemplary elements in brackets ('e.g., well-being, self-confidence, motivation' for the affective domain) and was coded with 1

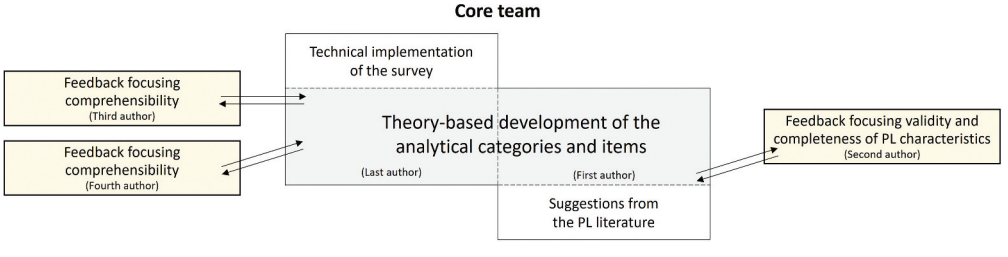

Figure 1. Illustration of the process for the construction of the survey (open-ended questions, closed questions). Abbreviation: PL = physical literacy.

('response was selected') or 0 ('response was not selected'). The initial PL part asked whether PL was mentioned explicitly in the curriculum (four response options). The following question interrogated the availability of a definition in the respective country (three response options), as studies have underlined that a clear conceptual stance marks an important part of the PL identity (Bailey, 2022; Martins et al., 2021).

The main part of the PL survey consisted of 15 questions with opposing statements on each side of the continuum. One statement always stood *in line* with the conceptual ideas of PL and their pedagogical implications (as extensively presented in the introduction), while the opposite statement stood *not fully in line with* or even *in contrast to* these ideas. We decided to formulate all statements without the term 'physical literacy' assuming that its implementation can also theoretically be realized without explicit adherence to this notion (Wilkie et al., 2024). The PL-endorsing statements addressed the following interrelated aspects (see also the argumentation in the introduction): (i) student-centred acting; (ii) the development of a meaningful relationship with physical activities; (iii) the acknowledgement of 'unique journeys'; (iv) a balance between physical, cognitive, and psychosocial aspects; (v) exploration of different activity contexts; (vi) student involvement and the provision of movement choice; (vii) embodiment and the integration of body and mind; (viii) own responsibility for engagement in physical activities; (ix) the availability of assessment/charting methods for individual progress; (x) transcendence of the current horizon through 'lifelong learning'; (xi) prioritization of variety and exploration; (xii) reward and participation for everyone; (xiii) the inclusion and accessibility of PE for all; (xiv) student-identified purpose for activities; and (xv) encouragement of creativity and problem-solving. The representatives were advised to evaluate the current curriculum along a five-point scale with the statements located at the two extremes. The side of the PL-compatible statements deliberately fluctuated across the 15 questions. Accordingly, we reverse scored the eight items in which the PL-opposing statement was located on the right side with an optimal score of five. In summary, this PL main part underwent the most intensive revision both thematically and linguistically. The second author focusing on PL validity and completeness (Figure 1) was decisive for encouraging the core team to include two further aspects (ii, xv). An overview of the instrument with the closed PL questions can be accessed in Supplementary File 4.

2.3.3. Open-ended survey question

To compensate for the shortcoming of deductively derived PL categories and explore country-related PE specificities, we incorporated an open-ended question: 'Please report freely the compatibility of PE in your country with the basic ideas of the PL concept'. In brackets, we asked the representatives to keep the reports to a maximum of 800 words. We deliberately positioned this block before the closed main question of PL to enable better brainstorming and not cognitively restrict the reports to the pre-defined categories. For transparency reasons, full access to all original compatibility statements will be given via Open Science Framework (OSF) in a 61-page document.

2.4. Data analysis

For an initial overview, we applied descriptive distribution analyses for the ordinal items of the country's availability of a PL definition and the general relevance of the concept for

the curriculum. We also subjected the 15 questions of PL-compatible pedagogy to descriptive analyses by examining their absolute item means (M) and standard deviation (SD). The mean values were transformed to item difficulties (ID) to gain insights into the agreement with the PL-compatible statements in relation to their opposing statements. To approach the indicative quality of each question for PL-compatible pedagogy, we simulated the 15 questions as reflecting one consistent construct (Cronbach's $\alpha = .861$). By inspecting and comparing the item-total-correlations (r_{it}), we extracted the question with a high indicative quality for PL-compatible pedagogy and those which constituted an important theoretically derived PL aspect but empirically marked more of a distinct aspect (by following the guideline in psychometrics for low discriminatory item potential: $r_{it} \leq .20$; see Kline, 2015). Complementary to describing the values of PL-compatible pedagogy, we compared the rating across the 15 pooled criteria between the four regions of Europe as in line with the EuroVoc thesaurus held by the European Union (2024): Western Europe, Northern Europe, Southern Europe, Central and Eastern Europe (see Figure 2). Furthermore, we contrasted the values between anglophone and non-anglophone countries in accordance with the officially declared primary language. Statistically, we calculated two general linear models with the four categorial regions and the two language categories as the predictors, respectively, and the pooled PL-compatible pedagogy score as the outcome. We had to replace two items within the PL main part of the closed questions (0.3%) using a regression-based imputation, and the significance level was set at $p < .05$.

In parallel, we treated all 40 reports as documents with the corresponding text undergoing reflexive thematic analysis (Braun & Clarke, 2019). Thematic analysis represents a flexible research method that must harmonize with the research data as well as research questions and has unfolded popularity in both physical activity research (Braun & Clarke,

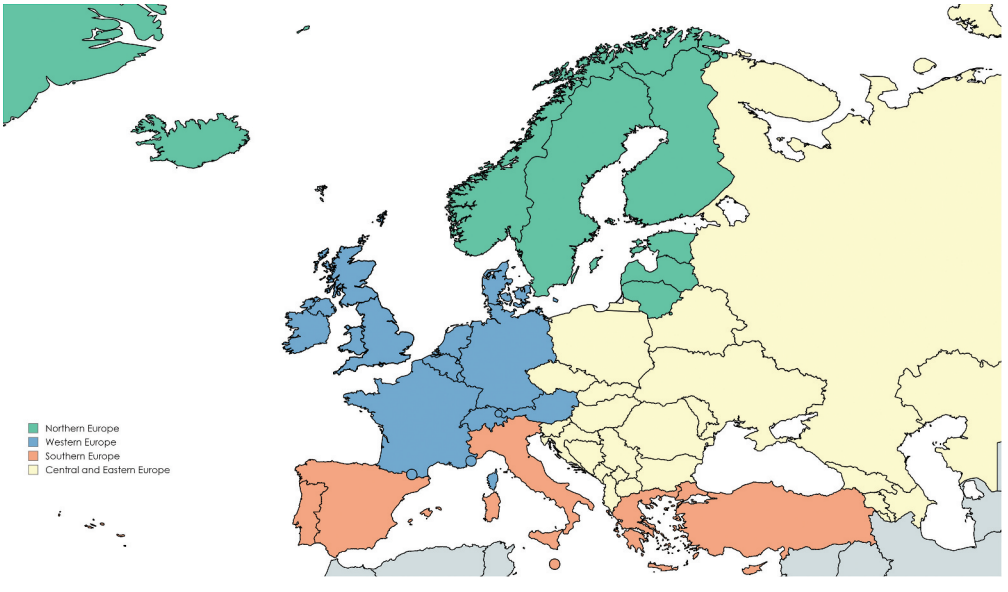

Figure 2. The definition of the four European regions (European Union, 2024) visualized via the open-source online service MapChart.

2019) and, more recently, also educational research (Xu & Zammit, 2020). As reflexive thematic analysis bundled many sub-forms (Braun & Clarke, 2019), we transparently disclose our qualitative position for this analysis. We were interested in gathering *inductive* insights from the compatibility reports by striving for an impartial extraction of themes. In this context, data were examined beyond the semantic level. We located the reflexive thematic analysis on the *interpretative level* to better exploit the representatives' messages within the verbally transmitted context. We adhered to the following six-step procedure (Braun et al., 2023): (1) familiarizing with the reports; (2) generating initial codes after analogue extraction; (3) searching for themes across the reports; (4) reviewing themes; (5) defining and naming themes; and (6) compiling the report. In line with the updated recommendations and the author's critical reflections (Braun & Clarke, 2019), we did not consider the method as a linear process, accepting back-and-forth processes (especially with steps 2–4). The first author (JC) has performed the reflexive thematic analysis, whereas the last author has re-checked the qualitative assignment (KS). Within this explanatory sequential design (Fetters et al., 2013), the qualitative data (albeit reflecting inductive work for data saturation) delivered complementary or additive insights to the quantitative results. Accordingly, the concluding synthesis as the final step within this mixed-methods approach has to be seen in connection to the quantitative findings.

3. Results

3.1. Quantitative findings (closed survey questions)

Experts from 21 countries declared that their country did not have a specific PL definition or that academics referenced different definitions (52.5%). Experts from 15 countries specified that their country consistently used the PL definition from another country or institution (37.5%), and another four countries (England, Ireland, Northern Ireland, Portugal) have even generated their own PL definition or formally agreed upon a PL definition (10%). Supplementary File 5 provides an overview of the specific definitions utilized and shows that most agreed definitions had 'Whiteheadian' origin or were taken from IPLA. The representatives of three countries (Estonia, Latvia, Slovakia) indicated that PL is 'the dominant concept' in their curriculum (7.7%). No country lists PL 'repeatedly' (verbatim) in the PE curriculum but seven countries (Bulgaria, Greece, Greenland, Hungary, Iceland, Lithuania, Montenegro) reported that PL is mentioned 'occasionally' verbatim (17.9%). The remaining countries (74.4%) indicated that PL is not mentioned verbatim in the curriculum. However, most curricula addressed the domains of PL as a direction for teaching, learning, and goals (without that PL must have been mentioned verbatim): 92.5% affective/psychological (e.g. well-being, self-confidence, motivation); 87.5% behavioural (e.g. pupils should be active/increase daily activity); 95.0% cognitive (e.g. knowledge and understanding about terms, effects, and ways of being active); 97.5% physical (e.g. motor skills, fitness, abilities); and 97.5% social (e.g. interaction, communication, empathy, fair play).

Among the 15 questions centring on PL-compatible pedagogy (Table 1), all items were located within the interquartile area around the scale mean ($0.31 \geq ID \geq 0.75$). All items contributed positively to operationalizing *PL-compatible pedagogy* ($0.33 \geq r_{it} \geq 0.81$). Only the

Table 1. Agreement and indicative quality (via item-total correlations) of the statements for PL-compatible pedagogy.

Item Number	PL aspect	Mean ± Standard deviation	Item difficulty (ID)[1]	Item-total correlation
i	Student-centred acting	3.03 ± 1.35	0.51	.46
ii	Development of a meaningful relationship with physical activities	3.63 ± 1.08	0.66	.64
iii	Acknowledgment of 'unique journeys'	3.05 ± 1.15	0.51	.35
iv	Balance between physical, cognitive, and psychosocial aspects	3.55 ± 1.08	0.64	.49
v	Exploration of different activity contexts	3.58 ± 1.24	0.65	.54
vi	Student involvement and the provision of movement choice	3.08 ± 1.05	0.52	.81
vii	Embodiment and the integration of body and mind	3.93 ± 1.05	0.73	.64
viii	Building own responsibility for engagement in physical activities	3.98 ± 0.95	0.75	.33
ix	Availability of assessment/charting methods for individual progress	2.23 ± 1.31	0.31	.10
x	Transcendence of the current horizon through 'lifelong learning'	3.55 ± 1.08	0.64	.51
xi	Prioritization of variety and exploration	3.60 ± 1.17	0.65	.34
xii	Reward and participation for everyone	3.54 ± 1.11	0.64	.47
xiii	Inclusion and accessibility of PE for all	4.00 ± 0.94	0.75	.65
xiv	Student-identified purpose for activities	3.72 ± 1.09	0.68	.76
xv	Encouragement of creativity and problem-solving.	3.45 ± 1.22	0.61	.62

All original answers were coded on a scale between 1–5.
[a]The item difficulty (ID) expressed the degree of approval to the pedagogical PL aspect (in relation to the statement which did not stand fully in line with or even in contrast to the PL idea; see Supplementary File 4).

theoretically postulated 'availability of explicit assessment/charting methods for individual progress' (item ix) would empirically mark a factor with a distinct contribution when applying classic criteria of item testing ($r_{it} = .10$). The 'student involvement and the provision of movement choice' aspect (item vi) marked the most central statement for PL-compatible pedagogy ($r_{it} = .81$), followed by the 'student-identified purpose for activities' (item xiv; $r_{it} = .76$) as well as 'inclusion and accessibility of PE for all' aspects (item xiii; $r_{it} = .65$).

In total, we registered considerable heterogeneity across Europe in the reported fulfilment of criteria for PL-compatible pedagogy ($1.93 \geq mean \geq 4.73$; Supplementary File 6). Estonia displayed the highest values of PL-compatible pedagogy, whereas Romania the lowest. We found statistically significant differences in PL-compatible pedagogy between the four European regions with large effect size, $F(3) = 4.37$, $p = .010$, $\eta^2 = .27$. Descriptively, the countries of Northern Europe revealed the highest compatibility with PL ($M = 3.97$, $SD = 0.54$), followed by Southern Europe ($M = 3.56$, $SD = 0.78$) and Western Europe ($M = 3.53$, $SD = 0.50$). The reported pedagogy in the countries of Central and Eastern Europe ($M = 3.04$, $SD = 0.60$) demonstrated the lowest compatibility with PL and differed significantly from those in Northern Europe, $t(19) = 3.57$, $p = .002$, $d = -1.60$. We did not record any differences in PL-compatible pedagogy between anglophone and non-anglophone countries, $F(1) = 0.615$, $p = .44$.

3.2. Qualitative findings (open-ended questions)

We extracted 11 themes with a specifiable topic plus one 'other aspects' theme (see Supplementary File 7 for an overview). A total of 22 qualitative reports explicitly held that

PL is not mentioned verbally within the curriculum (Austria, Croatia, Cyprus, Denmark, England, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Kazakhstan, Netherlands, Poland, Romania, Scotland, Spain, Sweden, Switzerland, Türkiye, Wales). The curricula of two non-anglophone countries have declared PL to be the basic aim of PE. In Greece, it 'is clearly stated that PE aims at shaping physically literate students, who will participate in lifelong PA for the benefit for their health, quality of life, and social well-being' (OSF, lines 353–355). In Slovakia, the PL inclusion was connected to a recent curriculum reform in primary schools (OSF, lines 996–997). The statements of many countries explicitly explained that the descriptions of the curricula harmonize with the idea of PL despite its verbal absence (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Kazakhstan, Netherlands, Northern Ireland, Norway, Scotland, Spain, Sweden, Switzerland, Türkiye, Ukraine, Wales). Accordingly, we frequently found a combination as reported by the Turkish representatives: 'Although the concept of PL is not directly mentioned in the content of PE curricula in Türkiye, the majority of the outcomes of the curricula cover the components of the concept of PL' (OSF, lines 1077-–1079). Montenegro was more neutral in describing the compatibility of PE with the spirit of PL by reporting that 'we reach that in some level' (OSF, lines 631–632). The experts from Croatia, Cyprus, Lithuania, and Romania levelled basic doubts regarding the alignment of the curriculum with the concept. For instance, the Lithuanian report expressed 'that compatibility is weak' (OSF, line 624). To elaborate on the alignment, many reports attempted to match descriptions of the curriculum with the domains of PL. For instance, the Estonian experts listed the 'five essential areas for developing lifelong PA' (OSF, line 259). As another example, the Irish report realized this task by presenting its own definition of the country (OSF, lines 404–406). The English experts criticized that the non-physical domains 'do not [. . .] have the same priority status' (OSF, line 225). Seven countries observed terminological and linguistic challenges around PL in their countries. Some comparisons resulted in other hybrid-like terms, such as 'sports-motor literacy' in Bulgaria (OSF, line 120), 'motoric literacy' in Croatia (OSF, line 126), 'critical movement literacy' (OSF, line 166), and 'movement identity' in the Netherlands (OSF, line 669). Interestingly, all three German-speaking countries (Austria, Germany, Switzerland) ascertained translation challenges or coexisting concepts (e.g. 'the ability to act' or 'action competence').

The descriptions of six curricula explicitly connected to philosophical foundations (France, Ireland, Netherlands, Northern Ireland, Romania, Wales) such as monism. Interestingly, six countries—consciously or unconsciously—drew on the description of a 'journey' to underline the processual character of learning advocated by the respective curriculum (Belgium, Greece, Ireland, Netherlands, Portugal, Wales). Many reports referred to a holistic approach underlying the curriculum conception. For instance, the curriculum in Northern Ireland 'promotes the holistic development of all learners' (OSF, lines 676–677) and the Portuguese curriculum grounds on the 'interrelated domains that support the holistic development of PL to help all generations to lead active, healthy and fulfilling lifestyles' (OSF, lines 811–812). Adopting a more critical perspective, the Dutch report stated that 'the ingredients are recognizable, but the holistic idea of PL (i.e. the interplay of the individual factors) is not' (OSF, lines 644–645). Six countries explicitly stressed that the individual stands in the centre of PE attention, as in line with the PL idea. For instance, the Norwegian representatives concluded that the 'emphasis in the

curriculum is clearly positioned within a student-centred perspective' (OSF, lines 711–712). In England, however, a 'child-centred approach is not referenced or does not appear to be a priority' (OSF, lines 236–237).

A total of 24 reports addressed health aspects when explicating the compatibility of PE with PL. For instance, the purpose of Latvian PE is 'to strengthen a person's health and ensure his physical development, integrating with intellectual, moral, aesthetic, ecological education, promoting comprehensive development of personality' (OSF, lines 613–615). Interestingly, numerous reports explicitly cited well-being as an outcome, encompassing Austria's 'connecting between PL and overall well-being' (OSF, lines 32–33). Despite this prominent aspect, six countries (without direct request) pointed to a theory-practice disconnect, criticizing the insufficient translation of the PL ideas, albeit advocated by the curriculum, into practice. For instance, the Cypriot report revealed: 'Theoretically, the curriculum is in harmony with the core principles of PL [. . .]. Nevertheless, in practice, PE implementation at schools, unfortunately, focuses on the development of physical competencies merely, and the approach is sports-oriented' (OSF, lines 150–154). The entire report from Romania was deliberately structured into a declarative and a reality section, directly serving to demonstrate this disconnect (OSF, lines 835–883).

4. Discussion

4.1. Synthesis

The goal of the present study was to investigate the adoption of PL within European PE curricula—a research area that has been largely unexplored so far. While PL as a verbal expression was absent among most curricula, many countries portrayed curricular content and goals that are endorsed by PL descriptions (e.g. in connection with the domains). Accordingly, we identified high agreement both quantitatively and qualitatively at the surface level of the curriculum. However, both data sources also revealed a heterogeneous picture concerning the alignment of current PE with the PL concept once analysing the 'stance' and 'spirit' (i.e. the deep structure) of the curricula alongside their practical implications. To our understanding, this is the first study that has derived manifest PL indicators and quantified the compatibility with PE on the country level. In addition to variations across countries, we also identified varying agreement to the different statements. Taking responsibility for engagement in physical activities and ensuring inclusion and accessibility was rated as being most frequently addressed by European curricula. This finding may reflect that both teaching personal and social responsibility and fostering inclusion in PE are prominent and established topics of the field (Pozo et al., 2018; Tant & Watelain, 2016). In contrast, there was least agreement to the availability of assessment or charting methods for individual progress, which reflects the criticism that existing assessments emphasize interpersonal comparisons instead of enabling personal growth (N. R. Green et al., 2018; Young et al., 2021). Across Europe, PE does not fully acknowledge individual backgrounds and the 'unique journey' that each person experiences throughout life (Pot et al., 2018; Rudd et al., 2020; Schaerz & Balderson, 2020), which conflicts with most phenomenological assumptions of PL (Whitehead, 2007, 2019). Similarly, current approaches do not sufficiently enable voice (i.e. student participation) and provide choice (e.g. student-centred activity options). In this regard, the application of open tasks and

differentiation methods has the potential to dissolve the teacher-driven character of PE (Colquitt et al., 2017) and better harmonize with the PL approach. Lastly, few countries offered concrete assessment tools for supporting the learning process. Researchers have already criticized the absence of good instruments for charting student progress (N. R. Green et al., 2018; Young et al., 2021). The PE community is advised to draw on experiences with and recommendations on assessment dissemination at scale (Goss et al., 2022; Jensen-Doss et al., 2018) without neglecting statutory regulations about proper implementation in the school setting.

When comparing the alignment of PE with PL within Europe, we registered the highest compatibility values for the Northern countries and the lowest for the Central and Eastern European countries. Researchers should consider the complex historical, institutional, political, and cultural background of the different regions (Hardman, 2008, Naul & Scheuer, 2020). The Northern curricula demonstrated prominent connections to self-organization as well as to balanced physical and psychological health. In contrast, the Central and Eastern European curricula revealed a stronger sports and performance orientation. The European countries have developed educational traditions and epistemic convictions over decades (Halász, 2012), which can hardly be cut instantly and may stand in opposition to a person-centred solutions as advocated by UNESCO (2015). An alignment process may take time and is at least based on open-minded staff with corresponding educational background favouring such a progressive concept. In summary, we identified conflicting results in terms of the role of language. The qualitative material has uncovered terminology and translation problems in the context of the curriculum and, therefore, corroborated a recent study from the broad PL field (Carl, Bryant, et al., 2023). In contrast, the quantitative analysis did not yield significant differences between anglophone and non-anglophone countries. However, this finding may be attributed to the low number of English-speaking countries undermining statistical power.

One strength of the present curriculum analysis is that we not only considered goals, content, and learning outcomes but, through the items, also covered the implications for teaching, organizational strategies, and pedagogical methods that indirectly arise from the formal curriculum and shape the overall learning experience (Vlček, 2019). While many curriculum scholars focused primarily on content and objectives, the deep structure emphasizes how these goals are achieved through teaching approaches, methods, and classroom management. The promotion of PL requires more than just focusing on what students learn, it also requires an understanding of how to learn, with whom, when, and where they learn (Whitehead, 2010). For example, teaching strategies that encourage personal reflections and own problem-solving are crucial for students not only to acquire physical skills but also to apply them in real-world contexts and foster lifelong engagement with PA (Houser & Kriellaars, 2023; Pot et al., 2018; Whitehead, 2010).

Rather than viewing pedagogical models as separate or even competing, PE teaching might benefit from a broad spectrum of learning experiences, promoting physical, cognitive, affective, and social development simultaneously (Dudley et al., 2022). Pedagogical models are characterized by different core assumptions and priorities (Fernandez-Rio & Iglesias, 2024), with PL embodying different assumptions and probably lying transversally across different approaches. In line with this hybrid function, teaching PL-informed PE is marked by high claims and teachers must possess a number of skills to guide classes in line with PL (Houser & Kriellaars, 2023). Researchers and practitioners have

generated several PL interventions for PE teachers, serving as an example of prospectively oriented professional development (Edwards et al., 2019; Simpson et al., 2022). Unfortunately, previous studies have shown mixed readiness by PE teachers to undertake changes in their pedagogical acting, especially if these were externally inspired or initiated (Kern & Kim, 2018). Professional development within PE should consider the teachers' personality, draw on the benefits of a community of practice, and acknowledge the relevance of emotions for pedagogical change (Beni et al., 2021; Fletcher & Hordvik, 2023; Schnitzius et al., 2021). In this sense, teacher programmes on PL should focus on co-constructing change rather than externally forcing it. Importantly, curriculum change is a highly politicized field that can quickly provoke resistance and even reactive stances, especially in contexts where hierarchical structures and power asymmetries exist (Becher & Maclure, 2024; Broom, 2016; Joseph, 2020).

4.2. Limitations and contributions of the study

We identified the following limitations of our study. First, though revealing promising initial reliability coefficients, we identified limited opportunities regarding the exploration of psychometric characteristics of our quantitative survey. We placed emphasis on the theoretical foundation of the survey through a multiple-eye procedure involving PL experts across different countries (content validity). A more elaborate analysis of reliability and factorial validity would have required the recruiting of a disproportionately larger number of experts (typical recommendations are $N \geq 300$ individuals; see Kyriazos, 2018), which lay outside the scope of this study. Instead, we aimed to gather experts with outstanding knowledge about the PE/PL situation in their country with a focus on information quality. Given the complexity behind the questions, we would advise against employing the present questionnaire with teachers. Second, the representatives had different academic backgrounds and worked with different target groups (e.g. expertise in primary vs. secondary schools). In this context, we recommended a tandem constellation for the different countries to enable conversations, increase reliability, and reduce single-person bias. A methodological alternative would have been to conduct an independent rating of the items per expert, enabling the calculation of inter-rater reliability. However, we prioritized discussion among the country experts, as there was often complementary expertise per country (i.e. not all experts had a pedagogical background) and a shared view indirectly fostered a better understanding of the PL concept, many items were new and not easy to answer, and the submitted qualitative data (i.e. one report per country) was already comprehensive to analyse. Third, all evaluations were based on subjective statements. While the qualitative material acknowledged country-specific narratives resulting in inductive insights, we attempted to provide more orientation for the quantitative part by introducing well-comprehendible opposing statements. We considered the mixed methods approach the most convenient and insightful way to address the research questions. Fourth, our study primarily used the PE curricula as the subject of evaluation and an examination of actual practices (e.g. through observations) would have delivered a worthwhile complementary perspective. Moving from the formal curriculum level to the practical level, future studies should seek insights

into actual teaching practices, pedagogical methods, and tangible organizational strategies. Fifth, some single European countries were still missing in this study, amongst which Russia and Belarus constituted the biggest countries. The present study delivered an important perspective on the compatibility of European PE with the student-centred concept of PL.

The present findings can help illustrate differences between the different countries in Europe. Approximately ten years after UNESCO (2015)'s release of the QPE guidelines, we stated heterogeneous implementation of PL into the PE curricula, especially when disentangling their deep structure. Analyses on the educational situation in Australia pointed to challenges with integrating PL into pedagogical action due to differing policies for schools (Scott et al., 2021), thus proposing PL as an additional proposition within the health and physical education curriculum (Brown & Whittle, 2021). Likewise, researchers from Indonesia identified a potential for more strongly aligning the national curriculum with PL (Bulqini et al., 2021). More than a decade ago, academics called for stronger alignment of PE with PL (e.g. Lloyd, 2011; Whitehead, 2013). In this regard, our study from the pedagogical sector stood in line with analyses from health science showing that innovations mostly take years and decades until reaching routine delivery (L. W. Green et al., 2009). Most importantly, PE is historically, professionally, societally, and culturally situated within the traditions of the different European countries. Sport pedagogy also critically discusses the PL concept. For instance, Quennerstedt et al. (2021) admonished that many actors tend to adopt 'beatific narratives' to describe PL by overly highlighting the potential benefits of a PL-inspired PE in contrast to categorically inefficient and 'old-fashioned' practices. In any case, the accumulation and dissemination of PL knowledge would ideally require collaborative efforts across disciplinary boundaries to permeate work in PA contexts. We invite stakeholders and policymakers, irrespective of their attitude towards the PL concept, to draw on the present insights for upcoming curriculum discussions (e.g. position statements, reforms, international alignment).

5. Conclusion

The PL concept has the potential to support holistic PE. Most countries in Europe have not yet followed UNESCO's encouragement to harmonize PE with the multidimensional PL concept. Methodologically, we derived 15 indicators for PL-compatible PE with the potential, if employed longitudinally, to inform international education policy monitoring. The present results stressed the cultural situatedness of PE, while the Northern countries could serve as 'role models' in demonstrating how to embody a student-centred approach to learning in the PE setting. The findings advocate for more consistently integrating international perspectives within pedagogical projects. Although caution is warranted, the findings indicated that PL alignment in its deep manifestations (i.e. not surface level of the curricula) do not necessarily follow an anglophone gradient. Universities have the potential to communicate the most recent concepts and equip younger generations with the knowledge and skills to facilitate practices in PE underpinned by the PL approach. Specifically designed professional development for PE teachers can enrich the didactical repertoire among practicing educators when adhering to the suggestions for pedagogical change.

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ORCID

J. Carl http://orcid.org/0000-0001-7393-0450
K. De Martelaer http://orcid.org/0000-0001-8242-2669
A. Kelso http://orcid.org/0000-0002-2104-2926
I. Müller http://orcid.org/0000-0002-6397-9979
S. Radisavljević Janić http://orcid.org/0000-0002-7986-1561
M. Semyonova http://orcid.org/0000-0002-4725-0686

Authors' contributions

Conceptualization: Johannes Carl, Kasper Salin, Petr Vlcek, Cristiana D'Anna & Peter Elsborg; Country-specific reviews and tables: All authors, except of the first and last author; Data curation: Kasper Salin; Formal analysis: Johannes Carl & Kasper Salin; Funding acquisition: no specific funding; Investigation: Johannes Carl & Kasper Salin; Methodology (primary development): Johannes Carl & Kasper Salin; Methodology (feedback): Hannah Goss, Suzanne Lundvall & Iuliia Pavlova; Project administration: Johannes Carl & Kasper Salin; Software: Kasper Salin; Supervision: Petr Vlček & Cristiana D'Anna; Revalidation: All authors, except of the first author; Visualization: Johannes Carl; Writing—original draft: Johannes Carl; Writing—review & editing: All authors. All authors have read and approved the final version of the manuscript.

Data availability statement

We transparently disclose all qualitative reports (raw material) from the country representatives and authors in Open Science Framework (OSF) directly after publication under this doi: 10.17605/OSF.IO/6MPQ8. Quantitative data of the current study were only reported on the aggregate level, but primary data can be accessed from the corresponding author upon reasonable request.

Ethics

This study met the ethical requirements of the included countries, and especially Finland as the country where the project is hosted, for (if required) scanning national documents (publicly available information) and transforming aggregated information into a cooperatively developed expert survey.

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