

Article type:
Original Research



A Progress-Oriented Assessment Model for Physical Literacy in Secondary School Physical Education: A Grounded Theory Study

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How to cite this article:

Gorzin, T., Saemi, H., Asghar Bayani, A., & Fakouri Hajiyar, H. (2026). A Progress-Oriented Assessment Model for Physical Literacy in Secondary School Physical Education: A Grounded Theory Study. *Foresight and Health Governance*, 3(1), 1-10. <https://doi.org/10.61838/jfhg.57>



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ABSTRACT

Conventional assessment in school physical education frequently privileges short-term physical performance and fixed motor benchmarks. Such practices may underrepresent the cognitive, affective, and developmental dimensions that are central to physical literacy. This study aimed to develop a context-sensitive, progress-oriented assessment model for secondary school physical education based on the paradigm of physical literacy. A qualitative grounded theory design was used. Sixteen experts in curriculum studies and physical education were selected through purposive and snowball sampling. Data were collected through semi-structured interviews and analyzed through open, axial, and selective coding in MAXQDA. Trustworthiness was addressed through member checking, peer debriefing, audit-trail documentation, and constant comparison. The analysis generated 58 initial codes, 9 subcategories, and 3 overarching categories. The core phenomenon was the establishment of holistic, formative, and progress-oriented assessment. The model comprised causal conditions, including the need to broaden the goals of physical education; contextual conditions, including quantitative grading structures and unequal school infrastructure; intervening conditions, including the absence of formal protocols and the dominance of entrance-exam culture; strategies, including standardized rubrics, ipsative assessment, portfolios, self-assessment, peer assessment, and descriptive feedback; and expected consequences, including fairer grading, stronger teacher accountability, holistic student development, and increased physical self-efficacy. The proposed model reframes assessment from a mechanism for ranking students to a pedagogical process that supports learning, inclusion, and lifelong active living. A preliminary 60-20-20 weighting structure is proposed, with 60% allocated to psychomotor performance, 20% to cognitive knowledge, and 20% to affective-social competence. The weighting requires empirical validation, and implementation requires formal assessment protocols, teacher professional development, and infrastructure-sensitive interpretation of student progress.

Keywords: physical literacy; progress-oriented assessment; physical education; secondary school; grounded theory; ipsative assessment; formative assessment

Introduction

Physical education has increasingly been positioned as a strategic component of public health, educational equity, and human development rather than as a marginal school subject. UNESCO's quality physical education guidelines frame physical education as a right of children and adolescents and emphasize inclusive, meaningful, and developmentally appropriate

learning experiences (Unesco, 2015). Similarly, the World Health Organization's global action plan on physical activity highlights the need for systems that make active living possible across the life course (World Health, 2018). In this policy context, school physical education is expected not only to improve fitness but also to cultivate knowledge, motivation, confidence, social responsibility, and sustained participation in movement.

The concept of physical literacy provides an appropriate theoretical foundation for this expanded role. Physical literacy is commonly understood as a lifelong disposition involving motivation, confidence, physical competence, knowledge, and understanding that enables individuals to value and take responsibility for participation in physical activity (Whitehead, 2010, 2019). This framing moves physical education beyond isolated motor skills and fitness records toward a more integrated conception of human movement, self-efficacy, and agency. Assessment practices, however, often lag behind this conceptual shift.

Assessment is not a neutral technical procedure; it shapes what teachers teach, what students value, and how educational success is defined. In physical education, traditional product-oriented assessment has often emphasized records, standardized performance tests, and final scores while giving limited attention to learning trajectories, tactical understanding, ethical conduct, self-regulation, and participation (Kirk, 2009). This is problematic because physical literacy cannot be reduced to a single physical record or a comparison with class norms. Physical literacy assessment needs to capture the interaction among movement competence, cognition, affect, and social responsibility (Dudley, 2015; Young et al., 2021).

The distinction between assessment of learning and assessment for learning is particularly relevant to secondary school physical education. Formative assessment supports learning when it provides feedback, involves learners in judgment, and informs subsequent teaching (Black & Wiliam, 1998). In physical education, assessment literacy requires teachers to design practices that are valid, transparent, inclusive, and pedagogically meaningful (DinanThompson & Penney, 2015). Digital or portfolio-based assessment can also document practical learning more authentically than final performance-only tests, provided that validity and equity are addressed (Penney et al., 2012).

Secondary school is a critical period for the stabilization or abandonment of active lifestyles. Adolescents are sensitive to peer comparison, body image, external judgment, and perceived competence. Fixed performance norms may therefore discourage students whose biological maturation, anthropometric characteristics, disability status, prior opportunities, or school context make standardized records difficult to achieve. A progress-oriented or ipsative approach, in which the student is compared primarily with their own baseline, offers a more equitable alternative. This approach does not eliminate performance expectations; rather, it interprets achievement in relation to individual growth, effort, and learning opportunities.

In Iran, policy documents such as the Fundamental Transformation Document of Education and the National Curriculum emphasize holistic development, including the biological and physical domain (Supreme Council of the Cultural, 2011). Yet previous Iranian studies have reported persistent gaps between curricular ideals and school-level implementation, including the marginalization of physical education, inconsistent assessment criteria, inadequate infrastructure, and the dominance of examination-oriented schooling (Aghazadeh & Saneh, 2013; Ershad et al., 2022; Hassani, 2020; Razavi et al., 2014; Taslimi & Babouie, 2018; Varahram et al., 2024; Zolghadri et al., 2019). These conditions make a locally grounded assessment model necessary.

Although international literature has advanced the conceptual basis of physical literacy assessment, fewer studies have generated a grounded, context-sensitive model for progress-oriented assessment in secondary school physical education. The present study addresses this gap by developing a model derived from expert interviews and organized through grounded theory. The guiding research question was: What are the components, relationships, and implementation requirements of a progress-oriented physical education assessment model based on physical literacy for secondary schools?

Methodology

Design

This study used a qualitative grounded theory design. The primary analytic framework was Strauss and Corbin's (1998) systematic grounded theory, because the analysis relied on open, axial, and selective coding and a paradigmatic model (Strauss & Corbin, 1998). Charmaz's (2014) constructivist perspective was used only as a sensitizing lens for attending to context and meaning, not as a separate coding procedure (Charmaz, 2014). The reporting structure was strengthened with reference to qualitative reporting standards, including SRQR and COREQ principles (O'Brien et al., 2014; Tong et al., 2007).

Participants and sampling

Participants were experts in curriculum planning, physical education, sports sciences, and school-based physical education assessment. Purposive sampling was used to recruit specialists with relevant academic qualifications and professional experience. Snowball sampling was then used to identify additional information-rich participants. Inclusion criteria were a doctoral or master's degree in a related field and at least 10 years of teaching, research, or professional experience related to curriculum or physical education. Sampling continued until theoretical saturation, which was reached after 16 interviews. Participant eligibility was also judged by relevance to school-based physical education assessment.

Table 1. Participant characteristics

Characteristic	Category	n
Sex	Male	9
Sex	Female	7
Highest degree	Doctoral degree	10
Highest degree	Master's degree	6
Primary expertise	Physical education / sport sciences	9
Primary expertise	Curriculum planning / educational sciences	7
Age	Range	40-58 years
Age	Mean (SD)	47.6 (5.5) years
Relevant professional experience	Minimum inclusion threshold	10 years or more
School-assessment relevance	Eligibility condition	Curriculum or physical education assessment experience

Data collection

Data were collected through semi-structured interviews. The interview protocol focused on four domains: limitations of the current assessment system, components of a desirable assessment model, appropriate tools for assessing physical literacy, and transformative approaches to assessment in upper-secondary physical education. Interviews lasted approximately 40-45 minutes. With consent, interviews were audio-recorded and transcribed verbatim immediately after completion. Participants were anonymized using codes P1-P16. Example prompts asked participants to describe weaknesses in current grading, define assessable components of physical literacy, identify feasible school-based tools, and explain how student progress should be documented.

Data analysis

Data analysis was conducted in MAXQDA. First, open coding was used to identify meaning units related to assessment goals, domains, tools, constraints, and expected outcomes. Second, axial coding was used to group conceptually similar codes into subcategories and to specify relationships among conditions, actions, and consequences. Third, selective coding was used to integrate categories around the core phenomenon and to construct the final paradigmatic model. Constant comparison was used throughout the analysis to refine categories, reduce redundancy, and strengthen theoretical density. Theoretical saturation was operationally defined as the point at which consecutive interviews no longer produced new axial categories and existing categories were sufficiently dense and internally coherent; this criterion was checked during constant comparison before sampling stopped at 16 interviews.

Trustworthiness and reflexivity

Trustworthiness was addressed through credibility, confirmability, and auditability procedures (Lincoln & Guba, 1985). Credibility was strengthened through member checking, in which selected interpretations were returned to participants for verification. Confirmability was supported by peer debriefing with two qualitative-method specialists. An audit trail documented sampling decisions, coding revisions, category development, and model construction. Reflexive attention was given to the possibility that professional assumptions about the value of physical education could influence interpretation; therefore, the research team repeatedly compared analytic claims with coded data and participant codes.

Research Findings

The analysis produced 58 initial codes. Through constant comparison and conceptual integration, these codes were organized into 9 axial subcategories and 3 overarching categories: holistic physical literacy domains, methodological and instrumental assessment structure, and implementation context with systemic challenges. These categories formed the basis of the core phenomenon: establishing holistic, formative, and progress-oriented assessment in secondary school physical education.

Table 2. Coding structure and extracted categories

Overarching category	Axial category	Representative open codes
Holistic physical literacy domains	Psychomotor performance assessment	Motor competence; mastery of basic and sport-specific skills; technical execution; health-related fitness including strength, endurance, flexibility, and speed.
Holistic physical literacy domains	Cognitive assessment	Knowledge of rules and tactics; scientific literacy in exercise, health, nutrition, and safe movement; understanding why and how movement supports health.
Holistic physical literacy domains	Affective-social competence assessment	Sportsmanship; respect; fairness; responsibility; emotional regulation; positive interaction; active participation; sustained effort.
Methodological and instrumental structure	Timing and assessment phases	Diagnostic baseline assessment; formative and continuous assessment; summative assessment for documenting final achievement.
Methodological and instrumental structure	Diverse assessment tools	Standardized performance tests; observational checklists; behavioral rubrics; oral/written knowledge tasks; portfolios; self-assessment; peer assessment.
Methodological and instrumental structure	Assessment orientation	Ipsative assessment; comparison with personal baseline; descriptive feedback; fairness based on individual growth and starting level.
Implementation context and systemic challenges	Structural and managerial barriers	Excessive reliance on quantitative grading; lack of formal protocols; inconsistent supervision; low institutional status of physical education.
Implementation context and systemic challenges	Contextual and environmental variables	Infrastructure inequality; economic differences among schools; developmental differences; gender-related needs; student-specific characteristics.
Implementation context and systemic challenges	Professional development and monitoring requirements	Teacher training; formal assessment protocols; descriptive reporting; supervision; bias reduction; manageable documentation workload.

Holistic domains of physical literacy assessment

The first major category indicated that the desirable assessment system must evaluate the three interdependent domains of physical literacy. Participants did not reject physical performance assessment; rather, they argued that performance should be interpreted as one part of a broader learning profile. The psychomotor domain remained central because physical education is movement-based. However, participants emphasized that technical quality, movement control, and improvement should be assessed alongside final records. This finding supports a 60% weighting for psychomotor performance.

The second domain was cognitive knowledge. Participants viewed knowledge of rules, tactics, safety, nutrition, and the scientific basis of exercise as necessary for sustainable participation. They argued that students in secondary school should understand the rationale behind movement rather than merely reproduce movement patterns. A 20% weighting for cognitive learning was therefore proposed.

The third domain was affective-social competence. Participants repeatedly linked physical education assessment with responsibility, fairness, emotional regulation, effort, participation, and respect. These competencies were treated as assessable learning outcomes rather than informal classroom impressions. A 20% weighting for affective-social competence was proposed. The resulting 60-20-20 structure preserves the movement-based identity of physical education while preventing assessment from becoming mechanically record-oriented. The 60-20-20 structure should therefore be interpreted as an expert-informed preliminary weighting synthesized from repeated emphasis in the interviews; it was not generated through psychometric weighting, Delphi consensus, or field validation.

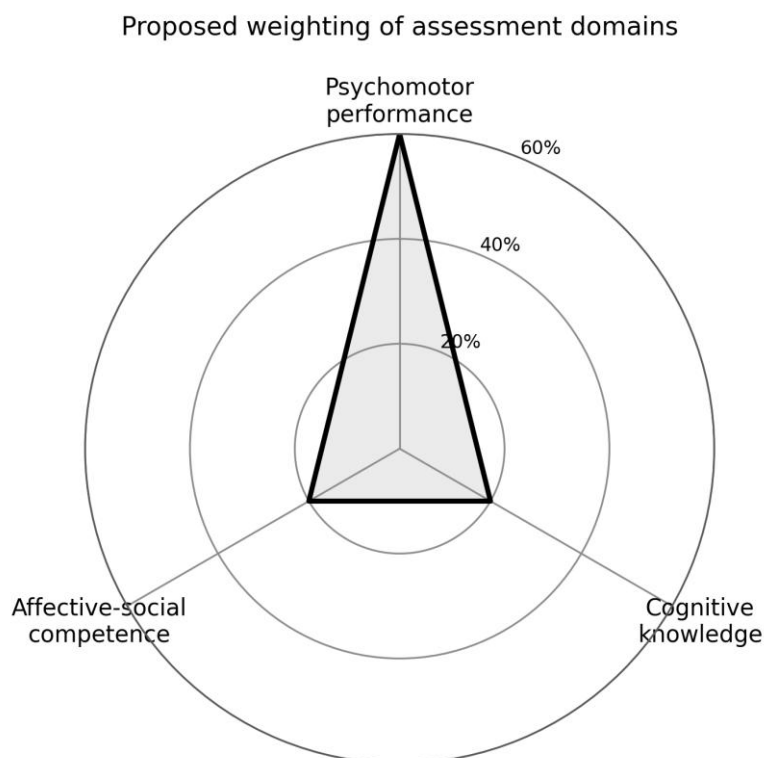


Figure 1. Proposed weighting model for the three domains of learning in physical education assessment.

Methodological and instrumental structure

The second major category concerned how assessment should be implemented. Participants described assessment as a continuous pedagogical process rather than a single end-of-term event. Diagnostic assessment identifies each student's starting point, formative assessment provides feedback and guides instruction, and summative assessment records final achievement. This temporal structure allows growth to become visible and reduces the risk that one final performance record will define the student's entire learning profile.

Participants also emphasized methodological pluralism. Standardized fitness and skill tests were considered useful but insufficient. Observational checklists, behavioral rubrics, student portfolios, oral or written knowledge tasks, self-assessment, and peer assessment were identified as necessary complementary tools. In this model, portfolios and descriptive feedback are not decorative additions; they are mechanisms for documenting progress, participation, effort, and reflection.

The central methodological shift was ipsative assessment. In this approach, the student's current performance is interpreted in relation to their own baseline, not only against class averages or fixed norms. Participants regarded this principle as essential for educational justice because students enter secondary school with different physical histories, maturation patterns, opportunities, and school resources.

Implementation context and systemic challenges

The third major category showed that assessment reform cannot be separated from institutional context. Participants identified several structural barriers: overdependence on the 0-20 quantitative grading scale, absence of formal assessment protocols, inconsistency in supervision, and the low status of physical education compared with entrance-exam subjects. These barriers weaken the reliability and legitimacy of assessment because teachers may rely on self-made and inconsistent criteria.

Participants also highlighted environmental inequality. Schools differ in sport halls, equipment, outdoor space, class size, and socioeconomic context. Applying identical performance thresholds across unequal environments may produce unfair judgments. The model therefore treats infrastructure, student characteristics, and developmental differences as contextual variables that should moderate interpretation. This does not mean lowering standards; it means interpreting progress through a fairer and better-documented evidence base.

The final grounded theory model was organized around six components: causal conditions, contextual conditions, intervening conditions, strategies, the core phenomenon, and potential consequences. Table 3 summarizes the model.

Table 3. Paradigmatic model of progress-oriented physical education assessment

Paradigm component	Extracted meaning	Participant source codes
Core phenomenon	Establishing a holistic, formative, and progress-oriented assessment system that balances psychomotor, cognitive, and affective-social domains.	P8, P12, P15
Causal conditions	Need to broaden the aims of physical education, motivate students with different ability levels, and assess physical literacy rather than isolated records.	P10, P12, P13, P15
Contextual conditions	Quantitative grading structure, unequal infrastructure, and the existing formal sequence of diagnostic, formative, and summative assessments.	P2, P4, P16
Intervening conditions	Lack of written protocols, inconsistent supervision, entrance-exam culture, and poor fit between fixed tests and local school conditions.	P3, P6, P7, P9
Strategies	Develop standardized rubrics, apply ipsative assessment, diversify tools, use portfolios and descriptive feedback, and strengthen monitoring.	P6, P8, P12, P15
Potential consequences	Expected fairer grading, higher teaching quality, better accountability, holistic student development, and stronger physical self-efficacy.	P4, P8, P12, P15

Paradigmatic model of progress-oriented PE assessment

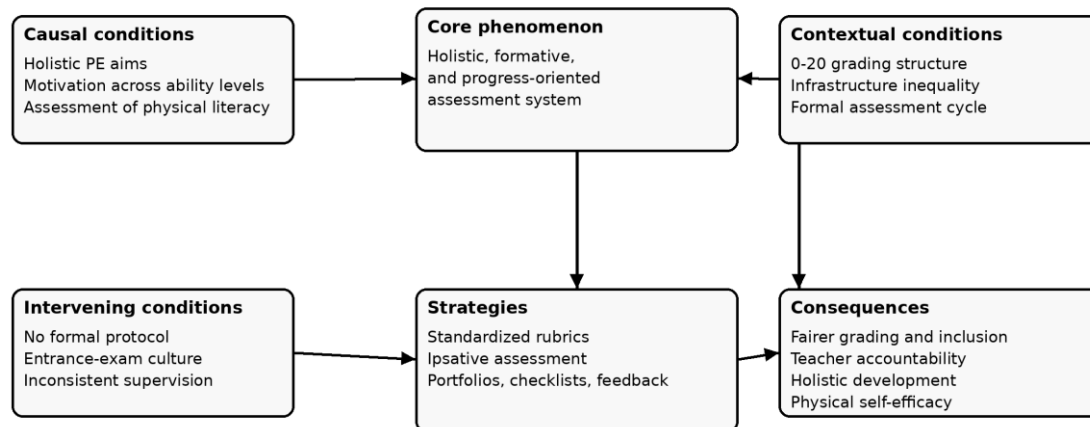


Figure 2. Paradigmatic model of progress-oriented assessment in secondary school physical education.

Operational assessment matrix

To translate the model into school practice, the findings were synthesized into an operational matrix. The matrix links each domain of assessment to indicators, recommended tools, timing, and evidence sources. It is intended as a framework for local adaptation rather than as a psychometrically validated instrument; therefore, it should be pilot-tested before high-stakes use.

Table 4. Operational matrix for implementing the proposed assessment model

Domain and weight	Indicators	Recommended tools	Timing	Evidence for judgment
Psychomotor performance - 60%	Motor competence; technical execution; health-related fitness; improvement in skill performance.	Performance tests; skill rubrics; teacher observation; video-supported review where available.	Diagnostic, formative, and summative.	Baseline-to-final progress, quality of movement, safe execution, and documented performance.
Cognitive knowledge - 20%	Rules, tactics, health knowledge, safety, nutrition, principles of training, and reflection on movement.	Short written tasks; oral questioning; tactical problem-solving; portfolio reflections.	Mainly formative, with summative documentation.	Accuracy of explanations, tactical reasoning, and ability to connect knowledge with practice.
Affective-social competence - 20%	Effort, participation, respect, fairness, responsibility, emotional regulation, teamwork, and persistence.	Behavioral checklist; self-assessment; peer assessment; teacher rubric; portfolio evidence.	Continuous formative assessment.	Repeated observed behavior, reflective evidence, and consistency across learning situations.

Discussion and Conclusion

This study developed a grounded model of progress-oriented assessment for secondary school physical education based on physical literacy. The central contribution of the model is its integration of three levels that are often treated separately: the content of assessment, the methodology of assessment, and the implementation context. The findings show that assessment reform in physical education cannot be achieved simply by adding new tests. It requires a conceptual shift in what counts as evidence of learning.

The first major finding was that assessment should reflect the multidimensional structure of physical literacy. This finding aligns with Whitehead's (2010, 2019) view of physical literacy as a lifelong and holistic disposition rather than a narrow measure of fitness (Whitehead, 2010, 2019). It also supports Dudley's (2015) argument that observable physical literacy includes cognitive, affective, and physical elements (Dudley, 2015). In the present model, psychomotor performance remains

the largest component, but cognitive and affective-social domains receive formal weighting. This weighting is important because what is weighted tends to become what is taught, practiced, and valued.

The second major finding concerned the pedagogical function of assessment. The model shifts the purpose of assessment from sorting students to supporting learning. This is consistent with Black and Wiliam's (1998) (Black & Wiliam, 1998) conception of formative assessment and with physical education research emphasizing assessment literacy and authentic evidence of student learning (DinanThompson & Penney, 2015; Penney et al., 2012; Young et al., 2021). The proposed use of portfolios, descriptive feedback, self-assessment, and peer assessment gives students a more active role in judgment and reflection. Such practices are particularly relevant to physical literacy because motivation, confidence, and responsibility cannot be captured by final performance tests alone.

The third major finding was the importance of ipsative assessment. In secondary school, students differ substantially in maturation, prior sport exposure, confidence, anthropometric characteristics, and opportunities for practice. Fixed performance norms can therefore reproduce inequality when they ignore baseline differences. The progress-oriented model addresses this by comparing each student with their own starting point while still documenting technical quality, knowledge, and participation. This makes assessment more inclusive without abandoning rigor.

The fourth major finding concerned systemic constraints. The dominance of quantitative grading, lack of official protocols, inconsistent monitoring, infrastructure inequality, and entrance-exam culture can all undermine assessment reform. This finding is consistent with Iranian research documenting implementation gaps in physical education and the marginalization of the subject within school priorities (Ershad et al., 2022; Hassani, 2020; Razavi et al., 2014; Taslimi & Babouie, 2018; Varahram et al., 2024; Zolghadri et al., 2019). The model therefore treats context not as background noise but as part of the theory. Assessment standards must be accompanied by teacher training, monitoring, and context-sensitive interpretation.

At the practical level, the model suggests several provisional applications for educational policy and classroom assessment. Grading regulations can be revised so that cognitive and affective-social learning outcomes are formally considered alongside psychomotor performance. Schools can pilot baseline assessment at the beginning of the term, report individual growth at the end of the term, use teacher-friendly rubrics for motor competence, knowledge, participation, responsibility, and sportsmanship, and use portfolios, preferably digital when infrastructure allows, to document progress, feedback, reflection, and behavioral evidence. In-service teacher training is also needed on ipsative assessment, formative feedback, rubric design, bias reduction, and infrastructure-sensitive interpretation of performance outcomes. Digital portfolios and simple dashboards may help teachers store evidence, track baseline-to-current progress, and communicate development to students and parents; however, technology should support pedagogical judgment rather than replace it. Because the model has not yet been field-tested, these practical applications should be read as provisional recommendations rather than demonstrated effects.

The study also has limitations that should be considered when interpreting the model. It was based on expert interviews and did not include direct interviews with students, parents, or school administrators; therefore, future research should examine whether the model is understandable, acceptable, and feasible for these groups. The proposed weighting structure is grounded in expert judgment but has not been psychometrically validated, so future mixed-methods studies should examine reliability, validity, inter-rater agreement, and predictive relationships with motivation, physical activity, and self-efficacy. Because the model was developed in the context of Iranian secondary schools, comparative studies across regions,

school types, and socioeconomic contexts are needed to evaluate transferability. Future work should also develop and pilot a digital portfolio system or assessment dashboard that supports formative feedback while protecting student privacy and minimizing teacher workload.

Conclusion

The study proposes a preliminary conceptual progress-oriented assessment model that reframes physical education assessment as a developmental and inclusive process. The model integrates psychomotor performance, cognitive knowledge, and affective-social competence and connects them to assessment phases, tools, contextual constraints, and expected outcomes. The proposed 60-20-20 structure may help maintain the physical identity of the subject while ensuring that knowledge, participation, responsibility, and personal growth are not ignored.

The model may support a transition from assessment of learning to assessment for learning. By documenting each student's progress relative to their own baseline, the model may reduce unfair comparison, strengthen motivation, and support physical self-efficacy. Its successful implementation requires formal assessment protocols, professional development for teachers, descriptive reporting, infrastructure-sensitive interpretation, and stronger institutional recognition of physical education as a core educational subject.

Acknowledgments

The authors would like to thank the experts, managers, and academic participants who contributed to this study.

Authors' Contributions

Authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

AI use statement

Artificial intelligence tools were used only for language polishing, formatting support, and editorial consistency under author supervision. The authors remain fully responsible for the scientific content, analysis, interpretation, and final text.

Ethical Considerations

This study was conducted using interview and questionnaire data. Participation was voluntary, and the confidentiality of participants' responses was preserved. The research procedure was designed to avoid harm to participants and to respect the principles of informed participation and academic integrity.

Transparency of Data

Reasonable requests for research materials should be directed to the corresponding author, subject to university policies and participant confidentiality.

Funding

This research was carried out independently with personal funding and without the financial support of any governmental or private institution or organization.

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