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THE CONCEPT OF PHYSICAL LITERACY IN CHILD-CENTRED EDUCATION

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ABSTRACT

The notion of physical literacy (PL) has gained prominence as a pivotal concept in explaining why children learn physical skills, how they understand their practical application in everyday life, and why physical literacy is important for overall development. In a child-centered learning environment, the emphasis is on the importance of personal development, linking new knowledge to an existing knowledge base. This is consistent with the concept of PL. The review's objective was to define PL, identify its elements, and demonstrate its connection in a child-centered setting. A literature review was conducted in the Scopus database on the topic of PL and physical or sport education to investigate the research questions. Researchers analyzed the identified elements of PL according to the description of child-centred teaching approach.

Results. The concept is described more as the philosophically based and developed by Margaret Whitehead (2010). PL is defined as motivation, confidence, physical competence, knowledge, and understanding of the use of physical activity throughout the lifespan. The six elements of the PL conceptual framework – motivation, confidence and physical competence, environment, sense of self, self-expression and communication, and knowledge and understanding are applicable to a child-centered learning approach.

Conclusions. The concept of PL is essential for developing physical education to individualize the learning process and enable students to learn independently. The framework of PL elements aligns seamlessly with the child-centered sport pedagogy approach.

Keywords: *physical literacy, physical education, physical activity, child centered, pedagogy*

Introduction

The topic of physical literacy (PL) has emerged as a key concept in understanding children's motivation to learn physical skills, their understanding of their practical application in everyday life, and their role in overall development. Current data on children's physical health and physical activity habits show that only 18.8% of adolescents in Latvia engage in regular physical activity for one hour a day, while 22.8% of seven-year-olds are overweight (Sabiedrības veselības pamatnostādnes 2021.–2027. gadam, 2022). This negative trend, which is based on sedentary lifestyles, is a global concern (Carl et al., 2023).

PL is a critical developmental concept that promotes healthy physical, emotional, social, and cognitive development in young people (Santos et al., 2022).

UNESCO and the World Health Organization have acknowledged physical literacy as a key element in developing quality sports education curricula from pre-school to university (World Health Organization (WHO), 2019). The concept is an integral component of high-quality school sport education curricula (Santos et al., 2022, Hogan et al., 2023). This is supported by Bores-García et al. (2021), who argue that effective physical education pedagogy must include curricula and teaching methods that emphasize learning across multiple domains (Bores-García et al.. 2020). Dudley (2015) and Whitehead (2019) emphasise idea, asserting that 'quality' physical education must promote personal growth, foster a holistic environment, and adhere to a whole-child development approach (Dudley, 2015, Whitehead, 2019). Studies have shown that physical education has a significant impact on every area of learning, particularly in supporting children's social development (Bores-García et al., 2020). Further research is necessary to clarify the current definition of the concept of "physical literacy" and the interpretation of its concepts in recent years.

The Latvian Ministry of Education and Science has developed the National Education Guidelines 2021–2027 "Skills for the Future Society." The document confidently outlines the "fastest organizing and hardest to predict" future trends in educational development. One of the developments is learning to learn and a personalised approach (Rīkojums Nr. 436, 2021). Child-centered learning is undoubtedly one of the most promising directions of learning processes. The child-centered approach is focused on understanding and meeting a child's specific developmental needs. This approach is clear: children and adults are equal, communication is respectful, and each child's values, wishes, and needs are taken into account (Grava, 2018, Medne, 2018). The explanation of a child-centred learning approach aligns seamlessly with the principles of a child-centred learning approach. In a learner-centered learning environment, the emphasis is on personal development. New knowledge is linked to an existing knowledge base. The approach emphasizes students' autonomy in choosing what and when to learn, underscoring their personal responsibility for their learning journey (Bayram-Jacobs & Hayırsever, 2016, Power et al., 2019). The child becomes an active participant in learning, initiating, directing, and interpreting their own learning. The emphasis is on experiential learning, play, self-directed exploration, and individualized pacing, which is in line with the concept of physical literacy (Whitehead, 2019). Active learning environments are an essential element of the concept of physical literacy. In these environments, children can move freely and choose activities, while adults play a supportive role. This approach aligns with the child-centered pedagogical approach (Power et al., 2019). It is essential to clarify the concept of PL and its relevance to a child-centered approach to education.

The Conceptual Framework for Physical Literacy

The term "physical literacy" is most commonly used in the English-speaking countries of the United Kingdom, Australia and Canada. In most European countries PL is

not defined as a concept or principle in school curricula (Carl et al., 2023). However, in most European countries, school curriculum descriptions align with the concept of PL and its components. Germany uses the concept of "Physical Activity Related Health Competence" (PAHCO) (Sudeck & Pfeifer, 2016), which is consistent with the concept of PL. Despite the current low level of recognition of PL in Europe, national representatives in the field of sport and physical education anticipate that the concept will be explored in more depth in the near future (Carl et al., 2023). The concept of PL has undoubtedly been widely disseminated and applied in sport and physical education, using different names for the concept. PL is most commonly identified with movement skills, physical or motor competence, and movement or motor abilities (Almond, 2013; Edwards et al., 2017). These terms describe components that fall under one of the domains of PL. PL, as outlined in the comprehensive framework by Margaret Whitehead (2010), is indisputably associated with physical activity. PL can take the form of any form of physical activity that is personalised, meaningful, and individually engaging. It is clear that physical activity requires attention from the body and mind, which develop through life experiences and different situations (Durden-Myers et al., 2020).

The goal was to clarify the definition of the concept of PL, its constituent elements, and its role in child-centered education. Two research questions emerged during the subsequent research process: 1.Explain the concept of PL and its elements in a sport education framework. 2.How are the elements of PL manifested through a child/student/learner-centred approach in physical education?

Methodology

The first research question was clarified by conducting a literature review in the Scopus database. The keywords and Boolean operators AND, OR were used in the search: ("physical AND literacy") AND ("physical education") AND ("child-centered)" OR ("student-centered") OR ("learner-centered"). The review included all social science publications and research from 2021 to 2025. The literature review included all relevant publications in English from the social sciences field. These publications were studied based on their keywords, titles, and abstracts. The goal was to identify those that examined PL in the context of sport or physical education. In this literature review, researcher thoroughly studied all definitions of PL, atfter conducted a content analysis to identify the description and manifestation of the elements of PL in individual behavior as defined by Waithead (2010). There are six key elements: 1) motivation, 2) confidence and motor competence, 3) interaction with the environment, 4) sense of self, 5) self-expression through non-verbal communication and interpersonal interaction, 6) knowledge and understanding of body health. The second research question was answered by analyzing the domains and elements of PL in the context of a student-centered educational approach, in conjunction with indicators of child-centered pedagogy (see Table 1). This explanation of the child-centred learning approach clearly demonstrates the manifestation of the concept of PL in research.

Results

After the selection stage, 69 articles were screened. Following a thorough screening process, 32 reports were identified as being relevant to our review. Following a thorough review of the literature, 22 papers were excluded from the review due to their irrelevance to physical literacy in child-centered or student-centered or learner-centered physical education (n = 12), and the lack of explanation of physical literacy elements (n = 10). The review included ten publications that met the inclusion criteria. Nine publications definitively defined physical literacy as "the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engaging in physical activity throughout life" (Whitehead, 2010, Whitehead, 2019, International Physical Literacy Association (IPLA), 2017). One publication included Dudley's (2015) definition of physical literacy: "the ability to move skillfully and confidently using all the physical resources available to a person at any given time in a variety of contexts." PL is defined as continuous learning through enabling individuals to achieve their goals, develop their knowledge, movement, and potential, and alongside this, develop their capacity and skills to participate fully in their community and wider society (Godbout, 2023). Waithead's (2010) philosophical explanation of PL identified six elements of physical literacy and their manifestations in human behavior (Whitehead, 2010). The logic of describing the elements of the concept of PL explains why different individuals have different levels of participation in physical activity. It is clear that a person's previous experiences, intrinsic motivation, self-confidence, and physical competence shape their understanding and responsibility for engaging in physical activity throughout their life. There's a clear link between these elements and behaviors and the characteristics of a student-centered learning process (see Table 1).

Table 1 PL elements relationship with a child-centered approach

Nr. p. k.	Physical literacy element by Whitehead	Expressions in human behavior (Whitehead, 2010)	Child-centered learning approach (Bayram-Jacobs & Hayırsever, 2016, Power et al., 2019)
1.	Motivation	Positive attitude	• Child is an active participant, satisfaction of needs (interests), • Child can initiate and direct their own learning activities
2.	Confidence and physical competence	Movement with poise, coordinated movements and movement patterns	• Contributes to meeting development needs. • Child can learn from first-hand (direct) experiences. • Child can learn from practical (hands-on) experiences. • Child can learn through physically active experiences. • Adults monitor child's progress predominantly through observations.

Nr. p. k.	Physical literacy element by Whitehead	Expressions in human behavior (Whitehead, 2010)	Child-centered learning approach (Bayram-Jacobs & Hayırsever, 2016, Power et al., 2019)
3.	Interaction with the environment	Smooth interaction with the environment around you in everyday life and during physical activities	• Child can learn from explorative experiences • Different learning activities constantly available in the learning environment. • Learning takes place indoors and outdoors.
4.	Sense of Self	Perceives the body as part of the personality, the embodied nature of the human being.	• Understanding and meeting personal needs
5.	Self-expression through non-verbal communication and interpersonal interactions	Empatethic relationships with other people	• Respectful communication • Adult extends the child's thinking by asking open (rather than closed) questions. • Adults encourage children to reflect on their learning experiences
6.	Knowledge and understanding of body health	Awareness of movement experiences and awareness of the impact of physical activity on lifestyle and health	• Take responsibility for their own learning. • Contributes to the definition of tasks. • Child is challenged and supported on their stage (not age) of learning

Motivation

Motivation is the key to determining the will and interest to meet developmental needs. This determination is achieved through the exploration and interaction with every aspect of the environment. The child's freedom to choose activities and pursue their own interests unquestionably promotes intrinsic motivation (Power et al., 2019). This review definitively establishes motivation as a central element of PL (Wong, 2022; Godbout, 2023; Santos et al., 2022; Schmittwilken et al., 2024; Carcamo-Oyarzun et al., 2023; Choi et al., 2022; Hogan et al., 2023). Conditioned motivation is a short- and long-term trigger of physical activity. The short-term intrinsic motivation aspect is clear: the child's engagement in the physical activity offered is associated with immediate participation, emotion, and situation (Wong, 2022; Schmittwilken et al., 2024; Wilkie et al., 2023; Hogan et al., 2023; Petrie et al., 2021). Research focuses on the long-term motivational aspects related to identity formation and the development of lifestyle habits and routines (Godbout, 2023; Santos et al., 2022; Carcamo-Oyarzun et al., 2023; Choi et al., 2022; Stage et al., 2025). Two of the studies reviewed cover both short- and long-term aspects (Hogan et al., 2023; Schmittwilken et al., 2024).

Confidence and movement competence

Confidence and movement competence in the context of child-centered pedagogy are defined as meeting developmental needs through direct, physically active, and hands-on

learning experiences. The educator plays a pivotal role as the observer of the child's progress (Power et al., 2019). In the context of physical literacy, these aspects are explained as the use of coordinated, fluid movement patterns and skills (Whitehead, 2010). The review confidently describes the interplay between confidence and movement literacy in different ways. It has been described as the ability to move with confidence in different contexts (Godbout, 2023), the analysis of results from objective tests of the relationship between movement competence and confidence (Carcamo-Oyarzún et al., 2023), approaches to building confidence in sport lessons by trying out different roles (e.g., coach, player, and referee) (Choi et al., 2022), and using the "teaching games for understanding" (TUG) approach (Petrie et al., 2021). These publications frequently feature the interplay between movement competence and confidence, suggesting that sport lessons and physical activity are more than just physical exercise. It is clear that certain publications place more emphasis on the confidence-building aspect of physical education (Wong, 2022; Godbout, 2023; Schmittwilken et al., 2024; Hogan et al., 2023; Wilkie et al., 2023). A small number of publications emphasize aspects of movement literacy (Stage et al., 2025; Santos et al., 2022). A contemporary approach to physical literacy in the context of physical education is clear: it promotes movement competence and child confidence through pared practical movement experiences.

Interaction with the environment

A child's self-organised motor learning experience is intrinsically connected to the surrounding environment. Child-centered pedagogy is defined as the availability of activity-inducing learning environments, both indoors and outdoors (Power et al., 2019). Physical literacy is defined as a seamless interaction with the environment in everyday life and during physical activity (Whitehead, 2010). Four interaction themes are identified: the environment as a learning resource (Wong, 2022; Choi et al. 2022), adapting the environment to the needs of schools and students (Petrie et al., 2021; Santos et al., 2022); the social and physical environments as determinants of physical literacy; (Carcamo-Oyarzun et al., 2023; Stage et al., 2025; Wilkie et al., 2023; Carcamo-Oyarzun et al., 2023, Schmittwilken et al., 2024) and the digital and information environments for physical literacy (Hogan et al., 2023; Godbout, 2023). Environment as a learning resource is a pedagogical approach integrating physical education into everyday school settings as mathematics and the arts. This promotes children's orientation to the environment and awareness of its impact on health and movement behaviors (Wong, 2022). The review definitively explores the environment as a learning resource in another strand, examining the course format and assessment culture (Choi et al., 2022). University-level sports education hinders the development of authentic interactions. The assessment of physical activity is based on technical criteria, not the quality of participation (Choi et al., 2022). There are two ways to adapt the environment to the needs of students and schools. The personalization of the environment is key to student engagement and interaction intensity. It is essential to understand physical literacy to design appropriate learning environments. Evaluating environmental adaptation in

the context of physical literacy reveals the importance of understanding the concept of physical literacy in shaping the learning environment. It is evident that a lack of understanding of the long-term importance of physical literacy in school environments leads to the organization of short-term physical activities or sporting events (Petrie et al., 2021). The social and physical environment definitively impacts the level of PL (Stage et al., 2025; Wilkie et al., 2023; Carcamo-Oyarzun et al., 2023; Schmittwilken et al., 2024). The results are clear: the environment has a significant impact on children's physical activity, behavior, and development. There are two aspects to environmental factors. The first is the physical environment, which includes things like school premises, outdoor facilities, and distance from the school (Stage et al., 2025; Wilkie et al., 2023; Carcamo-Oyarzun et al., 2023; Schmittwilken et al., 2024). The second is the social environment, which includes classroom dynamics and teacher support (Carcamo-Oyarzun et al., 2023; Schmittwilken et al., 2024). The themes of digital and information environments describe the interaction between students' digital literacies, such as e-portfolios, reflection building, and the physical environment (Hogan et al., 2023; Godbout, 2023).

Self-concept or Sense of Self

Self-concept in the context of a child-centered pedagogical approach is defined as understanding and meeting one's personal needs (Power et al., 2019). In the context of physical literacy, the body is an integral part of the personality. It is essential to be aware of one's own body to understand one's physical, emotional, cognitive and social needs, capabilities and potential (Whitehead, 2010). The review revealed three definitive themes: the general manifestation of self, short-term manifestations, and long-term manifestations. Manifestations of self-expression are identified as descriptions of affect (Wilkie et al., 2023, Hogan et al., 2023, Choi et al., 2022, Carcamo-Oyarzun et al., 2023, Schmittwilken et al., 2024), forms of evaluation (Godbout, 2023, Stage et al., 2025, Petrie et al., 2021) and connections to meaningful movement experiences (Santos et al., 2022, Wong, 2022). Short-term manifestations are clear: they are immediate expressions of emotion during movement activity (Wilkie et al., 2023), pleasure and feelings of satisfaction after successful activity (Schmittwilken et al., 2024), emotional attachment to movement activity (Hogan et al., 2023; Carcamo-Oyarzún et al., 2023; Stage et al., 2025; Wong, 2022; Godbout, 2023), and emotional responsibility during a single sport season (Choi et al., 2022). It's clear that long-term manifestations of self-feeling are associated with healthy self-development practices, self-awareness as part of personal identity, PL as a means to build self-confidence, and self-esteem formation through participation in a sports team.

Self-expression through non-verbal communication and interpersonal interaction

In the context of child-centered pedagogy, this element means respectful communication. The adult extends the child's thinking by asking open-ended questions and encouraging reflection on their learning experiences (Power et al., 2019). The concept of

PL clearly emphasizes empathic relationships with the people around them (Whitehead, 2010). The review confidently identifies three dimensions of self-expression: self-expression in movement (Godbout, 2023, Schmittwilken et al., 2024, Hogan et al., 2023), interpersonal interaction (Choi et al., 2022, Petrie et al., 2021, Wilkie et al., 2023, Stage et al., 2025), and personal growth (Santos et al., 2022, Carcamo-Oyarzun et al., 2023, Wong, 2022). Self-expression is defined as aesthetic, fluid movements and quality movement performance (Godbout, 2023). The child's expression, manifested through movement or "voice," is crucial in shaping the content of movement play (Schmittwilken et al., 2024). The expression of movement is evident in the creation of video recordings during digital portfolio production (Hogan et al., 2023). Interpersonal interactions take the form of collaboration, empathy within a community or group, and the dynamics of these relationships. Role-plays are offered to university students. Senior students take on the roles of player, coach, or referee (Choi et al., 2022). In the preschool and primary school age groups, peer learning and peer support are clear (Petrie et al., 2021; Wilkie et al., 2023; Schmittwilken et al., 2024). Interpersonal interactions also take place in community-based activities to promote active mobility (Stage et al., 2025). Personal development is marked by a strong sense of belonging and positive emotions in shared activities (Carcamo-Oyarzun et al., 2023). In summary, self-expression emerges developmentally through an individual's unique movement, language, and cooperation in communities at different levels.

Knowledge and understanding of body health

In child-centered education, knowledge and understanding are essential. Students must take responsibility for their learning by participating in defining tasks according to their learning or developmental stage (Power et al., 2019). Whitehead's explanation of the concept is clear: it is understanding the experience of movement and the impact of physical activity on lifestyle and health (Whitehead, 2010). The review definitively covers the following themes: theoretical understanding of physical activity and health by students and teachers (Stage et al., 2025; Godbout, 2023; Choi et al., 2022; Wong, 2022), and practical understanding through experience (Schmittwilken et al., The studies from 2021 to 2025 definitively demonstrate the importance of PL as a lifestyle compass, as well as the importance of the interaction between knowledge and practice. The impact of adapted, appropriate environments and resources is clear (Petrie et al., 2021, Wilkie et al., 2023, Santos et al., 2022, Carcamo-Oyarzun et al., 2023). Theoretical understanding is a vital component of the course, where students master crucial competencies. They gain a solid grasp on physical activity guidelines, fitness and health management skills, and nutrition knowledge and health risk factors. Practical experience includes the following tasks: measuring heart rate during physical activity (Schmittwilken et al., 2024), choosing, planning, and reflecting on one's own physical activity (Godbout, 2023), and developing reflective skills about changes in well-being resulting from physical activity (Hogan et al., 2023). The interaction between theoretical knowledge and skills includes clear insights that indicate environmental and real-world demands are crucial

for the practical application of physical activity. For example, knowledge about healthy lifestyles is unrelated to active mobility behavior (Stage et al., 2025). This unequivocally shows that learning environments must be designed and adapted close to real-life situations where knowledge can be applied in practice (Santos et al., 2022). PL as a lifestyle compass is the foundation for an active lifestyle based on personal choices. Therefore, skills that are transferable to other areas of life are emphasised PL as a life skill with interdisciplinary skills (Santos et al., 2022). Sport teachers must build physical activity habits, not just movement skills (Wilkie et al., 2023). The review definitively shows that knowledge is most effectively acquired through practical experience and reflection, rather than theoretical learning. A learning environment that is motivating, purposefully structured, and connected to real life is essential for knowledge transition into long-term behavior.

Discussion

The content analysis of the publications in the review definitively shows that the concept of PL is identified on the basis of a definition developed by English professor Margaret Whitehead. PL is defined as the motivation, confidence, physical competence, knowledge, and understanding to engage in physical activity throughout your life (Whitehead, 2010, 2019, IPLA, 2017). A literature review confirmed that most publications are based on Whitehead's definition of physical literacy (Edwards, 2017). The interplay between the elements of physical literacy is multi-layered (Whitehead, 2010). The explanation of the concept definition clearly identifies the construct elements of motivation, beliefs, physical competence, and environment in a specific order. These elements interact and develop into the next level of physical literacy through the development of self-concept, self-expression, knowledge, and understanding (Whitehead, 2010). The child's freedom to choose activities and pursue their own interests unquestionably promotes intrinsic motivation (Power et al., 2019).

Motivation is the primary element that builds the child's will and interest to meet developmental needs by exploring and interacting with every aspect of the environment (Whitehead, 2010). This approach aligns with the student-centered learning model and the child-centered approach, emphasizing the child's interests and choices (Bayram-Jacobs & Hayırsever, 2016; Medne, 2018; Grava, 2018). Motivation is a key part of physical literacy, and it's closely tied to a learner-centered approach to education. Student-centered pedagogy adapts the learning process to the needs, interests, and developmental level of the student, providing opportunities for choice, active participation, and meaningful experiences. This approach promotes intrinsic motivation, which is essential for long-term engagement in physical activity (Durden-Myers et al., 2020). Research indicates that environments where children can make choices, feel their voices are heard, and have their autonomy supported are key to motivating them to participate in physical activity (Wilkie et al., 2023; Hogan et al., 2023). In such an environment, motivation is not forced; it naturally arises from a desire to participate, explore, and improve. This aligns precisely with the component of Whitehead's (2010) definition of PL – motivation

as a driver to be physically active in different life situations. Game-based approaches, such as Teaching Games for Understanding (TGfU) or non-linear pedagogy, provide students with the opportunity to experience the joy, challenge, and self-transcendence of movement (Wong, 2022). These approaches contribute to both motor competence and inner satisfaction, which in turn strengthens motivation (Santos et al., 2022; Choi et al., 2022; Godbout, 2023). It is clear that motivation supports the development of physical literacy and realizes the principles of student-centred learning. It is a vital link between personal experience and a structured teaching environment, effectively empowering students to grow.

Confidence and motor competence – more than movement skills

Whitehead (2010) stresses that motor competence and confidence are not just the mechanical accumulation of skills. They develop in close interaction with the environment in which the child is motivated and has experiences that reinforce their perception of their abilities. Movement competence has two aspects: physical ability, such as balance, coordination, and endurance, and perceived competence, or how a child assesses his or her own abilities. Research (Carcamo-Oyarzun et al., 2023) definitively shows that perceived competence (PMC) is directly related to motivation and willingness to engage in physical activity. Children's confidence and motor competence are strengthened by success and clear progress. A learning environment that fosters risk-taking and supports students as they navigate challenges is crucial for this process (Schmittwilken et al., 2024). Studies show that environments where children are given the choice to take on roles such as coach or referee promote not only physical development but also emotional and social development (Choi et al., 2022). Motivational theories, particularly Self-Determination Theory (Ryan & Deci, 2017), clearly underscore the pivotal role of autonomy in fostering competence. It is clear that when a child feels in control of their actions and choices, they become more confident about their movement skills (Santos et al., 2022; Wong, 2022). This approach strengthens confidence through successful execution of movements and positive experiences. TGfU and non-linear pedagogy are essential for developing confidence and motor competence. It is clear that these approaches provide children with a variety of situations and tasks in which they can develop skills and adapt them to different circumstances (Wong, 2022; Godbout, 2023). This ability to adapt movements to different situations is an essential feature of physical literacy, which sets the stage for lifelong participation in movement activities. It is clear that confidence and motor competence are essential elements of PL. As the child develops, they will experience both successes and challenges. It is clear that the development of these elements is strongly influenced by the environment, the learning approach, and the opportunity to be an active participant in one's own learning. It's clear that the development of physical literacy (PL) is deeply connected to the environment in which a child grows, learns, and moves. The physical environment and the social environment have a significant impact on a child's opportunities for physical activity and the development of motivation, motor competence, and confidence – the components of PL.

The physical environment as a space for learning and development

The physical environment creates opportunity structures that determine a child's access to movement experiences. It includes spaces like halls, playgrounds, and parks, as well as equipment, learning materials, and how these environments are organized and adapted to the child's needs. Schmittwilken et al. (2024) make a strong case for designing the physical environment to allow children to experiment freely, make mistakes, and discover their bodies in motion. This approach fosters emotionally rich learning situations where children feel safe and motivated. The quality of the physical environment plays a key role in developing PL as an "environmental reader". Children must learn to recognize and respond appropriately to different movement contexts (Stage et al., 2025). However, the the Canadian Assessment of Physical Literacy second edition (CAPL-2) tool used in PL research does not directly measure the specificity of the environment. This underscores the necessity for future studies to incorporate measures that reflect the child's interaction with the environment, particularly during active mobility (Stage et al., 2025 Integrative programmes in such as the IMOVE (Influences of Classroom-Based Health Educational Programmes) initiative, which develops the health literacy of Danish primary school students with regard to physical activity, have been proven to be effective (Wong, 2022). These programs link physical education to other curricular areas, such as visual arts or mathematics. They help children understand the importance of the environment in the context of health and movement behaviors (Wong, 2022). This approach is essential for expanding children's understanding of movement as a lifestyle.

Social environment – the people who create the experience of the child

It is clear that physical space is not the only factor that influences PL development. The social environment – teachers, peers, and family – is equally important. They can either facilitate or inhibit PL development. Whitehead (2010) stresses that physical literacy is developed in a socio-cultural context. It is not an individual achievement; it takes place in relationships. Child-centered pedagogy emphasizes an autonomy-supportive environment where students can participate in decision-making, express their opinions, and be active participants in the learning process (Santos et al., 2022; Wong, 2022). Non-linear pedagogy and TGfU approaches definitively enable children to become motor problem solvers. These approaches effectively develop motor skills, self-efficacy, and confidence (Wong, 2022; Godbout, 2023). Schmittwilken et al. (2024) definitively show that adults must act as supportive partners. They must listen to children's needs, offer choices, and create an environment where "mistakes are allowed." This approach fosters a positive emotional climate, which is essential for the development of intrinsic motivation. The wider social environment also influences PL through the prism of culture, politics, and social justice. PL is a social justice issue. Marginalized children have limited access to health-promoting environments, as PL Santos et al. (2022) clearly demonstrate. It is evident that outdoor education programmes, as organised by Outward Bound Adventures (OBA), have a definitive impact on the transformation of environments into inclusive and developmental spaces (Santos et al., 2022). The digital environment undeniably impacts

children's relationship with movement, including social networks and media. Godbout (2023) discusses "situated learning" and the impact of media on children's movement choices, emphasizing that the environment is not just a physical space, but also a cultural and informational one (Godbout, 2023). Physical literacy undoubtedly develops in close interaction with the environment, both spatially and socially. Environmental design is the key.

Self-concept as a component of physical literacy

Whitehead (2010) emphasizes that PL encompasses movement competence, confidence, and self-awareness. In this context, students' sense of self is not just an emotional state but an essential developmental indicator. Wong (2022) and Santos et al. (2022) definitively state that autonomy-supportive approaches, such as TGfU and non-linear pedagogy, contribute to students' self-confidence and positive attitudes. These approaches empower children to make their own decisions, learn from their experiences, and develop positive self-esteem over time. Non-linear pedagogy helps students "know themselves in motion," improving their sense of well-being in relation to their bodies and abilities (Wong, 2022). Godbout (2023) proposes the concept of 'performance appreciation' – the ability to reflect on the quality of movement. This concept develops competence and fosters a positive attitude towards oneself as an individual capable of movement. Students must engage in self-reflection and see progress to ensure their emotional development and long-term well-being. Student-centered assessment is a proven method of strengthening self-esteem. Hogan et al.'s (2023) study definitively shows that e-portfolios effectively document a child's progress in physical literacy and promote a child's emotional connection to physical activity. Students confidently reflect on their achievements and goals, developing self-confidence and motivation. Schmittwilken et al. (2024) make a strong case for why this approach is key to student success. Students thrive when they have the opportunity to make mistakes in a safe environment, experience success at their own level, and receive recognition. This strategy reliably fosters a positive emotional response in students, strengthening their sense of capability and belonging. Carcamo-Oyarzun et al. (2023) definitively state that children with higher perceived motor competence (PMC) also show higher levels of joy and self-confidence, whereas low PMC is associated with negative self-esteem. A child's sense of self is essential for their emotional well-being, participation, learning effectiveness, and long-term relationship with physical activity. A student-centered pedagogy that includes choice, feedback, a safe environment, and personal development is the most effective way to enhance self-concept in physical education.

Movement as a form of identity

Self-expression in the context of physical literacy is not just an aesthetic display of movement. It is a deeply personal process in which children express their feelings, identity, and relationships with others. Godbout (2023) describes "performance appreciation" as an experience where children consciously appreciate the quality, aesthetics, and significance of movement. This helps them develop their physical expression skills. It develops

through movement, social interaction, and self-knowledge, becoming an important element of child-centered pedagogy. Students must be able to move freely and experiment with movement language. This is a tool for creative self-expression. Non-linear pedagogy and TGfU models provide opportunities to express oneself in the right or most efficient way of moving, but also to move in one's own way, finding meaning and joy in movement (Wong, 2022). Schmittwilken et al. (2024) make a clear point: free play is crucial for children's physical self-expression. Children boldly experiment in movement games, creating their own unique "movement language" that challenges social stereotypes (Schmittwilken et al., 2024). In this approach, students don't just follow a structure – they make it. They develop their own style of movement, rhythm, and positive attitude toward movement.

Interpersonal relationships and collective self-expression

Self-expression is inextricably linked to interpersonal dynamics, including cooperation, trust, and empathy. Santos et al. (2022) confidently propose adventure pedagogy as an environment in which young people develop social skills and self-expression through group work and reflection. Choi et al. (2022) also provide similar insights, highlighting that role reversal in the SE model (coach, referee, player) strengthens communication skills and collective responsibility. Wilkie et al. (2023) emphasize the crucial role of the teacher in fostering an inclusive environment and trusting relationships, where students feel free to express their ideas and emotions. Pedagogical models such as Teaching Personal and Social Responsibility and Cooperative Learning structure physical education as an environment where cooperation and emotional expression are integral parts of learning (Wong, 2022). In such settings, children develop emotional empathy, respect, and the ability to listen to others' perspectives. They also break social stereotypes by adopting new roles in a group. Godbout (2023) definitively states that "performance appreciation" is key. It's clear that watching and appreciating are essential parts of developing self-expression, not just mechanisms for evaluation.

Opportunities for personal growth

Self-expression is an essential part of inner development and autonomy. Research definitively shows that environments where children can make their own decisions and plan their own activities strengthen their confidence and self-esteem (Wong, 2022; Santos et al., 2022). Adventure pedagogy provides experiences that challenge children and encourage them to express their true selves, enhancing authenticity and meaningful participation (Santos et al., 2022). Self-expression is key to a child's development of identity and self-awareness. Santos et al. (2022) conclusively state that eudaimonia – emotional well-being resulting from an understanding of the meaning of life – is a key driver of personal growth in the context of physical literacy. Meanwhile, Schmittwilken et al. (2024) describe how children develop emotional intelligence, transcend roles and develop a positive self-image through play and decision-making. Hogan et al. (2023) demonstrate that e-portfolios can be used as personal development tools. They document progress and enhance self-efficacy and reflection on self-expression in motion. Digital tools such

as e-portfolios enable children to reflect on their movement experiences, structure their developmental pathway, and visually document their progress. This makes self-expression visible and purposeful (Hogan et al., 2023). Self-expression in physical education is not a separate part of the curriculum; it is a force that connects movement, social skills, and personal development. Child-centred pedagogy allows children to encounter themselves in movement, express themselves, and feel secure in their growth. Maintaining a positive attitude toward physical activity throughout life is absolutely possible.

Dimensions of knowledge and understanding

The section on the dimensions of knowledge and understanding in the context of PL makes several key points. These points highlight the need for holistic, experiential, and contextually relevant learning. Knowledge is not an isolated learning outcome. It is an integrated element closely linked to motivation, reflection, and the ability to make informed decisions about one's exercise lifestyle. Research clearly shows that while knowledge about health, exercise, and the body is important, it alone does not change behavior. CAPL-2 data analysis unequivocally shows that cognitive indicators such as knowledge of aerobic fitness and physical activity guidelines were not statistically significantly associated with children's behaviors such as active exercising (Stage et al., 2025). The authors make a strong case that motivation and decision-making capacity are critical factors in translating knowledge into practical action. Godbout (2023) and Wong (2022) definitively show that knowledge becomes influential when it is acquired in authentic contexts, such as integrating physical education into other subjects or using situated learning approaches. In such situations, students acquire theoretical knowledge about movement and health, as well as the skills to plan, evaluate, and manage their physical activity, which contributes to long-term understanding. Santos et al. (2022) definitively extended the knowledge dimension to include a socially critical perspective. The emphasis is on an interdisciplinary approach where knowledge is linked to real life, self-regulation, health behaviors, and community participation. The authors make a clear and unambiguous point: skills that help young people assess risk, think critically, and apply knowledge in different contexts are essential to physical literacy. Hogan et al. (2023) definitively show how e-portfolios can facilitate learning through self-reflection and personalised documentation of experiences (Hogan et al., 2023). This method provides an opportunity for students to develop technical literacy and an understanding of the interrelationship between health and movement. It also helps students develop a stronger connection to their own body and movement identity. In contrast, Wilkie et al. (2023) definitively show that even without theoretical exploration of the PL concept, teachers intuitively create an environment of understanding based on positive experiences, attitudes, and reflective learning (Wilkie et al., 2023). Teachers assessed students' development in terms of achievement, behavior, dedication, and understanding of the importance of movement in life.

In conclusion, knowledge and understanding in the context of PL cannot be reduced to the acquisition of facts. It includes the ability to understand oneself in movement, to

understand one's own needs and health status, to reflect on experiences, and to apply this knowledge to real-life situations. As Godbout (2023) definitively states, this integration of knowledge also promotes learner autonomy and self-direction, which are central elements in the concept of PL.

Conclusions

The concept of physical literacy (PL) is most commonly framed through Margaret Whitehead's influential definition, encompassing motivation, confidence, physical competence, knowledge, and understanding, all oriented toward lifelong engagement in physical activity. Motivation is a dynamic catalyst for the development of PL, aligning with the principles of learner-centered pedagogy. Connecting a child's lived experiences with a thoughtfully structured educational environment is key. This motivates active, self-directed, and knowledgeable participants in physical activity.

Confidence and movement competence evolve as living processes, continuously shaped by children's encounters with both achievement and challenge. Their development is intricately tied to the surrounding environment, the pedagogical strategies employed, and the degree of agency children are given in their learning journeys. These elements signal physical ability and reflect the emotional resonance a child develops with movement – both of which are essential foundations for a vibrant, healthy life.

Physical literacy emerges through rich interaction with spatial and social environments. A child-centered pedagogy – emphasizing autonomy, intrinsic motivation, and supportive relationships – creates conditions in which children actively co-construct their physical experiences. The ecological context that shapes this growth is environmental design, adult facilitation, and prevailing societal attitudes.

It is vital for children's emotional well-being, learning efficacy, and sustained engagement in physical activity that they foster a strong sense of self within this system. It is clear that approaches that prioritize student choice, meaningful feedback, psychological safety, and personal growth most effectively nurture self-concept in physical education settings.

Self-expression within PL is more than a physical display; it's a profound avenue through which children communicate emotions, explore identity, and build social connections. Movement becomes a medium for self-knowledge and relational understanding, establishing self-expression as a pivotal element of a child-centered educational approach.

The dimension of knowledge and understanding within PL extends beyond cognitive recall or technique. It encompasses the child's ability to interpret their own physical experiences, recognize personal needs and health statuses, and apply insights to real-world contexts. This integration of embodied knowledge fosters autonomy and reflective practice – cornerstones of child-centered pedagogy – and equips learners with the tools to navigate physical activity and life itself.

Future research on physical literacy (PL) must prioritize three interconnected directions. First, we must explore the ecological and environmental contexts shaping PL. We need to understand how spatial design, adult mediation, and cultural values

influence children's physical experiences across diverse settings. Second, we must delve deeper into embodied knowledge, self-expression, and learner autonomy to understand how movement fosters identity, emotional development, and reflective practice within child-centered pedagogies. Third, we must innovate assessment approaches to capture the multidimensional nature of PL. Longitudinal studies will illuminate developmental trajectories over time. We must also pay greater attention to inclusion by examining how children from diverse and marginalized backgrounds experience and construct physical literacy. Collectively, these research directions will advance a more holistic, equitable, and sustainable understanding of physical literacy in early childhood education.

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