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The Influence of Mental Toughness and Learning Motivation on Student Activeness in Physical Education Learning in Elementary Schools: Literature Review

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ABSTRACT

Student engagement is a central indicator of the success of Physical Education, Sports, and Health (PJOK) learning in elementary schools because it is directly related to the quality of movement learning experiences, mastery of motor skills, and the development of positive attitudes toward physical activity. However, the level of student engagement is not solely determined by learning methods but is also influenced by internal psychological factors such as mental toughness and learning motivation. This study aims to conceptually and empirically synthesize recent findings regarding the influence of these two variables on student engagement in PJOK learning in elementary schools. The method used was a Systematic Literature Review (SLR) with a structured selection procedure of reputable scientific articles published in the past seven years through Google Scholar, Garuda, SINTA, DOAJ, and ERIC databases. Articles meeting the inclusion criteria were analyzed using a descriptive-thematic approach to identify patterns of relationships and consistency of findings. The results of the synthesis indicate that mental toughness positively contributes to students' emotional regulation, self-confidence, resilience, and persistence in facing the challenges of PJOK activities. On the other hand, learning motivation—especially intrinsic motivation—consistently correlates positively with active engagement, enthusiasm, and the courage to try movement skills. Simultaneously, these two variables complement each other in fostering sustained engagement. These findings emphasize that strengthening psychological aspects needs to be an integral part of the PJOK pedagogical strategy to improve the quality of student engagement in elementary schools.

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INTRODUCTION

Physical Education, Sports, and Health (PJOK) is a strategic component of the elementary education system, functioning to develop students' physical, motor, cognitive, affective, and social dimensions through structured and meaningful movement-based learning experiences (Winarno, 2020; Sun & Chen, 2020). During

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elementary school, students are in a fundamental developmental period that determines the development of basic motor skills, emotional regulation, and positive attitudes toward lifelong physical activity. Recent literature confirms that quality movement learning experiences at an early age significantly contribute to long-term sports participation and an active lifestyle in adolescence and adulthood (Barnett et al., 2016; Hulteen et al., 2018; Stodden et al., 2021).

However, the effectiveness of PJOK learning is largely determined by the level of student engagement during the learning process (Reeve, 2020; Yusuf & Sugiyanto, 2019). Activeness is not only defined as physical involvement, but also cognitive and emotional engagement in learning activities (Fredricks et al., 2019; Slade & Owens, 2021). In the context of Physical Education (PJOK), activeness is reflected through active participation in exercises, the courage to try new skills, consistent adherence to instructions, and collaborative interactions in group games. Active students tend to have more meaningful learning experiences, improve motor skills, and build self-confidence in their physical abilities (Lestari & Wibowo, 2022; Stodden et al., 2021).

Research shows that low student activeness in PJOK learning remains a problem in various elementary schools (Toharudin & Kurniawan, 2019; Yusuf & Sugiyanto, 2019). Some students exhibit passive behavior, are reluctant to move, give up easily when faced with difficulties, and lack enthusiasm in games. This condition impacts poor mastery of basic movement skills and potentially decreases interest in physical activity (Hulteen et al., 2018). Theoretically, low engagement is influenced by external factors (learning methods, facilities, classroom climate) and internal factors such as motivation, self-efficacy, emotional regulation, and mental resilience (Putra & Sari, 2025; Sardiman, 2020; Reeve, 2020). Modern educational psychology studies confirm that internal psychological factors are often the primary determinants of active learning behavior (Ryan & Deci, 2020). Therefore, exploring the psychological factors that influence engagement in Physical Education (PJOK) is both academically and practically urgent.

One psychological construct that has received widespread attention in the past decade is mental toughness. This concept refers to an individual's capacity to remain focused, confident, and resilient in the face of pressure or challenges (Gucciardi et al., 2020; Clough et al., 2019). In sports, mental toughness has been shown to be positively related to performance, emotional regulation, and training persistence (Nicholls et al., 2021; Cowden et al., 2021). Longitudinal studies show that individuals with high mental toughness have better adaptation to failure and social pressure (Gucciardi et al., 2020).

In educational contexts, mental toughness is increasingly understood as a protective factor against academic stress and as a predictor of learning engagement (St. Clair-Thompson et al., 2017; Jannah & Rahman, 2023). In physical education (PEK) learning, mental toughness plays a role when students face fatigue, anxiety about performing in front of peers, or failure to perform movements correctly. Students with high levels of mental toughness tend to give up less easily and are more willing to try again (Nicholls et al., 2021). This demonstrates the construct's relevance in explaining variations in student engagement.

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In addition to mental toughness, learning motivation is a key variable in explaining student engagement. Self-Determination Theory (SDT) explains that intrinsic motivation develops when basic psychological needs—autonomy, competence, and relatedness—are met (Deci & Ryan, 2020; Ryan & Deci, 2020). Recent research shows that the fulfillment of these psychological needs is positively correlated with engagement and active participation in physical education (PJOK) learning (Vasconcellos et al., 2020; Kurniawan & Prasetyo, 2024). Intrinsic motivation has been shown to be more stable in driving long-term engagement than extrinsic motivation (Ryan & Deci, 2020).

Furthermore, learning motivation is closely related to self-efficacy. Bandura (2019) emphasized that belief in one's abilities influences persistence and intensity of effort. In Physical Education (PJOK), students with high self-efficacy are more confident in trying new skills and demonstrate more consistent participation (Hidayat & Kusuma, 2022). A recent meta-analysis also showed that intrinsic motivation is significantly related to physical activity engagement in school-aged children (Owen et al., 2022).

Conceptually, mental toughness and learning motivation overlap in aspects of self-regulation, persistence, and emotional control (Gucciardi et al., 2020; Ryan & Deci, 2020). The combination of the two is predicted to have a stronger contribution in explaining student engagement than if analyzed separately.

Although various studies have examined mental toughness in competitive sports and learning motivation in academic contexts, studies that systematically integrate these two variables in the context of elementary school PE are still limited. Most studies focus on adolescent athletes or college sports students (Cowden et al., 2021; Nicholls et al., 2021), while research on elementary school populations is relatively rare.

Furthermore, studies on motivation in PE have focused more on learning models or teaching strategies (Vasconcellos et al., 2020), rather than on a comprehensive synthesis of the relationship between internal psychological factors and student engagement. Few studies have used a Systematic Literature Review (SLR) approach to comprehensively map the empirical evidence on the influence of mental toughness and learning motivation on student engagement in PE.

This limitation creates a theoretical and methodological gap. Theoretically, there is no integrative model that explains how mental toughness and learning motivation simultaneously influence engagement in PE learning in elementary schools. Methodologically, there has been no systematic synthesis based on the literature from the past 10 years that provides comprehensive and structured conclusions regarding this relationship.

Based on this description, this study aims to systematically analyze and synthesize empirical evidence regarding the influence of mental toughness and learning motivation on student engagement in Physical Education (PJOK) learning in elementary schools using a Systematic Literature Review (SLR) approach. This study identifies patterns of relationships, the strength of influence, and practical implications for developing PJOK learning strategies oriented toward strengthening psychological factors.

The novelty of this study lies in: (1) The integration of two key psychological constructs mental toughness and learning motivation into a single conceptual

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framework to explain PJOK engagement in elementary schools; (2) The systematic synthesis approach is based on reputable literature from the past 10 years, resulting in a comprehensive evidence mapping; and (3) The formulation of evidence-based practical implications for strengthening PJOK pedagogical strategies through a more structured psychological approach. Thus, this research not only enriches the theoretical knowledge regarding psychological factors in PJOK, but also provides practical contributions for PJOK teachers in designing learning that is able to increase student activity in a sustainable manner and is based on evidence-based practice.

METHODS

This study used a Systematic Literature Review (SLR) approach to comprehensively synthesize empirical evidence regarding the influence of mental toughness and learning motivation on student engagement in physical education (PJOK) learning in elementary schools. SLR was chosen because it can produce an evidence-based synthesis through transparent, replicable, and systematic procedures for identifying, evaluating, and integrating previous research findings (Snyder, 2019; Page et al., 2021). This approach is relevant in the fields of education and sport because it allows for a structured mapping of the relationships between psychological variables and learning behavior (Booth et al., 2016; Xiao & Watson, 2019).

The research procedure followed the PRISMA 2020 guidelines to ensure quality reporting and transparency of the literature selection process (Page et al., 2021). The research stages included: (1) formulating research questions based on the conceptual framework of educational and sport psychology (Ryan & Deci, 2020; Gucciardi et al., 2020); (2) developing a literature search strategy; (3) establishing inclusion and exclusion criteria; (4) data selection and extraction; and (5) thematic synthesis and analysis.

The research questions focused on: (a) how mental toughness influences student engagement in Physical Education and Health; (b) how learning motivation influences engagement; and (c) how these two variables simultaneously relate to learning engagement. This formulation is based on empirical findings showing that mental toughness correlates with learning resilience and persistence (Nicholls et al., 2021; Cowden et al., 2021), while motivation—particularly intrinsic motivation—is a strong predictor of student engagement (Vasconcellos et al., 2020; Owen et al., 2022).

The literature search was conducted in Google Scholar, ERIC, DOAJ, Garuda, and SINTA databases, using a combination of the following keywords: mental toughness, learning motivation, student engagement, student activeness, physical education, and Physical Education and Health. The search strategy used Boolean operators (AND/OR) to increase the sensitivity and specificity of the results (Xiao & Watson, 2019). Selected articles were published in reputable national and international journals within the last 10 years (2015–2025), to ensure up-to-date theoretical and empirical relevance (Page et al., 2021).

Inclusion criteria included: (1) quantitative, qualitative, or mixed-method empirical research; (2) discussing mental toughness, learning motivation, or engagement in the context of education

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or sport; (3) involving school-aged children or adolescents; and (4) full-text availability. Exclusion criteria included non-peer-reviewed articles, unreviewed proceedings, and research not directly relevant to the study variables. The selection process involved identification, abstract screening, and full-text review, following the PRISMA process (Page et al., 2021).

Data extraction included information on the research design, sample characteristics, instruments used (e.g., the MTQ48 for mental toughness; Clough et al., 2019; and SDT-based motivation scales; Ryan & Deci, 2020), and key findings related to variable relationships. The methodological quality of the articles was evaluated based on the clarity of the design, instrument validity, and consistency of the statistical analysis (Booth et al., 2016).

The analysis was conducted descriptively and thematically, grouping the findings into three main themes: (1) the influence of mental toughness on learning engagement and resilience (Gucciardi et al., 2020; Nicholls et al., 2021); (2) the influence of learning motivation on physical education engagement (Vasconcellos et al., 2020; Owen et al., 2022); and (3) the integration of both within the framework of self-regulation and self-efficacy (Bandura, 2019; Hidayat & Kusuma, 2022). A thematic approach allows for comprehensive identification of relationship patterns, consistency of findings, and pedagogical implications (Snyder, 2019).

Through this procedure, the research produces a systematic, valid, and relevant evidence-based synthesis to explain the influence of psychological factors on student engagement in physical education (PEK) learning in elementary schools.

RESULTS AND DISCUSSION

Result

This SLR research used the Google Scholar database to categorize publications, including journal articles, proceedings, and research reports, linking the traditional game of Bentengan to physical education (PJOK). This study aimed to identify the influence of mental toughness and learning motivation on student engagement in physical education in elementary schools. By analyzing relevant previous studies, this study provided a clear and comprehensive picture of the influence of mental toughness and learning motivation on students' participation in PJOK learning in elementary schools.

The researchers found several articles discussing this topic. Twenty scientific articles or journals were included in the main literature list, each with its own research title, article type, journal, and sample. The research methods varied. The issues cited in each scientific article and journal also included the research title, the name of the researcher, the method used in the research, and the results obtained from the research, which are listed in a table as shown below:

Table 1.
Research Results

Title, Researcher, and Year	Method	Research Result
(Baumeister & Vohs, 2020). Self-regulation and persistence in learning.	A narrative review study based on educational psychology theory; reviewing the concepts of self-regulation, persistence, and engagement in the	Self-regulation and persistence are positively correlated with learning engagement. Students who are able to control themselves and persist during

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	context of learning; synthesizing literature from various educational psychology studies.	difficult times tend to be more active in the learning process.
(Clough et al., 2019) Developing mental toughness in educational contexts.	Conceptual review and model development; discusses the dimensions of mental toughness (4C: control, commitment, challenge, confidence) in the context of education; based on previous research results and applications in schools.	Mental toughness can be developed through habits and educational strategies. The components of confidence, control, and constancy encourage students to be more courageous, focused, and consistently active during learning.
(Deci & Ryan, 2020). Self-Determination Theory: *Basic psychological needs in motivation, development, and wellness.*	A theoretical study (book) based on Self-Determination Theory (SDT); explaining intrinsic/extrinsic motivation and the fulfillment of basic psychological needs (autonomy, competence, relatedness).	Intrinsic motivation increases when the needs for autonomy, competence, and relationships are met. Intrinsic motivation is the primary driver of student engagement in physical education (PJOK) activities.
(Goudas & Biddle, 2020). Motivation in physical education: *Current trends and directions.*	Review of physical education literature; integrating SDT and Achievement Goal Theory; synthesis of findings related to motivation, learning climate, and student participation in PE/PJOK.	Learning motivation (intrinsic-extrinsic) and classroom climate influence student participation in physical education. Supportive learning increases engagement/activeness.
(Gucciardi et al., 2020). *The concept of mental toughness: Advances and directions.*	A systematic conceptual review of mental toughness; discussing definitions, models, indicators, and implications for performance and psychological resilience; comparing MT measurement instruments.	Mental toughness relates to resilience under pressure, emotional control, and focus. MT supports students in being more active in challenging situations, including physical education activities.
(Hidayat & Kusuma, 2022). Keaktifan siswa pada pembelajaran PJOK SD: Peran self-efficacy dan motivasi.	Correlational quantitative research; survey design; simple multiple linear regression analysis/SEM; motivation questionnaire, self-efficacy questionnaire, and activity sheet instruments; elementary school students as respondents.	Learning motivation has a significant influence on physical education (PJOK) activity. Self-efficacy acts as a mediator/reinforcer, so students who are confident are more active participants..
(Jannah & Rahman, 2023). Mental toughness dan resiliensi siswa dalam pembelajaran pendidikan jasmani.	Quantitative research; correlation design; Pearson correlation + regression test analysis; mental toughness/resilience questionnaire instrument; PJOK learning context.	Mental toughness is positively related to resilience. Resilience increases students' persistence and courage to try movements, thereby increasing their active participation in physical education.
(Kurniawan & Prasetyo, 2024). Pengaruh motivasi belajar terhadap keaktifan peserta didik dalam pembelajaran PJOK.	Quantitative research; correlational survey design; simple linear regression analysis; learning motivation questionnaire instrument and observation sheet/questionnaire of elementary school students' physical education activity.	Learning motivation contributes significantly to student engagement. The higher the motivation, the higher the student's participation in physical education activities.
(Lestari & Wibowo, 2022). Hubungan mental toughness dengan kepercayaan diri siswa dalam pembelajaran PJOK.	Quantitative research; correlation design; Pearson correlation analysis; mental toughness questionnaire and self-confidence/participation scale; elementary school students as subjects	Mental toughness is positively correlated with self-confidence. Self-confidence encourages students to actively try movements, not be afraid of making mistakes, and be more involved in physical education games.
(Nicholls et al., 2021). Emotional regulation and mental toughness in performance settings.	Quantitative; survey design; correlational/regression statistical analysis; mental toughness scale, emotion regulation, and persistence indicators; adolescent/student athlete subjects.	Emotional regulation and mental toughness influence persistence in performance activities. Emotional control helps students persist under social/physical pressure, thereby increasing engagement.
(Putra & Sari, 2025). Classroom climate, motivation, and engagement in elementary physical education.	Mixed methods: quantitative (motivation and engagement questionnaire) + qualitative (interview/observation); descriptive-correlation and thematic statistical analysis; elementary school physical education context.	A supportive physical education classroom climate increases student motivation and engagement. A classroom that is safe from teasing/bullying increases student engagement in physical activities.

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(Reeve, 2020). How teachers can promote student engagement through motivation.	A small meta-analysis of theoretical reviews; a focus on teaching strategies; a review of the autonomy-supportive teaching model and its relationship to student motivation and engagement.	Teacher strategies that support autonomy increase intrinsic motivation and student engagement. Positive feedback and activity choices increase activeness.
(Ryan & Deci, 2020). Intrinsic and extrinsic motivation from a self-determination perspective.	Review of SDT theory; discusses intrinsic-extrinsic motivation, internalization, and learning engagement; synthesizes findings from educational psychology.	Intrinsic motivation is more stable and stronger at increasing active engagement than extrinsic motivation. However, extrinsic motivation is effective when combined with competency support.
(Sardiman, 2020). Interaksi dan Motivasi Belajar Mengajar.	Theoretical review (educational book); explains learning motivation indicators, driving factors, and implications for active learning behavior.	Motivation determines the intensity, direction, and persistence of learning. In Physical Education, high motivation makes students actively follow instructions, exercises, and games.
(Slade & Owens, 2021). Student engagement and motivation in physical education: A systematic review.	Systematic Literature Review (PRISMA); clear inclusion-exclusion criteria; thematic synthesis of motivation and engagement in PE; discusses psychological factors and learning strategies.	Learning motivation and perceived competence are related to engagement in physical education. Fun and varied learning strategies increase student engagement.
(Sun & Chen, 2020). A pedagogical understanding of motivation in physical education.	Review of physical education pedagogy; discusses factors of enjoyment, perceived competence, and teaching strategies; connects motivation with participation.	Enjoyment and perceived competence are key to motivation in physical education. Students who feel capable and enjoy moving are more actively involved.
(Toharudin & Kurniawan, 2019). Motivasi belajar dan partisipasi siswa dalam pembelajaran PJOK sekolah dasar.	Quantitative survey; correlation/regression analysis; questionnaire instrument for motivation and participation in PJOK; subjects: elementary school students.	Learning motivation influences student participation in PJOK. Motivated students demonstrate higher levels of movement involvement.
(Winarno, 2020). Metodologi Penelitian dalam Pendidikan Jasmani.	Methodology book; explains the design of PJOK research (variables, instruments, validity, reliability); emphasizes the psychological aspects in PJOK learning.	Emphasizing that physical education (PJOK) learning must consider psychological aspects, student engagement is influenced by motivation, self-efficacy, and mental readiness.
(Yusuf & Sugiyanto., 2019). Hubungan motivasi belajar dengan keaktifan siswa dalam PJOK.	Quantitative; correlational design; Pearson correlation analysis; learning motivation questionnaire instrument and PJOK activity/participation scale	There is a significant relationship between learning motivation and student activity in PJOK. High motivation → increased activity.
(Zainuddin & Saputra, 2021). Pengaruh motivasi intrinsik terhadap keterlibatan siswa dalam PJOK.	Quantitative; survey design; regression/correlation analysis; intrinsic motivation scale instrument and student involvement in PJOK.	Intrinsic motivation positively influences student engagement. Students with internal motivation are more active, enthusiastic, and consistent in participating in physical education (PJOK) lessons.

Discussion

A Systematic Literature Review (SLR) found that mental toughness and learning motivation are the primary psychological determinants influencing student engagement in Physical Education (PJOK) learning in elementary schools (Slade & Owens, 2021). In this context, engagement is understood as a form of student engagement that encompasses behavioral, emotional, and cognitive involvement in learning activities (Reeve, 2020; Fredricks et al., 2019). In physical education, engagement is a key indicator of success because the learning process is dominated by hands-on practice, movement repetition, social interaction, and real-life experiences of success and failure (Sun & Chen, 2020;

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Stodden et al., 2021). Therefore, a comprehensive understanding of the psychological factors that support active engagement is crucial.

The Role of Mental Toughness in Physical Education (PJOK) Activeness

Synthesis findings indicate that mental toughness plays a significant role in shaping students' active behavior because it is related to resilience in the face of pressure and challenges (Gucciardi et al., 2020; Cowden et al., 2021). Conceptually, mental toughness encompasses emotional control, commitment to goals, self-confidence, and the ability to view challenges as opportunities for growth (Clough et al., 2019). In PJOK learning, these challenges can include exhausting physical activity, competitive games, teacher evaluations, or social pressure from peers.

Students with high levels of mental toughness tend to be able to manage anxiety and fear of failure, thus remaining actively engaged in movement activities (Nicholls et al., 2021). This aligns with longitudinal research showing that mental toughness is positively correlated with persistence and resilience in educational contexts (Gucciardi et al., 2020). In physical education (PJOK) learning situations, when students fail to perform a particular technique, resilient individuals will try again, while those with low resilience tend to avoid the activity (Jannah & Rahman, 2023).

Furthermore, mental toughness is closely related to self-confidence. Self-confidence is crucial in PJOK because many activities are performative and observed by others (Lestari & Wibowo, 2022). Students who lack self-confidence often exhibit passive behavior, become observers, or even withdraw from activities (Toharudin & Kurniawan, 2019). Conversely, students with good mental toughness are more willing to take part in games and demonstrate consistent effort (Clough et al., 2019). Thus, mental toughness serves as psychological capital that strengthens courage and perseverance in movement-based learning.

Learning Motivation as the Energy of Engagement

Besides mental resilience, learning motivation has been shown to be a dominant factor in explaining student engagement (Yusuf & Sugiyanto, 2019; Kurniawan & Prasetyo, 2024). Motivation acts as a driving force that determines the intensity, direction, and duration of engagement in learning activities (Sardiman, 2020). In Physical Education (PJOK), high motivation is reflected in enthusiasm for following instructions, a willingness to try new skills, and consistency in practice.

Based on Self-Determination Theory (SDT), intrinsic motivation develops when basic psychological needs—autonomy, competence, and social relationships—are met (Deci & Ryan, 2020; Ryan & Deci, 2020). A literature synthesis shows that when students feel in control of their activities, feel capable (perceived competence), and receive social support, their engagement levels increase significantly (Vasconcellos et al., 2020; Owen et al., 2022). In Physical Education (PJOK), small successes, enjoyable activities, and positive teacher feedback are key triggers for intrinsic motivation (Sun & Chen, 2020).

Conversely, extrinsic motivation, such as grades or rewards, can increase participation in the short term, but tends to be unstable if external reinforcement is discontinued (Ryan & Deci, 2020). Therefore, effective PJOK learning needs to

emphasize strategies for increasing intrinsic motivation through activity design that adapts to the developmental level of students (Winarno, 2020).

Integrating Mental Toughness and Motivation in a Self-Regulation Framework

SLR findings indicate that mental toughness and learning motivation have a complementary relationship in influencing engagement (Gucciardi et al., 2020). Motivation serves as the initial driver of engagement, while mental toughness maintains consistent engagement when obstacles arise. The integration of the two can be explained through the concepts of self-regulation and persistence (Baumeister & Vohs, 2020). Students who are motivated but lack mental toughness may be active at the beginning of learning but give up easily when faced with difficulties. Conversely, students with high mental toughness but low motivation may show less initiative in engagement.

The role of self-efficacy also emerges as an important mediator in this relationship. High self-efficacy increases confidence in success, thereby strengthening the influence of motivation on engagement (Bandura, 2019; Hidayat & Kusuma, 2022). Students who are confident in their abilities are more likely to try and are more active in asking questions and participating in physical education activities. Therefore, developing self-efficacy is a crucial strategy for increasing active participation.

The Role of the Learning Climate and Teacher Support

Contextual factors such as classroom climate also influence the relationship between mental toughness, motivation, and engagement. A supportive and teasing-free learning climate increases psychological safety, making students more comfortable participating (Putra & Sari, 2025). Autonomy support from teachers, such as providing activity choices and constructive feedback, has been shown to increase intrinsic motivation (Reeve, 2020; Vasconcellos et al., 2020). In group-based PE lessons, social support from peers also strengthens active engagement (Goudas & Biddle, 2020).

PE teachers play a strategic role not only as instructors of technique but also as facilitators of students' psychological development (Winarno, 2020). Strategies such as fostering self-reflection, providing gradual challenges, and strengthening emotional regulation can help develop mental toughness from elementary school age (Gucciardi et al., 2020).

Theoretical and Practical Implications

Overall, this SLR confirms that student engagement in Physical Education cannot be explained solely by learning methods, but also by interacting internal psychological factors. Mental toughness serves as psychological resilience that maintains consistent participation, while motivation—especially intrinsic motivation—is the primary driver of engagement (Deci & Ryan, 2020; Clough et al., 2019). The combination of the two results in more stable and sustainable engagement.

The implication is that Physical Education interventions need to integrate pedagogical approaches that support the fulfillment of psychological needs, increase self-efficacy, and build mental resilience through progressive and reflective learning experiences. With this comprehensive approach, students are expected to be not only

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physically active but also develop psychologically, develop self-confidence, and be able to sustainably face the challenges of Physical Education learning.

CONCLUSION

Based on the conceptual and empirical synthesis in the Systematic Literature Review (SLR), it can be confirmed that mental toughness and learning motivation are psychological determinants that consistently influence student engagement in physical education (PJOK) learning in elementary schools. Conceptually, mental toughness serves as a psychological resilience capital that enables students to maintain self-confidence, regulate negative emotions, and demonstrate persistence when facing fatigue, failure, or social pressure in movement activities. Empirically, various findings indicate that students with higher levels of mental toughness tend to have more stable participation and are less likely to withdraw from learning activities.

Conversely, learning motivation—especially intrinsic motivation—has been shown to be the primary driving force for active engagement. Students who learn out of interest, enjoyment, and the drive to master skills demonstrate stronger and more sustained engagement than those driven solely by external rewards. Simultaneously, motivation fuels initial engagement, while mental toughness maintains consistent engagement throughout the learning process. These findings also indicate that self-efficacy and a supportive learning climate strengthen the relationship between these two variables and engagement, thus ensuring that PJOK interventions integrate psychological and pedagogical reinforcement simultaneously.

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