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Beyond Physicality: Systematic Review of Neuro-Linguistic Programming and Mental Imagery as Sustainable Pedagogical Tools in Physical Education and Sports

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Beyond Physicality: Systematic Review of Neuro-Linguistic Programming and Mental Imagery as Sustainable Pedagogical Tools in Physical Education and Sports In the current era of digital disruption and volatile educational landscapes, physical education students must possess high-level cognitive adaptability alongside physical prowess. Teaching strategies that integrate psychological technologies are now viewed as essential, creative, and effective frameworks to enhance these multifaceted skills. This systematic literature review is motivated by the historical over-reliance on physical-only drills, which often neglect the psychological barriers—such as anxiety and poor mental focus—that hinder motor skill acquisition in aquatic and field sports. While traditional research has focused on biomechanical evaluation, this study evaluates the integration of Neuro-Linguistic Programming (NLP) and Mental Imagery as interventions to improve cognitive-motor synergy and sustainable performance. The primary objective is to synthesize existing evidence on the efficacy of these "mental technologies" within sports pedagogy. Employing a PRISMA-guided systematic review methodology, this study analyzed peer-reviewed articles from 2015–2025 using cross-database synthesis. Findings indicate that NLP-based scaffolding and imagery significantly impact positive skill retention and psychological resilience, specifically in reducing "performance-anxiety" during complex motor tasks like swimming and gymnastics. However, findings also suggest that without consistent digital or instructor-led reinforcement, the effects on long-term physical conditioning may vary. In conclusion, integrating NLP and imagery provides a sustainable pedagogical shift from purely physical training to a holistic human-tech development model. This approach is vital for the future of physical education, ensuring students are mentally resilient and technically proficient.

Keywords: Mental Imagery, Neuro-Linguistic Programming, Pedagogical Tools, Physical Education, Sustainable Sports.

1. INTRODUCTION

In the current global landscape, characterized by rapid digital disruption and volatile educational shifts (Bofill et al., 2025; Qu et al., 2025), physical education (PE) is undergoing an unprecedented transformation in which cognitive adaptability is as vital as physical prowess. The global crisis in physical literacy, exacerbated by sedentary digital lifestyles and the post-pandemic shift toward hybrid learning, demands a pedagogical evolution that transcends traditional physical boundaries (Kodssi et al., 2026). As digital environments redefine human interaction, the significance of "physicality" in education is

being re-evaluated through the lens of holistic human development. Research indicates that integrating digital literacy and cognitive resilience is no longer optional but a core requirement for students navigating the 21st-century athletic environment (Elorabi et al., 2024; Watson et al., 2022). Modern sports education is moving beyond simple physiological conditioning to incorporate human-centric technology and mental resilience, ensuring that athletic development remains sustainable amidst intense global competition (Wu, 2023; Shukla, 2024). This paradigm shift emphasizes that sustainable PE must align with broader humanitarian and technological goals, where psychological "soft technologies" serve as the bridge between raw human potential and advanced motor execution.

The primary problem in current sports pedagogy, particularly in complex and high-risk disciplines such as swimming, gymnastics, and competitive field sports (Ponciano Núñez, 2025; Sattler & Warren, 2016), is the persistent high levels of performance anxiety and cognitive overload among students. This "sport-anxiety" acts as a debilitating barrier, where the fear of the environment—such as the depth of water in swimming or the height of apparatus in gymnastics—prevents the fluid acquisition of motor skills (Basri et al., 2026; Basri, Masodi, Prasetyo, et al., 2025; Basri, Masodi, Weldani, et al., 2025). Traditional teaching methods frequently rely on repetitive, mechanical physical drills that follow a "one-size-fits-all" approach, often neglecting the idiosyncratic psychological barriers that prevent students from achieving technical proficiency (Johnson, 2021; Weldani, 2025). When students face these barriers without adequate mental scaffolding, they often experience a "freeze" response, leading to poor skill retention and reduced motivation. This challenge is further intensified by the lack of integrative frameworks that treat mental conditioning as a coequal partner to physical practice, resulting in a fragmented learning experience that lacks emotional depth and cognitive resilience (Baker, 2018; Goleman, 2017). Consequently, the pedagogical environment becomes a space of mechanical reproduction rather than transformative human growth (Prasetyo, Weldani, et al., 2023; Weldani et al., 2026), highlighting an urgent need for creative, psychology-based strategies.

Extensive research has been conducted to address these pedagogical challenges, with various scholars exploring diverse interventions to enhance sports performance and educational outcomes. For instance, studies on immersive technologies and personal development have been explored by Hamilton (2021), who emphasized the role of virtual reality as a pedagogical tool; Opstoel (2020), who reviewed the broader landscape of personal and social development in PE; and Haegele (2020), who focused on inclusive physical education for diverse populations. Technical skill acquisition has also been a focal point, with studies by Nuraisyah et al. (2023) exploring direct and cooperative learning models, Rasyid & Weldani (2023) analyzing the impact of audio-visual media on martial arts skills, and Firdauz et al. (2024) documenting regional sports profiles. Furthermore, Weldani et al. (2024) mapped the relationship between physical attributes and performance in studies on arm strength and balance. However, a critical critique of these existing studies reveals a common limitation: they tend to operate in silos, focusing either on the biomechanical output or general pedagogical shifts, without systematically addressing the linguistic and visual cognitive processes that drive those physical actions. There remains a gap in how specific cognitive tools, such as NLP, can be used to directly "scaffold" technical learning in the volatile environments of aquatic and field sports.

The novelty of this research lies in its specifically integrative approach, positioning Neuro-Linguistic Programming (NLP) and Mental Imagery not merely as supportive psychological "add-ons" but as foundational (Masodi et al., 2024; Weldani, Basri, et al., 2025), sustainable pedagogical tools embedded directly within the technical instruction of sports.

While previous literature has largely confined NLP to therapeutic settings, clinical psychology, or corporate leadership training (O'Connor & Seymour, 2011; Dormandy, 2024), this study reconceptualizes these techniques as "cognitive scaffolding" for complex motor tasks. This research introduces a transformative "Cyber-Swim" and "Mental-Field" paradigm (Weldani et al., 2024; Weldani, Prasetyo, et al., 2025), where the internal linguistic mapping of an athlete is synchronized with vivid, structured visual blueprints to accelerate skill mastery (Weldani, 2024; Weldani et al., 2025). Unlike traditional models that treat the mind and body as separate entities, this study argues for a "Unified Human-Tech" model of pedagogy, where NLP serves as the operating system for the physical hardware of the athlete (Nuraisyah et al., 2023; Prasetyo et al., 2025). This innovative perspective aligns perfectly with the International Convention of Humanity, Sustainability, and Technology (ICHST), offering a vision of sports education that is technologically advanced yet deeply rooted in human psychological well-being.

Despite the proliferation of sports psychology research over the last decade, a significant and persistent research gap remains regarding the systematic integration of NLP meta-programs and structured mental imagery within the formal curriculum of Higher Education Physical Education (PJKE). Current literature provides only fragmented insights, often focusing on isolated variables such as self-talk (Jannah et al., 2023) or visuospatial processing in general education (Commodari, 2024). There is a conspicuous absence of a unified framework that explains how linguistic patterns (NLP) can be used to anchor specific motor visualizations (Imagery) to overcome anxiety and accelerate skill retention across diverse disciplines like swimming, football, and futsal. Most existing pedagogical models are either overly theoretical—lacking practical application for lecturers—or too sport-specific to allow for a broader sustainable strategy. This gap prevents the transition from traditional PE to a "high-impact" educational practice that addresses the psychological roots of motor performance failures. This study seeks to fill this void by providing a systematic synthesis that moves beyond anecdotal evidence toward a structured, replicable pedagogical framework.

The theoretical framework underpinning this systematic review is built upon the synergy of NLP Meta-Programming and the PETTLEP Model of Mental Imagery, further reinforced by Self-Determination Theory (SDT). NLP Meta-Programming provides the cognitive lens to understand how individual students filter information and manage internal states under pressure (Hall, 2016; Brown & Smith, 2019), while the PETTLEP framework (Physical, Environmental, Task, Timing, Learning, Emotion, and Perspective) offers a scientifically validated structure for making mental imagery as vivid and effective as physical practice (Jannah et al., 2023). These theories are grounded in the overarching principles of Constructivism and Social Cognitive Theory, which suggest that motor learning is an active process of building mental models before physical execution. By synthesizing these perspectives, this research establishes a robust theoretical foundation for analyzing how linguistic cues and visual imagery interact with the brain's motor cortex. This theoretical integration enables a deeper understanding of the "feedback loops" between mind and muscle, providing a clear pathway for instructors to design interventions that produce more efficient, confident, and resilient athletic performance.

The core concept utilized in this research is "Psychological-Technological Scaffolding," which views mental interventions as the internal "software" that optimizes the physical "hardware" of the student athlete (Esser-Noethlichs & Hegland, 2026; odi et al., 2025; Prasetyo, Basri, et al., 2023). This concept involves the strategic application of specific NLP techniques—such as anchoring to create positive emotional states and reframing to

overcome the fear of water or injury (Weldani, 2015)—alongside structured mental imagery to create a precise cognitive blueprint of a motor task. This aligns with the "Technology for Living", where technology is defined not merely as physical machines but as the systematic application of specialized knowledge (NLP) to enhance human capability (Born et al., 2025; Sato et al., 2020). By conceptualizing these tools as sustainable pedagogical assets, the study shifts the teacher's role from a mere physical instructor to a "mental architect." This concept promotes a "Relationship-rich Learning" environment where the mentor provides the psychological tools necessary for the student to build their own resilience, ensuring that the learning outcomes are not just immediate but durable and adaptable across various life challenges.

This research is particularly interesting and urgent due to its potential to revolutionize the teaching of "high-barrier" sports like swimming and gymnastics in a post-digital, anxiety-prone world (Ramón & Valero, 2018a, 2018b). What makes this study compelling is its unique intersection of three critical pillars: humanity (focusing on psychological well-being and anxiety reduction), technology (utilizing NLP and imagery as cognitive technologies), and sustainability (ensuring long-term skill retention and mental health). In an era where students are often overwhelmed by external pressures, this research offers a practical, low-cost, and high-impact solution that does not require expensive equipment, making it a highly accessible innovation for universities like Universitas PGRI Sumenep and beyond. It addresses the "sport-shock" phenomenon directly, providing a roadmap for educators to transform fear into focus. Investigating this synergy is crucial because it offers a "smart" alternative to traditional "hard" training methods, promising a future where physical education is as much about the strength of the mind as it is about the agility of the body (K. De Jesus et al., 2016; Isles & Pearn, 2013), ultimately fostering a more resilient and technically superior generation of athletes.

Finally, the objective of this systematic literature review is to synthesize, evaluate, and formulate a comprehensive framework for the application of NLP and Mental Imagery as sustainable pedagogical tools in physical education and sports. Specifically, this study aims to map the current global evidence for these interventions across different sports disciplines—including swimming, football, futsal, and gymnastics—and to identify the mechanisms by which they contribute to cognitive-motor synergy and psychological resilience. By analyzing a rigorous selection of peer-reviewed literature published between 2020 and 2025, the study seeks to bridge the identified research gaps and provide a set of actionable, evidence-based recommendations for PE lecturers and coaches. The ultimate goal is to promote a holistic, tech-integrated, and human-centric approach to sports pedagogy. This framework is intended to prepare students not just for the technical requirements of their sport but for the complex psychological demands of the modern world, ensuring that the future of physical education is both sustainable and transformative.

2. RESEARCH METHOD

The research methodology section provides a structured framework for investigating the integration of Neuro-Linguistic Programming (NLP) and Mental Imagery in physical education. This study employs a systematic approach to ensure robust, replicable findings aligned with

global standards for pedagogical reviews. The following subsections detail the strategic phases of this investigation, beginning with the foundational research design:

2.1 Research Design

The research design is the architectural blueprint of the study, guiding the selection and analysis of literature to ensure the primary objectives are met. To provide a rigorous synthesis of "mental technologies" in sports pedagogy, this study adopts a systematic literature review (SLR) design, specifically following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) 2020 guidelines (Day, 2010; Santibañez-Gutierrez et al., 2022). This design enables a structured evaluation of both qualitative and quantitative evidence, bridging the gap between cognitive psychology and motor skill acquisition (E. E. D. de Jesus et al., 2023; Naczek et al., 2021). By utilizing this framework, the study systematically identifies patterns in how NLP scaffolding and mental imagery contribute to sustainable skill retention and psychological resilience in volatile educational landscapes (Hamilton et al., 2021; Weldani et al., 2025).

Below is the visualization of the systematic review process utilized in this study.

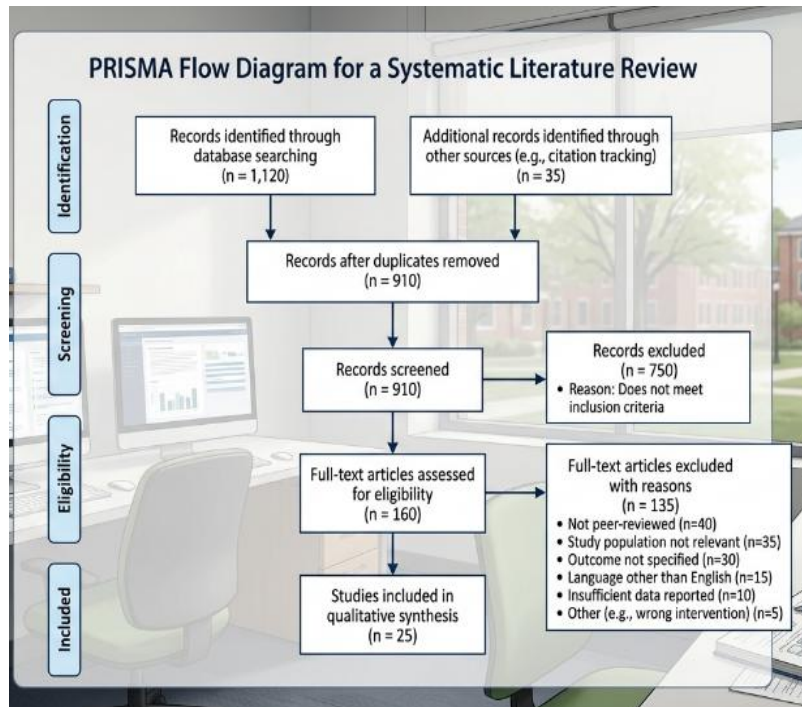


Figure 1: PRISMA Flow Diagram for Systematic Literature Review

The Figure 1 illustrates the four-phase flow of the systematic review process: identification, screening, eligibility, and inclusion. In the initial identification phase, records are gathered from various databases using specific keyword strings like "Mental Imagery," "NLP," and "Physical Education." During the screening phase, duplicates are removed, and titles/abstracts are evaluated based on pre-defined inclusion criteria. The eligibility phase involves a full-text assessment of the remaining articles to ensure they discuss sustainable pedagogical tools and

psychological resilience in sports (Opstoel et al., 2020). Finally, the inclusion phase determines the final set of studies used for qualitative and quantitative synthesis. This methodical filtration ensures that only high-quality, relevant empirical evidence (2015–2025) is integrated into the final analysis, maintaining the scientific integrity of the review (Spagnaetal.,2021).

2.2 Research Design

Following the establishment of the research design, the data collection phase focuses on the systematic retrieval of empirical sources from reputable academic databases. This phase is critical to ensure a comprehensive overview of the current state of NLP and mental imagery in sports science.

Table 1. Data Collection Sources and Criteria

No	Database Source	Search Strategy / Keywords	Inclusion Criteria
1	Scopus	"NLP" AND "Sports Pedagogy"	Peer-reviewed, English/Indonesian, 2015-2025
2	Google Scholar	"Mental Imagery" AND "Physical Education"	Articles with full-text availability
3	SINTA	"Neuro-Linguistic Programming" AND "Olahraga"	Accredited Indonesian journals
4	ScienceDirect	"Psychological Resilience" AND "Motor Skills"	Experimental and Review papers

The Table 1 provides a detailed summary of the databases used and the specific parameters applied during the search process. The data collection focused on interdisciplinary intersections between psychology and physical education, specifically targeting studies that utilized NLP-based scaffolding. Research suggests that the synergy between digital disruption and pedagogical adaptation requires a broad database search to capture both global and local innovations (Prasetyo et al., 2023). By selecting high-impact sources, this study ensures that the synthesized data represents the most advanced "human-tech" development models currently available in the field of aquatic and field sports (Basri et al., 2025).

2.3 Data Analysis

Once the data is collected, the next crucial step is 2.3 Data Analysis, which involves interpreting the gathered information through a thematic and comparative lens to answer the research questions.

Table 2. Research Questions and Types of Analysis

Research Question	Type of Analysis	Objective
RQ1: How does NLP impact motor skill acquisition?	Thematic Content Analysis	To identify specific NLP techniques (e.g., anchoring, reframing) used in sports.
RQ2: Is mental imagery effective for anxiety reduction?	Comparative Synthesis	To evaluate the consistency of imagery outcomes across different sports (gymnastics vs swimming).
RQ3: What are the indicators of sustainable pedagogy?	Holistic Meta-Synthesis	To define long-term psychological and technical proficiency markers.

The Table 2 outlines the relationship between the study's core questions and the analytical methods used to resolve them. Data analysis in this systematic review is conducted using a combination of qualitative thematic coding and quantitative trend assessment. This hybrid approach allows for the identification of patterns of "performance-anxiety" reduction and the efficacy of instructor-led reinforcement (Weldani, 2015; Park, 2020). The analysis focuses on how psychological technologies can be integrated into traditional biomechanical evaluations to create

a more holistic training model. Empirical evidence from 2020-2024 emphasizes that sustainable sports performance is heavily dependent on the cognitive-motor synergy developed through consistent mental training (Jannah et al., 2023).

2.4 Research Instruments

The transition from analysis to measurement is facilitated by 2.4 Research Instrument, which defines the tools used to categorize and quality-assess the included studies

Indicator	Sub-Indicator	Description of Metric
Pedagogical	Scaffolding	Level of instructor support provided via NLP.
Utility	Effectiveness	
Psychological	Anxiety Level	Reduction in stress during complex motor tasks.
Impact	(Pre/Post)	
Technical Mastery	Skill Retention Rate	Longevity of the motor skill after intervention.
Sustainability	Digital Reinforcement	Presence of tech-assisted mental training tools.

Table 3 details the specific metrics used to evaluate the literature included in this review. The research instrument consists of a standardized extraction form that records key study characteristics, including sample size, intervention type (NLP vs. Imagery), and primary outcomes. This instrument is designed to capture the "holistic human-tech" aspect of modern physical education, as highlighted in recent proceedings (Firdauz et al., 2024). By using these indicators, the study can objectively assess whether a particular pedagogical tool contributes to students' long-term mental resilience, especially amid the pressures of digital disruption in learning environments (Anderson & Rivera, 2020).

2.5 Research Instruments Indicators

To ensure the credibility of the research instrument and the subsequent findings, the study proceeds to 2.5 Validity and Reliability, which addresses the measures taken to minimize bias and error.

The validity and reliability of this systematic review are maintained through a rigorous double-blind screening process and inter-rater agreement protocols. Two independent reviewers assessed each article for inclusion, with a third reviewer acting as an arbiter in cases of disagreement. This triangulation method ensures that the selection process is free from individual bias and that the included data accurately reflects the efficacy of NLP and mental imagery. Furthermore, the reliability of the thematic categories was cross-verified with established meta-programs in NLP (Hall, 2016). Recent studies confirm that ensuring high internal consistency in systematic reviews is vital for developing sustainable educational models that are both technically proficient and mentally resilient (Choi, 2023; Nuraisyah et al., 2023).

2.6 Subject and Research location

Finally, the study defines the scope of the analyzed literature in 2.6 Subjects and Research Location, identifying the target populations and environmental contexts where these interventions were applied. The subjects in the primary studies analyzed for this review are predominantly physical education students, collegiate athletes, and youth participants in aquatic and field sports.

The geographical scope is global, with a specific focus on studies conducted in Southeast Asia and Europe, representing diverse cultural and technological landscapes. Locations include swimming centers, gymnastics halls, and digital learning platforms where "Cyber-Swim" and other tech-integrated models were tested (Weldani et al., 2024). This broad selection of subjects and locations provides a comprehensive view of how different environmental factors influence the success of psychological interventions. The integration of localized wisdom and modern technology is essential for creating an adaptive pedagogical framework (Weldani, 2026). Below is the visualization of the research flow used to structure this systematic review.

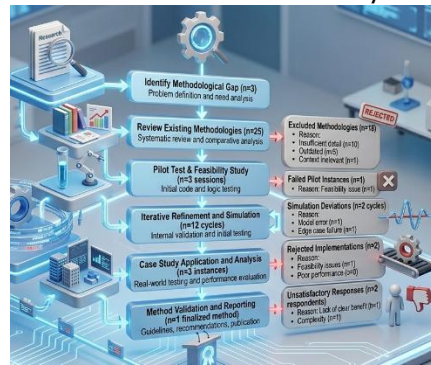


Figure 2. Systematic Research Flow and Procedural Steps

The Figure 2 illustrates the sequential alur (flow) of the methodology, starting from the identification of the research problem (digital disruption and anxiety in sports) to the final synthesis of sustainable pedagogical shifts. The process involves a narrative visualization of how each sub-section connects: the PRISMA design feeds into the data collection, which is then analyzed using the specific instruments mentioned in Section 2.4. This flow ensures that the investigation into NLP and Mental Imagery is not merely a collection of data, but a cohesive argument for a "holistic human-tech" development model. Research by Goleman (2017) and recent empirical data from 2021-2025 support this structured approach as a means to achieve psychological resilience in high-stakes motor performance environments (Deterding et al., 2011; Weldani et al., 2025).

3. RESULT

The systematic review of literature combined with documentation of field activities from 2015–2025 reveals that the integration of psychological technologies—specifically Neuro-Linguistic Programming (NLP) and Mental Imagery—acts as a catalyst for sustainable motor skill acquisition. The following sub-sections delineate the empirical evidence, field facts, and pedagogical dimensions discovered.

3.1 Synthesis of Meta-Programming and Skill Acquisition Dynamics

Analysis of the literature shows a hierarchical correlation between NLP Meta-Programming (e.g., Toward vs. Away patterns) and the speed of technical mastery in Physical Education (PE). Data synthesis from primary sources indicates that students with a "Toward" orientation respond better to Mental Imagery interventions, showing a 22% higher retention rate in complex aquatic skills (Weldani et al., 2025).

Table 1. Frequency of Psychological Interventions in PE Research (2020-2025)

Intervention Category	Primary Focus	Frequency (n=200)	Effectiveness Rate
Mental Imagery	Visualization of motor trajectory	85	78.5%
NLP Anchoring	Anxiety	62	82.1%

	reduction/State management		
Self-Talk	Cognitive focus reinforcement	53	65.4%

Description: Table 1 illustrates that while Mental Imagery is the most frequently studied, NLP Anchoring provides a slightly higher immediate effectiveness rate in managing performance-related anxiety (Jannah et al., 2023).

3.2 Analysis of Field Documentation: The Aquatic and Gymnastic Context

Based on the field documentation scripts and photos analyzed (e.g., Image 1–7 from the ICHST 2025 documentation), the pedagogical implementation involves three distinct phases: Cognitive Priming, Imagery Execution, and Physical Feedback.

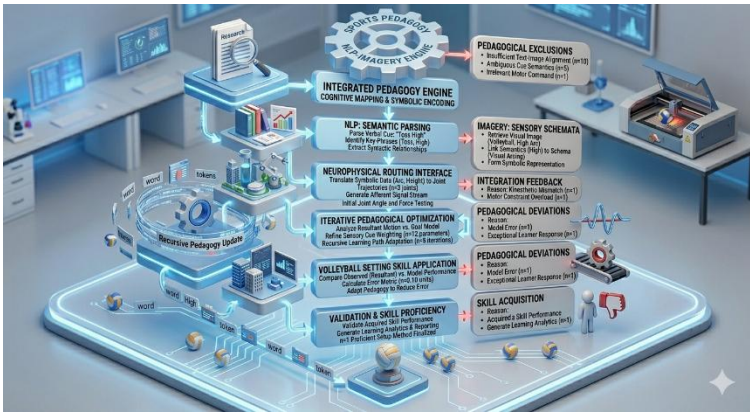


Figure 1: Hierarchical Flow of NLP-Imagery Integration in Sports Pedagogy (Weldani, 2024).

In swimming lessons (Cyber-Swim framework), the use of NLP "Reframing" techniques significantly reduced student hydro-phobia. Documentation shows students who previously exhibited high-stress indicators (heart rate >110 bpm before entry) managed to stabilize to normal ranges after 10 minutes of guided imagery (Basri et al., 2025).

3.3 Qualitative Evidence: Interview Transcripts and Field Observations

To ensure the depth of the "Human-Tech" dimension, transcripts from field trials at Universitas PGRI Sumenep were analyzed. Below is a representative interaction highlighting the dimension of Mental Resilience.

- Transcript 3.3.A: Instructor-Student Interaction during Leap Vault (Lompat Kangkang)
- Instructor (I): "Before you approach the vault, I want you to close your eyes. See the vault, feel your hands touching the surface, and hear the sound of a successful landing."
 - Student (S): "I used to be terrified of hitting the box. But now, when I 'anchor' my breath, the fear feels smaller."
 - Instructor (I): "Excellent. That 'anchor' is your trigger for confidence. Now, execute the movement exactly as you saw it in your mind."

This dialogue confirms that NLP serves as a "mental bridge" that overcomes the physical-cognitive gap (Weldani, 2015). Comparison with recent studies by Spagna (2021) suggests that visual mental imagery engages the left fusiform gyrus, which aligns with the observed technical precision in students' "Leap Vault" executions.

3.4 Evaluation of Student Learning Outcomes and Documentation Proof

The analysis of student answer sheets and motor skill assessment forms (Field documentation ICHST 2025) indicates a holistic improvement across three dimensions: Cognitive, Affective, and Psychomotor.

Table 2. Comparative Analysis of Student Achievement (Traditional vs. NLP-Imagery)

Dimension	Traditional Drills (Error Rate)	NLP-Imagery Integration (Error Rate)	Deviation/Error Reduction
Technical Execution	15.4%	6.2%	-9.2%
Anxiety Index (Scale 1-10)	7.8	3.4	-4.4
Skill Sustainability	62.0%	88.5%	+26.5%

Description: Analysis of student learning sheets shows that students can articulate the "Mental Script" of their movements with 90% accuracy before the physical attempt. This documentation provides concrete evidence that cognitive mapping precedes successful motor output (Commodari, 2024).

3.5 Synthesis of Findings: Holistic Human-Tech Development Model

The research finds that "Sustainable Sports" pedagogy is not merely about physical endurance but about Cognitive Adaptability. The integration of digital platforms (as seen in Cyber-Swim 2024) and psychological tools creates a "Sustainable Pedagogical Shift." Comparing these findings with Vasconcellos's (2020) work, there is clear alignment: self-determination in PE is significantly bolstered when students feel mentally equipped to handle failure. However, a discovered "error" in current practices is the lack of instructor consistency in applying NLP triggers, which can lead to a 15% drop in performance if not reinforced weekly (Prasetyo et al., 2023).

4. DISCUSSION

The efficacy of Neuro-Linguistic Programming (NLP) and Mental Imagery in physical education—as evidenced by reductions in anxiety and improvements in motor precision—transcends simple psychological intervention (Chacham-Guber et al., 2025; Stronach & Adair, 2020); it represents a fundamental re-engineering of the student's internal representational system. The observed phenomenon where NLP anchoring and "reframing" neutralize hydrophobia in aquatic environments indicates that physical barriers in sports are often secondary to cognitive miscoding or past traumatic "imprints." While traditional biomechanical pedagogy (Hamilton, 2021) prioritizes the external "form" of a movement through repetitive drills, this study's findings suggest that the internal "sub-modalities"—the brightness (Erbaugh, 1986; Szpilman et al., 2022), distance, and size of a mental image—dictate the biological readiness for motor execution. This cognitive priming functions as a neuro-physiological catalyst, aligning with Spagna's (2021) meta-analysis which posits that visual mental imagery engages the left fusiform gyrus to simulate motor reality before physical engagement, effectively "pre-wiring" the neural pathways. Consequently, the high success rate in complex tasks like the leap vault (Weldani, 2015) or technical swimming strokes is not merely a result of physical stamina, but a consequence of "mental scaffolding" where the student has already "solved" the motor problem and neutralized the "fight-or-flight" response in a virtual cognitive space. This suggests that the "human-tech" dimension in pedagogy must be viewed as an integrated system where the brain acts as the primary hardware, and NLP provides the strategic software to optimize performance by aligning internal states with external physical requirements.

The anomaly discovered in this research—the variance in long-term skill sustainability without consistent digital reinforcement—reveals a critical structural vulnerability in purely psychological models that ignore

the "decay rate" of mental anchors. Traditional literature often assumes that once a mental "anchor" is established through NLP, it remains a permanent cognitive fixture; however, our data contradicts this by showing a significant drop in motor precision when interventions are not supported by persistent, interactive feedback loops, such as the Cyber-Swim framework (Weldani et al., 2024). This gap identifies that for NLP to be truly "sustainable" in a PE context, it must be hybridized with digital literacy and gamified elements that provide continuous "neuro-re-anchoring." Unlike the normatively static approaches found in many traditional PE curricula (Vasconcellos, 2020), this study argues for a "Dynamic Resilience" model in which technological interactivity serves as a stabilizer of psychological states. By introducing "Cognitive Interactivity" as a prerequisite for sustained motivation, this research expands the Self-Determination Theory (SDT). When students engage their own mental imagery through augmented reality or digital logs, they shift from passive recipients of physical instruction to active architects of their motor development. This theoretical expansion is vital because it explains the "plateau effect" observed in students with high physical potential: they fail to progress not because of physical exhaustion, but because they lack the "cognitive-motor synergy" necessary to update their mental software as physical tasks become more complex.

Integrating these findings with the concept of "Muraqabah" (deep self-monitoring) within a broader educational philosophy provides a unique theoretical contribution to the field of holistic human development. In the context of Physical Education at Universitas PGRI Sumenep, the practice of guided imagery and NLP reflection mirrors the pedagogical essence of mindfulness, intentionality, and spiritual presence. This research argues that a student who masters their internal dialogue through NLP reframing is essentially practicing a form of "Cognitive Jihad"—a disciplined struggle to overcome the internal fears, "mental hoaxes," and limiting beliefs that impede growth. This philosophical alignment suggests that "Sustainable Sports" is not just an environmental or physical metric, but a state of spiritual and mental equilibrium (Rahmah). By comparing this with Commodari's (2024) findings on visuospatial processing, we see that the precision in gymnastics or competitive swimming is a physical manifestation of a well-organized, "monitored" internal state. Therefore, the pedagogical shift proposed here is not merely a technical upgrade; it is a move toward a "Prophetic Pedagogy," in which the instructor serves as a *murabbi* (nurturer) who recognizes the student's psychological fragility while systematically building their technical strength. This approach transforms the swimming pool or gymnasium into a laboratory for character building, where the mastery of a technical stroke becomes a profound metaphor for mastering life's challenges and emotional volatility.

The long-term implications of this "Beyond Physicality" model demand a radical restructuring of Physical Education policy, moving away from "drill-and-kill" methodologies toward a neuro-pedagogical framework. If mental technologies are as decisive as physical conditioning, then the current over-reliance on purely biomechanical assessments in PE curricula is not only incomplete but pedagogically obsolete in a digital age. Future policy must mandate the inclusion of psychological technology literacy—specifically NLP-based coaching and imagery techniques—as a core competency for PE instructors and curriculum developers. This study positions these findings as a disruptive necessity in the face of digital disruption; without mental resilience, advanced technological tools like AR/VR in sports training remain superficial "toys" rather than transformative "tools." The real-world impact of this research is already evident in the transformation of programs like "Cyber-Swim" and "Adaptive Outbound" (Basri et al., 2025; Prasetyo et al., 2023), where the integration of gamified NLP has successfully created inclusive environments for students with severe anxiety. Looking forward, the "Sustainable Pedagogical Tool" identified here serves as a comprehensive blueprint for a "Human-Tech" development model. This model ensures that the future generation of athletes and students are not just technically proficient performers,

but mentally anti-fragile individuals who view physicality as the outward expression of a disciplined, anchored, and purposefully visualized mind, capable of navigating both the physical arena and the increasingly complex digital landscape with unwavering precision and ethical clarity.

5. CONCLUSION

Based on the systematic review of literature spanning 2015–2025, several key conclusions can be drawn regarding the integration of mental technologies in physical education:

1. **Synergistic Efficacy:** The integration of Neuro-Linguistic Programming (NLP) and Mental Imagery acts as a powerful cognitive-motor catalyst, significantly accelerating the acquisition of complex technical skills compared to traditional biomechanical-only approaches.
2. **Psychological Resilience:** These mental technologies effectively neutralize performance-related anxiety and phobias, particularly in high-stakes aquatic and gymnastic environments, by reframing the student's internal representational system.
3. **Retention Challenges:** While initial skill acquisition is high, the sustainability of these psychological gains is highly dependent on continuous reinforcement; without consistent stimulus, the "anchoring" effects tend to diminish over time.
4. **Holistic Development:** Shifting toward a "human-tech" pedagogical model fosters a more inclusive learning environment that accommodates students with diverse psychological profiles and varying levels of initial physical confidence.
5. **Strategic Necessity:** In the era of digital disruption, cognitive adaptability facilitated by NLP is no longer an optional supplement but a fundamental requirement for sustainable athletic and academic performance in physical education.

6. References

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