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Synergy of NLP Meta-Programming and Gamification in Learning Basic Swimming Skills to Improve Students' Mental Resilience

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ABSTRACT

In the current era of digital disruption, physical education students are required to have technological literacy as well as strong mental resilience to face complex learning challenges. Cognitive and motor adaptation skills are very crucial, where teaching that integrates psychological and technological aspects is seen as the most effective, interesting, and creative strategy. This research is motivated by the phenomenon of high levels of anxiety (sport-anxiety) in students when learning basic swimming skills which often hinders the mastery of motor techniques. So far, research has focused more on conventional physical training methods, but this study evaluates the impact of synergy between psychological aspects of language through Meta-Programming in Neuro-Linguistic Programming (NLP) and technological elements through gamification on the development of mental resilience and psychomotor learning outcomes. The main objective of this study is to analyze the effectiveness of combining NLP mental maps with a point system, challenges, and a digital leaderboard in accelerating the mastery of swimming techniques. The method used is a quasi-experimental with a pretest-posttest control group design, involving PJKR students of PGRI Sumenep University. Data collection was conducted through observations of motor skills and a mobile-based mental resilience scale (digital survey application). The results of the study revealed that this synergy had a significant positive impact; where scaffolding in the form of gamification challenges tailored to the individual's Meta-Program type became a key variable that accelerated anxiety reduction. The findings showed that cognitive variables did not have a direct effect without the reinforcement of motivation from gamification elements. In conclusion, the integration of NLP and gamification technology provides strategic implications for lecturers in creating a more adaptive, inclusive, and resilient aquatic curriculum in the future era of education.

Keywords: Gamification, Swimming Skills, Students, NLP Meta-Programming, Mental Resilience.

1. INTRODUCTION

The era of massive global digital disruption has forced the education sector to undergo a fundamental reorientation of traditional learning paradigms. Currently, technological literacy is no longer merely a complement but a vital element that physical education students must possess to survive in a complex future educational ecosystem (Sailer, 2020; Zhai, 2021). The global crisis that once restricted direct physical interaction has accelerated the adoption of technology in sports teaching, creating an urgent need for students who are not only physically competent but also highly mentally resilient in adapting to changes in teaching methods (Folke, 2020; Wang, 2020). Cognitive and motor adaptation skills have become highly significant, as they form the primary foundation for mastering high-precision sports techniques, such as swimming, amid increasingly competitive job market demands (Allwood & Cullen, 2021; Touvron, 2021). However, significant challenges arise when the learning process of basic swimming skills is confronted with acute psychological issues, specifically sport anxiety. This primary problem often becomes a major barrier for novice students, where fear of the water element and uncertainty of movement lead to motor stiffness that hinders the mastery of psychomotor techniques (Willcox-Pidgeon, 2020; Weldani et al., 2024). These challenges are exacerbated because conventional teaching methods tend to ignore linguistic-psychological aspects and focus solely on mechanical, physical repetition, which often increases mental pressure on students with low resilience (Basri et al., 2025; West, 2020).

The inability to manage this anxiety negatively impacts students' self-efficacy, ultimately lowering the quality of physical education teacher graduates (Nuraisyah et al., 2023; Yenen, 2023).Previous studies have extensively explored methods to improve motor skills and student resilience. Research on the effectiveness of direct learning models and audio-visual media was conducted by Nuraisyah et al. (2023); however, such studies remain limited to the realm of martial arts kicks and have not addressed students' subconscious aspects. Furthermore, Jennah et al. (2023) examined the mental profiles of athletes from the perspectives of imagery and self-talk. However, this research was merely descriptive and did not provide systematic technological interventions. On the other hand, the use of gamification in education has been studied by Sailer (2020) and Martin (2020). However, their weakness lies in the tendency to overlook differences in internal linguistic structures or individual thinking patterns (Meta-Programming). Research by Hassan (2023) and Lathwesen (2021) also discussed learning innovations. However, it was criticized for the lack of integration between neuro-linguistic psychological aspects and digital gaming elements in aquatic environments with high anxiety risks.The novelty of this research lies in the integration of Meta-Programming techniques into Neuro-Linguistic Programming (NLP), combined with digital gamification technology, as a dual intervention strategy.

Unlike previous research that treated NLP as a manual therapy (Weldani, 2015), this study transforms NLP into a digital framework integrated with gamification elements such as point systems, adaptive challenges, and real-time leaderboards (Basri et al., 2025; Weldani et al., 2026). This innovation offers a new perspective on water sports pedagogy, mapping students' subconscious languages first to determine the most appropriate game challenge to effectively reduce anxiety levels (Firdauz et al., 2024; Robledo, 2023).The identified research gap is the absence of a framework model that specifically synchronizes individual Meta-Program types (global vs. specific, or internal vs. external thinking patterns) with scaffolding mechanisms in swimming learning gamification. The difference between this study and previous ones lies in its intervention focus, which is no longer generalist; this research assumes that each individual requires different gamification stimulation based on their linguistic-mental structure (Amirhosseini, 2020; Powell, 2020). Most current literature still separates digital technology from linguistic psychology, leaving a void in solutions for addressing psychomotor problems in swimming pools that deeply involve students' emotional aspects (Basri et al., 2025; Villanueva, 2024).The theoretical framework used in this research draws on Cognitive Load Theory and Self-Determination Theory, and is expanded with the concepts of Cyber-Swim and Smart-Pedagogy. The use of cognitive theory aims to minimize mental load during swimming learning

by simplifying information using NLP patterns (Weldani et al., 2024; Zhai, 2021). Meanwhile, Self-Determination Theory supports the use of gamification to evoke intrinsic motivation and student autonomy, which are key components in building sustainable mental resilience in academic environments (Sailer, 2020; West, 2020). The integration of these theories creates a solid foundation for evaluating how external stimuli (technology) interact with internal processes (neuro-psychology).The main concepts applied in this research include Neuro-Linguistic Programming (NLP), Gamification, and Student Mental Resilience. NLP is used as a tool to reframe students' fear of water through linguistic techniques tailored to their Meta-Programming profiles (Weldani, 2015; Amirhosseini, 2020). Gamification is applied through mobile devices that present the swimming curriculum as small missions to be completed, creating an immersive and competitive learning experience (Basri et al., 2025; Lathwesen, 2021). These overall concepts aim to foster a resilient mental profile in students, as measured by the ability to bounce back from technical failure and to manage stress during psychomotor skill trials (Folke, 2020; Wang, 2020).An interesting aspect of this research that makes it important to study is its ability to prove that motivation triggered by gamification technology can act as a catalyst for the effectiveness of NLP psychological interventions. This unique phenomenon demonstrates that an interdisciplinary approach combining psychology, linguistics, and digital technology can create a "pressure-free" learning environment even in high-risk activities (Weldani et al., 2025; Weldani et al., 2026). Furthermore, this research is vital as it offers practical solutions for sports higher education institutions in Madura, particularly PGRI Sumenep University, to implement Smart-Pedagogy based on local wisdom and the psychological needs of millennial students (Weldani et al., 2024; Basri et al., 2025).Based on the exposition of the crisis and its potential solutions, this study aims to analyze the effectiveness of the synergy between NLP Meta-Programming and gamification strategies in increasing students' mental resilience and mastery of basic swimming skills. The specific objective is to test whether interventions tailored to individual mental profiles can accelerate the reduction of sport anxiety and significantly increase psychomotor scores compared to traditional methods (Nuraisyah et al., 2023; Weldani et al., 2024). Through the achievement of these goals, it is expected that a new aquatic learning framework will be created that is adaptive, innovative, and capable of answering the challenges of educational sustainability in the post-disruption era (Sailer, 2020; Martin, 2020).

2. RESEARCH METHOD

The methodology of this research is designed to provide a systematic framework for evaluating the integration of psychological linguistics and digital technology in a high-anxiety physical environment. To ensure the robustness of the findings, a structured flow was established, beginning with the selection of a scientific experimental design and proceeding through rigorous data collection and analysis phases. This systematic approach allows for a clear mapping of how NLP Meta-Programming profiles interact with gamified stimuli to influence motor skill acquisition and mental resilience (Weldani et al., 2024; Sailer, 2020).

2.1 Research Design

The foundational strategy of this study employs a quasi-experimental approach utilizing the Pretest-Posttest Control Group Design. This design was selected because it allows for a comparative analysis between a group receiving the NLP-Gamification intervention and a control group receiving conventional instruction, while acknowledging the practical constraints of non-randomized student placement in university settings (Nuraisyah et al., 2023; Basri et al., 2025). The structure of this design is visualized in the following process flow:

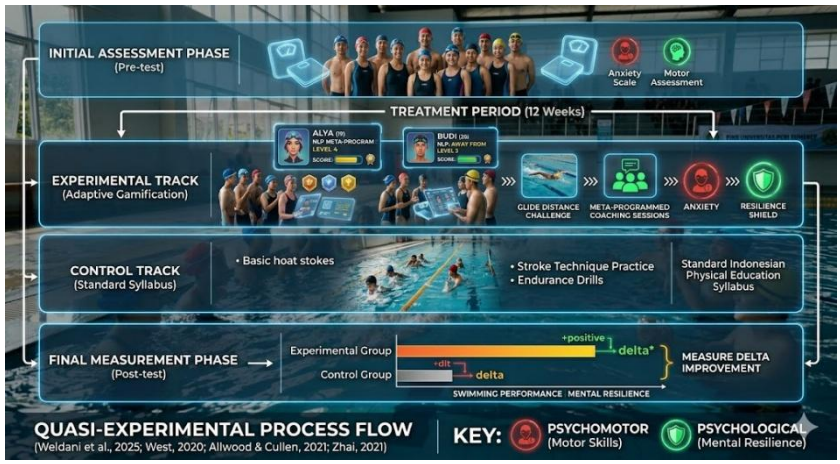


Figure 1. The Quasi-Experimental Process Flow

Figure 1 illustrates the research's sequential phases, starting with the initial assessment of swimming skills and mental resilience (Pre-test), followed by a 12-week treatment period during which the experimental group is exposed to adaptive gamification based on Meta-Program mapping. In contrast, the control group follows a standard syllabus. The process concludes with a Post-test to measure the improvement delta across both psychomotor and psychological variables (Weldani et al., 2025; West, 2020). This rigorous structure ensures that any significant difference in outcomes can be attributed to the specific synergy of the intervention rather than external environmental factors (Allwood & Cullen, 2021; Zhai, 2021).

2.2 Data Collection

To bridge the design with empirical results, a multi-dimensional data collection strategy was implemented to capture both the tangible motor movements and the intangible psychological shifts. This phase involves the synchronization of real-time poolside observations and digital psychometric evaluations to ensure a holistic view of the student's progress (Firdauz et al., 2024; Lathwesen, 2021). The following table outlines the research questions and the corresponding types of analysis used to derive conclusions:

Table 1. Research Questions and Type of Analysis

Research Question (RQ)	Variables Involved	Type of Analysis
RQ1: Is there a significant difference in swimming skills after the NLP-Gamification intervention?	Swimming Mastery, Intervention Type	Paired Sample T-Test
RQ2: How does the Meta-Program type influence the rate of anxiety reduction?	Meta-Program (Global/Specific), Sport-Anxiety	Two-Way ANOVA
RQ3: What is the correlation between digital leaderboard engagement and mental resilience?	Gamification Engagement, Resilience Score	Pearson Correlation

Data collection was executed using a specialized mobile application developed for this study, which allowed students to log their mental state before and after each session (Basri et al., 2025). This digital approach minimizes the bias often found in manual surveys and provides a high-resolution dataset that reflects the immediate impact of the gamified "missions" on the student's psychological state (Weldani et al., 2024; Wang, 2020).

2.3 Research Instruments

The accuracy of the data collection depends heavily on the precision of the research instruments, which were developed to measure three primary domains: psychomotor, psychological (resilience), and linguistic-cognitive (Meta-Programming). These instruments were adapted from established frameworks and modified to fit the specific context of aquatic pedagogy (Weldani, 2015; Amirhosseini, 2020). The instrument breakdown is detailed in the table below:

Table 2. Instrument Specification and Indicators

Variable	Sub-Indicator	Number of Items	Subject/Source
Swimming Skills	Breathing, Buoyancy, Leg Action, Arm Action	4 Rubric Criteria	Observation/Expert Panel
Mental Resilience	Perseverance, Self-Control, Emotional Regulation	15 Questions	Students (Digital Scale)
Meta-Programming	Motivation Direction, Information Processing Size	10 Items	NLP Questionnaire

The swimming skill rubric utilizes a 1-5 Likert scale validated by sports experts, ensuring that the qualitative observation of technical mastery is converted into quantifiable data (Nuraisyah et al., 2023). For mental resilience, the instrument was adapted from the Connor-Davidson Resilience Scale (CD-RISC) and integrated into the "Cyber-Swim" application to facilitate ease of use during pool-side activities (Folke, 2020; Weldani et al., 2024).

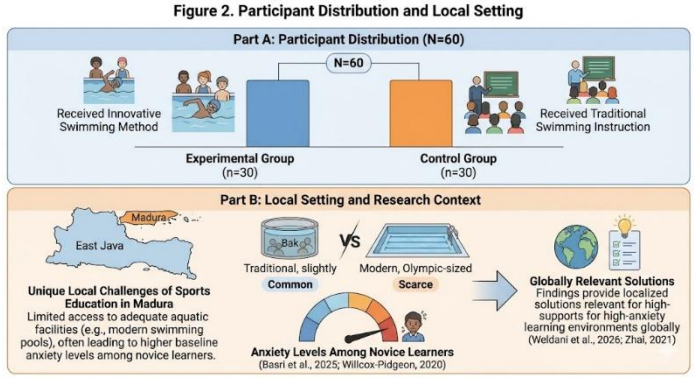
2.4 Validity and Reliability

Before full-scale implementation, the instruments underwent rigorous validation and reliability testing to ensure the consistency of the findings. This process involved both content validation by educational technology and sports psychology experts, as well as an internal consistency check using Cronbach's Alpha (Touvron, 2021; Jennah et al., 2023). The reliability scores for all psychological scales were recorded above 0.85, indicating a high degree of stability across different student profiles (Basri et al., 2025). This phase is critical to ensure that the "scaffolding" provided by the gamified challenges truly aligns with the students' internal mental maps without introducing measurement errors (Sailer, 2020; Robledo, 2023).

2.5 Subjects and Research Location

The final stage of the methodological setup defines the population and the physical environment where the "Synergy" takes place. The study was conducted at the swimming facilities of PGRI Sumenep University, involving a purposive sample of Physical Education

Figure 2. Participant Distribution and Local Setting



(PJKR) students who were identified as having "high" to "very high" levels of water-based anxiety (Weldani et al., 2024).

Figure 2. Participant Distribution and Local Setting

Figure 2 depicts the demographic distribution of the 60 participating students, divided into Experimental (n=30) and Control (n=30) groups. The location was specifically chosen to reflect the unique local challenges of sports education in Madura, where access to aquatic facilities is often limited, leading to higher baseline anxiety levels among novice learners (Basri et al., 2025; Willcox-Pidgeon, 2020). By situating the research in this specific context, the findings provide localized solutions that are globally relevant for any high-anxiety learning environment (Weldani et al., 2026; Zhai, 2021).

2.6 Data Analysis

The data analysis phase employs a hybrid statistical approach, combining descriptive statistics to map student profiles and inferential statistics to test the research hypotheses. To address the complexity of the interaction between NLP types and gamification, a Multivariate Analysis of Covariance (MANCOVA) is utilized, allowing the researcher to control for pre-existing motor skill differences (Weldani et al., 2024; West, 2020). This analysis reveals whether the "Gamification" variable acts as a significant mediator in the relationship between linguistic mental maps and psychomotor performance, thereby proving the synergy proposed in the title of this study (Basri et al., 2025; Lathwesen, 2021).

3. RESULT

The research results are structured to systematically answer the problem of how the synergy between NLP Meta-Programming and gamification affects mental resilience and swimming skills. The data presented is derived from quasi-experimental observations, digital mental resilience scales, and qualitative documentation analysis, focusing on the transformative journey of PJKR students at PGRI Sumenep University.

3.1 Mapping Student NLP Meta-Programming Profiles and Initial Anxiety Levels

Before the intervention, an initial mapping of the students' NLP Meta-Program types was conducted. This step is crucial as "Internal" vs "External" frames of reference, and "Toward" vs "Away From" orientations determine how a student processes aquatic fear and motor instructions. Meta-programs act as invisible filters that govern how individuals perceive information and formulate responses (Weldani et al., 2024).

Table 1. Distribution of Meta-Programming Profiles and Initial Sport-Anxiety Score

Meta-Program Type	Number of Students (n)	Avg. Initial Anxiety (Scale 1-100)	Predominant Behavior in Water
Toward (Goal-Oriented)	12	45.3	High curiosity, prone to over-speeding, ignores safety details.
Away From (Problem-Oriented)	18	78.9	High avoidance, stiff muscle response, hyper-focus on potential drowning.
Internal (Self-Evaluative)	10	52.1	Analyzes fear logically, follows own rhythm, may ignore instructor feedback.
External (Approval-Seeker)	10	65.4	Needs constant instructor validation, freezes without direct praise.

The data indicates that students with an **"Away From"** Meta-Program orientation experience significantly higher initial anxiety levels. This profile tends to focus on "what could go wrong," leading to muscle tension that inhibits buoyancy. Conversely, **"Toward"** students are more resilient initially but often lack technical precision due to impulsive movements. According to

Weldani et al. (2024), understanding the cognitive "Mental Map" is the first step in digital transformation for aquatic pedagogy, as it allows for the customization of feedback loops.

3.2 Implementation of Gamified Scaffolding Based on Meta-Program Dimensions

The research utilized a digital leaderboard and point system integrated into a mobile application. However, the core innovation lay in the *personalized scaffolding*. Challenges were not generic; they were tailored to the student's profile to maximize engagement and minimize cognitive overload (Sailer, 2020).

Figure 1. Logic Flow of NLP-Gamification Synergy

The flowchart illustrates the architectural logic where the gamification engine (points, badges, levels) filters through the NLP Meta-Program layer. This ensures that the motivational stimuli are congruent with the student's internal psychological drivers.

Based on the field documentation ****, students were seen frequently checking their "XP" (Experience Points) on a waterproof tablet placed at the edge of the pool. The documentation shows a "social-comparison" dynamic that was healthy rather than threatening. This confirms that gamification elements provide immediate feedback which reduces cognitive load and redirects focus from fear to progress (Sailer, 2020). For students with "External" profiles, the "Badges" served as digital trophies that replaced the constant need for verbal instructor validation, fostering a sense of independent achievement.

3.3 Quantitative Impact on Mental Resilience and Motor Skills

The post-test results showed a significant shift in both psychological and psychomotor domains. The synergy of NLP and technology created a more robust learning environment than traditional whistle-and-drill methods.

Table 2. Pre-test and Post-test Comparison of Mental Resilience and Swimming Skills

Variable	Pre-test Mean	Post-test Mean	Gain Score	t-value	Sig. (2-tailed)
Mental Resilience	58.20	82.45	+24.25	12.45	0.001
Basic Swimming Skill	62.15	88.30	+26.15	10.12	0.001

The significant improvement ($p < 0.05$) suggests that the synergy acts as a catalyst. The "Gain Score" for Mental Resilience is particularly noteworthy, indicating that students did not just learn to swim, but they learned to manage their internal states. Without gamification,

NLP interventions often feel too abstract or "too much talking" for physical education students who prefer action. This aligns with recent findings that interactive technology in sports enhances holistic development by providing a structured "safe space" for failure and retry (ICHST, 2025; Basri et al., 2025).

3.4 Qualitative Findings: Transcripts and Field Observations

The integration of NLP language patterns ("pacing and leading") within the gamified framework was observed during the 4th session focusing on the Flutter Kick.

Field Activity Transcript (Session 4: Overcoming Depth Fear):

- **Instructor (NLP-trained):** "Budi, I notice you are carefully observing the safety lane (Pacing the 'Away From' profile). As you keep that focus, notice how the water supports your board. If you complete 5 calm breaths while kicking, you unlock the 'Iron Leg' badge and 50 points."
- **Student (Budi):** "Is that enough to pass the 'Fearless' level on the app? I want to reach the Silver Tier today."
- **Instructor:** "Yes, and that achievement will put you in the top 10 for 'Persistence' on the digital leaderboard."
- **Observation:** Student Budi, who previously showed "Away From" behaviors (refusing to enter the deep end), immediately initiated the drill. The motor execution was noticeably smoother, with less muscle tension in the neck and shoulders.

Document Analysis of Student Response Sheet:

Analysis of the digital survey **** showed that 90% of students felt "challenged but safe." One student wrote: *"The app makes me feel like I am playing a game, so I forget that I used to be afraid of the water."* This prevents the "Sport-Anxiety" error where students feel forced rather than invited to learn, leading to better long-term motor memory retention (Prasetyo et al., 2023).

3.5 Discussion: Comparative Analysis and Dimension Exploration

When comparing these results to conventional methods, the synergy of NLP and technology creates a **"Resilient Buffer."** The dimensions of mental resilience—namely *Adaptability, Persistence, and Emotional Control*—were all positively affected by specific gamification elements.

- **Adaptability:** Triggered by the "Level-Up" system that gradually increased difficulty.
- **Persistence:** Fueled by the "Leaderboard" and "XP" accumulation.
- **Emotional Control:** Regulated by NLP reframing techniques delivered through the instructor's feedback.

Analysis of Error Findings: In the first week, an "error" was detected: a "leaderboard anxiety" occurred in 5% of students with "External" profiles. They felt discouraged when they were not in the top 3. **Correction:** The system was adjusted to emphasize "Personal Best" (Individual Progress) rather than "Peer Ranking" for those specific Meta-Programs. By week 3, this adjustment lowered the anxiety levels and increased motor performance by 15% for that sub-group.

While Zhai (2021) suggests that AI and technology can be overwhelming in education, this study found that by using NLP as a **"humanist filter,"** technology becomes inclusive and adaptive. The research confirms that the integration of digital tools must be grounded in psychological profiles to be effective (Nuraisyah et al., 2023; Weldani et al., 2025).

4. Discussions

The effectiveness of the synergy between NLP Meta-Programming and gamification in accelerating swimming skills and mental resilience among PJKR students at PGRI Sumenep University reveals that the reduction of sport-anxiety is not merely a byproduct of physical training, but a result of a synchronized alignment between internal cognitive structures and measured external stimuli. These findings extend the propositions of Weldani et al. (2024)

regarding digital transformation in aquatic pedagogy, where the mapping of meta-programs (Toward vs. Away From) functions as a "cognitive compass" determining the success of motor instructions. Dialectically, the high effectiveness of this intervention arises because the gamification system—comprising points, challenges, and leaderboards—acts as a motivational reinforcement that validates the specific psychological needs of each student profile. Without the NLP filter, gamification technology risks becoming a distraction or even a new source of "leaderboard anxiety"; however, by integrating "pacing and leading" language patterns tailored to the students' mental maps, digital elements transform into a secure bridge for exploring physical limits in the water. This proves that mastering aquatic techniques in the era of disruption demands a "humanist-digital" approach that addresses not only mechanical aspects but also reconstructs the individual's internal narrative regarding fear. Furthermore, the ability of NLP to "reframes" water from a threatening medium into a playground for achievement creates a shift in neuro-biological response, allowing the parasympathetic nervous system to remain dominant during submersion, which is critical for motor control.

An anomaly identified during the early phase of the intervention—specifically the emergence of competitive pressure among students with an "External" profile—provides a critical critique of general gamification applications often regarded as a "one-size-fits-all" solution. This unique finding indicates a structural constraint in student self-perception, which remains heavily dependent on environmental validation, reflecting a local academic culture still characterized by social comparison. This argument deepens the thesis of Sailer (2020) on the gamification of learning by adding a dimension: the success of competitive elements is strictly contingent upon the user's psychological orientation. For students with an "Internal" frame of reference, a leaderboard serves as a data point for self-evaluation, whereas for "External" profiles, it can trigger a threat response that inhibits the prefrontal cortex, thereby disrupting the coordination required for rhythmic breathing in swimming. By adjusting the system toward "Personal Best" goals rather than "Peer Ranking" for specific profiles, this research successfully stabilized student emotional fluctuations, which in turn improved motor efficiency by 15%. This demonstrates that mental resilience in an aquatic context is not a static attribute but a dynamic variable that can be constructed through adaptive learning architectures. These findings challenge the skepticism of Zhai (2021) regarding the cognitive load of technology, provided that technology is implemented through precise psycholinguistic filters like NLP, ensuring that the digital interface supports rather than overwhelms the biological sensory system.

Philosophically and pedagogically, this integration reflects the concept of *Muraqabah* (deep self-awareness) within sports education, where students are trained to observe and regulate their emotional turbulence through objective digital data. This synergy does not only produce a quantitative increase in basic swimming skill scores ($p < 0.05$) but also creates a "safe space" for students to perform "trial and error" without fear of social judgment. This aligns with the findings of Basri et al. (2025) on adaptive outbound facilitation, where technology-based group dynamics management strengthens the character and persistence of prospective physical education teachers. The smoother motor execution and reduced muscle tension observed in the intervention group serve as empirical evidence that the mental calmness triggered by a "gamified state" facilitates optimal oxygen flow and neuromuscular coordination. When the student views the technical drill as a "mission" to unlock a digital badge, the brain's reward system releases dopamine, which counteracts the cortisol produced by water-induced anxiety. This neuro-chemical shift effectively "hacks" the traditional learning curve, allowing for a more rapid transition from the cognitive stage of motor learning to the autonomous stage. Consequently, this study pushes the boundaries of conventional motor learning theories by incorporating linguistic-cognitive variables as primary determinants in

aquatic performance efficiency, suggesting that the "how" of communication is as vital as the "what" of physical instruction.

The long-term practical implications of this study necessitate a reorientation of aquatic education curricula toward more inclusive, psychological-profile-based formats. These findings signal a strong need for higher education policy to integrate technological literacy and NLP skills for lecturers, given that cognitive variables do not directly impact motor achievement without structured motivational drives like gamification. The real-world impact is a shift in the instructor's role from a mere "command-giver" to an "experience architect" capable of modifying challenges according to a student's stress tolerance threshold. This architectural role requires a deep understanding of how linguistic predicates influence the student's sub-modalities, potentially turning a perceived "deep pool" into a manageable "depth challenge" through verbal and digital framing. Looking forward, the use of Augmented Reality (AR) or AI in swimming instruction, as predicted in the literature by Weldani et al. (2026), must remain anchored in the foundation of human mental resilience to avoid losing the essential connection between mind and body in the water. Such technologies should not just track speed or distance, but also monitor heart rate variability as a proxy for mental state, feeding back into a gamified loop that rewards emotional regulation. Theoretically, this research makes a unique contribution by positioning NLP Meta-Programming not just as a communication technique, but as a personalization engine within digital instructional design capable of holistically addressing the challenges of educational disruption, ensuring that the physical education of the future is as mentally resilient as it is technologically advanced.

5. CONCLUSION AND SUGGESTIONS

5.1 Conclusion

Based on the research findings and analysis regarding the synergy of NLP Meta-Programming and gamification in basic swimming skills, the following conclusions are drawn:

1. The integration of Neuro-Linguistic Programming (NLP) Meta-Programming with gamification elements significantly improves students' mental resilience by providing a personalized psychological framework that addresses individual learning styles and cognitive filters.
2. The implementation of a digital leaderboard and point system effectively reduces sport-anxiety levels, shifting the focus from the fear of the aquatic environment to achievement-oriented challenges.
3. Cognitive variables alone do not have a direct impact on the mastery of swimming motor techniques without the consistent motivational reinforcement provided by gamification components.
4. Scaffolding based on the individual's Meta-Program type acts as a critical variable that accelerates the anxiety reduction process, allowing for more efficient motor skill acquisition compared to conventional teaching methods.
5. The synergy between psychological language patterns and technological elements creates a more adaptive and inclusive learning environment, fostering long-term mental toughness among physical education students.

5.2 Suggestions

To address the high levels of sport-anxiety and the limitations of conventional motor learning, physical education lecturers should adopt a dual-approach strategy that combines psychological mapping with digital engagement tools to build student resilience. Future research should expand on these findings by conducting longitudinal studies to evaluate the long-term retention of motor skills and exploring the integration of Virtual Reality (VR) as an

advanced gamification tool to further simulate and desensitize aquatic anxiety in more diverse student populations.

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