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Examining Interaction Patterns Between Teaching Approaches and Self-efficacy in Karate Kumite Skill Acquisition

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ABSTRACT

This study examines how teaching approaches interact with students' self-efficacy in influencing karate kumite skill acquisition. Instructional effectiveness in physical education is often treated as uniform, despite differences in learner characteristics. This study aims to analyze interaction patterns between teaching approaches and self-efficacy to provide a more precise understanding of learning outcomes. A quasi-experimental design with a 2x2 factorial structure was used, involving 32 students divided into Direct Instruction (DI) and Personalized System for Instruction (PSI) groups, each categorized into high and low self-efficacy levels. Data were collected using a self-efficacy questionnaire and a standardized kumite skill assessment instrument. The results showed that DI produced the highest improvement among students with high self-efficacy, while its effectiveness decreased in the low self-efficacy group. In contrast, PSI demonstrated more consistent outcomes across both levels. A significant interaction effect was identified, indicating that instructional effectiveness varies depending on students' psychological conditions. The study concludes that teaching approaches should be adapted based on self-efficacy to optimize learning outcomes in karate kumite.

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INTRODUCTION

Instructional effectiveness in physical education is often treated as a uniform outcome, where a single teaching approach is expected to produce similar learning gains across students. However, recent developments in sport pedagogy challenge this assumption by emphasizing that learning outcomes are conditional and shaped by the interaction between instructional design and learner characteristics (Casey & Kirk, 2020; Metzler, 2017). This issue becomes more critical in complex motor skill learning, where performance depends not only on repetition but also on cognitive processing and psychological readiness. Karate kumite represents a relevant context for examining this issue because it involves dynamic, open-skill performance that integrates decision-making, timing, and adaptive responses under pressure (Sierra-Ríos et al., 2020; Simões et al., 2024).

Previous research has demonstrated that structured teaching approaches such as Direct Instruction (DI) can improve motor skill performance through systematic explanation, demonstration, and guided practice (Guzmán & Payá, 2020; Stockard et al., 2018). At the same time, learner-centered approaches such as the Personalized System for Instruction (PSI) support autonomy, self-paced learning, and mastery-based progression (Mannion et al., 2023). However, most empirical studies evaluate these approaches based on their overall effectiveness without sufficiently considering variability across learners. For example, studies in physical education and sport learning often compare instructional models using aggregate outcomes, assuming similar effects across participants (Casey & Kirk, 2020; Sierra-Ríos et al., 2020). This approach limits the ability to explain differential learning outcomes under varying learner conditions.

Psychological factors, particularly self-efficacy, have been identified as important determinants of learning behavior and performance. Self-efficacy influences students' effort, persistence, and engagement when performing challenging tasks (Bandura & Wessels, 1997; Schunk & DiBenedetto, 2020). Empirical studies have shown that higher self-efficacy is associated with better performance and greater persistence in motor learning contexts (López-Rodrígueza et al., 2025; Trautner & Schwinger, 2020). In addition, research by Peng & Zhang (2021) demonstrated that self-efficacy can moderate performance outcomes in sport settings. Despite these findings, many studies still treat self-efficacy as an independent predictor rather than examining how it interacts with instructional approaches.

A key limitation in the existing literature is that interaction effects are often reported statistically but not interpreted substantively. For instance, factorial studies in sport education frequently identify significant interaction effects without providing detailed explanations of how instructional effectiveness varies across learner characteristics (Abbas & North, 2018; Peng & Zhang, 2021). As a result, the literature provides limited insight into the mechanisms underlying

these interactions, particularly in specific contexts such as martial arts learning. This indicates a gap in understanding not only whether an interaction exists but also how and why it influences learning outcomes.

To address this limitation, this study shifts the focus from general effect analysis to conditional effect analysis. Instead of asking whether a teaching approach is effective, this study examines when and for whom a particular approach produces optimal learning outcomes. Specifically, this study investigates how teaching approaches interact with students' self-efficacy in shaping karate kumite skill acquisition. It is hypothesized that the effectiveness of teaching approaches differs across levels of self-efficacy, indicating the presence of distinct interaction patterns.

This study employs a quasi-experimental design with a 2x2 factorial structure to analyze interaction patterns between teaching approaches (DI and PSI) and self-efficacy levels (high and low). This design enables a more detailed examination of how combinations of instructional strategies and psychological conditions influence learning outcomes (Fraenkel et al., 2023). By focusing on interaction patterns, this study extends previous research that primarily emphasizes main effects.

This study aims to examine the interaction patterns between teaching approaches and students' self-efficacy in influencing karate kumite skill acquisition. The findings are expected to contribute to sport pedagogy by providing a clearer explanation of conditional instructional effectiveness. In addition, the results are expected to offer practical implications for educators and coaches in selecting teaching approaches that align with students' psychological readiness.

THEORETICAL FRAMEWORK

The alignment between instructional conditions and learner characteristics influences motor skill learning in physical education. Contemporary sport pedagogy emphasizes that instructional effectiveness is conditional rather than universal, meaning that learning outcomes depend on how teaching approaches interact with students' psychological readiness (Casey & Kirk, 2020; Metzler, 2017). Based on this perspective, this study integrates teaching approaches as instructional variables, self-efficacy as a psychological moderator, and motor skill acquisition as the learning outcome.

Teaching approaches determine how learning experiences are structured and delivered. DI is characterized by explicit explanation, demonstration, guided practice, and immediate feedback, which facilitate accurate execution of motor skills and reduce performance errors (Rosenshine, 2012; Stockard et al., 2018). In contrast, the PSI emphasizes

self-paced learning, repetition, and mastery-based progression, allowing learners to regulate their own learning process and revisit tasks until mastery is achieved (Mannion et al., 2023). While both approaches are effective, their impact may vary depending on how learners respond to structure, feedback, and autonomy (Casey & Kirk, 2020).

Self-efficacy, derived from social cognitive theory, refers to individuals' beliefs in their ability to perform specific tasks (Bandura & Wessels, 1997). It functions as a key mechanism that influences effort, persistence, and responsiveness to instructional input (Schunk & DiBenedetto, 2020). Empirical evidence shows that learners with high self-efficacy tend to utilize feedback more effectively and maintain engagement during practice, whereas those with low self-efficacy often require supportive and flexible learning conditions to sustain participation (López-Rodrígueza et al., 2025; Trautner & Schwinger, 2020). Furthermore, self-efficacy has been shown to moderate performance outcomes in sport contexts, indicating its role in shaping how learners respond to different instructional conditions (Peng & Zhang, 2021).

Motor skill acquisition in karate kumite involves the integration of perceptual, cognitive, and motor processes in dynamic and unpredictable environments. As an open skill, kumite requires learners to adapt their actions based on situational demands continuously, making practice structure and feedback critical components of learning (Schmidt & Lee, 2014; Simões et al., 2024). Therefore, the effectiveness of a teaching approach depends on its ability to support these adaptive processes under varying learner conditions.

The interaction between teaching approaches and self-efficacy can be explained through the concept of conditional instructional effectiveness. This concept suggests that instructional strategies do not produce uniform effects; instead, their effectiveness is contingent upon learners' psychological characteristics (Casey & Kirk, 2020). In this context, structured approaches such as DI may be more effective for learners with high self-efficacy who can process feedback efficiently. In contrast, flexible approaches such as PSI may better support learners with lower self-efficacy by providing autonomy and repeated practice opportunities. This interaction reflects a moderating mechanism in which self-efficacy influences the direction and magnitude of instructional effects.

Based on this framework, this study proposes that teaching approaches directly influence karate kumite skill acquisition, while self-efficacy moderates this relationship. The combination of these variables produces different learning outcomes across conditions, forming distinct interaction patterns. Therefore, analyzing these interaction patterns is essential to understanding how instructional effectiveness varies across learners.

METHOD

Research Design

This study employed a quasi-experimental design using a 2x2 factorial structure to examine the interaction between teaching approaches and self-efficacy in influencing karate kumite skill acquisition (Fraenkel et al., 2023). The teaching approach was treated as the independent variable, consisting of DI and the PSI. Self-efficacy functioned as the moderating variable, categorized into high and low levels. The dependent variable was students' kumite skill acquisition. The factorial design enabled the analysis of both main effects and interaction effects, with a specific focus on identifying interaction patterns across different combinations of instructional approaches and self-efficacy levels.

Participants

The study was conducted in a school-based karate extracurricular program at a public senior high school in Bandung Regency, Indonesia. The program was implemented as part of regular extracurricular activities during the 2024/2025 academic year. The initial population consisted of 60 students who actively participated in karate training sessions. Participants were selected using purposive sampling based on the following criteria: (1) active participation in the karate extracurricular program, and (2) basic ability to perform kumite techniques.

To examine the moderating effect of self-efficacy, participants were classified into high and low groups using the 27% upper–lower method (Miller, 2008; Sumaraw et al., 2025). Students in the top 27% were categorized as high self-efficacy, while those in the bottom 27% were categorized as low self-efficacy. Students in the middle range were excluded to ensure clearer group differentiation. This procedure resulted in 32 participants, consisting of 16 students in each category. Participants were then assigned to treatment groups using an ordinal pairing technique to ensure balanced group distribution across experimental conditions.

Instruments

Two instruments were used to collect data in this study. Students' self-efficacy was assessed using the General Self-Efficacy Scale (GSES-12), which measures individuals' confidence in handling tasks and overcoming challenges. The instrument consists of 12 items rated on a Likert scale, with higher scores indicating higher levels of self-efficacy (Soetjipto et al., 2023). Kumite skill acquisition was evaluated using the System for Technical Assessment of Kumite (STAK). The instrument assesses four fundamental techniques: *kizami-zuki*, *gyaku-zuki*, *mawashi-geri*, and *ura-mawashi-geri*. Each technique was evaluated based on four criteria: technique accuracy, power, control (*zanshin*), and distance. Scoring was conducted using a three-point scale by two qualified karate experts. Inter-rater reliability was examined using the Intraclass Correlation Coefficient (ICC) to ensure scoring consistency (Ferreira et al., 2024).

Table 1. Overview of Research Instruments and Measurement Indicators

Instrument	Description	Indicators	Notes
Self-Efficacy (GSES-12)	Measures general self-efficacy in handling challenges and performing tasks	- Initiative - Effort - Persistence	12 items, 5-point Likert scale; validated Indonesian version with strong psychometric properties
Kumite Skill Assessment (STAK)	Assesses technical execution in karate kumite based on standardized observation system	- *Kizami-zuki* - *Gyaku-zuki* - *Mawashi-geri* - *Ura mawashi-geri* - Good form - Vigorous application (power & speed) - *Zanshin* (control and awareness) - Correct distance	Scored 1-3 scale; high inter and intra-rater reliability (ICC = 0.774-0.959)

Procedure

The research procedure consisted of six sequential stages, as illustrated in Figure 2. In the first stage, participants were selected from an initial pool of 60 students through purposive sampling based on active participation and basic kumite ability. In the second stage, all participants completed the GSES-12 to measure their self-efficacy levels. In the third stage, participants were classified into high and low self-efficacy groups using the 27% upper–lower method, resulting in 32 students. In the fourth stage, a pretest was administered to assess baseline kumite skill performance using the STAK instrument.

Following the pretest, participants were assigned to treatment groups using an ordinal pairing technique to ensure balanced distribution across experimental conditions. The intervention was carried out over 10 instructional sessions within approximately six weeks, with each session structured into three phases: warm-up, main practice, and cool-down. Participants in the DI group received structured instruction consisting of explicit explanation, demonstration, guided practice, and immediate corrective feedback. In contrast, participants in the PSI group engaged in self-paced learning using modular instructional materials, progressing based on individual mastery attainment. Upon completion of the intervention, a posttest was administered using the same STAK procedures as the pretest to measure changes in kumite skill acquisition. The collected data were subsequently analyzed using normalized gain (N-gain) scores and a two-way ANOVA to examine main effects and interaction effects between teaching approaches and self-efficacy levels.

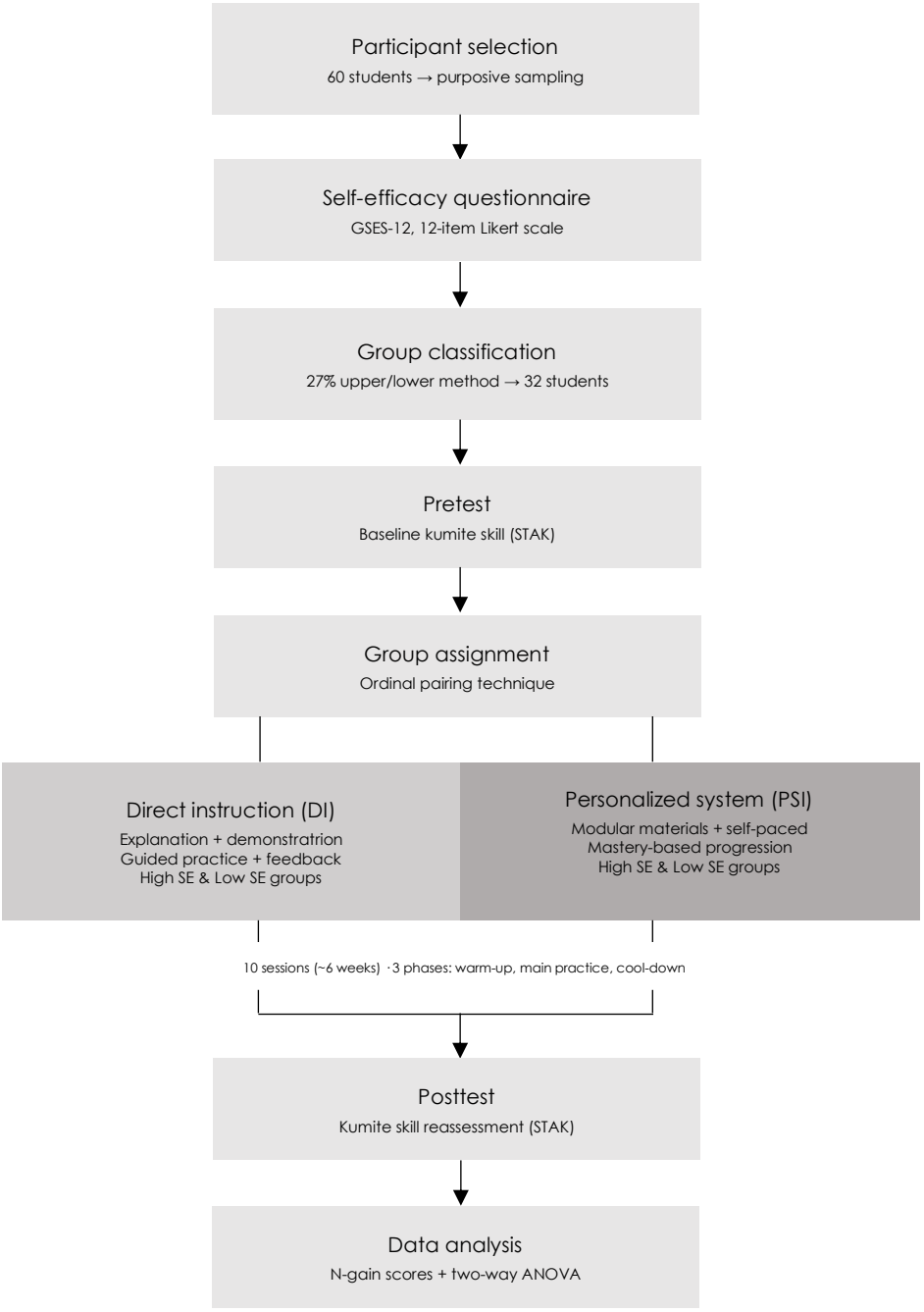

Figure 1. Research Procedure Flowchart

RESULTS

Descriptive statistics were calculated to examine the pattern of improvement in karate kumite skill acquisition across the four experimental groups formed by the combination of teaching approaches and self-efficacy levels. The improvement in performance was analyzed using normalized gain (N-gain) scores, which represent the relative increase from pretest to posttest (Hake, 1998; Nissen et al., 2018).

The results indicate clear variations in learning outcomes across groups. As shown in Table 1, students in the DI group with high self-efficacy demonstrated the highest improvement (M = 0.63, SD = 0.12). In contrast, the lowest improvement was observed in the DI group with low self-efficacy (M = 0.33, SD = 0.11). Meanwhile, students in the PSI groups showed relatively consistent improvement across both self-efficacy levels (high: M = 0.37, SD = 0.15; low: M = 0.39, SD = 0.13).

These findings indicate that the effectiveness of teaching approaches varies depending on students' self-efficacy levels. The DI approach appears to produce substantially higher gains when combined with high self-efficacy, whereas its effectiveness decreases under low self-efficacy conditions. In contrast, the PSI approach shows a more stable pattern across both levels of self-efficacy, with only slight variation in performance improvement.

Table 2. Descriptive Statistics of N-gain Scores Across Experimental Groups

Group	N	Mean	SD
DI - High Self-Efficacy	8	0.63	0.12
PSI - High Self-Efficacy	8	0.37	0.15
DI - Low Self-Efficacy	8	0.33	0.11
PSI - Low Self-Efficacy	8	0.39	0.13

To further examine the statistical significance of these differences, a two-way analysis of variance (ANOVA) was conducted. The results revealed that teaching approaches had a significant effect on kumite skill acquisition ($F = 5.123$, $p = 0.032$, $\eta p^2 = 0.155$), indicating a moderate effect size. Self-efficacy also showed a significant effect ($F = 10.290$, $p = 0.003$, $\eta p^2 = 0.269$), representing a large effect. More importantly, a significant interaction effect was found between teaching approaches and self-efficacy ($F = 12.736$, $p = 0.001$, $\eta p^2 = 0.313$). The large effect size of this interaction indicates that the effectiveness of teaching approaches strongly depends on students' self-efficacy levels.

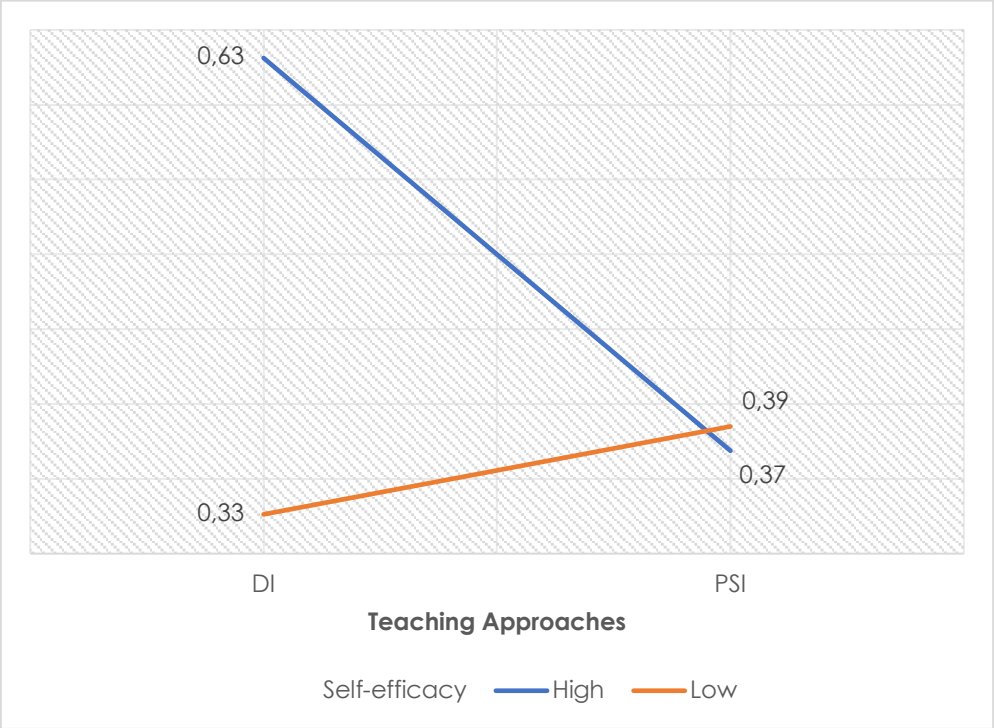

Figure 2. Interaction Pattern Between Teaching Approaches and Self-Efficacy

Figure 1 illustrates the interaction pattern between teaching approaches and self-efficacy. The lines are not parallel, indicating a clear interaction effect. The Direct Instruction group shows a sharp decline in performance from high to low self-efficacy, whereas the Personalized System for Instruction group demonstrates relatively stable performance across both levels.

The interaction pattern suggests that the DI approach is highly effective under high self-efficacy conditions but less effective when self-efficacy is low. Conversely, the PSI approach demonstrates relatively consistent effectiveness regardless of self-efficacy level. This pattern confirms that instructional effectiveness is not uniform but varies depending on the interaction between instructional strategy and learner characteristics.

DISCUSSION

The findings of this study indicate that the effectiveness of teaching approaches in karate kumite learning is not uniform but depends on students' self-efficacy levels. The significant interaction effect demonstrates that instructional strategies operate differently under varying psychological conditions. This result supports the hypothesis that instructional effectiveness is conditional and shaped by the interaction between teaching approaches and learner characteristics.

The superior performance observed in the DI group with high self-efficacy can be explained through the alignment between structured instruction and learners' psychological readiness. Students with high self-efficacy tend to respond positively to explicit guidance, corrective feedback, and performance demands, allowing them to refine motor skills more efficiently (Moore et al., 2023; Volgemute et al., 2024). This finding is consistent with social cognitive theory, which emphasizes that individuals with strong self-efficacy are more capable of sustaining effort and utilizing feedback during challenging tasks (Bandura & Wessels, 1997; Schunk & DiBenedetto, 2020).

This pattern can be further interpreted within the specific context of karate pedagogy. Karate training is traditionally characterized by disciplined practice, hierarchical instruction, and repeated technical drills, where learners are expected to follow instructions precisely and accept direct correction from instructors (Cynarski, 2017; Light & Eckford, 2025). Such training environments emphasize control, precision, and adherence to instructional sequences, which closely align with the principles of DI (Light & Eckford, 2025). Recent studies in martial arts pedagogy also highlight that structured and disciplined learning environments can enhance technical performance when learners are able to engage actively with instructional feedback and maintain focus during repetitive practice (Greco et al., 2019; Simões et al., 2024).

Students with high self-efficacy are more likely to adapt effectively to these structured and disciplined conditions. They tend to interpret corrective feedback as constructive input and are able to maintain confidence while refining their techniques (Alesi et al., 2014; de Lima Amaral et al., 2022). In contrast, students with lower self-efficacy may experience such environments as demanding or restrictive, which can reduce engagement and limit learning gains. This explains why the effectiveness of DI is more pronounced under high self-efficacy conditions, while its impact becomes less optimal when self-efficacy is low (Predoiu et al., 2024).

The relatively stable performance observed in the PSI across both self-efficacy levels suggests that learner-centered approaches provide a more flexible learning environment. PSI allows students to progress at their own pace and repeat tasks until mastery is achieved, which can reduce performance pressure and support gradual confidence development. This finding aligns with previous research indicating that autonomy-supportive learning environments can enhance engagement, particularly for learners who require additional time and repetition to build competence (Mannion et al., 2023; Trautner & Schwinger, 2020).

The interaction pattern identified in this study reinforces the concept of conditional instructional effectiveness, which suggests that no single teaching approach is universally optimal (Casey & Kirk, 2020). Instead, instructional success depends on the compatibility between teaching strategies and learner characteristics. While previous studies have reported interaction effects, they often limit interpretation to statistical significance without explaining

how instructional effectiveness changes across conditions (Abbas & North, 2018; Peng & Zhang, 2021). This study extends prior research by demonstrating a clear interaction pattern, showing that Direct Instruction is most effective under high self-efficacy conditions. In contrast, PSI provides more consistent outcomes across varying levels of self-efficacy.

From a theoretical perspective, these findings support the integration of instructional theory and social cognitive theory in explaining motor skill learning. Learning outcomes are shaped by the interaction between external instructional conditions and internal psychological factors, highlighting the dynamic nature of skill acquisition in sport contexts. From a practical perspective, the results suggest that educators and karate instructors should avoid applying a single instructional approach uniformly. Instead, teaching strategies should be adapted based on students' self-efficacy levels. Structured approaches such as DI may be more effective for students with high confidence. In contrast, more flexible approaches such as PSI may better support students who require gradual skill development and reduced performance pressure.

Despite these contributions, this study has limitations. The sample size was relatively small and limited to a single school context, which may restrict generalizability. In addition, only self-efficacy was examined as a psychological variable, whereas other factors, such as motivation or anxiety, may also influence learning outcomes. Future research is recommended to explore interaction patterns across different sports, larger populations, and additional psychological variables to develop the concept of conditional instructional effectiveness further.

CONCLUSION

This study concludes that the effectiveness of teaching approaches in karate kumite learning is influenced by the interaction between instructional strategies and students' self-efficacy. DI produces the highest improvement in skill acquisition when applied to students with high self-efficacy, while its effectiveness decreases under low self-efficacy conditions; in contrast, PSI demonstrates more consistent outcomes across different self-efficacy levels. These findings confirm that instructional effectiveness is not universal but conditional, depending on learners' psychological characteristics, as the same teaching approach can produce different outcomes under different conditions. The study contributes to sport pedagogy by emphasizing the importance of aligning teaching approaches with students' self-efficacy profiles, and educators and coaches are encouraged to adapt their instructional strategies based on students' confidence levels to optimize learning outcomes.

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REFERENCES

Abbas, Z.-A., & North, J. S. (2018). Good-vs. poor-trial feedback in motor learning: The role of self-efficacy and intrinsic motivation across levels of task difficulty. *Learning and Instruction*, *55*, 105–112. https://doi.org/10.1016/j.learninstruc.2017.09.009

Alesi, M., Bianco, A., Padulo, J., Vella, F. P., Petrucci, M., Paoli, A., Palma, A., & Pepi, A. (2014). Motor and cognitive development: the role of karate. *Muscles, Ligaments and Tendons Journal*, *4*(2), 114.

Bandura, A., & Wessels, S. (1997). *Self-efficacy*. Cambridge University Press Cambridge.

Casey, A., & Kirk, D. (2020). *Models-based practice in physical education*. Routledge.

Cynarski, W. J. (2017). The traditionally understood karate-do as an educational system: application of the martial arts' pedagogy. *Gdańskie Studia Azji Wschodniej*, (12), 7–20. https://doi.org/10.4467/23538724GS.17.014.7940

de Lima Amaral, L., Carlos Mazzei, L., Oviedo Frosi, T., Kioshi Yamanaka, G., & Jaqueline Farias Fabiani, D. (2022). *The scientific literature on karate in the Web of Science®-a narrative review*. https://smaes.archbudo.com/view/abstract/id/15378

Ferreira, F., Silva, R. M., Badicu, G., Muracki, J., Bogdański, B., & Kawczyński, A. (2024). Development, validation, and reliability of a new instrument of observation and technical evaluation in karate athletes. *Baltic Journal of Health and Physical Activity*, *16*(4), 1. https://doi.org/10.29359/BJHPA.16.4.01

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2023). *How to design and evaluate research in education* (Eleventh Edition). McGraw Hill.

Greco, G., Cataldi, S., & Fischetti, F. (2019). Karate as anti-bullying strategy by improvement resilience and self-efficacy in school-age youth. *Journal of Physical Education and Sport*, *19*, 1863–1870. https://doi.org/10.7752/jpes.2019.s5276

Guzmán, J. F., & Payá, E. (2020). Direct instruction vs. cooperative learning in physical education: Effects on student learning, behaviors, and subjective experience. *Sustainability*, *12*(12), 4893. https://doi.org/10.3390/su12124893

Hake, R. R. (1998). Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses. *American Journal of Physics*, *66*(1), 64–74. https://doi.org/10.1119/1.18809

Light, R., & Eckford, D. (2025). Teaching karate for the 21st century. *Idō̄ Movement for Culture*, *20*(3). https://doi.org/10.14589/ido.25.3.2

López-Rodríguezа, L., Carballidoa, L. G. G., Montoya-Romeroa, C. A., Suárez-Rodríguezа, M. C., González-Rabeiroa, M., Charlot-Cardozaa, O., Yañez-Riveraa, A., & Feria-Madueñob, A. (2025). Self-Efficacy in High-Performance Sports: A Systematic Review and Meta-

Analysis. *Psychology in Russia: State of the Art*, *18*(1), 116–143. https://doi.org/10.11621/pir.2025.0107

Mannion, A., Coyne, R., Ferrari, C., Neşeli, M., McGee, C., Mollaoglu, S., & Leader, G. (2023). Personalized System of Instruction in Higher Education: A Systematic Review. *Journal of Behavioral Education*, 1–41. https://doi.org/10.1007/s10864-023-09530-8

Metzler, M. (2017). *Instructional models in physical education*. Routledge.

Miller, P. W. (2008). *Measurement and teaching*. Patrick W. Miller & Associates.

Moore, B., Dudley, D., & Woodcock, S. (2023). The Effects of a Martial Arts-Based Intervention on Secondary School Students' Self-Efficacy: A Randomised Controlled Trial. *Philosophies*, *8*(3). https://doi.org/10.3390/philosophies8030043

Nissen, J. M., Talbot, R. M., Nasim Thompson, A., & Van Dusen, B. (2018). Comparison of normalized gain and Cohen's d for analyzing gains on concept inventories. *Physical Review Physics Education Research*, *14*(1), 10115. https://doi.org/10.1103/PhysRevPhysEducRes.14.010115

Peng, F., & Zhang, L.-W. (2021). The relationship of competitive cognitive anxiety and motor performance: Testing the moderating effects of goal orientations and self-efficacy among Chinese collegiate basketball players. *Frontiers in Psychology*, *12*, 685649. https://doi.org/10.3389/fpsyg.2021.685649

Predoiu, R., Ghinea, A. L., Grants, J., Nijloveanu, D., & Predoiu, A. (2024). Aggression level and self-efficacy in karate practitioners as a leisure-time motor activity. *Timisoara Physical Education & Rehabilitation Journal*, *17*(33).

Schmidt, R. A., & Lee, T. D. (2014). *Motor Learning and Performance From Principles to Application* (Fifth Edition). Human Kinetics.

Schunk, D. H., & DiBenedetto, M. K. (2020). Motivation and social cognitive theory. *Contemporary Educational Psychology*, *60*, 101832. https://doi.org/https://doi.org/10.1016/j.cedpsych.2019.101832

Sierra-Ríos, J. V., Clemente, F. M., Rey, E., & González-Víllora, S. (2020). Effects of 6 weeks direct instruction and teaching games for understanding programs on physical activity and tactical behaviour in u-12 soccer players. *International Journal of Environmental Research and Public Health*, *17*(14), 1–14. https://doi.org/10.3390/ijerph17145008

Simões, H., de Oliveira Santos, P. M., Pereira, B., & Figueiredo, A. (2024). Karate practice: empowering solutions to mitigate school-age bullying. *Retos: Nuevas Tendencias En Educación Física, Deporte y Recreación*, (53), 618–627. https://doi.org/10.47197/retos.v53.101908

Soetjipto, H. P., Putra, M. D. K., Widhiarso, W., & Khakim, Z. (2023). Assessment of the psychometric properties of the Indonesian version of the General Self-Efficacy Scale-12 (GSES-12) in a sample of Indonesian high school students. *Psikohumaniora: Jurnal Penelitian Psikologi*, *8*(2), 259–274. https://doi.org/10.21580/pjpp.v8i2.18024

Stockard, Jean, Wood, Timothy W, Coughlin, Cristy, & Rasplica Khoury, Caitlin. (2018). The Effectiveness of Direct Instruction Curricula: A Meta-Analysis of a Half Century of Research. *Review of Educational Research*, *88*(4), 479–507. https://doi.org/10.3102/0034654317751919

Sumaraw, F. D., Perdana, G. S., & Makdada, F. A. (2025). The effects of teaching style and motor skills on 100-m running results: A factorial experimental design. *Journal of Physical Education & Sport*, *25*(4). https://doi.org/10.7752/jpes.2025.04080

Trautner, M., & Schwinger, M. (2020). Integrating the concepts self-efficacy and motivation regulation: How do self-efficacy beliefs for motivation regulation influence self-regulatory success? *Learning and Individual Differences*, *80*, 101890. https://doi.org/https://doi.org/10.1016/j.lindif.2020.101890

Volgemute, K., Vazne, Z., & Krauksta, D. (2024). An Intervention into Imagery and Self-Efficacy: Enhancing Athletic Achievements of Alpine Skiers. *Education Sciences*, *14*(5). https://doi.org/10.3390/educsci14050513