



Cognitive Attribution in Martial Arts Skill Acquisition: A Survey-Based Study among Physical Education Majors

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Abstract

Martial arts, as a traditional sport, offer significant cultural and health benefits, yet students' cognitive attributions during skill acquisition play a crucial role in their learning outcomes and motivation. This study investigates the cognitive attribution patterns of physical education majors at Zhejiang Normal University, focusing on their psychological states and how these factors influence martial arts learning effectiveness. A total of 80 students participated in a survey, which assessed their self-perception of physical condition, martial arts skill foundation, attributions of learning difficulties, and psychological factors. The findings reveal that students tend to externalize difficulties, attributing them to technical challenges rather than psychological factors. Additionally, many students overestimate their physical limitations, which could hinder their learning engagement. Despite recognizing the importance of confidence, students showed limited awareness of psychological development, which could undermine their ability to cope with learning difficulties. Based on these insights, the study proposes a differentiated teaching approach that combines technical skill breakdown, psychological development strategies, and a peer support system to enhance learning outcomes. The study emphasizes the need for a comprehensive pedagogical approach that addresses both technical and psychological dimensions to optimize martial arts education.

Subject Areas

Sports Sciences

Keywords

Martial Arts, Cognitive Attribution, Physical Education, Psychological State, Learning Outcomes, Teaching Optimization, Confidence

1. Introduction

Martial arts represent a traditional form of physical activity that combines cultural heritage with substantial health benefits. In recent years, martial arts have attracted increased academic and practical interest, particularly within physical education curricula [1]-[3]. However, students' cognitive attributions—that is, their beliefs about the causes of success and failure during skill acquisition—play a critical role in determining their learning outcomes and sustained motivation. This study aims to investigate the cognitive attribution characteristics of students majoring in physical education at Zhejiang Normal University [4]-[6]. Specifically, it examines how students' psychological states relate to martial arts learning effectiveness and provides pedagogical recommendations to optimize teaching practices in martial arts education.

2. Research Participants and Methodology

2.1. Participants

Participants were undergraduate students majoring in physical education at Zhejiang Normal University. A total of 100 questionnaires were distributed, with 85 returned. Of these, 80 were deemed valid, yielding an effective response rate of 94.12% [7]-[9].

2.2. Methodology

Questionnaire Survey: A 20-item instrument was developed to assess students' self-evaluation of physical fitness, foundational skills, attribution of learning challenges, psychological states, and perceived value of martial arts training. Each item was rated on a five-point Likert scale [10]-[12].

Data Analysis: Valid responses were analyzed using Microsoft Excel to calculate item means and response proportions [13] [14]. This facilitated the identification of dominant attribution types and relevant psychological traits during martial arts learning.

3. Core Findings on Cognitive Attribution Patterns

3.1. Discrepancy between Physical Self-Efficacy and Skill Foundation

Physical Condition: 45% of students rated their physical condition as “good”, whereas only 5% rated it as “poor”.

Skill Foundation: In contrast, only 23.75% rated their martial arts foundation as “good”, with 66.25% indicating “average” and 10% “poor”.

Interpretation: This discrepancy highlights that while students perceive themselves as physically fit, they lack confidence in their martial arts skill base. This suggests that the primary challenge is rooted in the perceived complexity of technical movements rather than physical inadequacy [15]-[17].

3.2. Confidence and Attribution to Technical Difficulty

Difficulty Reporting: 77.5% of students acknowledged encountering learning dif-

difficulties.

Attribution Patterns: Only 30% attributed difficulties to a lack of confidence, whereas 80% attributed them to technical complexity (Item 13). Additionally, 83.75% identified “technical skills” as the area most needing improvement (Item 14).

Interpretation: The students predominantly externalize the source of learning difficulties, attributing them to technical aspects rather than psychological readiness. This may hinder the development of coping strategies and affect long-term learning efficacy.

3.3. Misconceptions about Flexibility

Flexibility Perception: 46.25% of respondents perceived inflexibility in their limbs or tendons as a major constraint (Item 11), despite 45% rating their general physical condition as good (Item 6).

Interpretation: Such cognitive bias may generate psychological barriers, reducing engagement and willingness to persist in overcoming perceived physical limitations.

4. Psychological State and Learning Outcomes

4.1. Confidence as a Key Determinant

Importance of Confidence: Confidence was ranked highest among factors affecting martial arts learning, with a mean score of 2.79. It was cited by 43.75% of students as the most important influence.

Psychological Neglect: Nevertheless, only 37.5% recognized “psychological state” as an area requiring development (Item 14).

Conflict: This highlights a disconnect between recognizing the importance of confidence and actively pursuing psychological skill development, potentially undermining resilience in the face of learning difficulties.

4.2. High Levels of Concentration

Focus Ability: 88.75% of students reported the ability to maintain concentration during martial arts practice (Item 4).

Interpretation: Students generally exhibit strong attentional focus, which is an asset for overcoming learning obstacles and achieving skill mastery.

5. Perceived Value of Martial Arts Learning

5.1. Positive Life Impact

Positive Outlook: 58.75% of students believed martial arts training had a positive influence on their lives, with none reporting negative effects (Item 15).

Interpretation: This positive perception contributes to student motivation and long-term engagement in martial arts practice.

5.2. Preferred Support Mechanisms

Support Needs: 57.5% expressed a preference for professional coaching, and 27.5%

desired peer support (Item 16).

Recommendation: Teaching strategies should incorporate expert instruction alongside structured peer support systems to maximize student learning potential.

6. Recommendations for Teaching Optimization

6.1. Technical Strategies

Action Decomposition: Deconstruct complex martial arts techniques into progressive, manageable segments to reduce entry-level difficulty and build student confidence.

Differentiated Instruction: Adapt teaching methods according to students' baseline skills to ensure personalized learning pathways and equitable progress [18]-[20].

6.2. Psychological Support

Confidence Training: Incorporate targeted interventions such as guided reflection, success reinforcement, and psychological workshops to cultivate resilience and confidence.

Cognitive Reframing: Educators should correct misbeliefs regarding physical limitations by providing evidence-based guidance and real-world demonstrations.

6.3. Support System Design

Professional Guidance: Increase the presence of skilled martial arts instructors capable of delivering personalized feedback and technical corrections.

Peer Learning Networks: Develop a collaborative learning model that integrates “coach demonstration + peer support” to foster community, motivation, and cooperative learning.

6.4. Evaluation Reform

Process-oriented Assessment: Move beyond outcome-based evaluations by including measures of effort, progress, and engagement to promote a growth-oriented learning mindset.

7. Conclusion

This study examined the cognitive attributions of physical education majors engaged in martial arts learning at Zhejiang Normal University. The findings reveal a predominant attribution pattern characterized by an emphasis on technical challenges, underestimation of psychological factors, and overestimation of physical constraints. Such patterns may lead students to externalize difficulties and underinvest in internal growth mechanisms. It is therefore recommended that martial arts pedagogy adopt a dual-pronged strategy—“differentiated technical instruction + psychological development support”—to realign students' cognitive frameworks. By transforming technical attributions into self-regulated capacity building, educators can enhance student engagement, skill acquisition, and holistic de-

velopment in martial arts education.

Conflicts of Interest

The authors declare no conflicts of interest.

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