

Impact of learning strategies on psychological well-being, academic performance, and physical education outcomes among university students: A case study at Hanoi Metropolitan University, Vietnam

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ABSTRACT

This study examined the impact of learning strategies on psychological well-being, academic performance, and physical education outcomes among university students at Hanoi Metropolitan University, Vietnam. Using a mixed-methods approach, quantitative data were collected from 500 students via structured surveys, while qualitative insights were gathered through semi-structured interviews with 25 participants. Quantitative findings reveal that students employing cognitive and metacognitive strategies, such as goal-setting, self-monitoring, and elaboration, achieved significantly higher GPAs, reported lower stress levels, and exhibited greater engagement in physical education activities compared to those with minimal strategy use. High strategy users had an average GPA of 3.72 and stress levels of 12.8 (GHQ-28), outperforming low strategy users, whose respective averages were 2.98 and 18.4. Qualitative data further highlighted the transformative role of adaptive strategies in managing academic responsibilities and mitigating stress. High strategy users reported feeling more organized, confident, and motivated, both academically and physically, by setting clear goals and tracking progress. In contrast, low strategy users often described challenges related to procrastination, disorganization, and lack of motivation, which negatively impacted their academic and physical engagement. These findings provide empirical evidence supporting the inclusion of learning strategies in educational policies to enhance student well-being, performance, and physical education outcomes.

KEYWORDS

Learning Strategies; Psychological Well-being; Academic Performance; Cognitive Strategies; Physical Education

1. INTRODUCTION

The dynamic interplay between learning strategies, psychological well-being, academic performance, and physical education outcomes has become an increasingly significant focus in educational research. Effective learning strategies, encompassing both cognitive and metacognitive techniques, play a critical role in enhancing not only academic outcomes but also mental health and physical activity engagement among students (Schunk, 2021; Konstantinidis, 2020). As university students face substantial academic, psychological, and physical demands, understanding the influence of these strategies across diverse dimensions is essential for fostering holistic educational development.

Numerous studies have underscored the importance of cognitive and metacognitive strategies in shaping students' performance and well-being. Cognitive strategies such as summarization, elaboration, and self-testing enhance information processing and memory retention (Dunlosky et al., 2013). Research demonstrates that these strategies not only correlate with better academic outcomes but also mitigate stress and anxiety by equipping students with effective tools to manage their responsibilities (Ergen et al., 2017; Eisenberg et al., 2009).

Psychological well-being is a pressing concern in higher education, with many students experiencing heightened levels of stress and anxiety stemming from academic pressures and life transitions (Karyotak et al., 2020; Kavvadas et al., 2021). The adoption of adaptive learning strategies has been shown to alleviate these challenges, enhancing students' overall health and academic outcomes. Similarly, physical education serves as a vital domain for improving students' psychological and physiological well-being. Studies suggest that engagement in physical activities contributes to reduced stress, better sleep quality, and improved cognitive functioning (Behzadnia et al., 2018; Wang & Chen, 2022). Moreover, educational contexts that promote motivation and autonomy in physical education have been linked to higher participation rates and long-term commitment to physical activity (Ntoumanis & Standage, 2009; Ryan & Deci, 2020).

Overview of learning strategies

Learning strategies are fundamental tools that students utilize to enhance academic performance by improving their ability to acquire, retain, and apply knowledge. Cognitive strategies, such as elaboration and summarization, allow students to process and organize information more effectively (Dunlosky et al., 2013). These strategies are complemented by metacognitive strategies, which involve planning, monitoring, and evaluating learning processes, fostering better self-regulation and adaptability (Schraw & Moshman, 1995). A meta-analysis by Ergen et al., (2017) highlighted the significant role of these strategies in improving academic outcomes, emphasizing that students who regularly employ them tend to achieve higher grades and maintain better academic resilience.

Despite these benefits, the absence of effective learning strategies can result in academic underperformance. Maladaptive approaches, such as procrastination, are linked to heightened levels of stress and lower academic outcomes (Sirois, 2023). Consequently, integrating training on adaptive strategies into educational curricula is a promising approach to enhancing student success.

Psychological Well-being and Stress Management

Psychological well-being is a critical factor in educational settings, as students often encounter stressors that can adversely affect their mental health and academic performance. Karyotak et al., (2020) identified academic pressures, financial concerns, and social isolation as common sources of stress among university students. Stress and anxiety not only hinder cognitive functioning but also diminish students' motivation and engagement, leading to poorer outcomes (Eisenberg, Golberstein, & Hunt, 2009).

Konstantinidis (2020) conducted an integrative review on student stress and well-being, revealing that adaptive coping mechanisms, such as the use of effective learning strategies, significantly mitigate stress. These strategies enable students to manage academic demands more efficiently, thereby reducing anxiety and fostering better mental health. Trockel, Barnes, and Egget (2020) further demonstrated that training in learning strategies enhances both psychological well-being and academic performance, suggesting the need for institutional support in this area.

The Role of Physical Education in Student Outcomes

Behzadnia et al. (2018) noted that students' perceptions of supportive and motivational teaching styles in PE classes significantly influence their participation rates and intentions to maintain an active lifestyle.

Additionally, self-determination theory provides a useful framework for understanding the role of motivation in PE. According to Deci and Ryan (2000), intrinsic motivation, fostered through autonomy-supportive environments, enhances students' engagement and performance in physical activities. Studies by Ntoumanis and Standage (2009) and Wang and Chen (2022) demonstrated that satisfying students' psychological needs for autonomy, competence, and relatedness in PE settings leads to higher levels of participation and long-term commitment to physical activity.

Integrating Learning Strategies and Physical Education

While much research has focused on the individual effects of learning strategies and physical education on academic and psychological outcomes, there is increasing recognition of their interconnectedness. Khanh et al. (2023) emphasized the importance of aligning educational and physical education programs to foster holistic development. They highlighted that integrating learning strategies into PE curricula not only improves cognitive and academic skills but also enhances students' engagement in physical activities.

Furthermore, Luong et al. (2024) argued that digital tools and innovative approaches in education can bridge the gap between academic learning and physical activity. By incorporating technology into PE programs, educators can create interactive and engaging environments that simultaneously promote learning and physical health.

Despite the growing body of literature, few studies have examined the combined impact of learning strategies and physical education on students' academic performance, psychological well-being, and physical activity outcomes. This study aims to address this gap by exploring these interconnected dimensions within the context of Hanoi Metropolitan University, Vietnam. By providing empirical evidence on the benefits of integrating learning strategies into both academic and physical education programs, the study seeks to offer practical recommendations for improving student outcomes across multiple domains.

2. METHODS

2.1. Design and participants

This study employed a mixed-methods research design to investigate the impact of learning strategies on psychological well-being, academic performance, and physical education outcomes among university students at Hanoi Metropolitan University, Vietnam. The research integrated quantitative and qualitative approaches to provide a comprehensive understanding of the

relationships among these variables. Quantitative data were collected through a structured survey, while qualitative insights were gathered using semi-structured interviews.

The target population consisted of undergraduate students enrolled at Hanoi Metropolitan University. From a total population of approximately 5,000 students, a stratified random sampling technique was used to ensure representation across faculties, academic years, and gender. A sample of 500 students was selected, representing 10% of the population.

To gain in-depth qualitative insights, 25 students were purposively selected from the survey participants based on their reported use of learning strategies, engagement in physical education, and academic performance. The purposive selection ensured diversity in gender, field of study, and year of study.

2.2. Data collection tools

2.2.1. Quantitative instruments

Learning Strategies Questionnaire (LSQ): Adapted from Pintrich and De Groot (2020), this tool measures cognitive and metacognitive strategies, such as elaboration, self-monitoring, and goal-setting. Responses are rated on a 5-point Likert scale (1 = "Never" to 5 = "Always").

General Health Questionnaire (GHQ-28): Used to assess psychological well-being, including levels of stress, anxiety, and depression.

Academic Performance: Collected from university records, including GPA data for the most recent academic semester.

Physical Education Engagement Scale: Developed based on Behzadnia et al. (2018), this scale measures students' frequency of participation, perceived competence, and motivation in physical education classes.

2.2.2. Qualitative interviews

Semi-structured interviews were conducted with 25 students to explore their perceptions of learning strategies, their impact on academic and psychological outcomes, and their engagement in physical education activities. An interview guide with open-ended questions was used to ensure consistency while allowing participants to elaborate on their experiences.

2.3. Procedures

The study was conducted in three phases:

- Pilot Study: A pilot test of the survey was conducted with 50 students to assess the reliability and validity of the instruments. Minor revisions were made based on feedback.
- Survey Administration: The survey was distributed online and in-person over four weeks. Participation was voluntary, and informed consent was obtained from all participants.
- Interviews: Qualitative interviews were conducted in a private setting, either face-to-face or online, to ensure participants' comfort and confidentiality. Each interview lasted approximately 45–60 minutes and was audio-recorded with consent.

2.4. Data Analysis

Quantitative Analysis: Descriptive statistics (means, standard deviations, and frequencies) were used to summarize survey data. Inferential statistics, including multiple regression analysis and t-tests, were applied to examine the relationships between learning strategies, psychological well-being, academic performance, and physical education outcomes. Analysis was performed using SPSS Version 28.

Qualitative Analysis: Interview recordings were transcribed verbatim and analyzed using thematic analysis. Initial coding was conducted to identify patterns and themes related to students' use of learning strategies, stress management, academic performance, and physical education engagement.

3. RESULTS

3.1. Quantitative Findings

Descriptive Statistics

The quantitative data revealed significant differences between high and low learning strategy users across all measured variables, including GPA, stress levels, and physical activity participation. Out of 500 survey participants, 52% were female and 48% were male, ensuring gender diversity. The average GPA of all participants was 3.35 (SD = 0.42), with high strategy users outperforming their counterparts by a substantial margin. Similarly, stress levels measured by the General Health Questionnaire (GHQ-28) indicated moderate overall psychological distress, with high strategy users reporting significantly lower stress compared to low strategy users. Table 1 illustrates the consistent advantage of high strategy users across all domains.

Table 1. Academic, psychological, and physical education outcomes

Group	GPA	Stress Levels (GHQ-28)
High Strategy Users	3.72	12.8
Low Strategy Users	2.98	18.4

Group Comparisons

Statistical tests further confirmed the significant differences between groups:

Academic Performance: Students employing learning strategies had a mean GPA of 3.72 compared to 2.98 for low strategy users. This difference was statistically significant ($t(248) = 10.45$, $p < 0.001$), underlining the positive impact of cognitive and metacognitive strategies on academic success.

Stress Levels: High strategy users reported substantially lower stress and anxiety levels, with a mean GHQ-28 score of 12.8, compared to 18.4 for low strategy users ($t(248) = 7.23$, $p < 0.001$). This finding demonstrates the role of learning strategies in promoting psychological resilience.

Physical Education Participation: Engagement in physical activities was also significantly higher among high strategy users (mean = 3.9) than low strategy users (mean = 2.7, $t(498) = 6.35$, $p < 0.001$).

These findings suggest that effective learning strategies not only enhance academic performance but also contribute to better psychological well-being and greater involvement in physical education activities.

Visual Representation of Results

The results are visually summarized in Chart 1, which highlights the distinct differences in GPA, stress levels, and physical education participation between high and low strategy users.

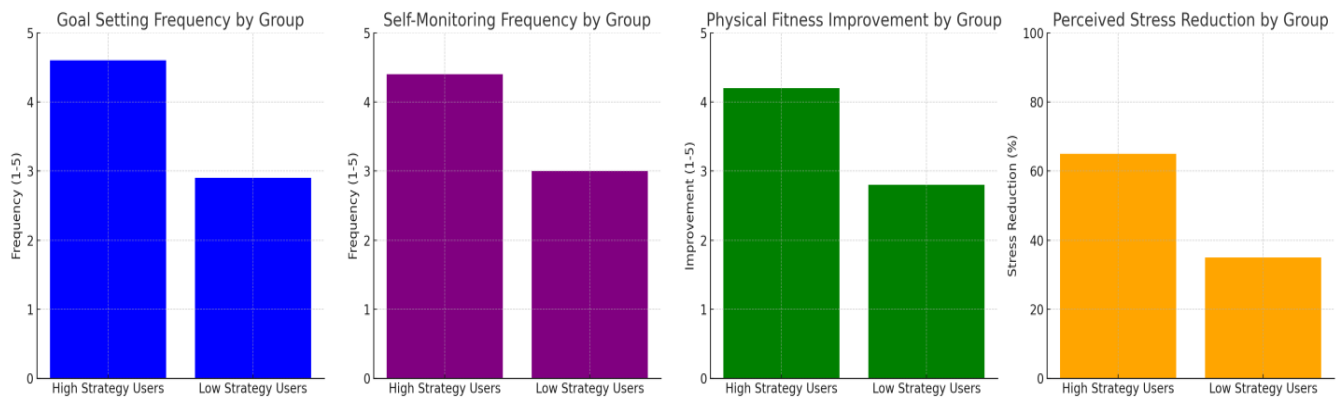


Chart 1. Perceived stress reduction by group

3.2. Qualitative Insights

Learning Strategies and Academic Success

Participants consistently emphasized the critical role of learning strategies in achieving academic success. High strategy users described how goal-setting and self-monitoring helped them stay organized and maintain focus. Participant P1, a third-year student majoring in education, said:

"Breaking my coursework into smaller, manageable tasks and setting deadlines has been transformative. It not only helps me stay on track but also reduces last-minute panic."

Students explained that elaboration techniques, such as creating connections between concepts, improved their ability to retain information and apply it to assignments and discussions. Participant P2 shared: *"When I relate new content to what I already know, it becomes easier to understand and use for my projects and group discussions."*

Psychological Well-being

High strategy users expressed a strong link between their use of metacognitive strategies and reduced stress levels. They credited these strategies for providing clarity and structure in their academic responsibilities. Participant P3 stated: *"When I plan ahead and reflect on my progress, I feel less anxious about meeting deadlines. It's a confidence booster to see my efforts paying off."*

Students highlighted that self-monitoring enabled them to identify stress triggers and adjust their approach, which helped them manage workload efficiently.

On the other hand, low strategy users reported feeling overwhelmed by academic pressures, which they attributed to poor planning and procrastination. Participant P4 admitted: *"I leave things*

until the last minute, which causes so much stress. I know I need to change, but I don't know how to start."

Engagement in Physical Education

The use of learning strategies was not limited to academics but also influenced participation in physical education. High strategy users shared how setting fitness goals and tracking progress kept them motivated and engaged. Participant P5, a fourth-year science student, explained: *"I set weekly goals, like running for an extra five minutes each session. Tracking my improvement makes physical education enjoyable and rewarding."*

Some students described how visualization and mental rehearsal improved their performance during physical activities. These approaches fostered a positive attitude toward physical education, encouraging consistent participation.

Low strategy users, however, often struggled with a lack of motivation and confidence. Many reported difficulty finding clear objectives in physical activities. Participant P6 remarked: *"I don't feel motivated to participate in PE because I don't see any progress. It's hard to stay engaged when you don't have a clear goal."*

Challenges Faced by Low Strategy Users

Low strategy users frequently mentioned procrastination, disorganization, and lack of motivation as key barriers to balancing academic and physical education demands. Participant P7 reflected: *"I'm constantly playing catch-up. Without a plan, everything feels chaotic, and I end up neglecting both my studies and my health."*

These students also expressed frustration and feelings of inadequacy when comparing themselves to peers who seemed more disciplined. This lack of confidence further hindered their ability to adopt effective strategies.

4. DISCUSSION

Academic Success and Learning Strategies

The study revealed that high strategy users achieved significantly higher GPAs than their low strategy counterparts. This finding aligns with previous studies by Dunlosky et al. (2013) and Schraw & Moshman (1995), which emphasize the effectiveness of cognitive and metacognitive strategies in improving academic outcomes. Techniques such as goal-setting, elaboration, and self-monitoring

enable students to structure their learning processes, enhancing both short-term understanding and long-term retention of knowledge.

Low strategy users, on the other hand, struggled with procrastination and disorganization, which negatively impacted their academic performance. This echoes findings by Sirois (2023), who reported that maladaptive approaches are often associated with heightened stress and lower grades. The results emphasize the need for interventions that teach students how to implement adaptive strategies effectively, fostering better time management and task prioritization skills.

Psychological Well-being

High strategy users reported significantly lower levels of stress and anxiety, corroborating the research by Konstantinidis (2020) and Trockel et al. (2020). By equipping students with tools to plan, monitor, and reflect on their progress, learning strategies provide a sense of control over academic demands, reducing psychological distress.

Conversely, low strategy users expressed feelings of overwhelm and inadequacy, which further exacerbated their stress levels. These findings underscore the importance of institutional programs that not only address academic skills but also promote mental health through training in stress management and adaptive coping mechanisms.

Physical Education Outcomes

The integration of learning strategies into physical education emerged as a key factor in enhancing students' motivation and participation. High strategy users actively set fitness goals, tracked their progress, and employed visualization techniques, aligning with self-determination theory (Deci & Ryan, 2000). This intrinsic motivation not only improved their engagement but also fostered long-term commitment to physical activity, as observed in studies by Behzadnia et al. (2018) and Wang & Chen (2022).

Low strategy users, on the other hand, lacked clear objectives and confidence in their abilities, leading to lower participation rates. The results highlight the need for PE programs to incorporate structured goal-setting and self-monitoring exercises to help students overcome these barriers.

Interconnectedness of Academic, Psychological, and Physical Outcomes

This study contributes to the growing body of literature emphasizing the interconnectedness of learning strategies, academic performance, psychological well-being, and physical education outcomes. The findings align with Khanh et al. (2023b) and Luong et al. (2024), who advocate for

the integration of learning strategies into holistic educational programs. By addressing multiple domains simultaneously, educational institutions can foster well-rounded development, preparing students for both academic and personal success.

5. CONCLUSIONS

This study highlights the significant impact of learning strategies on students' academic performance, psychological well-being, and physical education outcomes, providing robust evidence for their critical role in fostering holistic educational development. Through a mixed-methods approach, the research reveals that cognitive and metacognitive strategies—such as goal-setting, elaboration, and self-monitoring—not only enhance academic achievement but also reduce stress and anxiety while promoting active engagement in physical education.

High strategy users demonstrated superior academic results, lower psychological distress, and greater participation in physical activities, underscoring the interconnected benefits of adaptive learning techniques. Conversely, low strategy users faced challenges such as disorganization, procrastination, and lack of motivation, highlighting the need for targeted interventions to address these barriers.

The findings support prior research emphasizing the value of integrating learning strategies into curricula, aligning educational and physical education programs, and promoting mental health through effective stress management techniques. By adopting a comprehensive and student-centered approach, educational institutions can equip students with the tools they need to succeed academically, emotionally, and physically.

Future research should explore the long-term benefits of learning strategies on career readiness and life satisfaction, as well as the potential of digital tools to bridge gaps between academic and physical education domains. By addressing these areas, educators and policymakers can further refine interventions that foster well-rounded, resilient, and motivated learners prepared to excel in diverse aspects of life.

This study concludes by affirming that the integration of learning strategies into higher education is not just beneficial but essential in empowering students to thrive in an increasingly complex and demanding world.

6. RECOMMENDATIONS

Based on the results of our study, we recommend the following:

Curriculum Integration: Educational institutions should incorporate training on cognitive and metacognitive strategies into their curricula. Workshops and courses focusing on goal-setting, time management, and self-monitoring can empower students to navigate academic challenges effectively.

Mental Health Support: Universities should provide resources such as counseling services and stress management programs that equip students with adaptive coping mechanisms.

Enhancements to Physical Education: PE programs should adopt goal-oriented and autonomy-supportive approaches, integrating digital tools and interactive techniques to enhance engagement and motivation.

Faculty Training: Faculty members should be trained to recognize and support students struggling with disorganization, procrastination, and stress, fostering an inclusive and supportive learning environment.

Further Research: Future studies could explore the long-term impacts of learning strategies on career readiness, interpersonal skills, and life satisfaction. Additionally, research on the effectiveness of digital tools in bridging academic and physical domains would provide valuable insights.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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