Exploring the Moderating Role of Test Anxiety on the Relationship Between Motivational Beliefs and Self-Regulated Learning Strategies among University Students

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ABSTRACT

This study examines the moderating effect of test anxiety on the relationship between motivational beliefs and self-regulated learning (SRL) strategies among university students. Prior research at Universiti Teknologi MARA Kelantan Branch demonstrated a strong positive correlation between motivational beliefs and SRL strategies but identified significant test anxiety levels as a possible disruptor (Hatta et al., 2024). Using a sample of 160 undergraduates, this study employs hierarchical regression analyses to test how test anxiety influences the motivation and SRL relationship. The hierarchical regression results show that higher motivational beliefs strongly promote the use of self-regulated SRL strategies, while test anxiety negatively affects these strategies. Importantly, when test anxiety is higher, motivational beliefs play an even more crucial role in enhancing and sustaining students' engagement in SRL, highlighting a complex interaction between emotion and motivation in learning. This highlights the necessity of addressing emotional factors alongside motivation in educational interventions to optimize learning outcomes.

Keywords: Test Anxiety, Motivational Beliefs, Self-Regulated Learning Strategies, Moderating Role

INTRODUCTION

Motivational beliefs and self-regulated learning strategies are crucial constructs in educational psychology, influencing students' academic success and lifelong learning skills. Motivational beliefs, including self-efficacy and intrinsic value, drive learners' engagement and persistence, while self-regulated learning involves planning, monitoring, and regulating one's cognitive and behavioral learning processes.

Prior studies, such as the research conducted by Hatta et al. (2024) at Universiti Teknologi MARA Kelantan, have robustly demonstrated a positive correlation between these constructs. However, a consistent challenge in learning environments is the presence of test anxiety, a psychological condition manifesting as excessive worry or fear during evaluation contexts, potentially hindering motivational processes and learning regulation. To be exact, Hatta et al. (2024) discovered although motivational beliefs showed a strong positive relationship with SRL strategies ($r = .711$, $p < .01$), students also reported high test anxiety levels (mean = 3.3), which may impede learning self-regulation.

This study aims to extend previous findings by exploring the moderating role of test anxiety on the relationship between motivational beliefs and self-regulated learning strategies. By focusing on this emotional barrier, the researchers address an identified gap in existing literature and provide insights useful for enhancing educational interventions.

BACKGROUND OF THE STUDY

Self-regulated learning (SRL) refers to learners' ability to actively manage their emotions, cognitions, behaviour, and environment throughout the learning process to achieve academic goals. With the rapid evolution of educational contexts marked by technological advancements and pandemic-driven shifts to online and hybrid learning, SRL has become more critical than ever for student success (Zimmerman, 2011; Dent & Koenka, 2016). The development of SRL skills empowers students to independently set learning goals, monitor their progress, and adapt strategies to enhance learning outcomes.

Motivation is widely acknowledged as a fundamental determinant of SRL (Pintrich & De Groot, 1990). Motivational beliefs, including self-efficacy and intrinsic task value, influence students' engagement and persistence with self-regulatory behaviours (Wolters & Rosenthal, 2000). Concurrently, test anxiety, an emotional response involving worry and physiological distress during examinations, has been identified as a significant factor shaping students' academic experiences (Spielberger, 1980). Test anxiety can impair learners' cognitive resources, undermining their ability to effectively apply SRL strategies (Pelikan et al., 2021).

The COVID-19 pandemic accelerated the adoption of online and hybrid learning models, imposing greater demands on students' motivation and self-regulation skills. In Malaysia, the rapid shift to open-distance and hybrid learning has underscored the imperative for students to be autonomous and motivated learners capable of self-regulating in less structured environments (Hatta et al., 2024). Despite the acknowledged roles of motivation and SRL, the interplay between motivational beliefs and test anxiety and how these dynamic influences the use of SRL strategies remains underexplored, particularly in the Malaysian higher education context.

Problem Statement

The adoption of online and hybrid learning during and after the COVID-19 pandemic has introduced new challenges for university students. While open-distance learning facilitates educational continuity, it requires students to extend beyond traditional educational structures by relying heavily on their motivational beliefs and self-regulated learning strategies. However, many students face difficulties in managing their motivation and regulating learning behaviours autonomously (Ya-Hui Kuo, 2010).

Academic procrastination and reduced engagement are common issues in online courses, often linked to complex interactions among students' motivational beliefs, personal characteristics, and perceptions of the learning environment (Cheng & Xie, 2021). Additionally, test anxiety remains a significant barrier that can attenuate the positive effects of motivation on SRL, inhibiting students' performance particularly in evaluative situations (Pedrotti & Nistor, 2019; Bannister & Tuck, 2022).

This study seeks to investigate how test anxiety moderates the relationship between motivational beliefs and the use of self-regulated learning strategies among university students. Clarifying this moderation effect is essential for developing targeted interventions to support students' motivation, reduce anxiety, and enhance self-regulation, thereby improving academic success in evolving educational formats.

Research Questions

1. What is the relationship between motivational beliefs and self-regulated learning strategies among university students?
2. Does test anxiety moderate the relationship between motivational beliefs and self-regulated learning strategies?

Research Objectives

1. To examine the relationship between motivational beliefs and self-regulated learning strategies among university students.
2. To investigate whether test anxiety moderates the relationship between motivational beliefs and self-regulated learning strategies.

LITERATURE REVIEW

Context The Role of Self-Regulated Learning (SRL) in Academic Success

SRL has become a cornerstone concept in educational psychology, denoting learners' proactive engagement in managing their cognition, motivation, behaviour, and environment to achieve academic goals (Zimmerman, 2011). SRL involves phases of planning, monitoring, and reflecting on one's learning processes, which are critical for

students' academic success (Pintrich, 2003). The capability to self-regulate enhances learners' autonomy, enabling them to adapt flexibly to evolving instructional methods and demands (Dent & Koenka, 2016; Hattie & Donaghue, 2016).

The growing emphasis on student-centred learning reflects a shift toward pedagogies that empower learners to take ownership of their education (Brenner, 2022). This trend aligns with the broader educational reforms that prioritize competency-based learning and lifelong learning skills, where SRL serves as an essential mechanism to navigate learning challenges independently.

a) Motivational Beliefs as Drivers of Self-Regulated Learning

Motivation is a well-established antecedent of SRL and is pivotal in initiating and sustaining self-regulatory behaviors (Boekaerts, 2010; Pintrich, 1999). Motivational beliefs include self-efficacy, intrinsic task value, and expectancy of success, which influence a student's persistence, effort, and strategic approach to learning (Schunk & Zimmerman, 1994; Wolters & Rosenthal, 2000).

Self-efficacy, or students' belief in their capabilities to succeed in learning tasks, has been consistently linked to increased use of SRL strategies and better academic outcomes (Bandura, 1997; Zimmerman et al., 1992). Students with high self-efficacy tend to proactively employ cognitive and metacognitive strategies, set challenging goals, and engage more deeply with learning materials (Schunk & Ertmer, 2000). Intrinsic value , the perceived importance and interest in the learning task – further motivates learners to engage in self-regulation by fostering meaningful cognitive engagement and persistence (Ryan & Deci, 2000). Previous studies in Malaysian contexts echo these relationships, highlighting motivation as a crucial component for autonomous learning behaviours in university students (Anuar et al., 2023; Yew et al., 2023).

b) Test Anxiety: An Emotional Barrier to Effective Self-Regulation

While motivation facilitates SRL, emotional factors such as test anxiety can impose substantial barriers. Test anxiety is characterized by excessive worry, tension, and physiological symptoms that interfere with cognitive functioning during evaluative situations (Spielberger, 1980). Test anxiety disrupts working memory resources essential for effective metacognitive regulation, leading to decreased strategy use and poorer academic performance (Cassady & Johnson, 2002).

Emerging research underscores how high test anxiety impairs learners' ability to maintain focus, make strategic decisions, and regulate effort, which can diminish the positive effects of motivational beliefs on academic self-regulation (Pelikan et al., 2021). In online and hybrid learning environments, where students face additional stressors and reduced social support, the impact of test anxiety may be intensified, demanding targeted interventions (Bannister & Tuck, 2022).

c) SRL in Online and Hybrid Learning Contexts

Technological advancements have transformed educational delivery, necessitating more substantial SRL from learners (Albelbisi & Yusop, 2019). Online and hybrid learning formats require students to independently organize their study schedules, monitor comprehension, and seek help proactively. Research demonstrates that learners with stronger SRL skills exhibit higher success rates in massive open online courses (MOOCs) and distance education (Pedrotti & Nistor, 2019).

The abrupt transition to remote learning during the COVID-19 pandemic amplified the need for self-regulation amid limited instructor interaction and increased distractions (Pelikan et al., 2021). Within Malaysia, awareness of these demands has risen, yet challenges remain as students struggle to deploy effective SRL strategies, particularly when faced with motivational deficits and anxiety (Hatta et al., 2024).

d) Interrelationship of Motivation, SRL, and Academic Achievement

Academic achievement is multifaceted, influenced by cognitive strategies, motivation, and emotional regulation. Past longitudinal and correlational studies reveal that motivational beliefs are predictive of the extent to which students use self-regulated learning strategies, which in turn mediate academic success (Zimmerman, 2000; Bai & Guo, 2019). Furthermore, the interplay between self-efficacy, control beliefs, and anxiety shapes SRL engagement, with anxiety exerting a negative influence on learning behaviors (Nen et al., 2022).

Given these findings, integrating motivation-enhancing practices and emotional regulation training within curricula can potentiate SRL development, equipping students with skills necessary in dynamic learning environments (Schunk & Zimmerman, 1998).

e) Contextual Significance and Research Gap

Despite considerable evidence linking motivational beliefs with SRL and acknowledging the detrimental impact of test anxiety, limited research comprehensively examines test anxiety as a moderating factor in this relationship. Most prior studies focus on direct effects, leaving a gap regarding how anxiety may weaken the motivational drive towards effective self-regulation, particularly in post-pandemic hybrid learning settings prevalent in Malaysian higher education.

This study aims to address this gap by exploring how test anxiety moderates the relationship between students' motivational beliefs and their use of self-regulated learning strategies, thereby informing interventions designed to foster both motivation and emotional resilience in learners.

f) Conceptual Framework

This study's conceptual framework examines how motivational beliefs, including self-efficacy and intrinsic value, influence university students' use of SRL strategies, such as cognitive strategies and self-regulation behaviours. It also considers test anxiety as a moderator that can weaken the positive relationship between motivational beliefs and SRL strategies. High test anxiety may reduce students' ability to effectively self-regulate their learning despite strong motivation. The framework highlights the dynamic interplay between motivation, emotional factors, and learning strategies in shaping students' academic engagement and success.

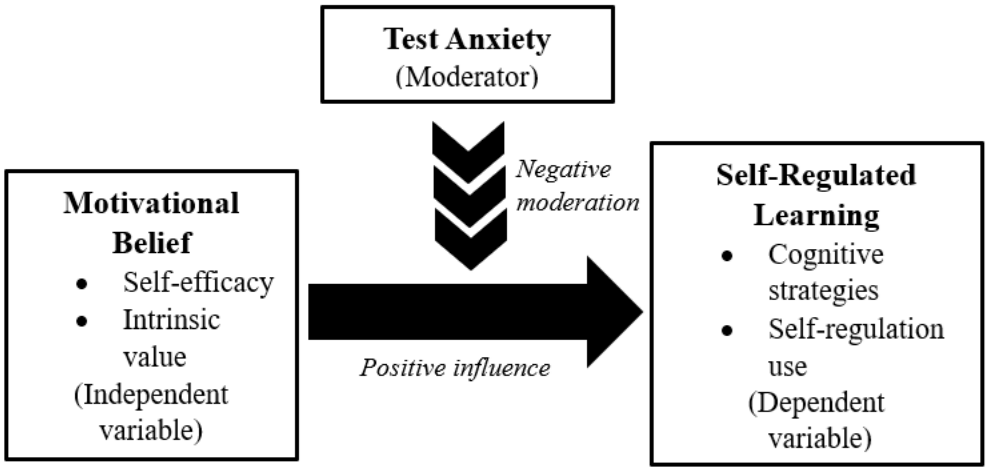

Figure 1: Conceptual Framework of the Study-Relationship between Motivational Beliefs and use of Self-Regulated Learning Strategies, with Test Anxiety as a moderating variable.

METHODOLOGY

This research aimed to investigate how test anxiety influences the connection between motivational beliefs and self-regulated learning strategies among university students. The study utilized quantitative methods, employing descriptive statistics to examine survey data collected from a purposive sample of 160 undergraduate students. These participants enrolled at Universiti Teknologi MARA (UiTM) Kelantan Branch. Data collection was conducted using a 5-point Likert scale questionnaire adapted from the work of Martin & Bollinger (2018).

In addressing the first research question, Pearson correlation analysis was conducted using SPSS to analyse the relationship between motivational beliefs and self-regulated learning strategies among university students. This statistical method was chosen to measure the strength and direction of the linear association between the mean scores of motivational beliefs and various self-regulated learning strategies, including

metacognitive, effort regulation, cognitive, social, and affective strategies. Pearson correlation provides a straightforward and effective way to determine whether a significant relationship exists between these variables, offering insights into how motivational beliefs correlate with the use of self-regulated learning strategies in an educational context. This analysis aids in identifying the degree to which these constructs are related, contributing to a clearer understanding of students' learning behaviours.

To answer the second research question, 'Does test anxiety moderate the relationship between motivational beliefs and self-regulated learning (SRL) strategies?', hierarchical regression analysis was used. This approach allows examination of the interaction effect between motivational beliefs and test anxiety on SRL strategies, beyond the individual direct effects. By entering variables in a stepwise manner, hierarchical regression allows assessment of whether test anxiety significantly changes the strength or direction of the relationship between motivational beliefs and SRL strategies. This method provides a nuanced understanding of how test anxiety may influence students' use of self-regulated learning strategies in relation to their motivational beliefs, highlighting the conditional nature of this relationship in the context of academic performance and emotional factors.

Table 1 shows distribution of items in the survey. It has four sections. Section A has items on demographic profile. Section B has two items on motivational beliefs. Section C has two items on self-regulated learning strategies and lastly, section D on test anxiety.

Part	Strategy	Scale	No of items	Total Items
B	Motivational beliefs (Pintrich & DeGroot, 1990)	Self-effficacy	9	18
		Intrinsic value	9	
C	Self-Regulated Learning strategies (Pintrich et al., 1991)	Cognive stratgy use	13	22
		Self-regulation	9	
D	Test anxiety	Test anxiety	4	4
Total number of items				44

Table 1: Distribution of Items in the Survey

Table 2 shows the reliability of the survey. The analysis shows a Cronbach alpha of .932, thus, revealing a good reliability of the instrument used. Further analysis using SPSS is done to present findings to answer the research questions for this study.

Reliability Statistics

Cronbach's Alpha	N of Items
.932	44

Table 2: Reliability of Survey

FINDINGS

a) Findings for Demographic Profile

i) Gender

Table 3 shows the demographic information of the respondents. A total of 160 students participated in the survey, with the majority being female, representing 78%, while only 22% of the total population were male.

Male	22%
Female	78%

Table 3: Percentage for Gender

ii) Age Group

Based on Table 4, the majority of respondents (59%) were aged between 18 and 20 years, followed by 38% aged 21 to 23 years, while the smallest group, 3%, were aged 24 to 26 years.

18 to 20 years old	59%
21 to 23 years old	38%
24 to 26 years old	3%
27 to 29 years old	0

Table 4: Percentage for for Age Group

iii) Discipline

Table 5 shows the academic discipline of the respondents. 51% of the respondents were from Business and Management, 44% were from Science and Technology, and only 5% were from the Social Science and Humanities discipline.

Science and Technology	44%
Social Science and Humanities	5%
Business and Management	51%

Table 5: Percentage for Discipline

iv) Academic Level

Out of 160 respondents, 50% were degree students, 38% were diploma students, and the smallest group, 12%, were pre-diploma students.

Pre-Diploma	12%
Diploma	38%
Degree	50%
Master	0

Table 6: Percentage for Academic Level

b) Findings for Motivational Beliefs

This section presents data to answer research question 1- How do learners' motivational beliefs influence their learning?

1.1 Self-Efficacy (9 items)

Table 7 presents the mean scores for self-efficacy among the respondents. The highest mean score of 4.0 was reported for the statement, "I expect to do very well in this class," while the lowest mean score of 3.1 corresponded to the statement, "My study skills are excellent compared with others in this class." The overall mean self-efficacy score, as shown in Figure 6, is 3.57, indicating a generally high level of self-efficacy among the participants.

Statement/ Question	Mean
Compared with other students in this class I expect to do well.	3.4
I'm certain I can understand the ideas taught in this course.	3.8
I expect to do very well in this class.	4
Compared with others in this class, I think I'm a good student	3.2
I am sure I can do an excellent job on the problems and tasks assigned for this class.	3.8
I think I will receive a good grade in this class.	3.7
My study skills are excellent compared with others in this class.	3.1
Compared with other students in this class I think I know a great deal about	3.3

the subject.	
I know that I will be able to learn the material for this class	3.9

Table 7: Mean for Self-Efficacy

1.2 Intrinsic Value (9 items)

Table 8 presents the mean scores for intrinsic value. The highest mean score of 4.4 was for the statement, "Understanding this subject is important to me," while the lowest mean score of 3.6 corresponded to the statement, "I often choose paper topics I will learn something from even if they require more work." The overall mean intrinsic value score, as shown in Figure 7, is 4.1, indicating a generally high level of intrinsic value among the respondents.

Statement/ Question	Mean
I prefer class work that is challenging so I can learn new things.	3.7
It is important for me to learn what is being taught in this class.	4.3
I like what I am learning in this class.	4.2
I think I will be able to use what I learn in this class in other classes.	4
I often choose paper topics I will learn something from even if they require more work.	3.6
Even when I do poorly on a test I try to learn from my mistakes.	4.3
I think that what I am learning in this class is useful for me to know.	4.3
I think that what we are learning in this class is interesting.	4.3
Understanding this subject is important to me.	4.4

Table 8: Mean for Intrinsic Value

C. Findings for Use of Self-Regulated Learning Strategies

I. Self-Regulated Learning Strategies

i.i Cogntive Strategey Use (13 items)

Table 9 presents the mean scores for cognitive strategy use. The highest mean score of 4.2 was reported for three statements: "When I study for a test, I try to put together the information from class and from the book," "When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly," and "When I study for a test, I try to remember as many facts as I can." The lowest mean score of 3.6 was for the statement, "I often choose paper topics I will learn something from even if they require more work." The overall mean cognitive strategy score, as shown in Figure 9, is 4.1, indicating a generally high level of cognitive strategy use among the respondents.

Statement/ Question	Mean
When I study for a test, I try to put together the information from class and from the book.	4.2
When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly.	4.2
It is hard for me to decide what the main ideas are in what I read.	3.4
When I study, I put important ideas into my own words.	3.9
I always try to understand what the teacher is saying even if it doesn't make sense.	3.8
When I study for a test, I try to remember as many facts as I can.	4.2
When studying, I copy my notes over to help me remember material.	3.8
When I study for a test, I practice saying the important facts over and over to myself.	4
I use what I have learned from old homework assignments and the textbook to do new assignments.	4
When I am studying a topic, I try to make everything fit together.	4
When I read material for this class, I say the words over and over to myself to help me remember.	4
I outline the chapters in my book to help me study.	3.9
When reading I try to connect the things, I am reading about with what I already know.	4

Table 9: Mean for Cognitive Strategy

i.i Self-Regulation (9 Items)

Table 10 presents the mean scores for self-regulation among the respondents. The highest mean score of 4.0 was for the statement, "I work hard to get a good grade even when I don't like a class," while the lowest mean score of 3.0 corresponded to the statement, "I find that when the teacher is talking, I think of other things and don't really listen to what is being said." The overall mean self-regulation score, as shown in Figure 10, is 3.54.

Statement/ Question	Mean
I ask myself questions to make sure I know the material I have been studying.	3.8
When work is hard I either give up or study only the easy parts.	3.1
I work on practice exercises and answer end of chapter questions even when I don't have to.	3.5
Even when study materials are dull and uninteresting, I keep working until I finish.	3.8
Before I begin studying, I think about the things I will need to do to learn.	3.8

I often find that I have been reading for class but don't know what it is all about.	3.3
I find that when the teacher is talking, I think of other things and don't really listen to what is being said.	3
When I'm reading, I stop once in a while and go over what I have read.	3.6
I work hard to get a good grade even when I don't like a class.	4

Table 10: Mean for Self-Regulation

D. Findings for Test Anxiety

1.Test Anxiety (4 items)

Table 11 presents the mean scores for test anxiety among the respondents. The highest mean score of 3.6 was for the statement, "I worry a great deal about tests," while the lowest mean score of 3.1 corresponded to the statement, "I have an uneasy, upset feeling when I take a test." The overall mean test anxiety score, as shown in Figure 8, is 3.3, indicating a moderately high level of test anxiety among the students.

Statement/ Question	Mean
I am so nervous during a test that I cannot remember facts I have learned.	3.4
I have an uneasy, upset feeling when I take a test.	3.1
I worry a great deal about tests.	3.6
When I take a test I think about how poorly I am doing.	3.4

Table 11: Mean for Test Anxiety

e). Findings for Relationship between motivational beliefs and use of self-regulated learning strategies

This section presents data to answer research question, what is the relationship between motivational beliefs and self-regulated learning strategies among university students? In order to assess whether there is a significant relationship among the mean scores of metacognitive, effort regulation, cognitive, social, and affective strategies, the data were analyzed using SPSS for correlation. The results are displayed separately in Tables 3, 4, 5, and 6 below.

Table 12 indicates a relationship between motivational beliefs and self-regulated learning strategies. The correlation analysis reveals a highly significant positive association between these variables ($r = .711^{**}$, $p = .000$). According to Jackson (2015), a correlation coefficient is considered significant at the .05 level, with positive correlations ranging from 0.1 to 1.0. Specifically, a weak positive correlation falls

between 0.1 and 0.3, moderate between 0.3 and 0.5, and strong between 0.5 and 1.0. Therefore, the findings demonstrate a strong positive correlation between motivational beliefs and self-regulated learning strategies.

Correlations

		MOTIVATIONALBELIEFS	SELFREGULATED
MOTIVATIONALBELIEFS	Pearson Correlation	1	.711**
	Sig. (2-tailed)		.000
	N	160	159
SELFREGULATED	Pearson Correlation	.711**	1
	Sig. (2-tailed)	.000	
	N	159	159

**. Correlation is significant at the 0.01 level (2-tailed).

Table 12: Correlation between motivational belief and self-regulated learning strategies

F) Findings For Moderating Effect Of Test Anxiety On The Relationship Between Motivational Beliefs And Self-Regulated Learning Strategies

Table 13 shows the results from the hierarchical regression analysis. It was discovered that motivational beliefs have a strong positive effect on the use of self-regulated learning (SRL) strategies among university students (B = 0.7041, $p < 0.001$). Test anxiety has a significant negative direct effect on SRL strategies (B = -0.2923, p = 0.003). Importantly, the significant positive interaction between motivational beliefs and test anxiety (B = 0.0957, p = 0.024) indicates that test anxiety moderates this relationship. Contrary to expectations, as test anxiety increases, the positive influence of motivational beliefs on SRL strategy use becomes slightly stronger.

Predictor	Coefficient (B)	p-value
Motivational Beliefs	0.7041	<0.001
Test Anxiety	-0.2923	0.003
Interaction (Motivational Beliefs x Test Anxiety)	0.0957	0.024
Sample Size (N)	160	160

Table 13: Hierarchical Regression Results

DISCUSSION

A) Motivational Beliefs Influence On Self-Regulated Learning

The descriptive results indicated that students generally reported high levels of self-efficacy (mean = 3.57) and intrinsic value (mean = 4.1), reflecting their optimism about their academic capabilities and the perceived importance of their studies. These findings align with prior research showing that students with strong motivational beliefs are more likely to engage meaningfully with learning tasks.

Conversely, test anxiety was reported at a moderate to high level (mean = 3.3), suggesting that students experience considerable worry and nervousness around tests. Despite this, the overall engagement in SRL strategies was also high; the cognitive strategy use mean score was 4.1, and self-regulation mean score was 3.54, indicating that students actively employed effective strategies such as planning, monitoring, and persistence in their learning behaviours.

b) Relationship Between Motivational Beliefs and Self-Regulated Learning Strategies

Correlation analysis revealed a strong positive relationship between motivational beliefs and use of self-regulated learning strategies ($r = 0.711$, $p < 0.001$). This supports the hypothesis that students' confidence in their abilities and the value they assign to academic tasks significantly motivate them to utilize SRL strategies. Such strategies are essential, especially in hybrid learning environments, to independently manage study schedules, comprehend material, and prepare effectively for assessments.
Consistent with Bandura's social cognitive theory, these findings underscore self-efficacy as a critical predictor of self-regulated learning, facilitating cognitive engagement, strategic behavior, and adaptive learning outcomes. The intrinsic value component further motivates students by highlighting the personal significance and interest in the learning tasks, fostering sustained effort and engagement.

c) Moderating Role of Test Anxiety

The hierarchical regression results reveal that higher motivational beliefs are strongly associated with greater use of self-regulated learning strategies, affirming motivation's key role in effective learning. Meanwhile, test anxiety negatively impacts SRL strategies, consistent with its interference in student learning behaviours. However, the moderation effect suggests a nuanced relationship: under conditions of higher test anxiety, motivational beliefs become an even more important driver for engaging in SRL strategies. This may indicate that when students experience more anxiety, those with stronger motivational beliefs are better able to maintain or boost their self-regulated learning efforts. These findings highlight the complex interplay between emotional factors and motivation in shaping students' learning strategies. Further

research could explore how motivation helps mitigate anxiety's potentially harmful effects on learning.

d) Pedagogical Implications

The findings offer important pedagogical implications for supporting university students' learning. First, educators should recognize the critical role of motivational beliefs in promoting effective self-regulated learning strategies, especially for students facing higher test anxiety. Enhancing students' motivation through targeted interventions, such as goal-setting, positive feedback, and fostering a growth mindset can help strengthen their engagement in self-regulated learning despite anxiety. Second, since test anxiety negatively affects learning behaviours, addressing anxiety through stress-reduction techniques, counselling, and a supportive learning environment is essential. Importantly, the moderation effect suggests that boosting motivation can partly counterbalance the negative impact of anxiety, so combining motivation-enhancing practices with anxiety management may offer the most benefit. Overall, educational programs should integrate both motivational support and strategies for coping with test anxiety to optimize students' learning and academic success.

e) Suggestions for Future Research

Based on the findings, future research could explore several areas to deepen understanding of the relationship between motivational beliefs, test anxiety, and self-regulated learning strategies. Studies might investigate the specific mechanisms by which motivational beliefs help students manage or overcome test anxiety to maintain effective learning behaviors. Longitudinal research could examine how these relationships evolve over time and across different academic contexts or disciplines. Additionally, future research could test intervention programs designed to simultaneously enhance motivation and reduce anxiety to assess their combined impact on self-regulated learning and academic outcomes. Exploring diverse student populations and including qualitative methods may also provide richer insights into how emotional and motivational factors interact to influence learning strategies.

CONCLUSION

Motivational beliefs play a crucial role in promoting the use of self-regulated learning (SRL) strategies among university students, as evidenced by the strong positive correlation between the two variables. Students with high self-efficacy and intrinsic value demonstrate greater engagement in cognitive strategies, planning, monitoring, and persistence, which are essential for academic success, especially in hybrid learning environments. Despite experiencing moderate to high test anxiety, students with strong motivational beliefs are still able to actively employ effective SRL strategies, highlighting motivation's pivotal influence on learning behaviors.

The study also reveals a complex moderating role of test anxiety in the motivation-SRL relationship. While test anxiety generally has a negative impact on SRL strategy use, it simultaneously intensifies the importance of motivational beliefs; students with higher anxiety appear to rely more heavily on their motivation to sustain or enhance their self-regulation efforts. This nuanced interplay between emotional and motivational factors suggests that educational interventions should both bolster motivation and provide support to manage anxiety, thereby optimizing students' learning outcomes. Future research may focus on intervention programs and longitudinal studies to further clarify these dynamics and develop targeted strategies to enhance academic resilience among students.

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