

A Study of the Relations of College Learning Motivation, Self-efficacy, and Academic Achievements

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Abstract

This study aims to explore and investigate the relationships between psychological elements, such as learning motivation and self-efficacy, and academic achievements, while examining the mediating role of self-efficacy during this process. To achieve the final goal, the study randomly selected 182 students, and a questionnaire-based survey methodology was used to assess their perspectives. The questionnaire comprises subscales for three dimensions, including a learning motivation scale, a general self-efficacy scale, and a self-assessment scale for academic achievement, all of which demonstrate high reliability and validity. The result indicates that college academic achievements exhibit a significant positive correlation with self-efficacy and learning motivation, and self-efficacy plays a partial mediating role between the two, accounting for a percentage of the total effect. The study finds that learning motivation and self-efficacy play a key role in achieving academic success. Therefore, it is highly recommended that academic progress can be enhanced by increasing learning motivation and subjective initiative, thereby indirectly reducing academic and peer pressure, and consequently helping college students achieve academic success and a sense of self-worth.

Keywords

learning motivation, self-efficacy, academic achievement, college students, psychology

1. Introduction

With the rapid development of society, the system of national education is evolving and becoming more comprehensive, and the philosophy that education serves as the cornerstone of a century-long developmental strategy is being thoroughly applied. The demand for degrees in the talent market is rising. Currently, technological, talent, and educational competition directly relate to the strategic positions of various nations. Education has become a powerful tool for cultivating talent and an important means of overcoming challenges in the field of technology (Wang, 2025). Education is the cradle for cultivating talents and the source for technological innovation. A high-quality educational system can deliver a large number of highly competent people to society, meeting the demand for talent that is required by technological advancement and industrial upgrading. As an important power for technological innovation, education is a source of intelligence by cultivating innovative thinking, stimulating innovative activity. It is one of the significant tasks to strengthen the supporting role of education to technology and talent. Besides, higher education plays a crucial role in building a strong educational nation (Xinhua News Agency Commentator, 2025).

Economic development, talent demand, the improvement of living standards, parents' and personal expectations lead to the constant seriousness of academic stress, which is especially evident among undergraduates. As the national education reform develops consistently and deeply, all sectors of society have

established higher standards for students' academic performance. Teenagers who live in the modern age are always in an increasingly competitive environment, and they have to face increasing and serious academic pressure from the primary school years (Liu, 2025). Pressure has a significant impact on personal progress. The moderate academic pressure prompts individuals to achieve the goals that have been set and make efforts in terms of time and energy, hence, they can achieve the goals and academic success. Generally, the success of an academy is tightly connected to various mental elements. In addition, the strength of learning motivation and the level of self-efficacy play an important role in an individual's academic success.

Studies on the relationship between learning motivation, self-efficacy, and academic success provide a rich and useful theoretical foundation. Furthermore, the studies provide valuable references and suggestions for various universities and colleges. This article intends to answer the questions below: Firstly, how does learning motivation influence undergraduates' academic success? Secondly, what role does self-efficacy play in academic motivation and academic achievement? Thirdly, is there any mediating or regulating effect among these three? The research applies the methods of literature research, questionnaire survey, and statistical analysis to separately analyze and explain learning motivation, self-efficacy, and academic success.

2. Literature Review

2.1 Learning Motivation

Learning motivation refers to a kind of impulse that enables learners to realize the meaning and value of the learning activity and strive to achieve the expected learning outcomes (Gao, 2020). Learning motivation, combined with strong subjective initiative, plays a crucial role in encouraging and supporting learners, especially when they encounter difficulties that urgently need to be addressed. Meanwhile, numerous research achievements of motivation are applied to the practical areas of educational and organizational management, becoming the theoretical bases of teaching behavioral strategy and training schemes made by educators and organizational leaders (Luo et al., 2023). It is universally believed that learning motivation can be divided into intrinsic motivation and extrinsic motivation. Intrinsic motivation originates from the interests, hobbies, and the pursuit of one's values, expecting to achieve personal growth through learning. On the contrary, extrinsic motivation comes from external material rewards, other's approval, or the fear of punishment or criticism that one would face if they did not engage in this activity. Generally speaking, the motivating effect of extrinsic motivation on learners is weaker compared to that of intrinsic motivation.

2.2 Self-efficacy

As one of the significant concepts in social cognitive theory, self-efficacy refers to individuals' prediction and judgment on whether they can manage the act, and it is also the belief in one's ability that a person holds in a specific activity. It determines the extent to which individuals invest effort and the perseverance to overcome difficulties, and it is a key factor that influences learning input and academic performance improvement (Wu & Fu, 2024).

The self-efficacy concept has been applied in various areas, which has important research value in educational psychology, developmental psychology, and the psychology of success, emphasizing the vital role in promoting an individual's own beliefs, confidence, and actions, such as the important impulse effect of learning motivation. It has been admitted that self-efficacy can play a certain mediating role. Guo and Jiang (2008) suppose that one's self-efficacy plays a key role in the mediation.

This article adopts Bandura's definition of self-efficacy, which means that self-efficacy refers to the degree of confidence in one's ability to utilize the skills one possesses to finish a certain task (Bandura et al., 2003). An individual believes that they can organize and take action to achieve a specific accomplishment. Self-efficacy can be easily understood and generalized as 'confidence', and its level can influence learning motivation, learning interests, and learning engagement (Wang et al., 2011).

2.3 Academic Achievements

Different researchers have different judgments of academic success. The definition of academic success made by Wang et al. is more comprehensive and reasonable, holding that academic success is a total of

undergraduates' learning results, learning behavior, and learning attitude over time, mainly including two parts: undergraduates' behavior performance and objective achievements (Petrides & Furnham, 2001). Additionally, the evaluation system of Chinese undergraduates' academic accomplishments is not complete. From a general perspective, academic performance is often equated with academic achievement. Therefore, grade point average is regarded as an important index of academic success to evaluate the learning outcome in each curriculum of college students during their school years. The vast majority of colleges and universities regard the comprehensive quality development of undergraduates as a main manifestation of their academic achievements, including moral education, intellectual education, physical education, aesthetic education, and labor education, and more comprehensively and systematically regulate undergraduates' performance during their academic year. Cao and Zhang contend that academic achievement refers to the knowledge and skills in academic fields that students acquire after studying and training. And it is a concentrated reflection of students' learning conditions and levels (Schwarzer et al., 1997).

This research, based on the opinions about the academic achievement that proposed by researchers and the new era's demands for the comprehensive development of college students under the development and progress of the country and society, defines academic achievements as the combination of hard skills such as learning ability (comprehensive ability, memory) and learning attitude, skills master and knowledge acquisition and the soft skills like emotional regulation, interpersonal relationships and communication and expression instead of focusing on grade point average or the final grade only.

3. Methodology

3.1 Participants

The online questionnaire was published in various ways, such as group chats, class platforms, and friend circles, and was given to junior college students and undergraduates from different colleges by their mentors and professors teaching at the college on July 30th, 2025. Before administering the questionnaires, participants were informed that their participation in the survey was voluntary and their willingness would be respected. In the research, statistics and results can only be used in academic research and discussion, being banned from being made public. Meanwhile, to screen out the sample size later and ensure the validity of the samples, personal information includes only participants' age, sex, and education level. The questionnaire is anonymous and will be collected later after completion to protect participants' privacy. Participants answer based on their own will, and free withdrawal is allowed. At the same time, participants should promise to be honest when they apply the questionnaires. Based on the time spent on answering and the questions they answered, the valid questionnaires collected all met the standards.

At last, two hundred college students participated in the survey and answered the questionnaires. After screening out according to the time spent on the answers, their ages, and the completion of the answers, there are 182 valid questionnaires in total. There are 78 males, accounting for 42.86%, and 104 females, accounting for 57.14%. The ratio of male to female students is approximately 1:1. Therefore, the gender distribution of the respondents involved in this survey is relatively balanced and representative, without any gender bias. As a result, the survey results are scientifically valid and representative.

Additionally, questionnaires that were answered by students who have already obtained a master's or doctoral degree are excluded, and their answers aren't subject to the discussion, which is up to the education level and age standard. Among the remaining valid questionnaires, 96 people with a college degree accounted for 52.75% of the total valid sample size, and there were 86 people with a bachelor's degree. The subjects in the survey were of the same age group, which could largely eliminate the influence of age on the research results. Moreover, the proportions of those with a college degree and those with a bachelor's degree were nearly 1:1. As a result, the research results were comprehensive.

3.2 Procedure

3.2.1 Learning Motivation Questionnaire

The first part of the questionnaire is the College Students Learning Motivation Scale. It adopts a Likert 5-point scoring system. The higher the grades one gets on the answers means that the higher the learning

motivation one has. Learning motivation scale in this study partly based on the College Students Learning Motivation Questionnaire (This questionnaire was developed based on Ausubel's achievement motivation theory model, dividing college students motivation into multiple dimensions that involves meeting the needs of job hunting, developing major interests, improving abilities, rewarding to the elders, gaining other people's acknowledge and praise, creating conditions for landing a job, serving the society and contributing to one's hometown and the reliability and validity indicators of this scale have both met the requirements of psychological measurement.) authorized by Tian and Pan in 2006, emphasizing measuring the strength of learning motivation rather than emphasizing the type of learning motivation, items are adjusted by adding or removing, which meets the requirements of this research. The number of titles of the College Students Learning Motivation Scale has changed from 34 originally to 11 (1-11) after the regulation (For example, I have known what my goal is during my college years.) The scale uses a 5-point scoring system, including 5 choices, which are "0-Strongly disagree," "1-Disagree," "3-neither agree nor disagree," "4-Agree," "5-Strongly Agree." After adjustment, its Cronbach's coefficient was calculated to be 0.967, indicating a high level of reliability, consistency, and validity. Meanwhile, as the pictorial diagram shows, the data shows a normal distribution result. Participants' answers to specific titles are paid attention to when browsing the questionnaire. For example, there are indeed several extreme answers compared to other items' answers. However, it can still be believed that these data are reasonable to some extent and will finally be kept.

3.2.2 General Self-efficacy Questionnaire (GSES)

The College Student General Self-Efficacy Questionnaire uses a general self-efficacy scale compiled by Schwartz, Babule, and Quayatakis, and is composed of 20 items (For example, I am confident that I could deal efficiently with unexpected events). Then, the scale was mended to ten titles (12-21), being widely applied, and it has a satisfying reliability, construct validity, criterion validity, and predictive validity (Schwarzer et al., 1997). This research uses the General Self-efficacy scale to measure college students' self-efficacy, which mainly involves the confidence one has while encountering difficulties and obstacles. The questionnaire includes indicators such as "If I put effort, I will always be able to tackle the problems" and "For me, it is easy to insist on my dream and achieve goals." GSES is a four-point rating scale. Following the learning motivation scale and academic achievement scale, and to make the answers more accurate, the research also uses a Likert five-point system (Strongly Disagree- Strongly Agree), retaining the inherent meaning of the original scale questions. The Cronbach's coefficient of this scale is 0.964, indicating its reliability. At the same time, according to the pictorial diagram, the data show a normal distribution result.

3.2.3 Academic Achievement Self-Assessment Scale

Since there has not been a unification of the academic achievement definition nowadays, its judgment criteria are also different. The College Students Academic Achievement Scale in this questionnaire is based on the definition given in the research designed by this study. The definition of academic achievements given in this article is a comprehensive quality for measuring academic achievements from hard power, such as learning abilities (Comprehension, memory, etc.), learning attitude, skills, mastery of knowledge retention, and soft power, such as relationships, conversation skills, and expression skills. There is a total of 11 items (22-32) (For example, I know how to change the topic of a conversation, and I have mastered the key points of a conversation.), and it also uses a Likert five-point system (Strongly Disagree- Strongly Agree). The higher grades one gains mean the higher academic achievements one has. The Cronbach's coefficient of this scale is 0.953, directly indicating its reliability.

3.3 Data Processing

The research utilizes SPSS software for statistical analysis to process, combine, and code the data and responses. Then all the scores should be summed up for the independent and dependent variable issues. Eventually, use the SPSS software to conduct a Pearson correlation analysis and a mediation effect test on the data.

4. Results

4.1 Difference Analysis

Among the data collected during the survey, the ratio of men and women is approximately 1:1. Therefore, there is a great value in analyzing the role of gender in learning motivation, self-efficacy, and academic achievement. The t-test conducted with gender as the variable showed that there were no significant differences between males and females in terms of learning motivation ($p=0.759$), self-efficacy ($p=0.927$), and academic achievement ($p=0.3880.05$). Different samples (including males and females) show no difference in learning motivation, self-efficacy, and academic achievements. Thus, gender doesn't act as a major factor influencing college students' learning motivation, self-efficacy, and academic achievements.

4.2 Correlation Analysis

SPSS software was used for statistical analysis and data processing in this research, calculating Pearson's correlation to evaluate the relations among learning motivation, self-efficacy, and academic achievements (Table 1).

Table 1 is a correlation analysis scale about learning motivation, self-efficacy, and academic achievement, clearly depicting the correlation relationships among them. Correlation analysis was conducted while controlling for participants' gender, age, and education level. The correlation coefficient value between learning motivation and self-efficacy is 0.800 ($p<0.01$), indicating there is a significant positive correlation between learning motivation and self-efficacy. Additionally, the correlation coefficient value between learning motivation and academic achievement is 0.813 ($p<0.01$), and the correlation coefficient value between self-efficacy and academic achievement is 0.889 ($p<0.01$), indicating that there is a significant positive correlation between learning motivation and academic achievement, as well as between self-efficacy and academic achievement. To sum up, there is a significant positive correlation among learning motivation, self-efficacy, and academic achievement.

Table 1: Pearson Correlation-Standard Format.

	Learning motivation	Self-efficacy	Academic achievement
Learning motivation	1		
Self-efficacy	0.800**	1	
Academic achievement	0.813**	0.889**	1

* $p<0.05$ ** $p<0.01$

4.3 Test of the Mediating Model of Self-efficacy

After using SPSS software to conduct correlation analysis among the three variables—learning motivation (LM), self-efficacy (SE), and academic achievement (AA), the test of the mediating effect model has been proved between them according to the three-step approach. Aiming to make the test results more interpretable, all variables have undergone standardized processing while controlling for gender and age (Table 2).

The previous text has already conducted a correlation analysis between learning motivation, self-efficacy, and academic achievement, and tested the direct effect between learning motivation and academic achievement, as well as self-efficacy and academic achievement. This section introduces self-efficacy as a mediating variable.

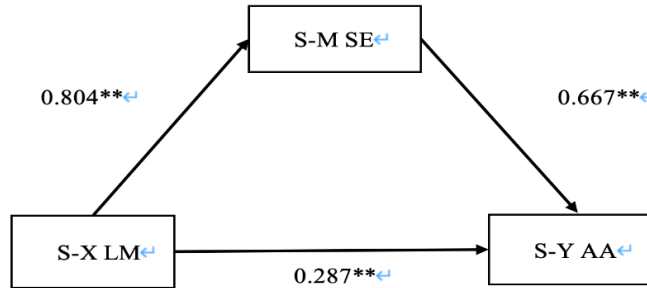
The result of the mediating effect (Table 2) indicates that learning motivation has a significant positive predictive effect on academic achievement before introducing the mediating variable—self-efficacy. And the overall effect of learning motivation on academic achievement is 0.823 ($p<0.001$); Meanwhile, self-efficacy has a significant positive predictive effect on academic achievement, and its effect is 0.667 ($p<0.001$).

After adding self-efficacy, which acts as the mediating variable, a further study and analysis of the effect of learning motivation, self-efficacy, and academic achievement have been conducted. It finds that the direct effect of learning motivation on academic achievement has declined from 0.823 originally to 0.287 ($p<0.001$), and its indirect effect is 0.536 (Boot 95%CI [0.430, 0.627], $p<0.001$). The Mediating Effect Model has been constructed (Figure 1) through the test of mediating effect. The results show there is a mediating effect among learning motivation, self-efficacy, and academic achievement. The effect decomposition process shows that the direct effect accounts for 34.84% of the total effect, and the indirect effect accounts for 65.160%, conforming to the characteristic of the Mediating Model. Self-efficacy plays a significant role as a partial mediator.

Table 2: Test of Mediating Effect-Horizontal Format.

Item	Symbol	Meaning	Effect Intensity	95% CI		Standard Error (SE)	z /t	p	Conclusion
				Lower limit	Upper limit				
S X LM=>S M SE SE=>S Y AA	a*b	Indirect effect	0.536	0.430	0.627	0.051	10.519	0.000	Partial mediating
S X LM=>S M SE	a	X=>M	0.804	0.716	0.892	0.045	17.859	0.000	
S M SE=>S Y AA	b	M=>Y	0.667	0.563	0.772	0.053	12.533	0.000	
S X LM=>S Y AA	c'	Direct effect	0.287	0.182	0.392	0.054	5.358	0.000	
S X LM=>S Y AA	c	Total effect	0.823	0.737	0.909	0.044	18.738	0.000	

Figure 1: Model Diagram of the Mediating Effect of Self-Efficacy



5. Discussion

This research explores the relationships and impacts between college students' learning motivation, self-efficacy, and academic achievements. The average values of each item are all greater than 3 in titles that measure learning motivation, which indicates that college students' learning motivation is at a relatively high level, especially during the undergraduate years. It might, since college students have a stronger self-awareness and goal orientation awareness, being able to make sure their tasks and long-term goals are planned. They are more active in their learning behaviors. Therefore, they have a stronger sense of learning motivation. Besides, college students' self-efficacy is at a higher level from analyzing the self-efficacy scale. However, there is an imbalance phenomenon in college student groups, so it is indispensable for teachers to shift their attention to the cultivation of the self-efficacy of some students. What's more, this study conducted a comparative analysis and correlation analysis on the differences among college students' learning motivation, self-efficacy, and academic achievements.

It also examined the mediating effect of self-efficacy between learning motivation and academic achievement. The research finds that the self-efficacy between college students' learning motivation and their academic achievements, as well as the relationship between academic achievements and self-efficacy, all show a significant positive correlation, which follows the ideas and results proposed by Uguroglu and Walberg and other domestic scholars like Gao and Wang (Gao, 2020; Uguroglu & Walberg, 1979; Wang et al., 1999). There is not an extinct difference between learning motivation and self-efficacy on gender, which means that gender basically doesn't act as an influence factor. Meanwhile, self-efficacy plays an important role between learning motivation and academic achievements for college students. Academic achievement doesn't rely on one factor only—the strength of learning motivation, following the research results given by scholars like Tao et al. (2019) and Skaalvik et al. (2015). College students with a higher self-efficacy have a stronger sense of confidence and are braver to face difficulties and dare to beat challenges instead of giving up or being doubt to themselves when they face learning tasks, especially when countering learning blocks. This point is highly in according with the results put forward by researchers like Zhang et al. (2021). Students with higher self-efficacy prone to choose more challenging tasks and set higher goals, and they also put more effort into the tasks. Higher self-efficacy can help them perform well in all aspects, generating positive implications and encouragement for themselves. Successful experience can generate new acknowledgment for themselves constantly, stimulating them to go forward to the academic goals that they have set. Regarding the relationship between self-efficacy and academic performance, the academic community generally holds a consensus view: Self-efficacy has a positive impact on academic performance (Pan et al., 2025). This idea highly agrees with the Self-efficacy Theory, which is defined and emphasized by Bandura. According to the Self-efficacy Theory

by Bandura, Self-efficacy belief determines their level of motivation, showing the extent of individuals' efforts and the perseverance when they face difficulties and challenges (Pan et al., 2025). This indicates that teachers, scholars, researchers, and education workers not only need to stimulate students' learning motivation to improve academic performance, but they are also supposed to put their attention to cultivating and strengthening students' self-efficacy by positive feedback, goal setting, etc, fully leverage the significant role of individual self-efficacy in achieving academic success.

5.1 Limitation

There are several limitations and blanks with the following respects to the current study. Firstly, this study adopts the mediation effect and hierarchical regression to construct the mediating model of self-efficacy between learning motivation and academic achievements, paying attention to the psychological elements that influence undergraduates' academic achievements, such as learning motivation and self-efficacy, etc. The influencing factors are simple and single, which are unable to rule out the possibility that other factors may also have an impact on college students' academic achievements. It is said that perseverance, a significant non-cognitive factor, has an evident positive effect on academic achievements; however, the effect can be influenced by learning strategies on regulatory effects. The positive effect of perseverance could be sharply reduced, and students may feel reluctant to learn due to the ineffective efforts they made when they adopt low-efficiency or inappropriate strategies (Du et al., 2025). Generally, academic achievements are decided and influenced by various factors. A further study about whether the learning qualities possessed by students, such as perseverance, consciousness, the level of effort they put in, the learning strategies they adopted, and their cognitive abilities, emotional state, and anxiety level, acts intermediary effect is still indispensable. It might need to apply more complicated statistical models and analysis methods. For example, in order to improve the external validity of the research, tools like multilevel linear models and multilevel models are used (Liu & Meng, 2002; Yuan, 2025). Secondly, the variation of learning motivation and self-efficacy is dynamic, partly because undergraduates' development is characterized by continuity and stages. From Bandura's perspective, self-efficacy cannot be invariable but changeable, which can be adjusted according to new circumstances and self-renewing thoughts, emphasizing one's confidence to accomplish specific tasks (Zhou, 2024). Because of the limited research time, this research adopts a quantitative research method to finish the initial investigation of the current situation of the participants without disclosing the dynamic changes and impacts of variables under the influence of the period, which lacks a long-term follow-up study; thereby, there are limitations. Thirdly, this research discusses the mutual relations and the mediating variable effect based on learning motivation, self-efficacy, and academic achievements, while offering suggestions and important theoretical value for researchers and subsequent studies. Based on this theoretical study, discussions about implementing practical intervention guidance strategies are conducted, which offer more practical bases and value. In addition, it is indispensable for us to consider differences in cultural backgrounds, situations, and whether the research population can be further expanded and promoted, such as high school students and primary school students, etc., aiming to master universality and particularity in these relations and the mechanism of action.

5.2 Future Study Suggestions

Taking into account that the extensive attention and urgent demands currently faced by undergraduates in terms of academic success and the value and limitations of this research towards influence factors such as learning motivation, self-efficacy, universities, and researchers should assist students in achieving academic success by taking various effective approaches, such as improving learning motivation and enhancing self-efficacy.

Firstly, Universities should strive to create an appropriate learning and development environment for undergraduates, aiming to provide enough opportunities to step into the workplace more easily and enhance their self-efficacy by accumulating a large amount of successful experience. Professors' timely and sufficient support and commendations can effectively establish comfortable and intimate psychological relations and shorten the psychological distance between professors and students or students themselves, which will stimulate their learning motivation and make them willing and have sufficient motivation to realize the goal (Tripon et al., 2023). A pleasant learning experience brings students a comfortable psychological state, greatly enhancing their tolerance level when they face the unavoidable challenges and obstacles; thus, it is easier to

gain a sense of victory and achievements after overcoming difficulties. What's more, academic goals can be realized based on high-level self-efficacy.

Secondly, researchers should fully consider the significant role that personal factors play in achieving academic success while attaching great importance to the differential manifestations existing in various aspects, for example, psychological or cognitive abilities among different individuals. Teachers are obliged to insist on student-based, students' peculiarity, their physical and psychological development, stimulating their full potential, and nourishing their souls during teaching and education (Zhang, 2025). For students with a weak foundation and low self-confidence, it is wise to adjust the difficulty of the task, avoiding being extremely hard, which leads to a dilemma that is far beyond the scope of what they could have accomplished through their efforts, and a sense of failure will be produced, which hinders the cultivation and strengthening of self-efficacy and internal motivation; by contrast, tasks that are too easy can make one doubt one's ability, especially while comparing with their peers, more seriously, a sense of inferiority emerges eventually. However, for those with stronger abilities, teachers are supposed to adjust the difficulty of tasks and materials, which contributes to obtaining a sense of conquest and achievement in acquiring knowledge.

6. Conclusion

This study conducts quantitative research by collecting questionnaires to explore the relationships and mechanisms between learning motivation, self-efficacy, and academic achievements. The results show the following aspects: Firstly, self-efficacy plays a mediating role between learning motivation and academic achievements. Secondly, academic achievements can be achieved through promoting learning motivation and self-efficacy reasonably. Thirdly, this research deeply analyzes the relationships between the two of them and the mechanism of the three factors, providing professors and educational workers with valuable thoughts and suggestions in various aspects such as educational practices, task objective setting, relations between teachers and students, the creation of a study environment, and school culture building, and offering significant theoretical value for promoting the further evolution and reform of the education and teaching. Fourthly, this study emphasizes the core value that psychological variables in education, paying attention to the impact of students' learning motivation, self-efficacy on realizing academic achievements, and then the important role of psychological intervention in the university teaching system can be enhanced. Fifthly, combining the current phenomenon of rapid development of the economy and the high-pressure environment teenagers live in, the research offers significant support to promoting college students' academic achievements, meeting the demand of the talent market, and achieving the prosperity of national educational revitalization.

References

- Bandura, A., Caprara, G. V., Barbaranelli, C., Gerbino, M., & Pastorelli, C. (2003). Role of affective self-regulatory efficacy in diverse spheres of psychosocial functioning. *Child Development*, 74(3), 769-782. <https://doi.org/10.1111/1467-8624.00567>
- Du, F., Han, J., & Li, J. (2025). A study on the relationship between perseverance and academic achievement of students majoring in education from comprehensive universities - the mediating role of self-regulated learning. *Journal of Yangzhou University (Higher Education Research Edition)*, 29(3), 86-97.
- Gao, X. (2020). The characteristics of contemporary college students' learning motivation and its impact on academic performance. *Higher Education Exploration*, (1), 43-47.
- Guo, B., & Jiang, F. (2008). *Self-efficacy theory and its applications*. Shanghai Education Publishing House.
- Liu, H., & Meng, Q. (2002). Multilevel linear models in educational and psychological research. *Advances in Psychological Science*, (2), 213-219.
- Liu, Y. (2025). *The impact of junior high school students' learning pressure on academic burnout: A regulated mediating model* [Unpublished master's thesis, Dongying Normal University]. Dongying.
- Luo, Y., Huang, Y., Li, H., Li, C., & Fu, Y. (2023). The influence of college students' self-efficacy and learning motivation on learning engagement. *Journal of Guilin Normal College of Higher Education*, 37(3), 73-79.

- Pan, X., He, X., & Chen, X. (2025). The influence of psychological factors on academic performance in advanced mathematics courses: An analysis based on structural equation modeling. *Journal of Nanchang University of Aeronautics (Social Sciences Edition)*, 27(1), 76-85,94.
- Petrides, K. V., & Furnham, A. (2001). Trait emotional intelligence: Psychometric investigation with reference to established trait taxonomies. *European Journal of Personality*, 15(6), 425-448. <https://doi.org/10.1002/PER.416>
- Schwarzer, R., Bäßler, J., Kwiatek, P., Schröder, K., & Zhang, J. X. (1997). The assessment of optimistic self-beliefs: Comparison of the German, Spanish, and Chinese versions of the general self-efficacy scale. *Applied Psychology*, 46(1), 69-88. <https://doi.org/10.1111/J.1464-0597.1997.TB01096.X>
- Skaalvik, E. M., Federici, R. A., & Klassen, R. M. (2015). Mathematics achievement and self-efficacy: Relations with motivation for mathematics. *International Journal of Educational Research*, 72, 129-136. <https://doi.org/10.1016/J.IJER.2015.06.008>
- Tao, S., Li, C., & Guo, L. (2019). The relationship between achievement motivation, self-efficacy and autonomous learning performance: A moderated model with mediation. *Psychological Research*, 12(2), 76-83.
- Tripon, C., Gonța, I., & Bulgac, A. (2023). Nurturing minds and sustainability: An exploration of educational interactions and their impact on student well-being and assessment in a sustainable university. *Sustainability (Switzerland)*, 15(12), Article 9349. <https://doi.org/10.3390/SU15129349>
- Uguroglu, M. E., & Walberg, H. J. (1979). Motivation and achievement: A quantitative synthesis. *American Educational Research Journal*, 16(4), 375-389. <https://doi.org/10.3102/00028312016004375>
- Wang, J. (2025). Theoretical construction of the content related to children's education in the important discussions on education by president Xi Jinping. *Research on the Communist Youth League*, (3), 52-58.
- Wang, K., Xin, T., & Li, Q. (1999). A study on the relationship between middle school students' self-efficacy attribution and academic performance. *Psychological Development and Education*, 4(4), 22-25.
- Wang, Y., Li, Y., & Huang, Y. (2011). A study on the relationship between college students' psychological capital, achievement goal orientation, and academic achievement. *Higher Education Exploration*, (6), 128-136,148.
- Wu, J., & Fu, H. (2024). A meta-analysis of the relationship between achievement goal orientation and academic achievement: The mediating role of self-efficacy and student engagement. *Advances in Psychological Science*, 32(7), 1104-1104. <https://doi.org/10.3724/sp.j.1042.2024.01104>
- Xinhua News Agency Commentator. (2025, March 7). *Strengthening the supporting role of education for technology and talent*. Xinhua Daily News.
- Yuan, J. (2025). *The relationship between peer relationships and adolescents' learning engagement: The mediating role of academic self-efficacy* [Master's thesis, Shanghai Normal University]. CNKI. <https://doi.org/10.27312/d.cnki.gshsu.2025.001434>
- Zhang, L. (2025). Enlighten the mind and purify the heart; teach according to individual aptitude. *Shanghai Education*, (4), 96.
- Zhang, W., Jin, L., & Zhang, M. (2021). The relationship between college students' learning engagement, self-efficacy in learning, and learning burnout. *Journal of the Education Institute of the Corps*, 31(4), 39-43.
- Zhou, H. (2024). *The relationship between college students' self-efficacy and depression - the mediating role of psychological flexibility and the intervention study* [Unpublished master's thesis, Guangzhou University]. Guangzhou.

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Conflicts of Interest

The authors declare no conflict of interest.

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