

# The Impact of Self-efficacy on Academic Achievement among College Students

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**Abstract.** With the increasing attention paid to the quality of education and the importance placed on the personal development of students, there is growing interest in the connection between academic achievement and students' self-efficacy. The purpose of this study is to investigate how college students' self-efficacy affects their academic accomplishment, as well as the influence of factors such as family background, gender, and grade on this relationship. Hence, the study collected data using questionnaire survey and scale evaluation methods and conducted data analysis through statistical analysis. Specific methods comprise descriptive statistics, correlation analysis, and regression analysis. This paper found that academic achievement is positively impacted by the self-efficacy of college students. Accordingly, this study offers a thorough grasp of the role that college students' self-efficacy plays in their academic success as well as the factors that influence it. At the same time, the research results can also provide reference and inspiration for educators to further improve teaching methods and educational strategies.

## 1 Introduction

In today's society, the significance of self-efficacy for college students on academic achievement is receiving increasing attention. Students are under increasing strain as a result of the rising standard of education and heightened competitiveness. Self-efficacy affects students' attitudes and coping styles towards stress, and stress can also affect their self-efficacy. Balancing these two can help improve students' psychological resilience and ability to cope with challenges. Therefore, educators can receive better guidance and support by studying how self-efficacy influences college students' academic achievement, helps students fully realize their potential, and improves academic achievement.

People's subjective speculation and judgment on whether they can successfully engage in a certain achievement behavior is known as self-efficacy, which directly affects their functional performance in the psychological process of executing a certain activity [1]. Academic self-efficacy refers to the expectation and judgment of students towards completing a learning task in a specific context, which is not related to their learning skills, but to their level of recognition of their own abilities. Academic achievement refers to the total amount of learning outcomes, behaviors, and attitudes of college students during a certain period [2].

Previous studies have shown self-efficacy and academic achievement are closely intertwined [3]. Weiguo Pang found that self-efficacy affects students' academic performance in three ways [4]. First, self-efficacy can affect students' choices when facing learning tasks. Students with high self-efficacy will

choose learning tasks that are challenging. Those who lack self-efficacy tend to choose less challenging learning tasks. Second, self-efficacy affects the effort, duration, and adaptability of students in a certain learning task. Third, the tension and anxiety that students feel when tackling specific learning tasks are influenced by their self-efficacy [4].

Three types can be used to categorize the influence of self-efficacy on academic achievement. First and foremost, college students' academic achievement and self-efficacy are positively correlated [5]. Secondly, self-efficacy indirectly affects academic achievement by influencing other psychological processes closely related to academic achievements, such as the significant negative impact of school maladaptation patterns on academic achievement, and academic self-efficacy plays a partial mediating role [6]. Additionally, learning persistence can partially mediate the significance of self-efficacy for college students on academic achievement [7]. Thirdly, predicting academic achievement can be achieved through academic self-efficacy [8]. Learning ability self-efficacy can positively predict academic performance, while learning behavior self-efficacy may have a negative impact on academic performance [9]. Similarly, David and Maximilian Kubota's research also found this [10]. In addition, Li and Cao indicate that self-efficacy can to some extent explain students' motivation and emotional responses, such as interest and anxiety towards learning [11].

By understanding the mechanism by which self-effects affect academic achievement, researchers can provide better guidance and support to students, encourage and motivate students to overcome difficulties

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and self-limitations, fully tap into their potential and talents, and enhance academic performance and achievement. At the same time, the research results can also provide reference and inspiration for educators to further improve teaching methods and educational strategies.

Though previous scholars had explored the domain of self-efficacy, most studies often simply explored the correlation between the two, without delving into the mechanisms and influencing factors behind this relationship. Future research should focus on the significance of self-efficacy for college students' academic achievement and the mechanisms it influences, including exploring which factors affect the formation and development of self-efficacy, and how self-efficacy affects academic achievement by influencing students' learning attitudes, motivations, and behaviors. This article mainly investigates the importance of self-efficacy in the academic achievement of college students and its influencing mechanisms in regard to the following aspects.

The research hypothesis is that self-efficacy has a positive impact on academic achievement, that is, students with high self-efficacy will achieve better academic achievement. Moreover, the study will explore the impact of factors such as gender and grade on the significance of self-efficacy for college students' academic achievement, and explore the reasons behind it.

## 2 Methodology

### 2.1. Research design

This study collected data using convenience sampling methods. The study was conducted with undergraduate students from Guangdong Polytechnic Normal University, and 199 valid questionnaires were gathered in total. This study adopted the sampling method to distribute online questionnaires to freshmen, sophomores, juniors, and seniors in diverse majors.

Three parts are involved in the research process, the first of which is the questionnaire design. At the beginning of the questionnaire, there is a short introduction to the concepts of self-efficacy and academic achievement, as well as their correlation. This helps respondents understand the purpose and content of the questionnaire.

The main body of the questionnaire uses the General Self-Efficacy Scale and the College Student Academic Achievement Scale. In question design, concise and easy-to-understand language should be used to ensure that respondents can answer accurately. At the same time, the problem should be targeted and reflect the key factors of self-efficacy and academic achievement of college students.

The end of the questionnaire provides the contact information of the respondents for subsequent data analysis and result feedback. The questionnaire design needs to consider the convenience of data collection and analysis in order to draw valuable conclusions from the data.

During the preliminary investigation, the researcher selected approximately 30 college students as pre-experimental samples to ensure the diversity and representativeness of the samples. The researcher distributed the preliminary designed questionnaire to the samples and ensured that the respondents could understand the questionnaire content. Next, the researcher collected responses from the respondents and recorded relevant data. To assess the reliability and validity of the questionnaire being modified, the researcher conducted a preliminary analysis of the collected data. To guarantee the accuracy and effectiveness of the formal survey, the questionnaire needs to be improved based on the analysis results.

The researcher distributed the completed questionnaire to the survey subjects through WeChat and other forms and collected the questionnaire within the specified time. After the collection was completed, the researcher processed the collected questionnaire data, including data cleaning, coding, conversion, etc. Based on the research question and purpose, the researcher used appropriate statistical methods to analyze the data, including descriptive statistics, factor analysis, regression analysis, etc. Based on the analysis results, explain and report the survey results, including descriptive statistical results, causal analysis results, etc.

The respondents to this questionnaire are 35.7% male and 64.3% female. Most of the respondents are sophomore students, and the fillers are available in various majors ranging from arts, business, and science to engineering majors.

### 2.2 Measures

Individual self-efficacy in one dimension was measured using the General Self-Efficacy Scale (GSES) in this study when dealing with different environments, suitable for children, adolescents, and adults. The scale includes 10 questions (such as "If I try my best, I can always solve problems") Schwarzer et al., who are German scholars, developed GSES, a survey questionnaire that utilizes Bandura's self-efficacy theory to examine individuals' overall self-efficacy [12]. Zhang and other individuals reviewed the Chinese version in 1995 [13]. The Likert 4-level scale is used to rate this scale, which has a dimension of 10 items. The scale has a total score of 10 to 40, and the higher the score, the more confident the individual's self-efficacy is. The Cronbach's  $\alpha$  coefficient of the scale is 0.973, and the split-half reliability is 0.938. After two months of retesting, Ning, Li, and Feng had a retest reliability of 0.866 [14].

In addition, this study adopted the Academic Achievement Self-Assessment Scale revised by Wang [15]. This scale evaluates academic achievement by assessing the comprehensive scores of the subjects. There are 19 questions in the questionnaire, which is divided into four dimensions. The components of overall performance are divided into learning dedication, learning performance, and interpersonal promotion., with a 6-point scoring system ranging from low to high of 1-6 points. The academic achievement of the student is

determined by the total score on the questionnaire. The Cronbach's  $\alpha$  coefficients of learning dedication, learning performance, interpersonal facilitation, and overall performance in the dimensions of academic achievement reached 0.949, 0.953, 0.918, and 0.930, indicating that the scale has extremely high reliability [15].

### 2.3 Data analysis

Before conducting data analysis, the researcher first conducted descriptive statistics on the data. This includes calculating the mean, standard deviation, maximum, minimum, and other indicators for each variable to understand the basic distribution of the data. The study utilizes the Pearson correlation coefficient to measure indicators such as college students' self-efficacy and academic achievement. Self-efficacy having an impact on academic achievement is indicated by a significant correlation coefficient. Once self-efficacy and academic achievement are correlated, regression analysis can be carried out. Through regression analysis methods such as multiple linear regression or stepwise regression, the study aims to analyze the impact of self-efficacy on academic achievement. Other possible influencing factors such as gender, age, etc. can be controlled to

more accurately evaluate the impact of self-efficacy on academic achievement. It also evaluates the regression model, including its fit, significance level, etc. Academic achievement can be significantly affected by self-efficacy when the model fits well. The analysis results present the degree and direction of self-efficacy's impact on academic achievement as presented in this paper. The evidence suggests that self-efficacy has a positive impact on academic achievement, as evidenced by the correlation between self-efficacy and academic achievement scores.

### 3 Results

In order to understand the distribution of each variable, each variable was analyzed descriptively by the researcher to obtain the mean and standard deviation. Self-efficacy is high among the majority of respondents, with an average self-efficacy scale value of approximately 2.785. The academic performance of the respondents is also relatively high, with an average of about 4.224. The standard deviation of the data is relatively low. It can be known that the answers of most respondents are close to the average value.

**Table 1.** Pearson correlation analysis

|                            |                     | Self-efficacy | Learning dedication | Learning performance | Interpersonal facilitation | Total performance |
|----------------------------|---------------------|---------------|---------------------|----------------------|----------------------------|-------------------|
| Self-efficacy              | Pearson Correlation | 1             |                     |                      |                            |                   |
|                            | Sig. (2-tailed)     |               |                     |                      |                            |                   |
| Learning dedication        | Pearson Correlation | .713**        | 1                   |                      |                            |                   |
|                            | Sig. (2-tailed)     | 0             |                     |                      |                            |                   |
| Learning performance       | Pearson Correlation | .701**        | .893**              | 1                    |                            |                   |
|                            | Sig. (2-tailed)     | 0             | 0                   |                      |                            |                   |
| Interpersonal facilitation | Pearson Correlation | .587**        | .751**              | .848**               | 1                          |                   |
|                            | Sig. (2-tailed)     | 0             | 0                   | 0                    |                            |                   |
| Total performance          | Pearson Correlation | .611**        | .759**              | .756**               | .725**                     | 1                 |
|                            | Sig. (2-tailed)     | 0             | 0                   | 0                    | 0                          |                   |

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

As shown in Table 1, self-efficacy and learning dedication had a significant positive correlation, as demonstrated by the Pearson correlation analysis results. ( $r=0.713$ ,  $p<0.05$ ), a significant positive correlation between self-efficacy and learning performance ( $r=0.701$ ,  $p<0.05$ ), a significant positive correlation between self-efficacy and interpersonal facilitation ( $r=0.587$ ,  $p<0.05$ ), and a significant positive correlation between self-efficacy and total performance ( $r=0.611$ ,  $p<0.05$ ). Further analysis can be conducted to verify the hypothesis of this article.

Based on the four dimensions of academic performance, this article conducted a stepwise regression analysis on these four dimensions. To exclude the influence of variables such as gender and age, these

variables were added as covariates for analysis. Before incorporating the three covariates of gender, grade, and major, self-efficacy had a significant positive impact on four dimensions: learning dedication, learning performance, human-machine promotion, and overall performance ( $B>0$ ,  $\text{sig.}<0.05$ ). After adding three covariates of gender, grade, and major, self-efficacy still had a significant positive impact on the four dimensions ( $B>0$ ,  $\text{sig.}<0.05$ ). The higher the self-efficacy score, self-efficacy has a positive impact on academic achievement, as evidenced by the higher academic achievement score.

Regression analysis was conducted on the four dimensions of self-efficacy and academic achievement, with and without the addition of demographic variables.

The correlation between self-efficacy and academic achievement was not affected by demographic variables. Table 2 displays the final conclusion after the study performed a regression analysis on the overall

relationship between self-efficacy and academic achievement.

**Table 2.** Regressive analysis

| Model                                      |               | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig.  |
|--|---------------|-----------------------------|------------|---------------------------|--------|-------|
|  |               | B                           | Std. Error | Beta                      |        |       |
| 1  | (Constant)    | 1.14                        | 0.223      |                           | 5.11   | 0     |
|  | Self-efficacy | 1.113                       | 0.078      | 0.712                     | 14.215 | 0     |
| 2  | (Constant)    | 0.662                       | 0.307      |                           | 2.158  | 0.032 |
|  | Self-efficacy | 1.136                       | 0.078      | 0.726                     | 14.474 | 0     |
|  | Gender        | 0.279                       | 0.101      | 0.144                     | 2.755  | 0.006 |
|  | Grade         | 0.038                       | 0.074      | 0.025                     | 0.506  | 0.613 |
|  | Speciality    | -0.065                      | 0.046      | -0.072                    | -1.411 | 0.16  |
| a Dependent Variable: academic achievement |               |                             |            |                           |        |       |

According to the coefficient test table of the regression model, academic achievement is significantly impacted by self-efficacy ( $\beta= 1.136$ ,  $p=0<0.05$ ), in summary, academic achievement is significantly impacted by self-efficacy.

## 4 Discussion

### 4.1 Possible reasons

The high correlation between self-efficacy and academic achievement among college students may be mainly based on the following aspects:

Firstly, self-efficacy affects students' learning motivation and motivation. The positive attitude and behavior of students with high self-efficacy are beneficial for improving their academic achievement. Secondly, self-efficacy affects students' emotional and psychological states. Students with high self-efficacy are more capable of staying calm and actively coping with academic pressure and challenges. It can avoid affecting academic performance due to excessive anxiety.

Thirdly, self-efficacy affects students' learning strategies and habits. High self-efficacy students are more prepared and braver enough to experiment with new learning strategies and methods. These strategies and habits help improve learning outcomes and academic achievement.

Fourthly, self-efficacy affects students' career and future planning. Having clear goals and plans for their future is more likely for students with high self-efficacy. They actively seek practical opportunities and improve their abilities. This can prepare for future career development.

### 4.2 Suggestions for improving self-efficacy

The correlation between self-efficacy and academic achievement among college students is high, and this phenomenon can be further explored and expanded from the following aspects:

Firstly, the self-efficacy of college students is significantly impacted by the education and teaching environment of universities. The education and teaching environment of universities is mainly reflected in curriculum design and teaching strategies, feedback mechanisms, teacher roles and behaviors, psychological intervention and counseling, school support and services, and so on. Teachers should provide students with challenging learning tasks and provide valuable feedback. This can help students understand their own learning situation, thereby improving their self-efficacy.

Secondly, personal factors such as personality, attitude, interests, and the connection between self-efficacy and academic achievement can vary depending on the values of college students. For example, the ability of college students to maintain confidence in their learning abilities and improve self-efficacy can be enhanced by a positive learning attitude and strong motivation to learn. Thirdly, in terms of psychological intervention and counseling, universities can enhance the self-efficacy of college students through psychological intervention and counseling. For example, providing services such as psychological counseling, career planning guidance, and group counseling. This can help students recognize their strengths and weaknesses, improve their confidence and learning motivation, and thus improve their academic achievement.

Fourthly, the social support system of college students also has a significant impact on their self-efficacy and academic achievement. College students should actively seek and utilize social support resources. They can establish good interpersonal relationships to alleviate the pressure in learning and life and improve their self-efficacy.

### 4.3 Suggestions for future research

Further empirical research can be conducted on the correlation between the two. For example, through experimental research or case analysis. This research can examine the specific connection between self-efficacy and academic achievement, and the various factors that

affect this connection. This aids in acquiring a more comprehensive comprehension of the mechanism by which self-efficacy impacts academic achievement, and provides more targeted recommendations for education and teaching.

## 5 Conclusion

The focus of this study is on examining the connection between self-efficacy and academic achievement among college students. Previous studies have shown a close relationship between the two. The purpose of this study is to investigate the strong correlation between self-efficacy and academic performance in college students and to conclude that self-efficacy positively influences their academic achievement. Meanwhile, research has shown that factors such as family background, gender, and grade level affect the relationship between the two. However, the specific ways and degrees of influence need to be further explored. This study used various research methods such as questionnaire survey, scale evaluation, and statistical analysis to deeply explore the relationship between self-efficacy and academic achievement of college students. Descriptive statistics, correlation analysis, and regression analysis are some of the statistical methods that can be used to analyze the collected data. The significance of self-efficacy in college student academic achievement and its influences is revealed by this study.

This study addresses the shortcomings of existing research and improves the theoretical framework for self-efficacy and academic performance. This study also provides guidance and reference for educational practice. This study's findings can serve as a source of reference and inspiration for educators, helping them better understand the self-efficacy of students and taking effective measures and methods to improve their academic achievement. Meanwhile, this study can also provide useful insights for further improving teaching methods and educational strategies. The program that this study may apply is very extensive, which can not only help educators, governments, and institutions better support students' self-efficacy development and academic achievement but also provide useful insights for individual and organizational training and development.

The limitations of this study mainly manifest in the limitations of the sample, research methods, influencing factors, and research hypotheses. Therefore, future research should further expand the sample range and improve research methods. Future research should consider more factors that affect self-efficacy and examine the connection between academic achievement and self-efficacy. At the same time, to gain a deeper understanding of their internal mechanisms and influencing factors, it is essential to understand the impact of various factors on studying this issue. In summary, the specific areas that need to be addressed in future work involve multiple aspects, and researchers need to delve into the essence and influencing factors of self-efficacy. Researchers should focus on measuring

and evaluating self-efficacy, mechanisms of action, intervention and cultivation, interaction with other factors, and cross-cultural research.

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