

## Article

# The Influence of Academic Self-Efficacy on University Students' Academic Performance: The Mediating Effect of Academic Engagement

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**Abstract:** Challenges and competition are being faced in higher education. Students' unsatisfactory academic performance and dropouts are obvious problems worldwide. The "student-centered" pedagogy requires universities to pay attention to the needs of students. Research has demonstrated that academic self-efficacy is a positive psychological variable in the prevention of students becoming academically burnt out and withdrawing from their studies. By increasing academic engagement and improving academic performance, academic self-efficacy can reduce the dropout rates. This study attempted to achieve an in-depth comprehension of the nexus between academic self-efficacy and academic achievement among university students and the mediating role of academic engagement in the association between the two. A total of 258 participants were included in the cross-sectional study. The relationships among academic self-efficacy, academic engagement, and academic performance were examined using Pearson correlation coefficients. In order to examine the intermediating role of academic engagement in the relationship between academic self-efficacy and academic performance, a mediation analysis was applied. A favorable and strong correlation among academic self-efficacy, academic engagement, and academic performance was found in this study. Academic self-efficacy can be a direct predictor of academic achievement and can also be an indirect predictor of academic achievement via the intermediating effect of academic engagement. The findings of this study provide theoretical and practical recommendations for university researchers and administrators. The findings confirm the mediating role of academic engagement between academic self-efficacy and academic performance. The results provide universities with evidence for use in the design of projects and programs for the improvement of students' academic performance. Increasing the level of academic self-efficacy and enhancing academic engagement are of utmost importance for university students to maintain and improve their academic performance.

**Keywords:** academic self-efficacy; academic engagement; academic performance



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## 1. Introduction

Academic failure and dropouts are serious problems faced by universities worldwide [1]. Especially during the COVID-19 pandemic [2], university students faced increasing financial difficulties, a lack of social connections and sense of belonging, and insecurity regarding the future and access issues, all of which hampered their academic performance and well-being. Previous studies have explored the various reasons for academic failure and dropouts, including demographic (gender and age), individual (social background and school performance), psychological (motivation and attitudes), and institutional (curriculum, teaching quality, and learning environment) reasons [3,4].

Social cognition theory (Bandura, 1977) [5] is one of the most influential of the various theories that seek to understand and explain the factors that motivate and coordinate human behavior. Social cognition theory posits that human activity is determined by the interplay of two factors: the cognition of the individual and the external environment in which the individual lives. (Bandura, 2012) [6]. Of the individual cognitions, self-efficacy

(SE) is an important component that influences and regulates behaviors. According to Bandura [5], self-efficacy is the judgment of people's ability to successfully complete tasks, which involves goals, behaviors, and environmental conditions. Self-efficacy has been widely studied in many areas, such as leader effectiveness [7], addiction relapse [8], medical care [9], and academic performance [10]. In the field of education, self-efficacy is generally called academic self-efficacy (ASE), which denotes confidence about one's capability of learning or behaving in a certain way [11]. Academic self-efficacy is the embodiment of self-efficacy in the field of education. Academic self-efficacy has been identified as a key factor in determining and predicting the academic performance of students in higher education institutions [12]. Additionally, academic self-efficacy is one of the signs of students' psychological well-being.

Another important factor associated with the academic performance and achievement of higher education students is their academic engagement. In the past two decades, the question of how to guarantee and improve the quality of higher education quality has become a focus of general concern in the field of international higher education. Researchers, practitioners, and managers of higher education institutions have tried different programs, the most representative of which is research into students' engagement that emerged in American universities and has been popular worldwide since 2000. It is generally accepted that academic engagement is a major predictor of academic achievement in higher education [13]. Extensive studies have revealed that academic engagement is important for learning and academic performance. Academic engagement has been studied in different learning environments, such as primary school [14], secondary school [15], and university populations [13]. Additionally, Kahu's study investigated the influence of academic engagement across different disciplines and institutions [13].

Therefore, research on university students' academic achievements must simultaneously examine the learning behavior and the learning psychological characteristics that drive individual learning, represented by motivation and emotion. Academic self-efficacy and academic engagement are impactful factors in the improvement of students' academic achievement in higher education. The existing research has laid a solid foundation for the verification of the nexus between academic self-efficacy and academic achievement and has discussed the complex relationship between them. Some studies showed the mechanism by which ASE influences academic performance, which is through a variety of moderating and mediating factors, such as academic self-concept [12], academic aspirations [16], and personality [17]. However, most prior studies have discussed the direct relationship among academic self-efficacy, academic engagement, and academic achievement [18–20] but has ignored the possible mediating role of academic engagement in university populations. However, it is plausible that academic self-efficacy is related to academic performance if there is a mediating mechanism in place—academic engagement.

Studies have revealed that self-efficacy is an important contributor in the determination of how well students perform when studying, but its intermediary mechanism and regulatory mechanism still need to be further explored. This study intends to determine the influence of academic self-efficacy on the academic performance of university students and the intermediating role of academic engagement in the academic self-efficacy and academic performance relationship. This study contributes to research on the nexus between the academic self-efficacy and academic performance of university students and attempts to identify the mediating role of academic engagement that was ignored by previous research. Moreover, this study highlights the importance of interweaving the concepts of academic self-efficacy, academic engagement, and academic performance. The prior studies rarely investigated the nexus between academic self-efficacy and academic performance, whereas the mediating and moderating effect of academic engagement in a university population was included. In addition, this study provides enlightenment on how the rate of dropouts can be reduced and students' academic performance can be improved by increasing students' academic self-efficacy.

The framework of this study is as follows: Section 2 systematically reviews the existing research on academic self-efficacy, academic engagement, and academic achievement and puts forward the hypotheses and conceptual model of this study on the basis of the existing research. The statistical methods and data measurement methods of this study are depicted in Section 3. In order to test direct and indirect effects between variables, this study uses correlation analysis and intermediate analysis. Section 4 reports the results of this study. The main findings of this study are discussed in Section 5. In Section 6, we present the theoretical and practical contributions of this study. Then, Section 7 shows the limitations of this study and future research that can be based on the study. Finally, the conclusions are presented in Section 8.

## 2. Literature Review and Conceptual Framework

### 2.1. Academic Self-Efficacy and Academic Performance

Previous studies have shown that studying is one of the main sources of stress for students in higher education due to the requirement of examinations and graduation [21,22], especially in Asian countries such as China, Singapore, Taiwan, Japan, Korea, and Hong Kong, where the virtues of academic diligence and filial piety engrained by the Confucian heritage culture are still very much alive [23]. The research on academic self-efficacy reported that academic self-efficacy can enhance an individual's health and performance when coping with stressful situations [24,25]. Academic self-efficacy as an influential factor in improving academic performance has received much attention in educational psychology [26]. University students' academic self-efficacy is crucial for their academic achievement [27]. Previous studies have identified that learners' academic self-efficacy is strongly correlated with academic performance, that is, higher scores on academic self-efficacy are more likely to be associated with higher scores on academic performance [28,29].

Self-efficacy, as defined by Bandura, is a conviction in one's ability to organize and implement the actions necessary to cope with an expected situation [30]. However, the first application of self-efficacy to an educational setting was by Dale Schunk, who began to explore students' motivation and achievement in the early 1980s [31]. Schunk proposed that self-efficacy is a self-assessment of one's capability to accomplish an assignment. It includes assessments about one's capability to fulfill a task and one's self-confidence in one's capability to perform an assignment [32]. In a meta-analysis of 241 published articles, among the 50 educational research variables, including personality traits, self-regulatory learning strategies, and motivations, self-efficacy was found to be the variable that most strongly correlated with university students' grade point average (GPA) [19]. On the basis of these findings, we propose the following hypothesis:

**H1:** *Academic self-efficacy is a positive predictor of academic performance among university students.*

### 2.2. Academic Self-Efficacy and Academic Engagement

A review of the existing literature shows that student engagement is correlated with various concepts, such as school identity, academic motivation, academic self-efficacy, and academic performance [33]. Academic self-efficacy plays an important role in students' academic engagement. If students have confidence in their ability to do a task, they will be more engaged in the task. On the contrary, if they have little confidence in the task, they will not spend time and energy on the task. Students who score higher in self-efficacy measurement are more inclined to show positive social behavior and prefer deep learning to superficial learning [34]. Previous studies proved that self-efficacy and student engagement were highly related [35,36]. Self-efficacy theory posits that the development of skills and self-efficacy can be improved through active engagement in learning [37]. In the case of the COVID-19 pandemic, students were forced to move from a peer-supporting environment to a state of social isolation, potentially decreasing their self-efficacy and reducing their engagement in science, technology, engineering, and mathematics (STEM) undergraduate education in remote learning. One study found a significant decrease in

emotional engagement, and students reported a drastic decline in positive attitude toward science [38].

According to social cognitive theory, the learning environment and students' personal factors both influence students' engagement [30]. One of personal characteristic factors that affects students' engagement is self-efficacy. There is a strong relationship between self-efficacy and students' engagement. Students with a higher level of self-efficacy tend to have a higher level of engagement in the learning process. Self-efficacious learners are defined as learners who are improving their own skills and who are motivated to participate in learning [39]. Higher levels of academic self-efficacy are associated with higher levels of sustained academic engagement and attainment. On the basis of these findings, the following hypothesis is proposed:

**H2:** *Academic self-efficacy is a positive predictor of academic engagement among university students.*

### 2.3. Academic Engagement and Academic Performance

In the past few years, engagement originating from the workplace has become increasingly important within research related to students' academic performance [40,41]. At present, Schaufeli's view on student engagement is generally accepted. Schaufeli et al. defined engagement as a satisfying and work-focused positive state of mind that is characterized by dedication, vigor, and absorption. Dedication means that students have strong involvement in their learning. It is accompanied by feelings of enthusiasm and significance, as well as a sense of pride, inspiration, and challenge. Vigor refers to a high level of vitality and resistance, the tendency to make an effort in one's work, not to tire easily, and to persevere when faced with difficulties. Absorption is a pleasant state of being completely immersed in one's work, characterized by the rapid passage of time and an inability to disengage from work [42].

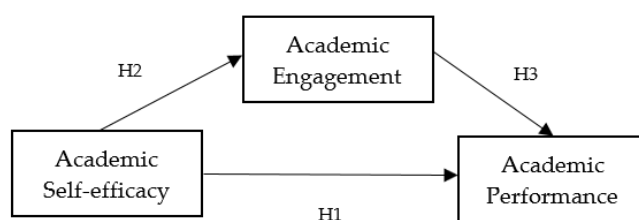
Bae and Han's study at an American research university showed that academic engagement is one of the key variables that explain students' academic performance [43]. Krause and Coates associated student engagement with high-quality learning outcomes [44]. The engagement of students is seen as a glue or a mediator that can create a link between the different contexts of students' learning [45]. The more the students are engaged with their academic work, the greater the level of academic performance. Henning elaborated and demonstrated how student engagement is important to the learning of students and the success of an institution [46]. However, Johnson and Stage's research showed that high-impact practices, particularly student engagement, do not necessarily boost the graduation rates at public universities [47]. In the existing literature, there is no consistent conclusion on the relationship between student engagement and academic performance. Based on this argument, we propose the following hypothesis:

**H3:** *Academic engagement will be a positive mediator of the relationship between academic self-efficacy and academic performance.*

### 2.4. Conceptual Framework

The research framework aims to analyze and clarify the key variables and the relationships between them, rather than claiming to represent all influences and relationships [15]. This framework aims to clarify how academic self-efficacy, as well as academic engagement, is related to academic performance in university students. This research framework can guide further research and, ultimately, be a usable tool for comprehensive intervention programs with the aim of improving students' academic performance. Contemporary studies have emphasized the values that are important when students are faced academic stresses [33,34]. Meanwhile, student engagement has been regarded as one of the predictors of academic performance [33]. Nevertheless, most of the existing research only separately examined the direct relationships among academic self-efficacy, academic engagement, and academic performance. The possible intermediary role of academic engagement has been ignored.

This study is an attempt at an in-depth understanding of the nexus between academic self-efficacy and academic achievement among university students. In the meantime, academic engagement as a potential intermediary variable was tested to explain how academic self-efficacy influences academic performance. (See Figure 1) The intermediating role was substantiated by the presupposition that students with higher levels of academic self-efficacy may trigger more academic engagement when compared with other learners [48], as they believe they can finish an academic task successfully, which, in turn, affects their academic performance [28]. To determine the correlational and mediational model among academic self-efficacy, academic engagement, and academic achievement, correlation analysis and mediation analysis were used.



**Figure 1.** Conceptual Framework.

### 3. Methodology

#### 3.1. Sample

The purpose of this study is to investigate the influence of academic self-efficacy on undergraduate students' academic performance and the mediating role of academic engagement in the Chinese context. The learning behavior and learning psychology characteristics of university students should be discussed under specific socio-cultural concepts. In different social and cultural situations, people have different understandings about learning behavior and learning psychological characteristics, so the research results may be quite different. Therefore, this study focuses on the study of university students' learning psychology characteristics and learning behavior in the context of Chinese culture. Chinese universities are also being confronted with common trends and challenges in higher education worldwide, such as the expansion and diversification of the student population, financial pressure, and the market-oriented requirement for greater accountability, quality, and efficiency [49]. In particular, in 2015, the Chinese State Council released the "Double First-class Initiative" to improve the global competitiveness of higher education. Now, Chinese universities are focusing on improving teaching quality and students' satisfaction. Initiatives need to be taken to improve the academic engagement and performance of university students. In this study, all the participants came from a Chinese public university that is seeking to improve the quality of education and university ranking. All the participants were Chinese and studied full-time in university. Students who were studying abroad and those on part-time programs were excluded from this study. This was due to the fact that this study probed the nexus among academic engagement, academic achievement, and academic achievement in the Chinese context.

A total of 300 questionnaires were distributed in the study, and 258 questionnaires were filled out, accounting for 86% of the total questionnaires distributed. Among them, 47.3% were male, and 52.7% were female. Out of 258 questionnaires, 22.1% were freshmen, 25.6% were sophomores, 24.4% were juniors, and 27.9% were seniors. Regarding the program participants were studying, 43.8% majored in social science, 35.3% majored in natural science, and 20.9% majored in arts. The demographic breakdown of the categorical variables (gender, grades, and majors) is presented in Table 1. All the participants agreed to take part in the study and to comply with the ethical standards of the study by signing a written consent form (according to the Declaration of Helsinki and later amendments).

**Table 1.** The demographic breakdown of categorical variables.

	Variable	<i>n</i>	%
Gender	Male	122	47.3
	Female	136	52.7
Grades	Freshman	57	22.1
	Sophomore	66	25.6
	Junior	63	24.4
	Senior	72	27.9
Majors	Social Science	113	43.8
	Natural Science	91	35.3
	Arts	54	20.9

### 3.2. Measures

Two self-reported scales with adequate reliability and validity were completed by all respondents: the academic self-efficacy scale (ASE) and The Utrecht work engagement scale student (UWES-S). Liang revised and designed the Chinese version of the ASE questionnaire designed by Pinrich and DeGroot in 1990 [50,51]. The ASE questionnaire was divided into two sub-scales: the learning ability self-efficacy scale (11 items, e.g., I think I'm a good student in comparison with others in my class) and the learning behavior self-efficacy scale (11 items, e.g., when I prepare for the examination, I am capable of achieving mastery through a comprehensive study of the subject). All participants were guided to complete the items on a 5-point Likert scale ranging from 1 (totally disagree) to 5 (totally agree). High levels of academic self-efficacy were indicated by high scores on the scale. The internal consistency coefficient of the total scale was 0.92, which is an indication that the scale had good reliability. The internal consistency coefficients for the learning ability self-efficacy sub-scale and learning behavior self-efficacy sub-scale were 0.83 and 0.86, respectively. The average variance extracted (AVE) was 0.68 and 0.63 for the learning ability self-efficacy sub-scale and learning behavior self-efficacy sub-scale, respectively, and the composite reliability (CR) for learning ability self-efficacy and learning behavior self-efficacy was 0.88 and 0.86, respectively. The value of AVE above the suggested threshold value of 0.50 shows it had good convergent validity, and the value of CR above 0.70 shows it had good internal consistency reliability [52]. This confirms that the academic self-efficacy scale has good structure validity in China.

The Utrecht work engagement scale student (UWES-S) is a scale with 17 items designed to evaluate students' academic engagement in relation to academic success [53]. Li revised and formed the Chinese version of the UWES-S [54]. It included three dimensions: vigor (6 items, e.g., studying makes me feel strong and energetic), dedication (5 items, e.g., I'm passionate about what I'm studying) and absorption (6 items, e.g., I find it difficult to disengage from my studies). The higher the score, the more academically engaged the student is. The Cronbach's  $\alpha$  coefficient of the UWES-S scale was 0.93, and for the vigor, dedication, and absorption subscales, it was 0.88, 0.81, and 0.86, respectively. The scale was also based on a 5-point Likert scale, with strongly disagree, disagree, neutral, agree, and strongly agree corresponding to 1, 2, 3, 4, and 5. The convergent validity (AVE) was 0.75, 0.77, and 0.73 for vigor, dedication, and absorption, respectively, and the composite reliability (CR) was 0.89, 0.82, and 0.87 for vigor, dedication, and absorption, respectively. The model fitting was tested using confirmatory factor analysis, and the fitting indexes met the requirements ( $\chi^2/df = 1.43$ , RMSEA = 0.04, NFI = 0.92, RFI = 0.91, IFI = 0.97, TLI = 0.97, CFI = 0.97, GFI = 0.84, and AGFI = 0.82). This is in line with the requirement of good validity of the structure.

Finally, the cumulative grade point average (GPA) over the course of their studies to date was used to measure university students' academic performance. The score was

self-reported by the students. Consistent with the credit system used in China's higher education system, the GPA value ranged from 1 (low) to 5 (high).

### 3.3. Data Analyses

The relationships among academic self-efficacy, academic engagement, and academic achievement were examined using Pearson correlation coefficients. Next, to evaluate the intermediating role of academic engagement in the association between academic self-efficacy and academic performance, a bootstrap medication analysis was performed.

## 4. Results

### 4.1. Descriptive Statistics and Correlation Analyses

In order to analyze the relationships among academic self-efficacy, academic engagement, and academic performance and how academic self-efficacy and academic engagement influence academic achievement, Pearson correlation coefficients were calculated. The scores for academic self-efficacy and academic engagement all exceeded the central value of ASE and UWES-S scales. The level of academic self-efficacy was at the middle level ( $M = 3.25$ ,  $SD = 1.05$ ). Meanwhile, the score for academic engagement ( $M = 3.35$ ,  $SD = 0.91$ ) was slightly higher than academic self-efficacy, but it was still at the middle level. Descriptive analyses and correlation coefficients analyses are shown in Table 2. The results showed that academic self-efficacy and academic engagement were substantially associated with academic performance. The correlation coefficients among academic self-efficacy, academic engagement, and academic performance were 0.85 and 0.76, respectively. In addition, the correlation coefficient between academic engagement and academic achievement was 0.79.

The results revealed that three variables were significantly associated with each other (Table 2). The correlation analysis showed that two dimensions of academic self-efficacy (learning behavior self-efficacy and learning ability self-efficacy) and three dimensions of academic engagement (vigor, dedication, and absorption) had positive relationships with academic performance. Additionally, each dimension of academic self-efficacy was positively related to each dimension of academic engagement ( $p < 0.01$ ). It is reasonable to further determine the intermediary effect of academic engagement between academic self-efficacy and academic performance to reveal the relationship between them.

**Table 2.** Correlation analyses among academic self-efficacy, academic engagement, and academic performance.

Variable	M	SD	1	2	3	4	5	6	7	8
<b>Predictor Variable</b>										
1 Academic Self-efficacy	3.25	1.05	1							
2 Learning Ability Self-efficacy	3.33	1.10	0.883 **	1						
3 Learning Behavior Self-efficacy	3.41	1.00	0.893 **	0.943 **	1					
<b>Mediator Variable</b>										
4 Academic Engagement	3.35	0.91	0.853 **	0.904 **	0.916 **	1				
5 Vigor	3.39	1.03	0.822 **	0.881 **	0.896 **	0.962 **	1			
6 Dedication	3.31	0.88	0.788 **	0.839 **	0.845 **	0.959 **	0.893 **	1		
7 Absorption	3.34	0.93	0.837 **	0.873 **	0.887 **	0.955 **	0.862 **	0.888 **	1	
<b>Target Variable</b>										
8 Academic Performance	3.00	1.01	0.756 **	0.889 **	0.844 **	0.792 **	0.767 **	0.722 **	0.780 **	1

Note. \*\*  $p < 0.01$ .

### 4.2. Mediation Analyses

Our proposal is that academic self-efficacy and academic engagement directly and indirectly influence academic performance. To determine the intermediating effect of academic engagement in the nexus between academic self-efficacy and academic achievement, a PROCESSOR macro developed by Hayes was used [55]. When controlling gender, class

standing, and program, the results of this study verified that academic self-efficacy was a strong indicator of academic performance ( $\beta = 0.69$ ;  $t = 18.02$ ;  $p < 0.001$ ), supporting H1. Additionally, the direct predictive effect of academic self-efficacy on academic achievement remained significant when the intermediate variable (academic engagement) was included in the equation ( $\beta = 0.28$ ;  $t = 4.39$ ;  $p < 0.001$ ). In addition, there was a positive association between academic self-efficacy and academic engagement ( $\beta = 0.73$ ;  $t = 24.84$ ;  $p < 0.001$ ), supporting H2. Moreover, there was also a significant positive predictive effect of academic engagement on academic performance ( $\beta = 0.56$ ;  $t = 7.53$ ;  $p < 0.001$ ).

In order to test the mediating effect of academic engagement, a non-parametric bias-corrected bootstrap was carried out [56]. For each of the data sets, a and b were calculated in each of the bootstrap samples. This process was repeated a total of 5000 times for each dataset, and 5000 bootstrap estimates of a and b were thus obtained. The two bootstrapped estimates of a and b in the 5000 samples, defining the 2.5 and 97.5 percentiles of the distribution, respectively, were used to construct 95% percentile confidence intervals for a and b [57]. After controlling the demographic variables (gender, class standing, and program), the importance of direct, indirect, and overall effects in the intermediary model was determined (Table 3). The bootstrap 95% confidence interval of the direct effect of academic self-efficacy on academic performance was (0.145, 0.453). The direct effect of academic self-efficacy on academic performance was 0.28, which accounted for 40.91% of total effect. Simultaneously, the significance of the indirect effect of academic self-efficacy through academic engagement was confirmed by the results of the non-parametric bootstrapping method (95% bootstrap CI = 0.271, 0.517). The indirect effect of academic self-efficacy had an impact of 0.41 that was generated by academic engagement as an intermediary on academic performance, which accounted for 59.08 of the total effect. The direct, indirect, and total effects were statistically significant, indicating that psychological self-efficacy can directly anticipate academic performance and indirectly predict academic performance via the intermediating effect of academic engagement, supporting H3. The direct and indirect effects of academic self-efficacy on academic performance are presented in Table 4, which indicate that academic engagement significantly and positively intermediated the effect of academic self-efficacy on academic performance. The mediating test confirmed that academic self-efficacy directly predicts academic performance and indirectly predicts academic performance through the mediation of academic engagement.

**Table 3.** Intermediary effect test of academic engagement between academic self-efficacy and academic performance.

Regression Equation		Fit Indices			Significance	
Target Variable	Predictor Variable	R	R <sup>2</sup>	F	$\beta$	t
Academic Performance	Gender	0.794	0.631	108.205 ***	0.212	2.580 *
	Class Standing				0.173	4.831 ***
	Program				0.075	1.497
	Academic Self-efficacy				0.688	18.022 ***
Academic Engagement	Gender	0.856	0.732	172.861 ***	0.128	2.033 *
	Class Standing				0.006	0.217
	Program				0.017	0.442
	Academic Self-efficacy				0.726	24.847 ***
Academic Performance	Gender	0.836	0.699	116.962 ***	0.141	1.872
	Class Standing				0.170	5.233 ***
	Program				0.066	1.444
	Academic Self-efficacy				0.281	4.391 ***
	Academic Engagement				0.560	7.530 ***

Note. \*  $p < 0.05$ , \*\*\*  $p < 0.001$ .



**Table 4.** The test of total effect, direct effect, and indirect effect.

	Effect	BootSE	BootLLCI	BootULCI	Indirect Effect
Total Effect	0.688	0.039	0.610	0.763	
Direct Effect	0.281	0.077	0.145	0.453	40.91%
Indirect Effect	0.406	0.062	0.271	0.517	59.08%

## 5. Discussion

This study attempts to probe the nexus between academic self-efficacy and academic performance and further explore the mediating effect of academic engagement on this association among university students. The correlation analysis showed a significant positive association among academic self-efficacy, academic engagement, and academic performance. The mediation effect analysis showed that academic self-efficacy could have a direct effect on the academic performance of university students and an indirect effect on the academic performance of university students when academic engagement was used as an intermediate variable. The findings supported H1, H2 and H3.

Firstly, academic self-efficacy can be a direct and significant predictor of the academic performance of university students, supporting H1, which is in line with previous studies [24–26]. The students who scored higher in academic self-efficacy were more proactive in taking on academic challenges, persevered for longer, and put forth more effort in academic endeavors [58]. A study from Debre Markos College of Teacher Education, City University of Hong Kong, and City University of New York demonstrated that self-efficacy strongly correlated with academic performance [18,59,60]. Academic self-efficacy directly predicts academic performance by influencing cognition, motivation, and behavior [59]. Academic self-efficacy affects university students' learning goals and the selection of learning assignments. The study confirmed that academic self-efficacy is a predictive factor of university students' academic performance [12]. Students with high levels of academic self-efficacy feel that they are more capable of accomplishing academic tasks and tend to choose assignments which are difficult and challenging, and therefore, they achieve a high level of academic performance.

Secondly, academic self-efficacy has a positive predictive effect on academic engagement, supporting H2. In a meta-analysis, engagement was reported to be strongly correlated with self-efficacy [61]. If students have confidence in their ability to do a task, they will have a higher level of engagement with the task. On the contrary, if students have little confidence in completing a task, they will not spend time or make an effort with it, and consequently, they will not engage in the task. Academic self-efficacy will affect students' learning processes. Students with a high sense of academic self-efficacy will conduct self-monitoring and self-management in the learning process and discover and adopt effective strategies to solve problems in a timely manner, so as to achieve learning objectives. An intervention program with 77 university students from various years and degree programs, with the aim of enhancing students' self-efficacy, reported significant effects on students' engagement [62]. The enhancement of academic self-efficacy may be a prerequisite for the improvement of students' academic engagement.

Finally, it was found that academic engagement is an important mediator between academic self-efficacy and academic performance, supporting H3. The higher the level of academic self-efficacy, the higher the level of students' academic engagement, which, in turn, will have a positive influence on students' academic performance. Academic self-efficacy has a positive and significant influence on academic achievement through the intermediary role of academic engagement. Individuals with a high sense of learning efficiency have more confidence in their learning ability. This positive emotional experience will encourage individuals to spend more time and use more experience to achieve their goals and will focus more on a boring learning process.

The findings of this study showed some parallels to previous research, in which self-efficacy was shown to be a mediating factor between personal characteristics and perceived

autonomy support to predict academic performance [63,64]. As a personality trait, academic self-efficacy can improve academic performance by increasing academic engagement. Students' core beliefs, alongside their ability to achieve personal goals through their own actions, determine all external and internal factors that affect their academic success [65]. Efficacious students have greater willingness to expand extra energy on completing a task or an assignment, thus improving academic engagement and performance. Meanwhile, excellent academic performance will also improve students' sense of self-efficacy. The virtuous circle of academic self-efficacy increases academic engagement, thus improving academic performance, which produces a higher sense of academic self-efficacy. Therefore, it can be concluded that the enhancement of academic self-efficacy among university students is a useful strategy for the improvement of academic performance in order to reduce attrition rates.

## 6. Implications

The findings of this study contribute by providing theoretical and practical enlightenment for university researchers and administrators. Learning is an active self-construction process, and every learner is an active learner. Compared with their counterparts with lower self-efficacy, students with higher self-efficacy reported greater engagement [66]. In addition, academic engagement is a predictor for academic performance [33]. Students who engage more in studies have a greater probability of achieving a higher level of academic performance. Academic engagement is an important factor which affects the learning process and learning results of students, and enhancing students' learning engagement is the common goal of higher education. Specifically, the role of academic engagement as a mediator between academic self-efficacy and academic performance has not been clearly established and is, therefore, in need of investigation [67]. Furthermore, it has been confirmed that academic engagement mediates the nexus between academic self-efficacy and academic achievement. In other words, it is important for university students to feel capable of coping with and engaging in academic challenges.

Practically, the findings of this study offer further support for universities in the design of projects and programs to enhance students' academic achievements and social skills. In the higher education market, the competition has been aggravated between academic institutions as a result of the paradigm shifts from a supplier market (in which supply is less than demand and the suppliers dictate quality) to a customer market (in which supply is more than demand and the customers dictate quality) [68]. Academic institutions should take into account and respond to the needs and expectations of students they serve and provide appropriate programs and courses to meet the needs of students. Students' academic achievements are the combination of their active participation in learning and the influences of various scaffolds created by universities on students. The quality and achieved level of university students' learning are determined mainly by their own behavior and their state of engagement. Other external factors can be used only as scaffolding to assist students' learning. Academic self-efficacy, as a positive psychological state, should attract the attention of universities and teachers. Self-efficacy can be improved when particular teaching strategies are employed. Students in a project-based learning program showed a positive attitude for English learning [69]. A comparative study of Tsinghua University and the top research universities in the United States showed that Tsinghua University is superior to its peers in terms of the campus environment support and extracurricular extended learning opportunities it provides; however, senior students are inferior to their peers in other universities in terms of academic challenges, active cooperative learning, and teacher–student interaction [70]. Universities should cultivate students' sense of supporting and belonging (i.e., academic guidance, career planning, and professional development), which have been shown to be positively associated with academic self-efficacy and academic performance [71]. In particular, studying online became the "new normal" during the COVID-19 pandemic, and unsatisfactory student academic performance was determined to be the main issue [72]. For university students, it

is important to increase their academic self-efficacy and enhance their academic engagement to maintain and improve their academic performance.

## 7. Limitations and Future Directions

Given the limitations of the study, the findings of this study are suggestive, not decisive. First, the research sample of this study was recruited from a university. This does not have a substantive influence on the research result; however, it perhaps impedes the feasibility of extending the research findings to other populations. Hence, we encourage further studies to be carried out to compare the results with other populations and other nations to make the results more representative and comprehensive. Second, a cross-section design was used to obtain the evidence in this study that corroborated the causal nexus among academic self-efficacy, academic engagement, and academic performance. The main limitation of this cross-sectional study design is that it was difficult to present the continuous process of individual psychology, and the inter-group differences may not have been caused by psychological development [73]. Thus, future studies need to implement a longitudinal research design to establish the true cause and effect nexus among academic self-efficacy, academic engagement, and academic performance. In addition, we considered only the direct effect of academic self-efficacy and the indirect effect of academic engagement on academic performance and did not consider other educational elements, such as curriculum, leaning support, teacher guidance, peer effect, and so on. Further research could discuss the variables deeply and comprehensively discuss these variables.

## 8. Conclusions

This study aimed to investigate the nexus between academic self-efficacy and academic performance and the mediating role of academic engagement. Academic self-efficacy and academic engagement are important indicators of university students' academic performance [12,15]. The results show that academic self-efficacy, academic engagement, and academic achievement are positively associated. Additionally, the results confirm that academic self-efficacy improves academic performance by increasing academic engagement. The results highlight that academic self-efficacy is beneficial to improving academic performance, which, in turn, achieves the goal of reducing dropout rates. Students with a high sense of self-efficacy are more confident in learning and can more effectively solve problems and engage more in learning, while students with a low sense of self-efficacy choose to avoid challenges, thereby reducing their academic performance [27]. In addition to attaching importance to the individual psychological characteristics of university students, the improvement of higher education needs to facilitate supportive external environments, such as curriculum, teaching, and cultural atmosphere, which can promote students' self-efficacy and engagement. Universities should provide a supportive learning environment to enable students to face academic challenges with confidence, improving their academic performance, which is conducive to increasing student retention rates. The findings offer further and valuable evidence which can aid university superintendents in the creation of consulting or training programs as components of the university curriculum system which will be oriented to enhance students' achievement. The results also broaden the research on the nexus between academic self-efficacy, academic engagement, and academic performance and provide theoretical and practical guidance for university administrators and students.

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