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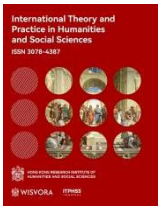

The effect of motivation and commitment to learning on academic achievement among university students majoring in computer application technology

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Abstract

The purpose of this study was to investigate the effects of motivation and study engagement on academic achievement of college students majoring in computer application technology using descriptive statistics, t-test, ANOVA, Pearson's correlation and multiple regression analysis. The results showed that students' motivation and commitment to learning were positively correlated with academic achievement, but the strength of this correlation was significantly affected by course satisfaction and grade level. Therefore, this study recommends the development and implementation of teaching methods and learning strategies that will enhance students' motivation and commitment to learning and ultimately improve academic achievement.

1. Introduction

University life is an indispensable stage in the transition from academic learning to active participation in society. It presents university students with a multitude of challenges that serve as catalysts for their personal and professional growth, ultimately aiming at the attainment of academic and professional success. These challenges encompass not only the rigorous demands of academic curricula but also the dynamic changes within the social environment that students must adeptly navigate. Students find themselves actively engaged in diverse academic activities, ranging from lectures and seminars to laboratory work and group projects, all while assuming the

mantle of responsible members of society. This dual role necessitates a delicate balance between academic pursuits and social responsibilities, fostering an environment where students learn to contribute meaningfully to their communities.

Upon embarking on their college journey, students are confronted with the immediate pressure to gain a comprehensive understanding of various career professions and to actively prepare for their future endeavors. This preparation often begins with exploring different fields of study, attending career fairs, and engaging in informational interviews. Academic achievement emerges as a pivotal factor in this process, significantly influencing students' employability and career prospects (Talib, Zia-ur-Rehman, 2012). High academic performance serves as a testament to students' dedication, problem-solving skills, and adaptability, qualities that are highly valued by potential employers.Academic performance is intricately linked to multiple facets of college life, creating a holistic picture of a student's experiences and growth. It is closely associated with the adjustment to college life, where students learn to cope with newfound freedoms and responsibilities, forge lasting friendships, and develop a sense of belonging within their campus communities. Additionally, it plays a crucial role in career development, guiding students towards choosing majors and courses that align with their passions and career aspirations. Lastly, it is instrumental in employment preparation, as employers often use academic records as a benchmark to evaluate candidates' qualifications and readiness for the workplace (Lim et al., 2022).This correlation is particularly accentuated among students pursuing Computer Application Technology. These individuals are tasked with the formidable challenge of mastering a substantial and ever-evolving body of specialized theoretical and practical knowledge. In addition to their rigorous academic coursework, they must also engage in professional practice, where they apply their theoretical knowledge in real-world scenarios, and prepare for qualification exams that are crucial for advancing in their careers. The pressure is heightened for these students, as their performance in these endeavors can have a direct and lasting impact on their future employment prospects, potentially shaping their career trajectories and determining their long-term success in the technology industry.

Therefore, university students' enrollment in higher education signifies not merely an adaptation to university life but also a pursuit of academic excellence, where motivation plays an indispensable role in this complex and rewarding journey (Filgona et al., 2020). Motivation serves as the cornerstone that fuels students' active engagement in the learning process, nurturing their enjoyment of learning, sustaining their learning behaviors, and propelling their learning progress. It is a dynamic force that drives students to push beyond their comfort zones, embrace challenges, and strive for personal and academic growth.

In a learning environment characterized by diversity, where students with varying learning abilities coexist, motivation emerges as a practical and equitable approach to ensure that all students comprehend and actively participate in the learning process on an equitable footing. By fostering a culture of motivation, educators can create an inclusive learning atmosphere where each student feels empowered to contribute, ask questions, and collaborate with peers, regardless of their initial academic proficiency. Learners' intrinsic motivation—driven by a personal interest in the subject matter or a desire for self-improvement—can significantly enhance the quality of learning goals and outcomes. Intrinsically motivated students are more likely to set ambitious yet achievable goals, persist through difficulties, and exhibit a deeper understanding of the material they are studying (Chen et al., 2021). This deep engagement and commitment to learning translate into more meaningful and lasting academic achievements.

The strength of college students' achievement motivation directly correlates with their commitment to learning. Students with a high achievement motivation are more likely to dedicate

themselves to their studies, invest time and effort in understanding complex concepts, and actively seek out opportunities for further learning and development. This suggests that motivation fulfills a vital psychological function—optimizing and maintaining the learning state, ensuring that students remain focused, engaged, and resilient in the face of academic challenges (Zuo et al., 2023).Enhancing learning motivation and learning engagement in the learning process is of paramount importance for achieving academic success. Educators should prioritize strategies that nurture students' intrinsic motivation, such as providing personalized learning experiences, fostering a growth mindset, and recognizing and rewarding students' efforts and achievements. By creating a supportive and motivating learning environment, universities can empower students to maximize their academic potential and successfully transition into their chosen careers.

Learning engagement is an optimal psychological state achieved by students when they are fully engaged in classroom and learning activities, which promotes optimal performance in classroom concentration and academic achievement (Conrad, Openo, 2018). Immersive learning as a practical behaviour is an effective means of enhancing academic performance and is considered as an objective assessment criterion (Dengel, Mägdefrau, 2018). Through immersive learning, students' academic performance improves, and high academic performance motivates learning-orientated students to participate more actively in classroom activities (Oprean, Balakrishnan, 2020).

It can be seen that academic achievement is a direct result of the learning process, which embodies the concrete implementation of the concepts and goals of university education in the teaching and learning process (Lei et al., 2018). It is not only the embodiment and result of learners' successful learning process, but also the standard for evaluating students' task completion, and the basis for students' confidence in the future. In university life, academic achievement means successful fulfilment of academic requirements, which is an important factor that enhances self-esteem of college students and influences professional satisfaction after graduation (York, et al., 2019).

Computer programmers are an important career path for graduates of computer application technology majors, who have to face diverse computer programming projects and demands, and their personal self-esteem level has a significant impact on job satisfaction and career development (Zhang Shuai, 2012). Therefore, in order to cultivate outstanding programmers with solid programming skills, it is crucial to explore a teaching strategy that can effectively enhance the motivation, immersion, and academic performance of students majoring in computer application technology. Although there have been studies focusing on the academic performance of computer science majors and the broader topic of academic performance of college students (Hussain et al., 2018), there is a lack of in-depth exploration of how motivation and immersion in learning specifically affect academic performance for computer applied technology students. Given this background, this study focuses on exploring the interrelationships between motivation, learning immersion, and academic achievement for college students majoring in computer application technology, aiming to provide basic data support for constructing efficient teaching and learning strategies.

2. Research methodology

2.1 Research target

This study was implemented during the period from 27 December 2024 to 5 January the following year for the student population of Computer Application Technology in Quanzhou Marine Vocational College. Through random sampling, 446 students were selected to participate in the survey. At the beginning of the survey initiation, the purpose, importance and specific

methodology of the study were verbally clarified to the participants, and a self-administered questionnaire was distributed only to those students who agreed to join the study. After a rigorous screening process, in which 18 questionnaires with dishonest responses were excluded, 428 valid subjects were identified for data analysis.

2.2 Research methodology

The questionnaire covered a number of dimensions, specifically including four questions on general characteristics, 29 questions designed to assess motivation, 22 questions focusing on engagement in learning, and nine questions measuring academic achievement. All of these questions were in the form of a 5-point Likert scale so that respondents could make choices based on their own realities and feelings.

2.2.1 Motivation to learn

Learning motivation was measured using the Learning Motivation Assessment Instrument (LMAI) just revised and refined by Cole (2004), which contains four core sub-factors: attention, relevance, self-confidence, and satisfaction. For the reverse questions in the questionnaire, the scores were reverse coded and factored into the mean score to ensure the accuracy of the assessment. Thus, a higher score means a higher level of motivation of the respondents. The reliability of this measurement instrument was assessed through Cronbach's alpha coefficient and the result was .921 showing a high level of internal consistency.

2.2.2 Learning inputs

Learning engagement was assessed using a modified version of the Learning Engagement Scale by Mazer (2012), which consists of five key subfactors: academic and cognitive integration, academic task focus, clear academic goal setting, match between task and ability, and time perception. The higher the respondent's score, the better he or she performs in terms of academic engagement. The reliability of the scale was validated by Cronbach's alpha coefficient at .880, showing good internal consistency.

2.2.3 Academic Achievement

Academic achievement was analysed by using the final examination results of the second semester of the year 2024 for the courses Java Programming, JavaScript Programming, and Website Development and finding the total score of the results, which were converted to standard scores.

2.3 Data analysis

The data collected in this study were statistically analysed using SPSS software. For the general characteristics of the subjects, we used the calculation of frequencies and percentages to describe their distribution. As for the subjects' motivation, commitment to learning and academic achievement, we quantified their levels by calculating the mean and standard deviation. Based on the general characteristics of the subjects, we further conducted in-depth analyses of motivation, commitment to learning and academic achievement using t-test and ANOVA. In order to investigate the degree of association between subjects' motivation, commitment to learning and academic achievement, Pearson's correlation coefficient was used in this study for analysis. In addition, multiple regression analyses were conducted in this study to investigate the key factors affecting the academic achievement of Computer Application Technology students. A 95% confidence level was used in all statistical analyses and therefore, the level of significance was set at 0.05.

3. Findings

3.1 The effect of general characteristics on motivation, commitment to learning and academic achievement

In terms of grade distribution, there were a total of 114 first-year students, accounting for 26.6 per cent of the total; 140 second-year students, accounting for 32.7 per cent; and the largest number of third-year students, 174, accounting for 40.7 per cent. In terms of the type of high school they graduated from, 336 students, or 78.5 per cent, came from general high schools, while 84 students, or 21.5 per cent, came from vocational high schools. In terms of motivation for choosing a major, 338 said it was to improve their competitiveness in employment, accounting for 79.0 per cent; 16 said it was to better adapt to the development of the society, accounting for 3.7 per cent; 62 chose the major after being recommended by others, accounting for 14.5 per cent; and 12 others chose it for other reasons, accounting for 2.8 per cent. Regarding professional satisfaction, 22 students, or 5.1%, said they were very satisfied; 186 students, or 43.5%, were satisfied; the largest number of students, or 47.7%, thought it was average; and 16 students, or 3.7%, were dissatisfied. In terms of motivation, there were significant differences between general characteristics and their motivation to enroll (F=9.516, *p*=0.000), professional satisfaction (F=34.453, *p*=0.000), and grades (F=3.172, *p*=0.025). In addition, a significant difference was shown between motivation to enroll and professional satisfaction (F=5.268, *p*=0.002). Within the context of academic achievement, a significant difference was found between professional satisfaction (F=9.914, *p*=0.000) and grades (F=3.982, *p*=0.000). Table 1 demonstrates the statistical results of the effect of general characteristics on motivation, commitment to learning and academic achievement.

Table 1: Effects of General Characteristics on Motivation, Engagement and Achievement in Learning

variant		n (%)	motivation			Learning inputs			Academic Achievements		
			Mean ±S.D	t/F	*P*	Mean ±S.D	t/F	*P*	Mean ±S.D	t/F	*P*
grade	1	114 (26.6%)	3.57 ±0.48	.226	.798	3.17 ±0.46	.438	.646	3.09 ±0.52	2.098	.125
	2	140 (32.7%)	3.56 ±0.40			3.17 ±0.43			3.22 ±0.50		
	3	174 (40.7 %)	3.61 ±0.44			3.23 ±0.48			3.26 ±0.46		
Types of graduation high schools	general high school	336 (78.5 %)	3.57 ±0.43	.810	.489	3.19 ±0.47	1.402	.243	3.20 ±0.52	.315	.815
	vocational high school	92 (21.5 %)	3.62 ±0.45			3.20 ±0.36			3.24 ±0.36		
Motivation for the choice of profession	competitiveness in employment	338 (79.0 %)	3.62 ±0.41	9.516	.000***	3.24 ±0.44	5.268	.002**	3.23 ±0.48	2.457	.064
	social adaptation	16 (3.7 %)	4.02 ±0.54			3.41 ±0.64			3.36 ±0.49		
	Recommended by others	62 (14.5 %)	3.28 ±0.38			2.97 ±0.38			3.06 ±0.50		
	the rest	12 (2.8%)	3.31 ±0.50			2.80 ±0.56			2.83 ±0.63		
Professional satisfaction	extremely satisfied	22 (5.1 %)	4.26 ±0.31	34.453	.000***	3.86 ±0.55	21.882	.000***	3.50 ±0.64	9.914	.000***
	satisfied	186 (43.5 %)	3.76 ±0.39			3.34 ±0.42			3.36 ±0.48		

commonly	204 (47.7 %)	3.38 ±0.34	3.02 ±0.35	3.06 ±0.42
unsatisfactory	16 (3.7 %)	3.12 ±0.35	2.86 ±0.48	2.81 ±0.56

Note:*p<.05, **p<.01, ***p<.001
Source:Self-collected data

3.2 The situation of learning motivation, learning immersion, and academic performance

The mean score of the subjects' motivation was 3.58 with a standard deviation of 0.44 (on a 5-point scale); the mean score of learning immersion was 3.20 with a standard deviation of 0.46; while the mean score of academic achievement was 3.20 with a standard deviation of 0.49. Table 2 demonstrates the statistical results of the situation of motivation, learning immersion and academic achievement.

Table 2: Motivation, learning immersion and academic achievement

variant	Min	Max	Mean±S.D
motivation	2.28	4.72	3.58±0.44
Learning inputs	1.68	5.00	3.20±0.46
Academic Achievements	1.44	5.00	3.20±0.49

Source:Self-collected data

3.3 Relationship between motivation, learning immersion and academic achievement

In terms of the correlation between motivation, commitment to learning and academic achievement, motivation was positively correlated with commitment to learning (r=.694, p=.000) and positively correlated with academic achievement (r=.590, p=.000). Commitment to learning was positively correlated with academic achievement degree (r=.695, p=.000). Table 3 demonstrates the statistical results of the relationship between motivation, learning immersion and academic achievement.

Table 3: Relationship between Motivation, Learning Immersion and Academic Achievement

variant	1	2	3
1	1		
2	.694***	1	
3	.590***	.695***	1

Note:*p<.05, **p<.01, ***p<.001
Source:Self-collected data

4. Factors affecting academic achievement

In order to investigate the key factors affecting the degree of academic achievement of Computer Application Technology students, this study used multiple linear regression analysis. In this analysis, motivation and commitment to learning were set as independent variables while academic achievement degree was identified as a dependent variable (dependent variable). The results of the analysis showed that the Durbin-Watson value was 1.887, a value close to 2, indicating that the residuals satisfy the independence requirement. Meanwhile, the value of Variance Inflation Factor (VIF) is 1.927, which is lower than the commonly considered critical value of 10 for the problem of multicollinearity, and therefore it can be judged that there is no problem of multicollinearity between independent variables. Further analysis revealed that motivation and commitment to learning are significant variables affecting the degree of academic achievement of Computer Application Technology students, which together have 50.1% explanatory power for the degree of academic achievement. This result suggests that motivation and commitment to learning play an important role in the academic achievement of Computer Application Technology students. Table 4 demonstrates the results of the analysis of the factors affecting academic achievement.

Table 4: Factors affecting academic achievement

Variables	B	SE	β	t(p)	*TOL*	*VIF*
Constant	.460	.202		2.280*		
Learningflow	.597	.073	.551	.000	.519	1.927
Motivationforlearning	.233	.075	.208	.002	.519	1.927
F(p)			107.763 ***			
adj. R^2			.501			
Durbin-Watson			1.887			

*Note:*p<.05, **p<.01, ***p<.001*
Source:Self-collected data

5. Reflections

This study is dedicated to exploring the interrelationship between motivation, learning engagement and academic achievement of computer application technology students, aiming to discover effective teaching strategies and learning paths for training programmers who meet the competencies of professional needs. The results of the study showed that the average score of participants' learning motivation was high, but there was still room for improvement. According to the different characteristics of the participants, learning motivation showed significant differences in enrolment motivation, professional satisfaction and academic achievement. Specifically, students' learning motivation scores were highest when their enrolment motivation matched their personal abilities and interests. This reflects that students who are able to choose a major based on their own strengths tend to show greater adaptability in the university environment, and that they are enthusiastic about their major studies and have higher expectations for achieving their learning goals. Therefore, it is particularly important to take measures to enhance the learning motivation of those students whose motivation for enrolling in the university is not clear enough or not well matched. In terms of professional satisfaction, when students expressed great satisfaction with their majors, their motivation scores and academic performance

were higher. This suggests that students with high satisfaction with their majors are more inclined to actively participate in their majors and university life, and that they make unremitting efforts to achieve their learning goals and take a keen interest in their academic progress. In addition, high motivation tends to be accompanied by increased concentration and efficiency, which contributes to higher academic achievement. Therefore, students with below-average levels of professional satisfaction also need to be motivated. Motivation not only influences the choice of learning strategies and the direction of learning, but also reinforces learning activities and increases engagement. In view of this, it is necessary to explore and implement new teaching methods and learning strategy improvement plans to improve the satisfaction and academic performance of computer application technology students, so as to continuously stimulate their learning motivation and lay a solid foundation for the training of programmers with the required competencies in the profession.

The mean score of subjects' learning engagement was 3.20, which was lower than the mean score of learning motivation. According to the different characteristics of the subjects, learning engagement showed significant differences in terms of enrolment motivation and professional satisfaction, which is similar to the findings of Qureshi (2023), which also pointed out the significant influence of professional satisfaction on learning engagement. Students' learning engagement scores were highest when their motivation for enrolment matched their personal interests and abilities. This suggests that students who are suited to the Computer Application Technology programme are more likely to be focused on their studies and have high expectations of achieving their learning goals. Since the level of learning engagement is influenced by the trusting relationship with the instructor, in order to enhance students' learning immersion, it is necessary to implement programmes to increase the opportunities for students to interact with their instructors and to strengthen the trusting relationship between them. Developing the competencies required of programmers is especially important for students who score low on learning engagement. At the same time, students who were very satisfied with their major had the highest learning engagement scores. This suggests that the higher the students' satisfaction with their major, the stronger their willingness and motivation to learn, and thus the more likely they are to be immersed in their studies. Teachers' interest and encouragement in the classroom can significantly contribute to students' engagement in learning, and a positive and interactive classroom atmosphere can help students become better immersed in their studies. Therefore, universities should aim to create a classroom environment that allows students to become immersed in learning. Teachers need to develop visual and active teaching methods to stimulate students' interest and motivation. Also, universities should actively engage in regular counselling and guidance to understand the characteristics and needs of students. In addition, for students with low levels of professional satisfaction, universities need to explore effective ways to improve their satisfaction and develop programmes to provide them with opportunities to improve their professional satisfaction.

The mean score of academic achievement among the subjects in this study was 3.20, revealing a nuanced landscape where academic performance varied significantly based on students' levels of professional satisfaction. This observation mirrors the findings reported by Deng Mingchuan in 2014, which emphasized the existence of a significant disparity in academic achievement when analyzed through the lens of professional satisfaction. When delving deeper into the data concerning professional satisfaction, it was discovered that the peak academic achievement score of 3.36 points was attained by students who expressed a high degree of satisfaction with their chosen majors. This result aligns seamlessly with previous research endeavors, which consistently pointed out that students who harbor a profound sense of

satisfaction towards their majors tend to exhibit superior academic performance. This correlation suggests that students who are more content with their academic pursuits are inclined to invest greater effort and dedication towards achieving their learning objectives, ultimately yielding higher academic achievement.

Educators must acknowledge the pivotal role that professional satisfaction plays in enhancing students' academic outcomes. To foster an environment conducive to improved academic achievement, teachers can adopt a proactive approach by offering courses and instructional methodologies that are tailored to the unique demands and characteristics of the Computer Application Technology profession. By aligning educational content with the practical needs of the field, teachers can better engage students, thereby enhancing their motivation and commitment to learning.The study uncovered a robust positive correlation between learning motivation, learning engagement, and academic achievement. Specifically, the correlation coefficient between learning motivation and learning engagement stood at an impressive 0.694 (p=0.000), indicating a strong and statistically significant positive relationship. Similarly, a positive association was observed between motivation to learn and academic achievement, with a correlation coefficient of 0.590 (p=0.000). Likewise, a significant positive correlation was found between commitment to learning and academic achievement, boasting a correlation coefficient of 0.695 (p=0.000). These findings resonate with the research conducted by Wang Yixue in 2023 and Liu Chaohui in 2021, which likewise demonstrated a positive correlation between motivation to learn and commitment to learning (r=0.258, p<0.002), as well as between motivation to learn and academic achievement (r=0.567, p<0.000). Additionally, a positive correlation was also established between commitment to learn and academic achievement (r=0.567, p<0.000).The higher students' motivation and commitment to learning, the more likely they are to achieve exceptional academic outcomes. This underscores the importance of fostering a supportive and engaging learning environment that nurtures students' intrinsic motivation and commitment to their academic pursuits. By doing so, educators can play a pivotal role in enhancing students' academic achievement and preparing them for successful careers in the Computer Application Technology profession.

This study offers valuable insights into the intricate relationships among various factors influencing the academic success of computer application technology students. Specifically, it uncovers positive associations between students' motivation to learn, their motivational adaptation to school, professional satisfaction, and their academic achievement. In essence, the study indicates that as students exhibit higher levels of performance in these areas—namely, greater motivation to learn, better adaptation to school environments, and higher professional satisfaction—their academic achievement also tends to increase accordingly. Among these factors, motivation and commitment to learning stand out as having a particularly significant positive effect on academic achievement. The study clarifies the interrelationships between these variables, highlighting how they work in tandem to influence students' performance. By understanding these dynamics, educators can tailor their approaches to foster an environment that nurtures and enhances students' motivations and commitments. Building on these findings, we anticipate that through the optimization of instructional design and learning strategies, we can significantly boost the motivation, engagement, and ultimately, the academic performance of computer application technology students. By actively motivating students and enhancing their engagement in learning, we expect to see a corresponding improvement in their academic outcomes. To achieve this, it is imperative that teaching methods and learning strategies are continuously explored, refined, and adapted to meet the evolving needs of students. Moreover, the curriculum itself should be a subject of ongoing optimization. It must be designed to not only impart knowledge but also to

inspire and challenge students, encouraging them to explore and innovate within the field of computer application technology. However, it is important to acknowledge the limitations of this study. Notably, the sample was confined to computer application technology students at a single university, which may limit the generalizability of the findings to a broader population. In light of this, future research should endeavor to expand the sample size and scope, incorporating students from diverse educational backgrounds and institutions to gain a more comprehensive understanding of the factors affecting academic performance in this field. Furthermore, based on the results of this study, there is a pressing need for the further development of educational programmes aimed at improving students' academic performance. These programmes should be grounded in a deep understanding of what motivates and engages students, and they should be rigorously validated to ensure their effectiveness. As we continue to uncover the nuances of student motivation and academic success, these educational interventions will play a crucial role in shaping the future of computer application technology education.

6. Conclusion

This study focussed on exploring how motivation and academic immersion affect the academic achievement of Computer Application Technology students and worked to explore effective teaching methods. The study aims to provide basic data to support the related field and draws the following key conclusions:

1. The students who participated in the study scored an average of 3.58 in motivation, 3.20 in commitment to learning and the same score of 3.20 in academic achievement.

2. According to the different analyses of students' characteristics, it was found that motivation to learn was significantly influenced by motivation to enter school ($F=9.516$, $p=0.000$), professional satisfaction ($F=34.453$, $p=0.000$) and grades ($F=3.172$, $p=0.025$). Learning engagement, on the other hand, was significantly different from motivation to enrol ($F=5.268$, $p=0.002$) and professional satisfaction ($F=21.882$, $p=0.000$).

3. The study further confirmed that motivation ($r=0.590$, $p=0.000$) and commitment to learning ($r=0.695$, $p=0.000$) are positively correlated with academic achievement.

4. Motivation and commitment to learning are the main factors affecting the academic achievement of computer application technology students.

Based on the comprehensive findings outlined above, it becomes unequivocally clear that there exists a direct and positive correlation between students' professional satisfaction and achievement levels, and their subsequent academic achievement degree. When students experience a high degree of satisfaction and achievement in their chosen field of study, they are more likely to demonstrate enhanced academic performance. This satisfaction and achievement can stem from various factors, such as mastery of course content, recognition from peers and instructors, and the application of learned knowledge in practical settings. The role of motivation and commitment to learning in bolstering academic achievement cannot be overstated. An increase in these critical factors has been shown to significantly elevate students' academic performance. Motivated students are more inclined to actively engage in the learning process, seek out additional learning resources, and persist through challenges, all of which contribute to higher academic achievement. Similarly, a strong commitment to learning fosters a resilient and dedicated approach to studying, enabling students to overcome obstacles and maintain a consistent level of academic excellence.

Given these insights, it is imperative that educational institutions and educators actively develop and implement teaching methods and learning strategies that are specifically designed to

enhance motivation and commitment to learning among students. These strategies should be tailored to meet the diverse needs and learning styles of students, ensuring that they are both engaging and effective. For instance, incorporating hands-on projects, collaborative learning activities, and real-world applications of course material can significantly increase students' motivation and commitment by making learning relevant and exciting.

Educators should foster an environment that encourages curiosity, experimentation, and a growth mindset among students. This can be achieved through positive reinforcement, constructive feedback, and the provision of opportunities for students to showcase their learning and achievements. By nurturing a supportive and motivating learning environment, educators can empower students to take ownership of their learning journey, develop a deeper appreciation for the value of education, and ultimately achieve an overall increase in academic achievement.The enhancement of students' academic performance is intricately linked to their levels of professional satisfaction and achievement, as well as their motivation and commitment to learning. By actively developing and applying innovative teaching methods and learning strategies, educators can effectively nurture these critical factors, leading to improved academic outcomes and a more fulfilling educational experience for all students.

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