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# Landscaping Students' Academic Performance in Vocational Education - A Case Study of a Public Physical Education College in Yunnan, China

**Huang Shiquan***

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## Abstract

**Purpose:** This study explored the effects of four independent variables (student satisfaction, social media use, learning motivation, human factors, skills, and knowledge) on one dependent variable (student academic performance). Furthermore, it also aims to identify significant differences between the variables. **Research design, data, and methodology:** The project objective consistency index (IOC) was used as validity, and the pilot trial (n=30) was used as reliability. Multiple linear regression analysis was performed on 90 valid responses from higher vocational college students to verify the significant relationship between the variables. Subsequently, 30 students underwent a 16-week intervention design implementation (SP). Then, paired-sample t-tests were performed to compare the post-sp and pre-sp quantification results. **Results: The** multiple linear regression study revealed that Students' Satisfaction, Learning Motivation, and Human Factors (skills, knowledge) significantly influenced the academic performance of PE students, while Social Media Use did not. The paired sample t-test results further demonstrated significant improvements in PE student academic performance following the 16-week intervention. These findings have practical implications for enhancing the academic performance of PE students in sports vocational colleges in Yunnan, China. **Conclusions:** By identifying the significant factors that influence academic performance, this research aims to provide valuable insights and strategies for improving the educational outcomes of students.

**Keywords:** Academic Performance, Satisfaction, Social Media Use, Learning Motivation, Knowledge

**JEL Classification Code:** I23, J28, L2

## 1. Introduction

Students, especially male students, tend to focus on the acquisition of motor skills and ignore the accumulation of theoretical knowledge. To solve the problem of poor academic performance in physical education colleges, we must focus on improving students' academic performance and theoretical knowledge literacy so as to achieve the goal of balanced skill and knowledge development.

In contemporary society, the significance of education is increasingly evident, and academic achievement, which serves as a crucial barometer for gauging students' learning progress, has garnered significant interest. This is particularly true in sports-focused institutions, where students' academic performance not only impacts their career prospects but also has far-reaching implications for the advancement of the sports industry. Consequently, examining the academic attainment of students enrolled in physical education vocational programs holds profound practical importance. In recent years, alongside the growing societal focus on sports, significant advancements have been made in developing sports-oriented colleges. Nevertheless, several challenges have emerged. Firstly, students in higher vocational colleges specializing in physical education often face issues such as a weak cultural background and a lack of sufficient motivation to learn, leading to difficulties in their academic pursuits. Secondly, deficiencies in the college's curriculum and teaching methodologies also impede students' learning outcomes.

A comprehensive examination of the academic achievement of students enrolled in physical education vocational colleges is essential to address these challenges. We can pinpoint the critical elements that impact students' learning outcomes by scrutinizing the various factors that

1*Huang Shiquan, Yuxi Sports School, Yunnan Province, China. Email 791524017@qq.com

influence academic performance. This, in turn, can inform the college's efforts to refine its teaching approaches and enhance overall educational quality. Simultaneously, exploring and refining the academic performance evaluation system will enable more scientific and objective assessments of students' learning accomplishments. In conclusion, delving into students' academic performance in physical education colleges carries significant theoretical weight and practical relevance, offering valuable insights for educational reform in sports-focused institutions and ultimately driving the progress of the sports sector.

## 2. Literature Review

### 2.1 Students' Academic Performance

Academic performance research is frequently employed in economics, sociology, and education (Li et al., 2021). Enhancing academic performance can be achieved through various methods. Irrespective of the chosen approach, establishing a link to learning is crucial to ensuring that any investment in academic activities effectively contributes to attaining the intended goals (Pritchard, 2010). Evaluating students' learning performance in educational settings is crucial to ascertain the effectiveness of online or blended learning initiatives. Through thorough assessments, educators can identify the challenges and obstacles students encounter in their learning amid the pandemic, aiming to enhance strategies for improving the academic performance of physical education students (Zainuddin et al., 2023).

### 2.2 Students' Satisfaction

The learner's perceived level of satisfaction with the entire learning environment is defined as their level of academic achievement. Academic accomplishment is a key indicator of success (Nikou & Maslov, 2023). Student satisfaction is the degree of contentment students feel about their performance as university students and the extent to which their expectations and academic goals are fulfilled. Some claim that student satisfaction can be used to gauge a person's academic achievement and that the degree to which students embrace a product or service relates to their quality assessment (Mallika Appuhamilage & Torii, 2019).
**H1:** Students' satisfaction has a significant impact on students' academic performance.

### 2.3 Social Media Use

Social media is an environment powered by technology where a broad range of behaviors, interactions, and exchanges may occur amongst a complex and diverse network of interconnected people (Griffith et al., 2022). Social media facilitates the creation and dissemination of scholarly information. It enables people and communities with preexisting social ties or common interests to explore topics and candidly discuss ideas, perspectives, and experiences through text, photos, and videos (Vitellaro et al., 2022). As the main information source, social media offers the most learner engagement (Stojanovic et al., 2018).
**H2:** Social media use has a significant impact on students' academic performance.

### 2.4 Learning Motivation

Learning motivation is defined in education as the inclination to participate and engage with the knowledge offered in the learning curriculum. Changes in learning capacity and motivation impact students' academic accomplishment as well (Nguyen & Nguyen, 2010). In order to achieve their learning objectives, students must be able to actively engage in their education and maintain their enthusiasm to finish the assignments given by their teachers; this is known as learning motivation (Tan, 2020).
**H3:** Learning motivation has a significant impact on students' academic performance.

### 2.5 Human Factors

In this study, "skills" and "knowledge" relate to the information that students have learned via mastering classroom material, their collaborative efforts, and their intellectual work (Tawfik & Elmaasrawy, 2023). The authors contend that the term "human factors" refers to the unique characteristics of individuals that influence how well they learn inside their workplace. Several motivations, experiences, and the capacity to manage interpersonal interactions are among these components (Saunila et al., 2019). This paper's human aspects are students and teachers working together to learn and specialized classroom services like knowledge and skill development (Saunila et al., 2019).
**H4:** Human factors (skills and knowledge) have a significant impact on students' academic performance.

## 3. Research Methods and Materials

### 3.1 Research Framework

The researcher applied three model theories from Alamri et al. (2020), Gumasing and Castro (2023), and Tawfik and Elmaasrawy (2023). All three theoretical frameworks mentioned above supported and developed a conceptual framework in Figure 1.

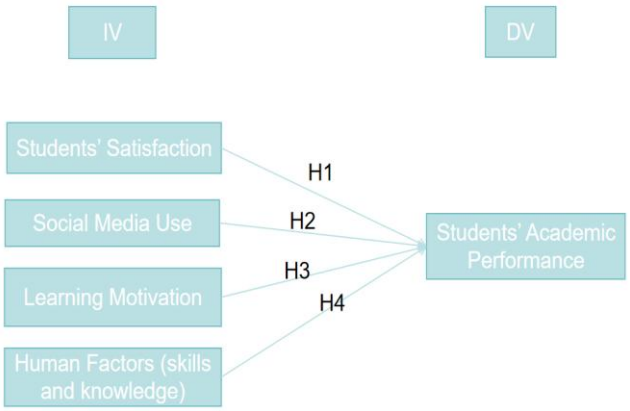


**Figure 1:** Conceptual Framework

**H1:** Students' satisfaction has a significant impact on students' academic performance.
**H2:** Social media use has a significant impact on students' academic performance.
**H3:** Learning motivation has a significant impact on students' academic performance.
**H4:** Human factors (skills and knowledge) have a significant impact on students' academic performance.

## 3.2 Research Methodology

This section will delineate comprehensive action research methods for each phase. The primary objective during the pre-strategic planning phase is to assess the current status of students and potential trends of change. A combination of quantitative and qualitative research methods was applied throughout the study. Initially, qualitative research methods involved data collection through interviews, with student feedback serving as qualitative data in the pre-strategic planning phase. During the initial stages of the strategic plan, three education experts were purposefully chosen for interviews, and 30 students were selected for the front side. Questionnaires on student satisfaction, learning motivation, social media use, and perception factors (skills and knowledge) were collected from the front side. Subsequently, based on qualitative analysis, the Questionnaire Star platform was utilized to gather quantitative research data. After validity and reliability tests are completed, a questionnaire will be disseminated to 90 students to assess the correlation between independent and dependent variables. The outcomes of multiple linear regression will be employed to formulate the conceptual framework and research hypothesis for Chapter 4. Upon confirmation of the credibility of the study's conceptual framework, a strategic plan will be devised for the independent variables, and the final research hypothesis will be validated. The subsequent section outlines the steps of the strategic plan, involving selecting 30 students from the School of Physical Education.

## 3.3 Research Population, Sample Size, and Sampling Procedures

### 3.3.1 Research Population

All students from PE higher vocational colleges were the subjects of this study. Sophomore students were the specific subjects of this study: a total of 783 students were selected. To ensure learning rigor, students in grades 1,2 and 3 were excluded from the study, and all participants in the study were students in five classes of higher vocational PE colleges, with a total of about 300 students. A total of 100 sports students received the paper questionnaire. Afterward, the researchers examined all the responses and confirmed that 90 responses were valid.

### 3.3.2 Sample size

Hair et al. (2010) believes that a sample size of 50 to 500 is generally sufficient for most research work. In the diagnostic stage, three experts were initially randomly selected as participants. In the pre-strategic planning stage, a group of 30 students was selected to participate in implementing the strategic plan. Subsequently, in the post-strategic planning stage, these 30 students implemented the strategic plan in the later stages. The interview will use the same research method as in the pre-strategic planning stage. The final sample size of this study was determined to be 90 students.

### 3.3.3 Sampling Procedures

The investigators performed multiple sampling, and the relevant sampling procedures were as follows:

Sample 1: Pilot survey and pilot test sampling. The researchers conducted a fair and unbiased random sampling of 30 students, asking them to fill in the questionnaire and provide feedback on the pilot survey and pilot test.

**Sample 2:** Sampling pre-survey researchers sampled 90 physical education students. The questionnaires were distributed on paper. Afterward, all responses were examined, and it was confirmed that 90 responses were valid.

**Sampling 3:** Sampling SP researchers randomly selected 30 voluntary students to implement SP.

## 3.4 Research Instruments

### 3.4.1 Design of Questionnaire

Researchers used the following methods to design the questionnaire

Three steps.

**Step 1:** Identify the source of the survey from previous research questionnaires.

The questionnaires in this paper are from Guo et al. (2022) and Ifinedo et al. (2017).

**Step 2:** Reconstitute the questionnaire tool for this study.

**Step 3:** Determine the questionnaire after passing the IOC test.

### 3.4.2 Components of Questionnaire

The questionnaire items are composed as follows

Two parts:

**Part one:** Gender, grade, age

**Part two:** 5 variables in the questionnaire, a total of 20 questions

### 3.4.3 IOC Results

Based on the actual situation, content validity was used as the type of validity analysis selected, and the method of expert judgment, i.e., item-objective agreement (IOC), was adopted. This approach involves gathering expert opinions to verify the tool's effectiveness (Rovinelli & Hambleton, 1976). Generally, a minimum of two specialists is required for the sports class. In order to improve the validity of the student academic achievement questionnaire, this study invited three experts to evaluate the effectiveness of the questionnaire design professionally. Among them is one teacher of physical education, one school leader is responsible for teaching, and 1 has the title of physical education professor. Scores for all dimensions in this study exceeded the criteria of 0.67.

### 3.4.4 Pilot survey and Pilot test results

The researcher randomly implemented a pilot survey of 30 students by asking them to fill out the questionnaire and give feedback. Afterward, the researcher implemented Cronbach's Alpha's internal consistency reliability test, in which values should be equal to or greater than 0.7 (Nunnally & Bernstein, 1994). Therefore, the table below demonstrates the approved results for the high reliability of each construct.

**Table 1:** Pilot Test Result

| Variables | No. of Items | Sources | Cronbach's Alpha | Strength of Association |
|---|---|---|---|---|
| Learning Motivation (LM) | 5 | Nguyen and Nguyen (2010) | 0.936 | Excellent |
| Students' Satisfaction (SS) | 4 | Nikou and Maslov (2023) | 0.953 | Excellent |
| Social Media Use (SMU) | 4 | Griffith et al. (2022) | 0.968 | Excellent |
| Human Factors (HF) | 4 | Saunila et al. (2019) | 0.965 | Excellent |
| Students' Academic Performance (SAP) | 4 | Li et al. (2021) | 0.968 | Excellent |

# 4. Results and Discussion

## 4.1 Results

### 4.1.1 Demographic Profile

The researcher demonstrated the demographic profile of the entire research population (n=90), followed by the selected students' group (n=30), who participated in SP, as shown in Table 2.

**Table 2:** Demographic Profile

| Entire Research Population (n=90) | | Frequency | Percent |
|---|---|---|---|
| **Gender** | Male | 60 | 66.66% |
| | Female | 30 | 33.34% |
| **Grade** | Class 1 of freshman year | 18 | 20% |
| | Class 2 of freshman year | 20 | 22.2% |
| | Class 3 of freshman year | 19 | 21.1% |
| | Class 1 of sophomore year | 16 | 17.8% |
| | Class 2 of sophomore year | 17 | 18.9% |
| **Age** | 17 | 15 | 16.66% |
| | 18 | 25 | 27.78% |
| | 19 | 50 | 55.56% |
| **Total** | | 90 | 100% |
| **Entire Research Population (n=30)** | | **Frequency** | **Percent** |
| **Gender** | Male | 8 | 26.66% |
| | Female | 22 | 73.34% |
| **Grade** | Class 1 of freshman year | 0 | 0% |
| | Class 2 of freshman year | 0 | 0% |
| | Class 3 of freshman year | 0 | 0% |
| | Class 1 of sophomore year | 0 | 0% |
| | Class 2 of sophomore year | 30 | 100% |
| **Age** | 17 | 0 | 0% |
| | 18 | 0 | 0% |
| | 19 | 30 | 100% |
| **Total** | | 30 | 100% |

### 4.1.2 Results of multiple linear regression

From the perspective of variables, the p-value of the three independent variables is less than 0.05, indicating that they significantly impact students' academic performance (SAP). However, the P-value of an independent variable, social media use (SMU), was greater than 0.05, indicating that its effect on student academic performance (SAP) was insignificant. In addition, the standardized regression coefficient of an independent variable is less than 0, suggesting that it is negatively correlated with student academic performance (SAP). The standardized regression

coefficients of the other three variables are greater than 0, indicating that they positively correlate with student academic performance (SAP). Three of the four independent variables positively correlated with student academic performance (SAP). In contrast, one independent variable, social media use (SMU), was less correlated with student academic performance (SAP).

From the perspective of the overall model: First, the model has a fit ($R^2$) of 0.721, showing that social media use (SMU) and three other independent variables together explain 72.1% of the variation in student academic performance (SAP). Secondly, the standardized regression coefficients of each independent variable were observed in descending order, namely, human factor (skills and knowledge) (HF), learning motivation (LM), social media use (SMU), and student satisfaction (SS), corresponding to 0.5738, 0.4379, 0.0273, and -0.1923. From a statistical point of view, this shows that of the four influencing factors studied, the human factor (skills and knowledge) (HF) has the highest degree of influence on student academic performance (SAP), far exceeding social media use (SMU) and student satisfaction (SS), while student satisfaction (SS) has the least influence. These findings provide important insights into the complexity and multi-dimensional nature of student academic performance (SAP) and highlight the critical role of human factors (skills and knowledge) (HF) in enhancing student academic performance. At the same time, these results also provide useful implications for student learning policymakers and school administrators, that is, when formulating relevant policies and measures, students' human factors (skills and knowledge) (HF), learning motivation (LM), and other influencing factors should be fully considered. Hence, enhancing students' satisfaction with academic performance more effectively is important.

**Table 3:** The multiple linear regression of five independent variables on students' academic performance

| Variables | Beta | t | P-value | R | R2 |
|---|---|---|---|---|---|
| Student Satisfaction | -0.1923 | -2.288* | 0.025 | 0.849 | 0.721 |
| Learning Motivation | 0.4379 | 4.021** | 0.001 | | |
| Social Media Use | 0.0273 | 0.240 | 0.811 | | |
| Human Factors (Skills and Knowledge) | 0.5738 | 4.429* | 0.001 | | |
| Dependent variable: Students' Academic Performance | | | | | |

**Note:** p-value <0.05*, p-value <0.001**

Based on the previous analysis, the research hypotheses of this study have been tested and supported by the results of multiple linear regression (MLR). The following are the final research hypotheses related to the changes in all variables between the pre-strategic plan and post-strategic plan stages:

H5: There is a significant mean difference in student satisfaction between pre- strategic plan and post- strategic plan stages.

H6: There is a significant mean difference in Learning motivation between pre- strategic plan and post- strategic plan stages.

H7: There is a significant mean difference in human factors (skills and knowledge) between pre- strategic plan and post- strategic plan stages.

H8: There is a significant mean difference in Students' Academic Performance between pre- strategic plan and post-strategic plan stages.

## 4.2 SP Intervention Stage

The SP intervention program lasted 16 weeks, based on quantitative and qualitative data collected in the pre-SP phase to achieve the purpose of this study, namely to improve the academic performance of PE students. The investigators illustrated the SP intervention chronologically, as shown in Figure 2.

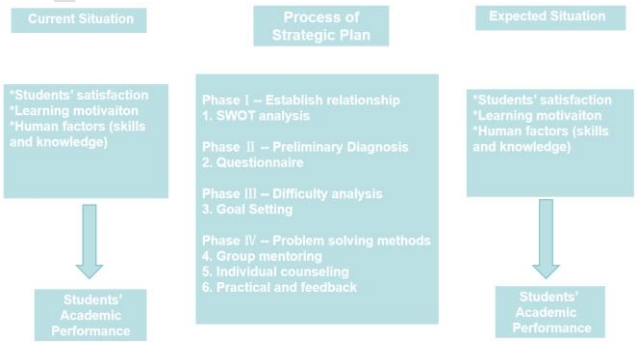


**Figure 2:** SP Activities

## 4.3 Results Comparison between Pre-SP and Post-SP

The researcher implemented a paired-sample t-test analysis on all four variables to identify whether there were any differences between Students' Self-leadership and Students' Creativity between the pre-SP and post-SP phases. The tables below illustrate paired-sample t-test analysis on four variables as follows:

**Table 4**: Paired-Sample T-Test Results

| Variables | Mean | SD | t-value | df | p-value |
|---|---|---|---|---|---|
| **Student Satisfaction** | | | | | |
| Pre-IDI | 3.03 | 1.048 | -3.72 | 29.0 | < .001 |
| Post-IDI | 3.80 | 0.690 | | | |
| **Learning Motivation** | | | | | |
| Pre-IDI | 3.03 | 1.017 | -4.08 | 29.0 | < .001 |
| Post-IDI | 3.89 | 0.733 | | | |
| **Human Factors (skills and knowledge)** | | | | | |
| Pre-IDI | 3.00 | 1.057 | -3.60 | 29.0 | < .001 |
| Post-IDI | 3.76 | 0.721 | | | |
| **Students' Academic Performance** | | | | | |
| Pre-IDI | 3.17 | 0.979 | -3.85 | 29.0 | 0 .001 |
| Post-IDI | 3.97 | 0.703 | | | |

Table 4 illustrates the results of paired-sample t-test analysis of pre-SP and post-SP comparison as follows: There was a significant difference in Students' Satisfaction between pre-SP (M=3.03, SD=1.048) and post-SP (M=3.80, SD=0.690) condition; t (29) =-3.72, p =< .001(<0.05) and the mean difference was -0.767. Therefore, H6 supported the idea that there is a significant mean difference in student satisfaction between pre-SP and post-SP.

The research findings provide strong support for H7, indicating a significant difference in Learning Motivation between pre-IDI (M=3.03, SD=1.107) and post-IDI (M=3.89, SD=0.733) condition; t (29) =-4.08, p < .001and the mean difference was -0.860. This further validates the significant mean difference in Learning Motivation between pre-SP and post-SP.

There was a significant difference in Human Factors between pre-IDI (M=3.00, SD=1.057) and post-IDI (M=3.76, SD=0.721) conditions; t (29) =-3.60, p =0.001(<0.05) and the mean difference was -0.758. Therefore, H8 supported the idea that there is a significant mean difference in human factors between pre-SP and post-SP.

There was a significant difference in Students' Academic Performance between pre-IDI (M=3.17, SD=0.979) and post-IDI (M=3.97, SD=0.703) conditions; t (29) =-3.85, p=0.001 (<0.05) and the mean difference was -0.792. Therefore, H9 supported the idea that there is a significant mean difference in students' academic performance between pre-SP and post-SP.

In summary, the quantitative results clearly demonstrate that the pre-SP and post-SP phases exhibit significant differences in Students 'Satisfaction, Learning Motivation, Human Factors (skills, knowledge), and Students' Academic Performance.

# 5. Conclusions, Recommendations and Limitations

## 5.1 Conclusions & Discussions

This study explored the effect of Students' Satisfaction, Learning Motivation, and Human Factors (skills, knowledge), three independent variables, on the dependent variable of student academic performance. The study used a comprehensive study design, data collection, and methodology to draw meaningful conclusions.

The study design used the validity of the project-target consistency index (IOC) and Konbach's Alpha to ensure the reliability of the measuring instrument. This rigorous measurement method strengthens the credibility of the study. Data were collected from 90 valid responses from PE higher vocational college students and multiple linear regression analysis to verify the significant relationship between the independent and dependent variables. In addition, a 16-week intervention design implementation (SP) was conducted on a small group of 30 students. Post-id data were collected and compared with pre-id data using the paired sample t-test.

The results show that certain factors significantly affect students' academic performance. Specifically, students 'satisfaction, learning motivation, and human factors (skills, knowledge) significantly influence students' academic performance. This suggests that focusing on positive learning-motivated behaviors, intrinsic satisfaction, and the impact of broadening PE student knowledge and skills in human factors can improve student academic performance.

Comparative results of paired sample t-tests showed significant differences in post-id and pre-id phases in PE academic performance. This suggests that the 16-week intervention design implementation has a positive and significant impact on the academic performance of PE students. In conclusion, this study demonstrates the valuable contribution to the high-level development of sports talents by improving the academic performance of sports students in the context of professional sports in Yunnan, China. The robust methodology, comprehensive analysis, and practical implications of the study provide insights into the factors that can improve the academic performance of PE students. These findings can inform educational strategies and interventions designed to develop these important skills for vocational PE students, ultimately preparing them for success in an increasingly competitive world of future sports careers.

## 5.2 Recommendations

The pursuit of cultivating and improving the academic performance of sports students has never been so appropriate. According to a recent study investigating the

impact of several key variables on students' academic performance, there is increasing knowledge telling educational institutions how to better prepare PE students for success in this great change unseen in a century. In this article, we will explore a set of recommendations derived from the study's results aimed at improving the competitiveness of sports students in a future society. One of the main recommendations made by this study is to improve the academic performance of PE students as part of the curriculum. Educational institutions, including students of higher vocational physical education colleges, aim to develop positive learning motivation among students and give play to more endogenous motivation. By integrating the self-performance improvement of sports students into the course, students will have the skills and knowledge they can learn to be responsible for their own learning and personal development. The Students' Satisfaction, Learning Motivation, and Human Factors (skills, knowledge) can significantly affect the academic performance of sports students. Educational institutions must encourage PE students to adopt active learning behaviors. This enables them to control their learning actions and decisions.

This study underscores the pivotal role of educators and administrators in implementing the recommendations. They should emphasize the satisfaction and accomplishment derived from the mastery of new skills and knowledge. By encouraging students to focus on intrinsic motivation, rather than relying solely on external rewards, institutions can foster a more enduring passion for learning and creative thinking. PE students 'satisfaction with learning content, motivation, and human factors play a vital role in improving students' academic performance. Educational institutions should recognize this and provide relevant help to help students develop a more positive and constructive internal learning environment. The satisfaction of learning content, the motivation of learning, and human factors are essential to improve the academic performance of sports students. By implementing ongoing assessments, institutions can identify areas where students may struggle and provide targeted interventions. This approach ensures that the development of these academic outcomes remains a priority. Educators and teachers, as the key implementers of these strategies, play a crucial role in improving the academic performance of PE students.

Therefore, it is essential to provide PE students with techniques and strategies to promote these skills. Learning seminars can focus on cultivating a mindset of sports students learning and growing, create a positive mindset learning environment, and provide constructive feedback to students. Peer mentoring and support programs can be established in an educational setting. Experienced students can act as mentors to guide their peers to develop their self-learning abilities and improve their academic performance. Learning from their PE peers who have successfully dealt with similar challenges is very rewarding. A positive learning environment is crucial as it can significantly impact students' motivation and academic performance.

In conclusion, the results of this study provide valuable insights into educational institutions that seek to improve the academic performance of PE students. By implementing these recommendations, PE vocational colleges can create an overall supportive learning environment that enables students to take responsibility for their learning development and improve their competitiveness in future sports careers. Active integration of self-active learning, promoting positive behavior, and emphasizing internal rewards can allow PE students to thrive in a competitive and innovative world. Educational institutions are responsible for accepting these recommendations and empowering PE students with the key skills necessary for success and personal growth.

### 5.3 Limitations for Future Research

While providing valuable insights into the impact of independent variables on improving academic performance among PE students, recognizing its limitations is essential to guide future research. These limitations provide potential venues for further investigation and research improvements. **Sample Size and Demographics:** This study focused on a specific group of PE students who came to higher vocational colleges. Future research should diversify the sample by including PE students from diverse educational, age groups, and cultural backgrounds to assess the generalizability of the findings. **Variables and Relationships:** The study focused on three specific independent variables and one dependent variable. Future studies could explore more independent variables and their potential interactions to provide a more comprehensive view of the factors influencing PE students' academic performance. **Intervention Design:** The study implemented a specific intervention program. Future research should explore more scientific alternative intervention designs that allow comparison of the effectiveness of different strategies in improving the academic performance of PE students.

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