Developing Higher Vocational College Student's English Academic Performance in Blended Learning in Henan, China

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Abstract

Purpose: This research aims to establish connections between study engagement, psychological capital, motivation, and academic performance in a higher vocational college in Henan that uses blended learning. It also seeks to identify significant differences between the variables. **Research design, data, and methodology:** The study utilized the Index of Item-Objective Congruence (IOC) to assess validity and conducted a pilot test with 30 participants to measure reliability using Cronbach's Alpha. Data from 80 valid responses from students at a higher vocational college in Henan were analyzed using multiple linear regression to examine the significant relationships between variables. Subsequently, 35 students participated in a 10-week Intervention Design Implementation (IDI). The quantitative results before and after the IDI were compared using paired-sample t-tests. **Results:** The multiple linear regression analysis indicated that psychological capital, extrinsic motivation, and intrinsic motivation had a significant impact on students' academic performance, while study engagement did not show a significant effect. However, the paired-sample t-test revealed a significant difference in academic performance between the pre-IDI and post-IDI stages. **Conclusions:** The study found that blended learning can improve student participation and academic performance in vocational education when implemented effectively. It is essential for teachers to be proficient in blended teaching methods and to motivate students to fully realize the benefits of blended learning in higher education.

Keywords: Blended Learning, Academic Performance, Psychological Capital, Motivation, Study Engagement

JEL Classification Code: I23, J28, L2

1. Introduction

Students in a higher vocational college in Henan face various challenges that require immediate improvements in their English academic performance through blended learning. These challenges include the potential impact of academic performance on future educational and employment opportunities, as well as the lack of effective learning habits and methods, which may hinder career development.

The college offers specialized software for both online and offline learning. This study will explore the factors affecting students' English performance in a blended learning environment at a vocational technical college in Henan, China. It will examine the impact of language skills, study habits, technology, teaching methods, and socio-economic backgrounds on academic success. The goal is to gain insights into how these factors influence students' achievements or challenges in their English studies within the context of blended learning.

The research aims to establish causal relationships between student engagement, psychological capital, extrinsic and intrinsic motivation, and academic success at higher vocational education institutions in Henan, utilizing blended learning. This study is important because it investigates the factors that affect the academic performance of vocational college students engaged in blended learning. The surveyed students come from a vocational college in Henan, where specialized software is used for both online and offline teaching. This program facilitates instant communication with teachers while students work on assignments. Understanding the factors that influence student success is crucial, as students are eager to improve their English grades for better university opportunities, and

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the school aims to enhance its reputation through improved academic performance. The results of this study will be valuable for administrators and educators interested in integrating blended learning methods and exploring advanced software options as they transition from traditional teaching to a blended learning format.

2. Literature Review

2.1 Study Engagement (SE)

Huitt and Cain (2005) define student engagement as purposeful planning, goal-oriented behavior, active participation, and motivated effort by an individual. This can be likened to "focused energy," representing personal energy with both purpose and intensity (Atman, 1987). Research has shown that student engagement significantly impacts academic achievement and personal development. Carini et al. (2006) found a positive correlation between authentic learning and personal growth through student engagement. Students who dedicate more time to studying and practicing a subject often gain a deeper understanding of it.

H1: Study Engagement (SE) has a significant impact on Academic Performance (AP).

2.2 Psychological Capital (PsyCap)

The concept of PsyCap originates from the field of positive organizational behavior within positive psychology (Luthans & Youssef-Morgan, 2017) and encompasses an individual's understanding and awareness of their own identity (Luthans et al., 2004). PsyCap is grounded in the inherent capabilities and valuable assets that individuals possess and can utilize, representing a branch of positive psychology. These resources are referred to as HERO (Hope, Efficacy, Resilience, Optimism), encapsulating four primary positive psychological states (Luthans et al., 2007). Therefore, PsyCap pertains to an individual's state of positive psychological development, characterized by: (1) possessing a strong sense of self-worth and a willingness to exert effort for challenging tasks; (2) maintaining a constructive mindset about current and future success; (3) persistently pursuing goals while adapting strategies as necessary for achieving success; and (4) demonstrating resilience by overcoming problems and adversity, ultimately surpassing previous levels of achievement.

H2: Psychological Capital (PsyCap) has a significant impact on Academic Performance (AP).

2.3 Intrinsic Motivation (IM)

A comprehensive definition of intrinsic motivation refers to a motive that naturally arises within an individual and originates from the activity itself (Deci, 1971). When students actively seek pleasure, interest, curiosity satisfaction, self-expression, or personal challenges in their academic pursuits, they are demonstrating intrinsic motivation (Liu et al., 2020). The desire that emerges from engaging in an activity for its own sake is termed intrinsic motivation and encompasses the joy and fulfillment derived from active participation (Deci, 1975). The inherent drive-in academics is crucial for their success, aptitude, and academic learning. Numerous studies have explored the positive correlation between intrinsic motivation and academic adaptability. In their respective studies, Petersen et al. (2009) and Lynch (2006) observed a favorable relationship between intrinsic motivation and academic flexibility.

H3: Intrinsic Motivation (IM) has a significant impact on Academic Performance (AP)

2.4 Extrinsic Motivation (EM)

Two forms of extrinsic motivation have been identified: one centered around compensation and the other focused on outward orientation. The compensation orientation emphasizes the importance of external rewards, while the outward orientation highlights comparisons to others (Amabile et al., 1994). According to Hsieh (2014), genuinely motivated students engage in educational activities driven by their innate curiosity or thirst for challenges. Extrinsic motivation, as pointed out by Goodman et al. (2011), stems from rewards and the impact of external authority or control on behavior. If students perceive these rewards or influences as crucial for attaining their short-term and long-term goals, they will be more inclined to complete relevant tasks.

H4: Extrinsic Motivation (EM) has a significant impact on Academic Performance (AP).

2.5 Academic Performance (AP)

Ortega-Maldonado and Salanova (2018) have identified academic performance (AP) as a critical outcome in the university setting. AP in higher education encompasses various dimensions, forming an overarching concept that can be further broken down into different sub-performance domains. The specific aspects of performance depend on the student's academic program, including their level of theoretical knowledge, proficiency in applying theory to practice, or practical expertise. A student's grade point average (GPA), which is the average of weighted course marks used to determine their final degree, is commonly used to assess their academic performance. GPA is also a key

factor in graduate employment and postgraduate selection, indicating occupational position (Strenze, 2007). Robbins et al. (2004) defined academic performance as how successfully a student completes their tasks and studies, usually reflected in grades, test scores, and teacher evaluations. According to Poropat (2009), academic performance can be measured by students' grades and standardized test scores, reflecting their mastery of course content and overall intellectual development. Academic performance involves demonstrating knowledge, skills, and competencies acquired through education and is often assessed through exams, projects, and overall grades (Kuh et al., 2006).

3. Research Methods and Materials

3.1 Research Framework

The researcher applied three theoretical models. The first theoretical framework was developed by Slåtten et al. (2021), the second by Liu et al. (2020), and the third by Meng and Hu (2022). These three frameworks collectively supported and contributed to the development of the conceptual framework presented in Figure 1.
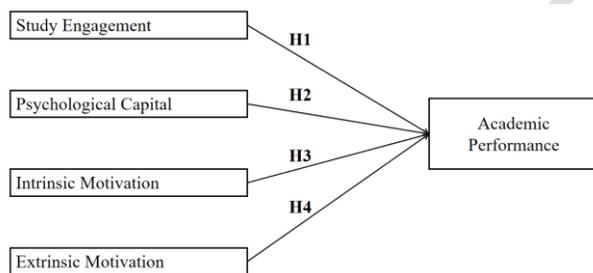

Figure 1: Conceptual Framework

H1: Study Engagement (SE) has a significant impact on Academic Performance (AP).H2: Psychological Capital (PsyCap) has a significant impact on Academic Performance (AP).
H3: Intrinsic Motivation (IM) has a significant impact on Academic Performance (AP).
H4: Extrinsic Motivation (EM) has a significant impact on Academic Performance (AP).

3.2 Research Methodology

The research process consists of four distinct stages. First, a survey was conducted on the entire research population (n=80) to collect data for the proposed conceptual framework. Next, all proposed hypotheses underwent multiple linear regression analysis to assess their significance at a p-value threshold of less than 0.05. Only the supported hypotheses were retained, while those that did not meet the criteria were excluded.

Subsequently, preliminary surveys were distributed to a randomly selected group of 80 students from the humanities college, in alignment with the proposed hypotheses. Following this, an Intervention Design Implementation (IDI) was conducted, focusing on 35 participants.

In the final phase, an intervention was developed and implemented to assess its impact on students' academic performance in English. The intervention lasted for 10 weeks, after which a survey was conducted among the 35 IDI participants to gather data for a paired-sample t-test analysis, comparing pre-IDI and post-IDI results. This comprehensive process enabled a thorough examination of the research objectives and hypotheses.

3.3 Research Population, Sample Size, and Sampling Procedures

3.3.1 Target Respondents

In this study, I chose to focus on the institution where I am employed, specifically the College of Humanities at our university. It is widely recognized as the largest liberal arts college, with a long history and a comprehensive academic program. The college offers 110 courses and serves a student population of 5,008, providing diverse educational opportunities across various humanities disciplines.

The research participants were all second-year students enrolled in three specific courses: English Reading and Speaking, English Teaching Methods for Primary School, and Chinese Teaching Methods for Primary School. A total of 102 students completed the online survey, of which 80 responses were deemed valid after verification by the researcher.

3.3.2 Sample Size

A pilot test was conducted with a randomly selected sample of 30 students to evaluate the reliability of the survey. Subsequently, out of the identified research population of 102 students, 80 valid responses were collected for further investigation using multiple linear regression analysis to assess the relationship between the independent and dependent variables. Finally, 35 voluntary students from one of the author's classes participated in the Intervention Design Implementation (IDI) phase.

3.3.3 Sampling Procedure:

The researcher employed several sampling techniques, as outlined below:

Sampling 1: Pilot Survey and Pilot Test
A random sample of 30 students was selected to complete

the survey questionnaire and provide feedback for the pilot survey and pilot test.

Sampling 2: Pre-Survey

A total of 102 vocational technical college students in Xuchang, Henan, from the same academic year, were selected for the pre-survey. The survey questionnaire was distributed online, and after verification, 80 responses were confirmed as valid.

Sampling 3: IDI Implementation

A group of 35 students from one of the researcher's classes was selected to participate in the IDI intervention phase.

3.4 Research Instruments

3.4.1 Design of Questionnaire

The researcher designed the survey questionnaire following three steps:

Step 1: Identified questionnaire sources from four openly published articles (DuPaul et al., 1991; Glanville & Wildhagen, 2007; Schaufeli et al., 2002).

Step 2: Adjusted the questionnaire and uploaded it to an online platform.

Step 3: Conducted an Index of Item-Objective Congruence (IOC) evaluation).

3.4.2 Components of Questionnaire

The survey questionnaire consisted of two parts:

Part 1: Basic Information Questions

This section collected general demographic information about the research participants, including gender and class.

Part 2: Pre-Survey Questions

This section aimed to assess the initial levels of the independent and dependent variables among 102 vocational technical college students in Xuchang, Henan.

3.4.3 IOC Results

The researcher invited three independent experts—two Thai professors and one Chinese professor—to conduct an Index of Item-Objective Congruence (IOC) evaluation. In this process, experts rated each item using the following scale: +1 for Congruent, 0 for Questionable, and -1 for Incongruent. All questionnaire items received a score greater than 0.67, leading to their retention in the final survey.

3.4.4 Reliability and Validity

The researcher conducted a pilot survey with a randomly selected sample of 30 students, asking them to complete the questionnaire and provide feedback. Subsequently, Cronbach's Alpha internal consistency reliability test was applied, with an acceptable threshold of 0.7 or higher, as recommended by Nunnally and Bernstein (1994). The results, as shown in the table below, confirmed high reliability for each construct.

Table 1: Pilot Test

Variable	No. of Items	Sources	Cronbach's Alpha	Strength of association
Study Engagement	6	Schaufeli et al. (2002)	0.938	Excellent
Psychological Capital	10	Luthans et al. (2007b)	0.975	Excellent
Intrinsic Motivation	3	Glanville and Wildhagen (2007)	0.885	Good
Extrinsic Motivation	3	Glanville and Wildhagen (2007)	0.851	Good
Academic Performance	7	DuPaul et al. (1991)	0.933	Excellent

4. Results and Discussion

4.1 Results

4.1.1 Demographic Profile

Researcher demonstrated demographic profile of entire research population (n=80), followed by selected students' group (n=30), who participated IDI as shown in Table 2.

Table 2: Demographic Profile

Gender	Frequency	Percentage
Female	31	88.57
Male	4	11.43
Total	35	100.00

4.1.2 Results of multiple linear regression

The researcher employed Multiple Linear Regression (MLR) to analyze the results from 80 survey responses and determine the support for each hypothesis. The MLR analysis, conducted using Jamovi, revealed that psychological capital, intrinsic motivation, and extrinsic motivation had a significant impact on students' academic performance ($p < 0.05$), whereas study engagement did not exhibit a significant effect ($p > 0.05$).

Furthermore, the R-squared (R^2) value was 0.889, indicating that the independent variables explained 88.9% of the variance in the dependent variable. Analyzing the standardized estimates, the researcher observed that extrinsic motivation had the highest standardized estimate ($\beta = 0.445$), suggesting that it exerted the greatest influence on students' academic performance.

Table 3: The MLR Results on Students' Academic Performance (n=80)

Variables	t-value	p-value	Stand. Estimate (β)	R²
SE	0.297	0.767	0.0382	
PsyCap	2.094	0.040	0.2629	0.790
IM	2.336	0.022	0.2811	
EM	6.802	< .001	0.4450	

Note: p-value <0.05*

As a result, H2, H3, and H4 were supported, while H1 was not. Based on the results of the multiple linear regression analysis, the researcher incorporated all variables into the Intervention Design Implementation (IDI) and formulated additional hypotheses. The IDI was then conducted to test the following hypotheses:

H5: There is a significant mean difference in study engagement between pre-IDI and post-IDI.
H6: There is a significant mean difference in psychological capital between pre-IDI and post-IDI.
H7: There is a significant mean difference in intrinsic motivation between pre-IDI and post-IDI.
H8: There is a significant mean difference in extrinsic motivation between pre-IDI and post-IDI.
H9: There is a significant mean difference in academic performance between pre-IDI and post-IDI.

4.2 IDI Intervention Stage

The IDI intervention was conducted over 10 weeks, utilizing quantitative data from the pre-IDI stage to achieve the study's objective—developing a blended learning approach to enhance students' academic performance. The researcher illustrated the IDI intervention process in Figure 2.
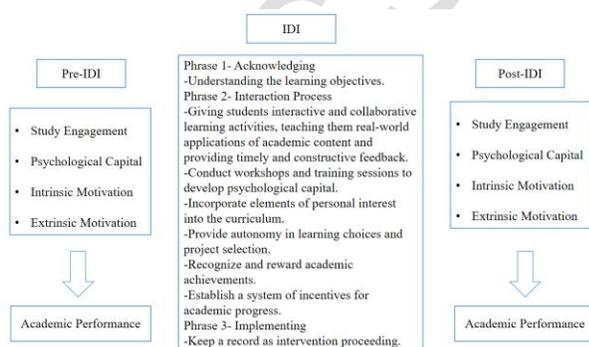

Figure 2: IDI Intervention Stage

4.3 Results Comparison between Pre-IDI and Post-IDI

Researcher implemented paired-sample t-test analysis on all five variables to identified whether there were any differences of students' academic performance between the pre-IDI and Post-IDI phases. Totally, the below tables to illustrated paired-sample t-test analysis on five variables as follow.

Table 4: Paired-Sample T-Test Results

Variables	N	Mean	Std. Deviation	t-value	df	p-value
Study Engagement						
Pre-IDI	35	3.81	0.669	-5.15	34.0	< .001
Post-IDI	35	4.16	0.455			
Psychological Capital						
Pre-IDI	35	3.64	0.673	-4.70	34.0	< .001
Post-IDI	35	3.95	0.503			
Intrinsic Motivation						
Pre-IDI	35	3.67	0.767	-4.77	34.0	< .001
Post-IDI	35	4.05	0.543			
Extrinsic Motivation						
Pre-IDI	35	3.73	0.690	-4.31	34.0	< .001
Post-IDI	35	4.07	0.559			
Academic Performance						
Pre-IDI	35	3.45	0.582	-5.58	34.0	< .001
Post-IDI	35	3.83	0.455			

Table 4 presents the results of the paired-sample t-test analysis, comparing pre-IDI and post-IDI scores across all study variables. The findings are summarized as follows:

Study Engagement (H5): There was a significant increase in study engagement from the pre-IDI stage (M = 3.81, SD = 0.669) to the post-IDI stage (M = 4.16, SD = 0.455), with p < 0.001 and a mean difference of 0.35. Therefore, H5 was supported, indicating a significant mean difference in study engagement between pre-IDI and post-IDI.

Psychological Capital (H6): A significant increase was observed in psychological capital from pre-IDI (M = 3.64, SD = 0.673) to post-IDI (M = 3.95, SD = 0.503), with p < 0.001 and a mean difference of 0.31. Therefore, H6 was supported, confirming a significant mean difference in psychological capital between pre-IDI and post-IDI.

Intrinsic Motivation (H7): The intrinsic motivation scores increased significantly from pre-IDI (M = 3.67, SD = 0.767) to post-IDI (M = 4.05, SD = 0.543), with p < 0.001 and a mean difference of 0.38. Therefore, H7 was supported, demonstrating a significant mean difference in intrinsic motivation between pre-IDI and post-IDI.

Extrinsic Motivation (H8): A significant increase was found in extrinsic motivation, rising from pre-IDI (M = 3.73,

SD = 0.690) to post-IDI (M = 4.07, SD = 0.559), with p < 0.001 and a mean difference of 0.34. Therefore, H8 was supported, indicating a significant mean difference in extrinsic motivation between pre-IDI and post-IDI.

Academic Performance (H9): The academic performance scores significantly increased from pre-IDI (M = 3.45, SD = 0.582) to post-IDI (M = 3.83, SD = 0.455), with p < 0.001 and a mean difference of 0.38. Therefore, H9 was supported, confirming a significant mean difference in academic performance between pre-IDI and post-IDI.

Based on the paired-sample t-test results, the researcher concluded the following:

All five variables (Study Engagement, Psychological Capital, Intrinsic Motivation, Extrinsic Motivation, and Academic Performance) showed significant mean differences between pre-IDI and post-IDI stages.

The most substantial increases were observed in Intrinsic Motivation and Academic Performance, suggesting that the IDI intervention effectively enhanced students' motivation and academic performance.

5. Conclusions, Recommendations and Limitations

5.1 Conclusions & Discussions

The study investigated the influence of four independent variables—study engagement, psychological capital, intrinsic motivation, and extrinsic motivation—on one dependent variable: academic performance. A comprehensive research design, data collection strategy, and methodology were employed to draw meaningful conclusions.

The research design incorporated the Index of Item-Objective Congruence (IOC) for validity and Cronbach's Alpha in a pilot test to ensure the reliability of the measurement instruments. This rigorous approach strengthened the credibility of the study. Data were collected from 80 valid responses from a higher vocational college in Henan and analyzed using multiple linear regression to verify the relationships between the independent and dependent variables. Additionally, a 10-week Intervention Design Implementation (IDI) was conducted with a selected group of 35 students. To determine whether significant differences existed between pre-IDI and post-IDI stages, a paired-sample t-test was performed. The findings revealed significant differences across all five variables, indicating the intervention's effectiveness.

The paired-sample t-test results demonstrated a significant improvement in academic performance between the pre-IDI and post-IDI stages. This suggests that the 10-week IDI had a positive and statistically significant impact on students' academic performance.

The study concluded that blended learning can significantly enhance student participation and academic performance in vocational education when implemented effectively. The findings emphasize the necessity of teacher proficiency in blended teaching methods and targeted interventions to motivate students. These insights not only serve as a valuable reference for educational institutions but also provide direction for future research.

5.2 Recommendations

The results of this research indicate that blended learning courses have indeed enhanced students' academic performance. The following recommendations are presented in five parts.

The first recommendation is to upgrade teachers' skills in teaching blended learning courses. The training should include how to use online interactive platforms for real-time discussion and feedback with students to enhance classroom interactivity. By introducing the case teaching method and flipped classroom approaches, teachers can better guide students' independent learning and critical thinking, thereby improving teaching effectiveness and boosting teachers' self-confidence in the face of emerging teaching technologies (Graham, 2006; McGee & Reis, 2012).

The second recommendation is to design targeted interventions to enhance students' motivation. Considering that many students lack motivation due to the difficulty of learning English, it is recommended that teachers design more targeted interventions during lesson preparation to stimulate intrinsic motivation. This can be achieved by combining gamification with individualized, interest-based learning pathways. Immediate positive feedback not only helps students stay motivated during the learning process but also enhances their sense of achievement, thereby further improving learning outcomes (Deci & Ryan, 2000).

The third recommendation is to enhance students' self-discipline and time management skills. Students who lack these skills may suffer academically due to procrastination or poor time management. Therefore, it is recommended that schools introduce special study skills training courses to help students improve these abilities. Additionally, schools can use online tools or applications to help students track and manage their learning progress, thereby improving learning outcomes in blended learning environments (Britton & Tesser, 1991; Zimmerman et al., 1992).

The fourth recommendation is to promote students' psychological capital. Studies have shown that students with high psychological capital are better able to cope with pressure and challenges in learning, and exhibit higher academic achievement and enthusiasm. Therefore, it is recommended that schools help students improve these key mental abilities through psychological counseling, team-

building activities, and psychological capital training courses. These activities not only enhance students' academic performance but also improve their overall mental health and promote success in their future careers (Luthans et al., 2007; Snyder et al., 2002).

The final recommendation is to strengthen administrative support for blended learning. The successful implementation of blended learning requires strong support from school administration. It is recommended that school management provide adequate technical support and resources, such as an efficient online learning platform, stable network infrastructure, and timely technical support services. In addition, schools should develop clear policies to encourage teachers to innovate in blended learning, and provide the necessary funding and incentives to do so. For example, schools can establish special funds to support teachers in developing new blended learning courses or improving existing ones, while encouraging teachers to explore and innovate through a reward system for teaching results (Garrison & Kanuka, 2004; Herrador-Alcaide et al., 2020).

5.3 Limitations for Future Research

The study has identified limitations that warrant further discussion in future research. The findings indicate that psychological capital, intrinsic motivation, and extrinsic motivation have a significant impact on students' academic performance, while study engagement does not exhibit the same influence. This contradicts previous literature, suggesting the need for future investigations to explore the diverse dimensions of study engagement across different instructional methods. More sophisticated analytical techniques, such as structural equation modeling, can be employed to elucidate the role of study engagement in shaping academic achievement.

Secondly, the time constraint on data collection in this study presents a significant challenge. The intervention and data collection were limited to one semester, leaving uncertainty regarding the sustainability of improvements in students' performance. Subsequent research should encompass multiple semesters to comprehensively assess the enduring impact of blended learning.

In addition, the study focuses on primary education majors and English language instruction, offering a comprehensive curriculum designed to enhance student motivation. However, it should be noted that the findings may not be directly applicable to more theoretical disciplines such as engineering and mathematics. Therefore, future research should aim to investigate the impact of blended learning on student engagement in technical subjects.

Finally, the study is centered on primary education and English language instruction, with the caveat that the findings may not be generalizable to fields such as

engineering or mathematics. Subsequent research should explore the impact of blended learning on student engagement in technical subjects. Additionally, it is important to note that the study exclusively examines classroom interaction, overlooking the potential influence of pre-class preparation and post-class reflection on students' overall learning experience. Future research should encompass all stages of learning and leverage technology for more precise monitoring of student engagement and performance, thereby enabling personalized support.

This study demonstrates the intricate interplay between study engagement, psychological capital, motivation, and academic performance in blended learning. Nevertheless, it is important to acknowledge the limitations of this study and recognize the need for further refinement of its dimensions. Additionally, longer-term follow-up studies are essential to gain a deeper understanding of the lasting impacts of interventions. Furthermore, future research should take into account potential moderating effects from different disciplines and course types on research outcomes. A comprehensive analysis of learning paths will be instrumental in enhancing teaching strategies within blended learning environments and will serve as a valuable guide for future educational research and instructional design.

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