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Factors Impacting Student Learning Performance in Blending Learning in a Graphic Design Course: A Case Study of Private University in Liaoning Province, China

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Abstract

Purpose: The study investigates the impact of five independent variables (learning anxiety, learning attitude, learning motivation, social media usage, and feedback) on one dependent variable (student learning performance in blended learning). Additionally, it aims to identify significant differences between variables. **Research design, data, and methodology:** In this study, the project-objective agreement index (IOC) was used to measure validity, and Cronbach's Alpha was used as a pilot test (n=33). To verify the significant relationship between variables, multivariate linear regression analysis was conducted on 289 valid questionnaires issued to Liaoning Polytechnic Vocational University graphic design students. Subsequently, 33 students underwent a 12-week Strategic Plan Intervention Design (SP). Then, the results were tested against the paired sample t-test of the current and expected SP. **Results:** Multiple linear regression showed that learning motivation and feedback significantly affected students' learning performance in blended learning while learning anxiety, learning attitude, and social media use had no significant effect. Conclusions: This statistical analysis helps identify significant differences or similarities between two data sets. At the same time, qualitative methods were used to conduct in-depth interviews with six students in our class to assess the effectiveness of specific strategies and activities to enhance learning motivation and provide constructive feedback.

Keywords: Learning Motivation, Social Media Usage, Learning Performance, Blending Learning, Graphic Design Course

JEL Classification Code: I23, J28, L2

1. Introduction

With the development of educational technology and innovative teaching models, universities and colleges have widely adopted blended learning models to supplement and extend traditional classroom teaching through online classes and discussion forums. This model not only promotes the flexibility of teaching but also makes the use of educational resources more efficient and diversified. Graphic design courses require much hands-on work. Blended learning allows students to apply what they have learned immediately after theoretical learning with hands-on operations through online assignments, projects, and simulation software. Combining theory with practice helps students master design skills and apply them to practical work. However, this model also needs some help.

On the one hand, blended learning requires students to have strong self-discipline and time management skills. Many students may need help to plan and manage their learning time effectively, resulting in a lag in learning progress, which in turn affects learning attitudes and engagement and, ultimately, learning outcomes. On the other hand, blended learning requires certain technical equipment. Students will feel inconvenienced if they are not familiar with the technical functions during the learning process, and the quality of interaction will also decline. Therefore, helping students overcome these challenges, giving full play to the advantages of blended learning, and improving the learning effect are important issues for teachers and universities.

According to Foung and Chen (2019), blended learning can cater to different students' learning styles and preferences compared to traditional face-to-face teaching or fully online courses. It can improve students' understanding and memory

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of course materials. In addition, the flexibility and accessibility of online components in a hybrid curriculum can promote active learning and student engagement, leading to improved academic performance. However, student learning performance in blended courses may vary depending on various factors such as course design, student engagement, and the effectiveness of blended learning methods. The current state of blended learning provides flexibility to educational strategies, allowing students to carry out the educational process anytime and anywhere. Compared with traditional classrooms, students can easily maintain a close connection with teachers; whether they are asking questions, sharing experiences, or discussing topics, they can get timely responses and guidance. In addition, blended learning allows students to explore deeper and broader areas of knowledge according to their individual learning needs, without feeling pressured or marginalized by other classmates (Attar, 2011).

Therefore, the primary objective of this study is to delve into the factors that influence students' learning performance in the blended learning mode. The aim is to enhance the learning performance of students in the graphic design course at a vocational private university in Liaoning. This research question is of significant importance, as it directly addresses the challenges and advantages of blended learning, and proposes strategies to improve learning performance in graphic design courses. By exploring this question, we cannot only understand the factors influencing learning performance but also devise effective strategies to enhance it, making this research both engaging and impactful.

2. Literature Review

2.1. Learning Anxiety

Yang et al. (2021) believe that educational anxiety originates from many aspects and is the result of interaction among individuals, families, society, and institutional dynamics. Educational anxiety mainly includes a series of negative emotions and psychological states, reflected as anxiety, tension, and worry, which are jointly produced by a variety of factors in the educational environment, including social pressure, academic environment, family expectations, internal pressure experienced by students, and external support mechanisms.

The research of Jegede et al. (1990) proved that learning anxiety is an emotional disorder produced in the learning process. The increase in anxiety level will hinder the absorption of knowledge and skills, and the anxiety level is negatively correlated with student's performance and achievement. Eysenck (2012) believes that the rise in anxiety levels constitutes a major obstacle to student's ability to retrieve and apply the language knowledge they have learned and affects the decline of students' performance in learning tasks. Stomff (2014) found that in the academic environment, there is a significant correlation between the degree of anxiety experienced by students and their overall performance in the educational environment, and the rise of anxiety level is inversely proportional to the state of students' academic performance. Rana and Mahmood (2010) point out that test anxiety is a key psychological factor leading to poor academic performance and decreased performance levels in students. Owens et al. (2012) found that, based on the interaction between mental health and educational outcomes, the rise of anxiety and depression hindered students' knowledge acquisition and led to a decline in academic performance. These studies have led to the following hypothesis:

H1: Learning anxiety has a significant impact on student learning performance in blended learning.

2.2 Learning Attitude

The concept of attitude represents the comprehensive integration of an individual's emotional reactions, cognitive assessments, and behavioral tendencies toward a unique behavior or object. The range of evaluative attitude orientations encompasses positive and negative attitudes (Chatterjee et al., 2021; Fishbein & Ajzen, 1977).

Research consistently shows a strong correlation between students' attitudes toward learning and academic achievement (Anghelache, 2014; Ekperi et al., 2019; Muzamil et al., 2022). Salma et al. (2020), by observing the relevant indicators of learning attitude, find that the indicators of learning attitude have an important impact on learning performance. Students' attitudes and learning styles directly affect their academic performance. Alshare and Lane (2011) used technology acceptance and a unified theoretical model to study the factors affecting students' perceived learning outcomes and satisfaction with enterprise resource planning courses. It is found that student attitude has the most significant direct impact on students' perceived learning outcomes and satisfaction. Hui et al. (2018) pointed out that fully designed and appropriate learning activities positively affect learning attitude and academic achievement. According to Chetioui et al. (2024), online learning attitude and satisfaction positively influence college students' academic performance. Students' attitudes and satisfaction levels toward e-learning directly impact their motivation to learn and participation in the learning process. These studies have led to the following hypothesis:

H2: Learning attitude has a significant impact on student learning performance in blended learning.

2.3 Learning Motivation

Learning motivation is an internal process or psychological state that drives individual students' participation in learning activities and state maintenance and further guides individual students' behavior to achieve specific educational goals (Noe, 1986; Tlili et al., 2019).

Steinmayr et al. (2019) empirically demonstrated the profound influence of achievement motivation on students' academic performance and broader learning outcomes. Achievement motivation, a complex construct, encompasses various dimensions, such as the cognitive appraisal of task value, goal orientation, and the intrinsic impetus to pursue academic success. These constituents are widely recognized as pivotal determinants shaping students' educational achievements. Griffin et al. (2013) studied various factors that affect students' academic performance and found that intrinsic motivation level is the most influential learning skill to promote students' positive academic performance. Dawson et al. (2009) extended the discourse by delineating the correlation between students' achievement orientation and engagement within an online learning milieu. It was elucidated that students' motivation to learn can be substantially explained by their achievement orientation. Gbollie and Keamu (2017) underscored the significance of motivation and learning strategies in shaping the academic performance of high school students in Liberia. It was highlighted that students' learning motivation may stem from intrinsic factors such as pursuing knowledge, extrinsic incentives, or the aspiration for personal achievement. The inherent nature of motivation was underscored as pivotal in augmenting students' learning outcomes. Garcia and Pintrich (1996) elucidated the positive association between optimistic motivational beliefs and heightened cognitive engagement, manifested through cognitive and metacognitive strategies, ultimately culminating in enhanced academic achievement. These studies have led to the following hypothesis:

H3: Learning motivation has a significant impact on student learning performance in blended learning.

2.4 Social Media Usage

In the academic discussion of Li (2021), the use function of social media encapsulates the function of users to access and read information files. Also, it includes the function of participating in the communication, publication, and editing of content, as well as organizing and classifying information and documents in the digital field. It integrates various comprehensive capabilities, enabling users to skillfully participate in content and engage in information interaction with purpose.

Arslan (2018) conducted a study on the relationship between social media use variables and college student's learning performance and found that social media, as a complementary place conducive to academic discourse exchange, had a significant but moderate positive impact on key aspects of academic participation, especially class participation and pre-class preparation. Student engagement in social media enhances interpersonal communication in a collaborative academic environment, thereby facilitating synergistic interactions among group members, underscoring the subtle dynamics of social media integration that enhances the academic landscape, promotes a rich learning environment, and has the potential to enhance student academic achievement (Arslan, 2018). Qi (2019) further supports the above view, showing that frequent use of social media can significantly enhance the communication dynamics among student groups and promote a more favorable view of group task performance.

Al-Rahim et al. (2017) highlights the critical role of social media in improving overall learning outcomes by illuminating the multiple ways in which social media can be effectively used to increase student engagement, interaction, and engagement levels. Sarwar et al. (2019) showed that as a dynamic tool, social media promotes the development of a learning environment by encouraging cooperation and communication among students, thus enhancing students' learning behaviors and performance. Al-Rahmi and Othman (2013) found in their research that social media, as a special communication tool, plays a key role in enhancing the motivation of collaborative learning among students. However, Hameed et al. (2022) cautions that unrestricted social media participation may bring hidden dangers, especially the adverse effects of excessive use of social media on students' academic performance when away from academic pursuits, and emphasizes the need to cultivate students' self-regulatory mechanisms to mitigate these adverse effects. These studies have led to the following hypothesis:

H4: Social media usage has a significant impact on student learning performance in blended learning.

2.5 Feedback

Schutz and Weinstein (1990) articulated a comprehensive definition of feedback, positioning it as a pivotal mechanism through which evaluators amass and scrutinize data about learners' academic achievements and proficiency within their respective knowledge domains.

Selvaraj et al. (2021) propose that feedback emphasizes students' strengths and guides them in developing and adjusting their learning strategies. Orrell (2006) discovered that assessment theory and academic literature underscore feedback's pivotal role in performance assessment tasks, given its capacity to facilitate improvement and enrich student learning outcomes. The research conducted by Ahea

et al. (2016) concluded that by providing timely and constructive feedback, educators can assist students in comprehending their strengths and areas needing improvement, consequently fostering enhanced academic performance. Zimbardi et al. (2016) investigated the association between feedback provision, feedback utilization, and academic success, determining that the duration of students' engagement with feedback significantly correlated with the rate of improvement observed in subsequent assessment tasks. Wisniewski and Zierer (2021) conducted an extensive analysis to examine the impact of feedback on students' academic achievement. Their findings highlight the cognitive effects of feedback and its essential role in various modes of instruction. Constructive feedback provided on learners' work possesses the potential to bolster their strengths and motivation, consequently contributing to the enhancement of their overall performance (Molloy & Boud, 2013; Shute, 2008). Previous studies have consistently shown the effectiveness of feedback on students' learning performance (Alderman et al., 2014; Evans, 2013; Orsmond & Merry, 2011). These studies have led to the following hypothesis:

H5: Feedback has a significant impact on student learning performance in blended learning.

3. Research Methods and Materials

3.1 Research Framework

Three basic theoretical frameworks, Rana and Dwivedi (2017), Mahande et al. (2022), and Lee and Lee (2018), enrich and advance the conceptual framework shown in Figure 1.

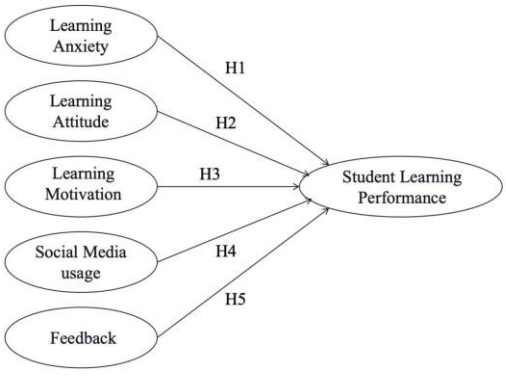

Figure 1: Conceptual Framework

H1: Learning anxiety has a significant impact on student learning performance in blended learning.
H2: Learning attitude has a significant impact on student learning performance in blended learning.
H3: Learning motivation has a significant impact on student learning performance in blended learning.
H4: Social media usage has a significant impact on student learning performance in blended learning.
H5: Feedback has a significant impact on student learning performance in blended learning.

3.2 Research Methodology

The study was divided into three stages: pre-SP, SP, and post-SP. In the initial phase, three experts initiated the assessment utilizing the Project-Objective Consistency (IOC) index. Following this, a pilot test involving 33 participants was conducted using Jamovi to ensure the reliability and consistency of each measurement item. In the subsequent stage, a sample of 289 students was randomly drawn from the target population of a graphic design course to participate in a questionnaire survey, thereby collecting data pertinent to the proposed conceptual framework. Subsequently, all hypotheses were rigorously tested employing multiple linear regression (MLR), with significance levels determined at a P-value threshold <0.05. Hypotheses that met this criterion were retained, while those failing to do so were discarded. During the second stage, strategic planning interventions were developed based on the MLR findings, involving a cohort of 33 students. This strategic plan included the construction of a model for strategic planning interventions, which was informed by interviews conducted with three teachers and 12 students. In the final stage, the current and anticipated Strategic Planning (SP) outcomes were compared using paired sample T-tests. This comprehensive methodology facilitated a meticulous examination of the research's objectives and underlying assumptions, ensuring a robust evaluation process throughout.

3.3 Research Population, Sample Size, and Sampling Procedures

3.3.1 Research Population

This study describes a student performance survey of blended learning modes in the graphic design curriculum area, focusing on fourth-year students at different academic levels. Study participants were from the classes of 2020, 2021, 2022, and 2023, and 289 students filled out questionnaires.

3.3.2 Sample size

In the initial phase of the study, the preliminary diagnostic phase, 15 participants were selected for reliability assessment. This step is essential to assessing the consistency of the research tools used. Then, 289 graphic design students were selected as the research group to conduct multiple linear regression analysis to determine the relationship between the independent variable and the dependent variable. Finally, 33 students were selected as focus groups to participate in the strategic planning intervention.

3.3.3 Sampling Procedures

The researchers conducted multiple samples, and the relevant sampling procedures are as follows:

Sample 1: Pilot survey and pilot test sampling

The researchers randomly selected 33 students and asked them to fill out questionnaires and give feedback on pilot surveys and pilot tests.

Sample 2: Survey sample

A questionnaire survey was conducted on 289 graphic design students of different grades through the online distribution of questionnaires by Wenjuanxing.

Sampling 3: SP sampling

The researchers randomly selected 33 students to participate in the strategic planning intervention.

3.4 Research Instruments

3.4.1 Design of Questionnaire

The questionnaire items used in this study were drawn from four published articles; academic contributions from Mahande et al. (2022) and Song et al. (2020), respectively, provide a powerful framework and measurement tool. To ensure the reliability and validity of the questionnaire content used in the current study. The questionnaire was adjusted for blended teaching mode.

3.4.2 Components of Questionnaire

The questionnaire structure of this study is divided into three different parts. The first part of the questionnaire is to make statistics on the age of students. The second part asks in detail about various factors that affect students' academic performance: learning anxiety, learning attitudes, learning motivation, social media use, and feedback. This exploration was conducted through a mechanism that utilized Likert scales as the primary methodological tool to measure the extent to which respondents agreed or disagreed with the presented statements. Within the scope of this study, based on the pioneering work of Likert (1932), a 5-point Likert scale was wisely chosen to measure responses. The scale was carefully designed to span the respondents' range of agreement, starting with "strongly disagree" (1), moving through "disagree" (2), "neutral" (3), "agree" (4), and finally reaching "strongly agree" (5). This grading facilitates a fine-grained analysis of student attitudes, enabling a detailed assessment of how various factors affect student performance. In the final part of the questionnaire, the focus shifts to assessing students' learning performance in a blended learning environment. This section is critical for assessing such teaching methods' effectiveness and providing empirical evidence for the outcomes associated with integrating traditional and digital learning models.

3.4.3 IOC Results

Three independent experts and scholars were invited to implement the IOC (Project-Objective et al.); one was an academic expert in career planning, and the other two were faculty colleagues affiliated with the university. In this IOC process, independent experts, scholars, or physicians mark "consistent" as +1, "suspicious" as 0, and "inconsistent" as -1. In this study, all questionnaire items were greater than 0.67, so the researchers retained all questionnaire items.

3.4.4 Pilot survey and Pilot test results

Within this academic study's scope, instrument reliability measurements were made by applying Cronbach's Alpha (CA), a statistical coefficient developed by Cronbach (1951). This coefficient is a hallmark of psychometric assessment and is a powerful indicator of the internal consistency and reliability of survey tools. The threshold of acceptability proposed by Sekaran (1992) is based on a CA coefficient value of 0.60 or higher, a benchmark indicating a satisfactory level of internal consistency and, in turn, the instrument's reliability.

The questionnaire, consisting of 29 questions, was distributed to a cohort of 33 individuals. Following this, a series of rigorous reliability assessments were conducted to determine the consistency and reliability of the responses obtained from the participants. The item-objective congruence (IOC) method, a reliable tool, was used to retain and verify complete questionnaire items. The empirical results from these assessments and the observed degree of correlation were carefully cataloged in the accompanying table. This table proves the robustness of the research tools employed in this study. Notably, every project included in this survey tool surpassed the threshold for reliability testing, consistently scoring above 0.6. The scores for learning anxiety, learning attitude, and learning motivation were 0.630, 0.722, and 0.935 respectively. The evaluation of social media usage yielded a feedback mechanism score of 0.970 and a near-perfect reliability score of 0.971, while student learning performance was equally valued with a score of 0.960.

Table 1: Pilot Test Result

Variable	No. of items	Sources	Cronbach's Alpha	Strength of association
Learning Anxiety	5	Malanchini et al. (2020)	0.630	Moderate
Learning Attitude	5	Malanchini et al. (2020)	0.722	Good
Learning Motivation	5	Malanchini et al. (2020)	0.935	Excellent
Social Media Usage	5	Arslan (2018)	0.971	Excellent
Feedback	4	Dwivedi et al. (2020)	0.970	Excellent
Student Learning Performance	4	Song et al. (2020)	0.960	Excellent

4. Results and Discussion

4.1 Results

4.1.1 Demographic Profile

Table 2 shows the demographic profile of the entire study population (n=289), followed by the selected group of students (n=33) who participated in the strategic planning intervention.

Table 2: Demographic Profile

Entire Research Population (n=289)		Frequency	Percent
Grade	2020	52	17.99%
	2021	7	0.69%
	2022	165	57.09%
	2023	65	22.49%
Total		**289**	**100%**
SP Participants (n=33)		**Frequency**	**Percent**
Gender	Female	23	69.69%
	Male	10	30.30%
Grade	2020	33	100%
Total		**33**	**100%**

4.1.2 Results of multiple linear regression

Multiple linear regression was used to verify the hypothesis. Since independent variables (learning anxiety, learning attitude, learning motivation, social media usage, and feedback) and dependent variables (student learning performance) are continuous variables, the multiple linear regression method can be used for analysis. The following table shows the results of the multiple linear regression method in this study:

Table 3: The multiple linear regression of five independent variables on student learning performance

Variables	Standardized Coefficients Beta	t	P-value	R	R Square
Learning Anxiety	0.010	0.346	0.730	.934	.873
Learning Attitude	-0.025	-0.529	0.597		
Learning Motivation	0.174	2.961*	0.003		
Social media usage	-0.040	-0.608	0.543		
Feedback	0.832	15.370**	<.001		
Dependent variable: Student learning Performance					

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

The results show that the p-value of the independent variable (learning anxiety, feedback) is less than 0.05, indicating that the independent variable (learning anxiety, feedback) significantly impacts the dependent variable. The R-square value is 0.873, indicating that the independent variable accounts for 87.3% of the dependent variable. In addition, the results of significant value ($p < 0.05$) showed that learning anxiety and feedback impacted students' learning performance. By observing the standardized regression coefficient, the standardized regression coefficient of feedback (0.832) is higher than that of learning anxiety (0.174), reflecting the higher impact of feedback on students' learning performance from a statistical perspective.

Therefore, H3: Learning Motivation has a significant impact on Student Learning Performance in Blended Learning. H5: Feedback has a significant impact on Student Learning Performance in Blended Learning. The two are supported by the multiple linear regression (MLR) results. According to the results, H3 and H5 were supported, but H1, H2, and H4 were not supported.

The research hypothesis was tested with MLR results. The following finalized research hypothesis is related to the changes between the pre-SP and post-SP stages on all the sub-variables.

H6: There is a significant mean difference in learning motivation between Pre-SP and Post-SP stages.

H7: There is a significant mean difference in feedback between Pre-SP and Post-SP stages.

H8: There is a significant mean difference in student learning performance between Pre-SP and Post-SP stages.

4.2 Strategic Plan Process

Based on the results of multivariate regression, the authors mainly focus on the intervention of student motivation and feedback. The detailed design of the SP phase takes 12 weeks, and the SP plan includes the time and place, the participants, the purpose of the intervention and tools, and specific activities.

Table 4: Implementation time and activities as Strategic Plan

No.	Time and Duration	Implementation Keywords
1	Week1	Team establishment Questionnaire
2	Week 2-3	Goal Setting SWOT analysis
3	Week 4-6	Encourage students to adopt blended learning methods The cultivation and stimulation of student learning motivation Train students in the use of social media for blended learning platforms Correct students' learning attitude
4	Week 7-8	Encourage students to participate in project-based teaching The cultivation and stimulation of student learning motivation Relieve student learning anxiety Classroom observation and feedback
5	Week 9-11	Encourage students to participate in project-based teaching The cultivation and stimulation of student learning motivation Relieve student learning anxiety Classroom observation and feedback
6	Week 10-12	Interview and summary

4.3 Results Comparison between Pre-IDI and Post-IDI

The researchers conducted a test analysis of all six variables to determine whether learning motivation and feedback differed in the pre-SP and post-SP stages.

Table 5: Paired-Sample T-Test Results

Variables	Mean	SD	p-value
Learning Anxiety (LAN)			
Pre-Strategic Plan	3.41	0.617	0.730
Post-Strategic Plan	3.73	0.665	
Learning Attitude (LAT)			
Pre-Strategic Plan	3.51	0.689	0.597
Post-Strategic Plan	3.87	0.644	
Learning Motivation (LMO)			
Pre-Strategic Plan	3.57	0.788	0.003
Post-Strategic Plan	4.09	0.832	
Social media usage (SMU)			
Pre-Strategic Plan	3.64	0.787	0.543
Post-Strategic Plan	4.32	0.803	
Feedback (FDB)			
Pre-Strategic Plan	3.65	0.781	<0.001
Post-Strategic Plan	4.34	0.747	
Student Learning Performance in Blended Learning (SLPBL)			
Pre-Strategic Plan	3.65	0.792	
Post-Strategic Plan	4.23	0.774	

Learning anxiety increased significantly in the post-SP stage (M=3.73, SD=0.665) and pre-SP stage (M=3.41, SD=0.617), and the mean difference between the post-SP stage and the pre-SP stage was 0.32. Therefore, there is a significant mean difference between pre-SP and post-SP learning anxiety.

Another significant finding was the increase in learning attitude in the post-SP stage (M=3.87, SD=0.644) compared to the pre-SP stage (M=3.51, SD=0.689), with a mean difference of 0.36. This also points to a significant mean difference in learning attitudes between the pre-SP and post-SP stages.

One of the most encouraging findings was the significant increase in learning motivation in the post-SP stage (M=4.09, SD=0.832) compared to the pre-SP stage (M=3.57, SD=0.788), with a mean difference of 0.52. This highlights a significant mean difference in learning motivation between the pre-SP and post-SP stages, indicating a positive impact of the intervention.

Social media usage increased significantly in the post-SP phase (M=4.32, SD=0.803) and pre-SP phase (M=3.64, SD=0.787), with a mean difference of 0.68 between the post-SP and pre-SP phases. Therefore, there is a significant mean difference between pre-SP and post-SP social media usage.

Feedback increased significantly in the post-SP stage (M=4.34, SD=0.747) and pre-SP stage (M=3.65, SD=0.781), with a mean difference of 0.69 between the two. Therefore, there is a significant mean difference between pre-SP and post-SP feedback.

The learning performance in blended learning was significantly increased in the post-SP stage (M=4.23, SD=0.774) and pre-SP stage (M=3.65, SD=0.792), and the mean difference between the post-SP stage and the pre-SP stage was 0.58. Therefore, there is a significant mean difference in learning performance between pre-SP and post-SP blended learning.

The above descriptive analysis results allow the following conclusions: First, all six variables had significant average differences between the post-SP and pre-SP phases. Second, the researchers found that learning motivation and feedback outcomes increased significantly during the pre- and post-SP stages.

5. Conclusions, Recommendations and Limitations

5.1 Conclusions & Discussions

This study examines the influence of five independent variables, namely, learning anxiety, learning attitude, learning motivation, social media use, and feedback, on the learning performance of blended learning students. This study used a comprehensive study design, data collection, and methodology to draw meaningful conclusions. The study design used the project-objective Agreement index (IOC) to measure validity, and Cronbach's Alpha was used as a pilot test to ensure the reliability of the measurement tool. This rigorous measurement method reinforces the credibility of the study. Data were collected from 289 valid responses from graphic design students of Liaoning Polytechnic Vocational College, and multiple linear regression analysis was performed to verify the significant relationship between independent and dependent variables. In addition, a 12-week Strategic Program (SP) was conducted with 33 students. After SP data is collected, the paired sample T-test compares the results between the current and expected state of strategic planning (SP). This statistical analysis helps identify significant differences or similarities between two data sets. At the same time, qualitative methods were used to conduct in-depth interviews with six students in our class to assess the effectiveness of specific strategies and activities to enhance learning motivation and provide constructive feedback. These interviews' comprehensive insights and opinions enrich our research, providing a holistic understanding of teaching activities and their effects on learning feedback.

The results of this study have practical implications for educators, researchers, and professionals in the field of education and psychology. They show that enhancing learning motivation and providing effective feedback can significantly improve students' academic performance, providing actionable insights that can be applied to teaching practices and student support strategies.

5.2. Recommendations

The results of this study show that learning motivation and feedback significantly impact improving students' learning performance. Suggestions will be made in the following four aspects.

Teachers can optimize the learning experience by structuring course content into modular units with clear objectives and assessment criteria. This method enables students to master knowledge systematically. Different learning resources, such as videos, interactive quizzes, and forums, are available to cater to different learning styles. Meaningful educational activities, such as combining real-world cases with design themes, increase engagement by asking challenging, open-ended questions. Questions should span different cognitive levels to stimulate critical thinking, analytical skills, evaluation skills, and innovation. Group discussion, role play, experiential learning, and other interactive ways to enrich the learning experience. These strategies foster an inclusive learning environment that supports diverse student needs, promotes deep engagement with course content, and enhances student motivation.

Due to the flexibility of blended learning, effective time management is critical. Educators can support students by establishing clear learning goals and expected outcomes to help them develop an organized learning plan. Through video, audio recording, design materials, cases, and other learning resources to enrich independent learning, deepen understanding, and promote exploration. Interaction and cooperative learning are key. Use online communication tools to facilitate student interaction so that experiences and resources are shared to enhance learning. Collaborative activities such as group discussions and projects deepen engagement with the course material and promote peer learning. In addition, students must develop effective information retrieval and assessment skills to enhance critical thinking and ensure the effectiveness of their self-directed learning.

5.3 Limitations for Future Research

Some limitations to this study need further research. First, MLR's sample results may need to fully present the broader student population enrolled in graphic design programs due to the limited number of student participants. Students from different institutions and backgrounds may have different learning experiences and outcomes. Therefore, future studies should include more students from different departments who will complete the questionnaire, resulting in more comprehensive and representative results.

Moreover, the students involved in this study are primarily from graphic design majors in vocational colleges, where the focus is on practical skills and creative thinking. However, the challenge of designing teaching activities that effectively improve learning motivation in purely theoretical courses is a significant one. It is crucial that future research explores the development of tailored activities to promote learning motivation in different types of courses, as this is a key aspect of effective education that cannot be overlooked.

Finally, while this study focuses on student academic performance, existing assessment tools and standards may only partially capture the breadth of student progress and

achievement in blended learning environments. This limitation is especially important for abilities like creative and design thinking, which are inherently difficult to quantify. To address this issue, future research should take a multifaceted approach to assessment and develop individualized assessment criteria that more accurately reflect each student's progress and achievement. By changing the one-size-fits-all assessment approach, this approach will provide a more holistic view of students' learning outcomes, promoting their all-around development in practical skills and innovative thinking.

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