

# A Case Study of University Students' Learning Performance in Finance Education Through Blended Learning in Chongqing, China

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Received: March 15, 2025. Revised: May 15, 2025. Accepted: May 22, 2025.

## Abstract

**Purpose:** This study aims to evaluate the factors influencing students' learning performance in finance education within a blended learning model at a public university in Chongqing. **Research design, data and methodology:** A quantitative research method was employed, utilizing a structured questionnaire to collect data from 80 finance students selected through purposive sampling. The questionnaire measured Cognitive Presence (CP), Teaching Presence (TP), Learning Motivation (LM), Interaction (INT), and Satisfaction (SAT). To ensure validity and reliability, the Item-Objective Congruence (IOC) index and Cronbach's Alpha test were applied, demonstrating strong content validity and internal consistency ( $\alpha > 0.70$ ). Data analysis was performed using Multiple Linear Regression (MLR) to examine the relationships among the variables and their influence on Students' Learning Performance (SLP). Additionally, an Intervention Design Implementation (IDI) was conducted with 30 students to assess changes in learning performance, supported by paired-sample t-tests. **Results:** The findings revealed that the conceptual research model successfully predicted and explained CP, TP, LM, INT, and SAT, all of which were identified as significant predictors of Students' Learning Performance (SLP) at the  $p < 0.05$  level. **Conclusions:** The study recommends that finance course instructors and higher education administrators prioritize improving quality factors influencing learning performance to enhance students' perceptions of the system's usefulness, thereby fostering positive attitudes toward blended learning.

**Keywords:** Blended Learning, Learning Performance, Finance Education, China

**JEL Classification Code:** A22, I23, L86, O30

## 1. Introduction

In recent years, the rapid advancement of digital technology has significantly transformed the landscape of higher education, particularly with the rise of blended learning models that combine online and face-to-face instruction (Graham, 2013). Blended learning has gained widespread popularity due to its flexibility, accessibility, and ability to cater to diverse learning styles (Hrastinski, 2019). This approach has become especially relevant in finance education, where a balance between theoretical knowledge and practical application is crucial (Alonso-García et al., 2019). However, despite its potential, the effectiveness of blended learning in enhancing students' academic performance remains a subject of debate, particularly in the

post-pandemic era, where both students and educators are still adapting to this hybrid model (Adedoyin & Soykan, 2020). This study explores the factors influencing students' learning performance in blended learning environments, focusing on a public university in Chongqing, China.

The COVID-19 pandemic marked a pivotal moment in the evolution of educational delivery methods, forcing a sudden shift from traditional face-to-face instruction to fully online learning (Hodges et al., 2020; Trust & Whalen, 2020). While this transition highlighted the potential of digital tools to ensure continuity in education, it also exposed significant challenges, such as limited technological infrastructure, varying levels of digital literacy, and difficulties in maintaining student engagement (Bao, 2020; Dhawan, 2020). As campuses reopened, there was a gradual shift from

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fully online learning to blended learning models, which integrate the strengths of traditional in-person instruction and online components (Boelens et al., 2017). For finance education, blended learning offers a unique opportunity to combine theoretical knowledge delivered online with practical, hands-on activities conducted in the classroom (Alonso-García et al., 2019; Costin et al., 2018). However, the adoption of blended learning is still nascent, with only two to three years of experimentation and adaptation since the pandemic. Both students and instructors are navigating this new educational landscape, exploring how best to balance online and offline components to optimize learning outcomes.

This study focuses on five key variables influencing students' learning performance in blended learning environments: cognitive presence, teaching presence, learning motivation, interaction, and satisfaction. Cognitive presence refers to students' ability to construct meaning through critical thinking and reflection, while teaching presence encompasses instructors' design, facilitation, and direction of learning activities (Garrison et al., 2001). Learning motivation reflects students' intrinsic and extrinsic drive to engage in learning (Deci & Ryan, 2000), and interaction involves the dynamic exchange of ideas between students, instructors, and course content (Moore, 1989). Satisfaction measures students' overall contentment with their blended learning experience (Sun et al., 2008). This research provides actionable insights for educators and policymakers to refine and improve blended learning practices in finance education by examining these variables.

The significance of this study lies in its potential to contribute to the ongoing discourse on educational innovation and digital transformation (Means et al., 2013; Picciano, 2019). By identifying the challenges and opportunities associated with blended learning, this research aims to enhance the quality and effectiveness of finance education in higher education institutions (Vaughan, 2014). Furthermore, the findings of this study can inform the development of more engaging, flexible, and student-centered learning environments that prepare students for the complexities of the modern financial world (Alonso-García et al., 2019). Ultimately, this research addresses the gaps in the current literature and offers practical recommendations for optimizing blended learning models to meet the evolving needs of students and educators in the digital age.

## 2. Literature Review

### 2.1 Cognitive Presence (CP)

Cognitive presence, a key component of the Community of Inquiry (CoI) framework, refers to how learners construct

and validate meaning through critical thinking, reflection, and discourse in a learning environment (Akyol & Garrison, 2011). It is vital in fostering deep and meaningful learning, particularly in blended learning settings where students must navigate online and face-to-face interactions. Research has consistently demonstrated a strong positive relationship between cognitive presence and students' learning performance, as it enables learners to engage actively with course content, solve problems, and apply theoretical knowledge to practical contexts (Cheng, 2022; Yin & Yuan, 2021).

In blended learning environments, cognitive presence is often influenced by the design of learning activities, instructor facilitation quality, and student engagement. Studies suggest that case studies, problem-solving tasks, and collaborative discussions can enhance cognitive presence by encouraging students to think critically and reflect on their learning. However, challenges such as limited interaction, lack of timely feedback, and insufficient opportunities for deep engagement can hinder the development of cognitive presence. Addressing these challenges through targeted interventions, such as structured discussions and reflective exercises, can potentially improve students' cognitive engagement and overall learning outcomes. The following hypotheses are proposed to examine the role of cognitive presence in this study:

**H1:** Cognitive presence has a significant impact on students' learning performance.

### 2.2 Teaching Presence (TP)

Teaching presence, another critical element of the Community of Inquiry (CoI) framework, refers to the design, facilitation, and direction of cognitive and social processes to achieve meaningful learning outcomes (Anderson et al., 2001). It encompasses the instructor's role in creating an engaging and supportive learning environment, providing clear guidance, and fostering student interaction. In blended learning, teaching presence is essential for bridging the gap between online and face-to-face instruction, ensuring students feel supported and motivated throughout their learning journey. Research has shown that effective teaching presence positively influences students' satisfaction, engagement, and academic performance (Shea & Bidjerano, 2009; Yin & Yuan, 2021).

The quality of teaching presence in blended learning is often determined by factors such as course design, timely feedback, and the instructor's ability to facilitate discussions and provide personalized support. Challenges such as limited instructor availability, inconsistent feedback, and poorly structured online activities can diminish teaching presence, reducing student engagement and performance. Interventions aimed at enhancing teaching presence, such as

improved communication strategies, structured feedback mechanisms, and interactive teaching methods, have the potential to address these challenges and create a more effective learning environment. The following hypotheses are proposed to examine the role of teaching presence in this study:

**H2:** Teaching presence has a significant impact on students' learning performance.

## 2.3 Learning Motivation (LM)

Learning motivation refers to the internal and external factors that drive students to engage in, persist with, and strive for success in learning activities (Wang et al., 2016). It plays a crucial role in determining students' level of engagement, effort, and persistence in blended learning environments. Research has consistently shown that motivated students are more likely to achieve higher academic performance as they can better set goals, overcome challenges, and apply effective learning strategies (Harandi, 2015; Mahande et al., 2022).

In blended learning, motivation can be influenced by factors such as course relevance, instructor support, peer interaction, and the flexibility of the learning environment. However, lack of face-to-face interaction, isolation, and insufficient alignment between course content and students' interests can negatively impact motivation. Interventions that enhance intrinsic motivation, such as goal-setting activities, personalized feedback, and collaborative learning opportunities, can help address these challenges and improve students' overall learning experience. The following hypotheses are proposed to examine the role of learning motivation in this study:

**H3:** Learning motivation has a significant impact on students' learning performance.

## 2.4 Interaction (INT)

Interaction, a cornerstone of effective learning, refers to the dynamic exchange of ideas and information between students, instructors, and course content (Moore, 1989). In blended learning environments, interaction is critical for fostering engagement, collaboration, and a sense of community among learners. Research has shown that high levels of interaction, particularly between students and instructors, positively influence students' satisfaction, motivation, and academic performance (Sabry & Baldwin, 2003; Zeqiri et al., 2021).

Despite its importance, interaction in blended learning can be hindered by limited opportunities for real-time communication, lack of structured collaborative activities, and technical barriers. To address these challenges, interactive discussion forums, group projects, and real-time

virtual sessions can be implemented to enhance interaction and create a more engaging learning environment. The following hypotheses are proposed to examine the role of interaction in this study:

**H4:** Interaction has a significant impact on students' learning performance.

## 2.5 Satisfaction (SAT)

Satisfaction with blended learning reflects students' overall contentment with their learning experience, including course design, instructor support, and the effectiveness of online and offline components (Almaiah et al., 2019). It is a key indicator of the success of blended learning models, as satisfied students are more likely to remain engaged, motivated, and committed to their studies. Research has consistently demonstrated a strong positive relationship between satisfaction and students' learning performance, highlighting its importance in creating a positive and effective learning environment (Hooper, 2012; Rienties, 2014).

Challenges such as technical issues, lack of timely feedback, and insufficient alignment between course content and students' needs can negatively impact satisfaction. Interventions aimed at improving satisfaction, such as enhancing the usability of online platforms, providing timely and constructive feedback, and offering personalized support, can help address these challenges and create a more satisfying learning experience. The following hypotheses are proposed to examine the role of satisfaction in this study:

**H5:** Satisfaction has a significant impact on students' learning performance.

## 2.6 Student's Learning Performance (SLP)

Students' learning performance refers to the measurable outcomes of their academic efforts, including knowledge acquisition, skill development, and the ability to apply learning to real-world contexts (Yin & Yuan, 2021). In blended learning environments, performance is influenced by a combination of factors, including cognitive presence, teaching presence, learning motivation, interaction, and satisfaction. Research has shown that students who actively engage with course content, receive timely feedback, and participate in collaborative activities tend to achieve higher levels of academic performance (Mahande et al., 2022; Zeqiri et al., 2021).

Challenges such as limited interaction, lack of motivation, and insufficient support can hinder students' performance in blended learning. Interventions that address these challenges, such as structured learning activities, enhanced instructor support, and opportunities for peer collaboration, can potentially improve students' academic outcomes and overall learning experience.

### 3. Research Methods and Materials

#### 3.1 Research Framework

The researcher applied three model theories from Yin and Yuan (2021), Mahande et al. (2022), and Zeqiri et al. (2021). Yin and Yuan (2021) explored the impact of digital learning environments on student engagement and academic achievement, highlighting key factors that influence blended learning effectiveness. Mahande et al. (2022) examined the role of interactive teaching strategies in finance education, emphasizing how technology integration enhances students' conceptual understanding and retention. Zeqiri et al. (2021) investigated the relationship between self-regulated learning and performance outcomes in online and hybrid learning models, underscoring the importance of adaptability and learner autonomy. The conceptual framework presented in Figure 1 was developed and supported by these three theoretical frameworks to evaluating university students' learning performance in finance education through blended learning.

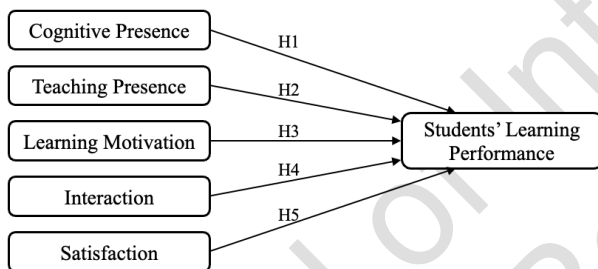


Figure 1: Conceptual Framework

#### 3.2 Research Methodology

This study employed a mixed-methods approach to explore factors influencing students' learning performance in blended learning. Conducted in three phases—pre-IDI, IDI intervention, and post-IDI—the research combined quantitative and qualitative data collection. In the pre-IDI phase, questionnaires were distributed to 80 finance students at a public university in Chongqing, China, measuring cognitive presence, teaching presence, learning motivation, interaction, satisfaction, and learning performance. Additionally, interviews with 12 students provided deeper insights. Multiple linear regression (MLR) analyzed relationships between variables.

The IDI intervention phase targeted key areas identified in pre-IDI, engaging 30 students in group and individual mentoring, discussions, and structured activities over eight weeks. Observations, progress tracking, and participant feedback assessed intervention effectiveness. In the post-IDI

phase, the same questionnaire and interview protocols were administered to 30 participants. Paired-sample t-tests compared pre- and post-IDI results, while thematic analysis of interviews offered further insights. This comprehensive methodology provided a robust evaluation of blended learning outcomes and IDI strategy effectiveness.

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

##### 3.3.1 Research Population

The research population consisted of students enrolled in finance-related courses at a public university in Chongqing, China. These students were selected from five majors: Finance, International Economics and Trade, Financial Management, Accounting and Auditing, and Business English. The total population included 2,308 students across these majors, representing diverse learners with varying academic backgrounds and experiences in blended learning environments. This population was chosen to ensure a comprehensive understanding of the factors influencing learning performance in blended finance education.

##### 3.3.2 Sample Size

The study employed a multi-stage sampling approach to determine the sample size. In the pre-IDI phase, 80 students were selected from the research population to participate in the initial survey. This sample size was determined based on the rule of thumb in regression analysis, which recommends a minimum of 10 to 15 observations per predictor variable to ensure reliable estimates and adequate statistical power (Green, 1991; VanVoorhis & Morgan, 2007). For the IDI intervention phase, a subset of 30 students was chosen from the initial sample to participate in the targeted interventions. According to Creswell and Creswell (2018), this number is generally acceptable for experimental designs where focused interventions are evaluated over time. The same 30 students were included in the post-IDI phase to allow for a comparative analysis of the pre- and post-intervention results. This sample size was deemed sufficient to provide meaningful insights while maintaining feasibility, aligning with best practices for educational research (Creswell & Creswell, 2018).

##### 3.3.3 Sampling Procedure

The sampling process involved purposive sampling to ensure the selection of participants with relevant experience in blended learning. In the pre-IDI phase, questionnaires were distributed to 80 students using the Wenjuanxing platform, a popular online survey tool in China. For the IDI phase, 30 students were selected based on their active engagement in class and willingness to participate in the intervention. These participants were chosen to represent



diverse academic years and majors, ensuring a balanced and representative sample. The same group of 30 students was retained for the post-IDI phase, allowing for a paired-sample analysis to evaluate the effectiveness of the interventions. This systematic sampling approach ensured the reliability and validity of the study's findings.

### 3.4 Research Instruments

#### 3.4.1 Questionnaire Design

The researcher designed the survey questionnaire in the following three steps.

Step 1: Identifying questionnaire sources from five openly published articles (Cheng, 2022; Li & Phongsatha, 2022; Mahande et al., 2022; Yin & Yuan, 2021; Zeqiri et al., 2021).

Step 2: Adapt and contextualize survey questionnaires for Chinese university students.

Step 3: Implementing IOC.

#### 3.4.2 Questionnaire Components

The survey questionnaire consisted of three main sections:

Part 1: Screening Questions. Screening questions were included to exclude individuals outside the research population.

Part 2: Basic Info Questions. Questions were designed to collect demographic information about the research population, such as gender and age.

Part 3: Pre-survey Questions. Pre-survey questions assessed the current levels of the independent variables (IVs) and dependent variable (DV).

#### 3.4.3 IOC Results

The Index of Item-Objective Congruence (IOC) was conducted to evaluate the questionnaire's content validity, with three experts independently assessing each item. CP3 and LM2 were removed as they did not meet the required threshold of 0.5. The remaining 23 items achieved satisfactory IOC scores, ranging from 0.67 to 1.00, confirming their alignment with the research objectives and ensuring the questionnaire's validity for data collection. This rigorous validation process enhanced the reliability and credibility of the research instrument.

#### 3.4.4 Reliability and Validity

The researcher conducted a pilot survey by distributing the finalized questionnaire to 30 students randomly selected from the research population, asking them to complete the survey and provide feedback. Following this, Cronbach's Alpha internal consistency reliability test was performed to assess the reliability of the questionnaire. According to Nunnally and Bernstein (1994), Cronbach's Alpha values

should be equal to or greater than 0.7 to indicate acceptable reliability. The results, as shown in the table below, demonstrated that all constructs met or exceeded the threshold, confirming the high reliability of the questionnaire for each variable.

**Table 1:** Pilot Test Result (n=30)

| Variable | Source of Questionnaire (Measurement Indicator) | No. of Items | Cronbach's Alpha | Strength of Association |
|----------|---|--------------|------------------|-------------------------|
| CP       | Yin and Yuan (2021)                             | 4            | 0.658            | Questionable            |
| TP       | Yin and Yuan (2021)                             | 3            | 0.694            | Questionable            |
| LM       | Mahande et al. (2022)                           | 3            | 0.812            | Good                    |
| INT      | Li and Phongsatha (2022)                        | 3            | 0.837            | Good                    |
| SAT      | Cheng (2022)                                    | 4            | 0.709            | Acceptable              |
| SLP      | Zeqiri et al. (2021)                            | 5            | 0.830            | Good                    |

## 4. Results and Discussion

### 4.1 Demographic Profile

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

**Table 2:** Demographic Information

| Entire Research Population (n=80) |                                   | Frequency | Percentage |
|-----------------------------------|-----------------------------------|-----------|------------|
| Gender                            | Male                              | 35        | 43.8       |
|                                   | Female                            | 45        | 56.2       |
| Grade                             | Freshman                          | 10        | 12.4       |
|                                   | Sophomore                         | 25        | 31.3       |
|                                   | Junior                            | 25        | 31.3       |
|                                   | Senior                            | 20        | 25.0       |
| Major                             | Finance                           | 14        | 17.5       |
|                                   | International Economics and Trade | 16        | 20.0       |
|                                   | Financial Management              | 15        | 18.8       |
|                                   | Accounting and Auditing           | 10        | 12.4       |
|                                   | Business English                  | 25        | 31.3       |
| IDI Participants (n=30)           |                                   | Frequency | Percentage |
| Gender                            | Male                              | 12        | 40.0       |
|                                   | Female                            | 18        | 60.0       |
| Grade                             | Freshman                          | 4         | 13.3       |
|                                   | Sophomore                         | 9         | 30.0       |
|                                   | Junior                            | 9         | 30.0       |
|                                   | Senior                            | 8         | 26.7       |
| Major                             | Finance                           | 5         | 16.7       |
|                                   | International Economics and Trade | 6         | 20.0       |
|                                   | Financial Management              | 6         | 20.0       |
|                                   | Accounting and Auditing           | 4         | 13.3       |
|                                   | Business English                  | 9         | 30.0       |

## 4.2 Multiple Linear Regression

The researcher conducted Multiple Linear Regression (MLR) on the survey questionnaire results collected from 80 participants to determine whether each hypothesis was supported. A total of six research hypotheses were tested, with the first five examining the impact of independent variables (cognitive presence, teaching presence, learning motivation, interaction, and satisfaction) on the dependent variable, students' learning performance (SLP). Based on the Variance Inflation Factor (VIF) analysis, multicollinearity was not a concern, as all VIF values were below 5 (Hair et al., 1995). The R-squared ( $R^2$ ) value of the multiple linear regression model indicated that the five independent variables collectively accounted for 74.6% of the variability in students' learning performance, demonstrating a strong explanatory power of the model

**Table 3:** The Multiple Linear Regression of Five Independent Variables on Students' Learning Performance

| Variable   | Standardized Coefficients Beta Value | t-value | p-value | VIF  | R <sup>2</sup> |
|--|--------------------------------------|---------|---------|------|----------------|
| Cognitive Presence                                 | 0.1921                               | 2.497   | 0.015*  | 2.66 | 0.746          |
| Teaching Presence                                  | 0.1787                               | 2.096   | 0.040*  | 1.11 |                |
| Learning Motivation                                | 0.1064                               | 2.135   | 0.036*  | 1.43 |                |
| Interaction  | -0.0181                              | -0.273  | 0.785   | 1.75 |                |
| Satisfaction                                       | 0.4931                               | 7.092   | <.001*  | 2.13 |                |
| Dependent Variable: Students' Learning Performance |                                      |         |         |      |                |

Note: p-value <0.05\*

The results revealed that four of the five hypotheses were supported: H1 (cognitive presence), H2 (teaching presence), H3 (learning motivation), and H5 (satisfaction) had a significant impact on students' learning performance. However, H4 (interaction) was not supported, indicating that interaction did not significantly influence students' learning performance in this context. Given this finding, the researcher removed the independent variable "interaction" from further analysis and adjusted the hypotheses accordingly.

Following the MLR analysis, the Intervention Design and Implementation (IDI) was conducted based on the revised hypotheses. The post-IDI hypotheses focused on examining the mean differences between the pre-IDI and post-IDI phases for each variable:

H6: There is a significant mean difference in cognitive presence between pre-IDI and post-IDI.

H7: There is a significant mean difference in teaching presence between pre-IDI and post-IDI.

H8: There is a significant mean difference in learning motivation between pre-IDI and post-IDI.

H9: There is a significant mean difference in interaction between pre-IDI and post-IDI.

H10: There is a significant mean difference in satisfaction between pre-IDI and post-IDI.

H11: There is a significant mean difference in students' learning performance between pre-IDI and post-IDI.

## 4.3 IDI Intervention Stage

The IDI Intervention plan lasted for 14 weeks and was based on quantitative and qualitative data collected at the pre-IDI stage to achieve the purpose of this research, which was to develop cognitive presence, teaching presence, learning motivation, interaction, and satisfaction to enhance students' learning performance. The researcher illustrated the IDI intervention in chronological order, as illustrated in Table 4.

**Table 4:** IDI Activities

| No. | Time and Duration | Objective                    | Plan Keywords                           |
|-----|-------------------|------------------------------|---|
| 1   | Week 1            | Establish experimental group | Meeting group members<br>Setting goals  |
| 2   | Week 2-3          | First interview              | Define goals<br>Group interview         |
| 3   | Week 4-10         | Mentoring                    | Group mentoring<br>Individual mentoring |
| 4   | Week 11-12        | Second interview             | Individual interview<br>Feedback        |

## 4.4 Results Comparison between Pre-IDI and Post-IDI

The researcher conducted a paired-sample t-test analysis on all six variables to determine whether there were significant differences between the pre-IDI and post-IDI phases. The results of the paired-sample t-test analysis for the six variables are presented in Table 5 below:

**Table 5:** Paired-sample T-test Results

| Variable                       |          | Mean | SD    | SE     | p-value |
|--------------------------------|----------|------|-------|--------|---------|
| Cognitive Presence             | Pre-IDI  | 3.28 | 0.604 | 0.1103 | 0.011   |
|                                | Post-IDI | 3.77 | 0.744 | 0.1358 |         |
| Teaching Presence              | Pre-IDI  | 3.24 | 0.402 | 0.0734 | <0.001  |
|                                | Post-IDI | 3.66 | 0.515 | 0.0940 |         |
| Learning Motivation            | Pre-IDI  | 3.06 | 0.743 | 0.1357 | <0.001  |
|                                | Post-IDI | 3.82 | 0.559 | 0.1020 |         |
| Interaction                    | Pre-IDI  | 3.17 | 0.688 | 0.1256 | <0.001  |
|                                | Post-IDI | 3.82 | 0.408 | 0.0745 |         |
| Satisfaction                   | Pre-IDI  | 3.18 | 0.533 | 0.0973 | <0.001  |
|                                | Post-IDI | 3.88 | 0.370 | 0.0675 |         |
| Students' Learning Performance | Pre-IDI  | 3.07 | 0.547 | 0.0998 | <0.001  |
|                                | Post-IDI | 3.87 | 0.488 | 0.0893 |         |

Table 5 illustrates the results of the paired-sample t-test analysis of pre-IDI and post-IDI comparison as follows:

Cognitive Presence showed a significant increase from pre-IDI ( $M = 3.28$ ,  $SD = 0.604$ ,  $SE = 0.1103$ ) to post-IDI ( $M$

= 3.77, SD = 0.744, SE = 0.1358), with a mean difference of 0.49 ( $p = 0.011$ ). This supports H6, indicating a significant difference in cognitive presence.

Teaching Presence increased significantly from pre-IDI ( $M = 3.24$ , SD = 0.402, SE = 0.0734) to post-IDI ( $M = 3.66$ , SD = 0.515, SE = 0.0940), with a mean difference of 0.42 ( $p < 0.001$ ). This supports H7, confirming a significant difference in teaching presence.

Learning Motivation improved notably from pre-IDI ( $M = 3.06$ , SD = 0.743, SE = 0.1357) to post-IDI ( $M = 3.82$ , SD = 0.559, SE = 0.1020), with a mean difference of 0.76 ( $p < 0.001$ ). This validates H8, reflecting a meaningful change in learning motivation.

Interaction demonstrated a significant rise from pre-IDI ( $M = 3.17$ , SD = 0.688, SE = 0.1256) to post-IDI ( $M = 3.82$ , SD = 0.408, SE = 0.0745), with a mean difference of 0.65 ( $p < 0.001$ ). This supports H9, showing a marked difference in interaction levels.

Satisfaction increased significantly from pre-IDI ( $M = 3.18$ , SD = 0.533, SE = 0.0973) to post-IDI ( $M = 3.88$ , SD = 0.370, SE = 0.0675), with a mean difference of 0.70 ( $p < 0.001$ ). This confirms H10, demonstrating a significant change in student satisfaction.

Students' Learning Performance showed a substantial improvement from pre-IDI ( $M = 3.07$ , SD = 0.547, SE = 0.0998) to post-IDI ( $M = 3.87$ , SD = 0.488, SE = 0.0893), with a mean difference of 0.80 ( $p < 0.001$ ). This supports H11, indicating a significant difference in learning performance.

According to the paired-sample t-test results demonstrated above, the researcher reached the following conclusions: all six variables had significant mean increases between the post-IDI stage and the pre-IDI stage.

## 5. Conclusions and Recommendation

### 5.1 Conclusions

This study explored the key factors influencing students' learning performance in a blended learning environment in financial education. The research identified significant relationships between these variables and students' academic outcomes by examining cognitive presence, teaching presence, learning motivation, interaction, and satisfaction. The findings highlight that cognitive presence, teaching presence, learning motivation, and satisfaction are critical determinants of learning performance, while interaction did not show a statistically significant impact. This suggests that while collaborative and interactive elements are important, their influence on learning outcomes may be indirect or context-dependent.

The intervention phase of the study, which included structured group discussions, personalized tutoring, and enhanced instructional design, demonstrated measurable improvements in all six variables. This underscores the importance of targeted interventions in optimizing blended learning environments. For instance, fostering cognitive presence through activities that promote critical thinking and reflection and enhancing teaching presence through clear instructional design and timely feedback can significantly boost students' engagement and performance. Additionally, addressing learning motivation by aligning course content with students' career goals and interests can further enhance their commitment to learning.

The study also revealed that satisfaction is pivotal in shaping students' attitudes toward blended learning. Students who perceive the system as useful and user-friendly are more likely to engage actively and achieve better outcomes. This aligns with previous research emphasizing the importance of user experience in technology-enhanced learning environments.

However, the non-significant impact of interaction warrants further investigation. While interaction is often considered a cornerstone of blended learning, its limited influence in this study may be attributed to the specific context of financial education, where individual cognitive engagement and instructor guidance might outweigh peer-to-peer interactions. Alternatively, it could reflect limitations in designing or implementing interactive components during the intervention.

These findings have practical implications for educators and policymakers in higher education. To maximize the effectiveness of blended learning, institutions should prioritize strategies that strengthen cognitive and teaching presence, such as incorporating problem-based learning and providing robust instructor support. Additionally, fostering intrinsic motivation and ensuring high levels of student satisfaction through user-friendly platforms and relevant content is essential.

In conclusion, this study contributes to the growing knowledge of blended learning by identifying key factors influencing learning performance in financial education. While the results are promising, further research is needed to explore interaction's role and validate these findings across different disciplines and cultural contexts. By addressing these gaps, educators can continue to refine blended learning models, ensuring they meet the evolving needs of students in an increasingly digital world.

### 5.2 Recommendations

This study offers several actionable recommendations for educators, instructional designers, and higher education institutions to enhance the effectiveness of blended learning

in financial education. First, strengthening cognitive presence is essential. Educators should incorporate problem-based learning and case studies to encourage critical thinking and practical application of knowledge. Reflective practices like journals or portfolios can help students analyze their learning processes and deepen their understanding.

Second, teaching presence must be prioritized. Clear communication of course objectives, timely feedback, and personalized support through learning management systems (LMS) are crucial. Instructors should leverage technology to monitor student progress and provide targeted assistance, ensuring students feel guided and supported throughout their learning journey.

Third, fostering learning motivation is key to student engagement. Aligning course content with students' career goals, introducing gamified elements like badges or leaderboards, and encouraging self-directed learning can boost intrinsic and extrinsic motivation. When students see the material's relevance to their future careers, they are more likely to remain engaged and committed.

Fourth, improving student satisfaction is vital for the success of blended learning. Institutions should ensure that online platforms are user-friendly and accessible, offering robust technical support to address any issues. Regularly soliciting student feedback and making iterative improvements based on their input can enhance satisfaction and overall learning experiences.

While interaction did not significantly impact this study, it remains an important component of blended learning. Educators should design meaningful collaborative activities, such as group projects or peer reviews, and balance synchronous and asynchronous interactions to accommodate diverse learning preferences. Training instructors in facilitation skills can also help create a sense of community and engagement in online environments.

Finally, institutional support is critical for the successful implementation of blended learning. Universities should invest in technological infrastructure, provide ongoing faculty training, and promote a culture of innovation. Future research should explore the long-term impact of blended learning across different disciplines and leverage data analytics to inform continuous improvement.

By adopting these recommendations, educators and institutions can create more effective blended learning environments, ultimately improving student outcomes and preparing them for success in the modern financial world.

### 5.3 Limitation and Further Study

While this study provides valuable insights into the factors influencing blended learning effectiveness, it has several limitations that should be addressed in future

research. First, the study was conducted in a single university in China, limiting the generalizability of the findings to other cultural or institutional contexts. Second, the sample size, particularly during the intervention phase, was relatively small, which may affect the robustness of the results. Third, the study focused primarily on financial education, and the findings may not fully apply to other disciplines. Fourth, the reliance on self-reported data through questionnaires introduces the potential for response bias. Finally, the study did not explore the long-term impact of blended learning on student outcomes, such as career readiness or lifelong learning habits. Future research should address these limitations by expanding the scope to include diverse contexts, larger sample sizes, and longitudinal designs.

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