



## Research on the Factors Impacting University Students' Satisfaction in Blended Learning: A Case Study on Private University in Guangzhou, China

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### Abstract

**Background and Aim:** With the advancement of education informatization, blended learning has developed rapidly in the world. China is also actively promoting blended learning to improve the quality of education. Taking a private university in Guangzhou as a case, this study aims to explore college students' satisfaction with blended learning and its influencing factors.

**Materials and Methods:** In this study, 80 students from a private university in Guangzhou were the sample by using the methods of questionnaire and interview. The questionnaire design is based on a literature review and related theoretical models, covering multiple dimensions such as teacher support, student expectations, course design, perceived usefulness, and perceived ease of use. The validity of the questionnaire structure was verified by the goal consistency index (IOC), and the reliability of the questionnaire was evaluated by a pilot test and Cronbach's  $\alpha$  coefficient. Descriptive statistics, correlation analysis, and multiple linear regression (MLR) were used for data analysis, and a paired sample t-test was used to evaluate the implementation effect of the strategic plan.

**Results:** Multiple linear regression analysis shows that course design and perceived ease of use have a significant positive impact on students' satisfaction, while students' expectation has a significant negative impact. The influence of teacher support and perceived usefulness is not significant. Paired sample t-test results show that after the implementation of the strategic plan, the satisfaction of each variable is significantly improved, indicating that the optimization measures are effective.

**Conclusion:** This study reveals that course design, perceived ease of use, and students' expectations are the key factors affecting college students' blended learning satisfaction. Optimizing course design, improving the usability of the technology platform, and reasonably managing students' expectations are important strategies to improve satisfaction.

**Keywords:** Blended learning, Student satisfaction, Private university

### Introduction

Since the 21st century, education informatization has become a key trend of global education reform, and many countries have incorporated it into national strategies. China is also rapidly promoting the process of education informatization. The Ministry of Education has issued a series of policies aimed at reforming the traditional teaching mode through information technology and promoting the coordinated development of online and offline integrated education in the information age. The core goal of these policies is to improve the quality of education through the fundamental reform of the education model. Education informatization not only changes the construction of teaching environment and resources, but also promotes the in-depth reform of the education mode.

Blended learning, as a mode combining the advantages of online and offline teaching, has attracted extensive attention because of its advantages in improving teaching effect and flexibility. Statistics show that more than two-thirds of education and training institutions in the United States have adopted a blended learning mode, and its application in higher education is also increasing. In China, blended learning has also been rapidly promoted. The emergence of new learning methods, such as mobile learning and ubiquitous learning, has also accelerated the process of blended learning research. Blended learning can not only meet the diverse learning needs of students but also improve the quality of education through personalized learning.





The Chinese government attaches great importance to the development of educational informatization and actively promotes the integration of MOOC and higher education to promote the reform of blended teaching. The blended learning mode mainly completes the knowledge transfer and evaluation through online learning, and interacts through offline discussions between teachers and students or teachers' guidance, combining online and offline teaching methods to achieve the best teaching effect.

It is of great significance to study college students' satisfaction with blended learning. This will not only help college teachers better prepare the teaching content, but also improve the teaching quality of the school and meet the social demand for high-quality education. Through a questionnaire survey and data analysis, this study aims to identify the areas that need to be optimized in blended learning and provide strategic suggestions for universities, teachers, students, and online education platforms, so as to promote the positive development of online education. Improving student satisfaction is not only the direct embodiment of improving the quality of education, but also the key for private universities to the survival and development of higher education institutions in the highly competitive education market.

## Objectives

Here are the objectives of the research:

- 1) To investigate the significant impact of teachers' support on Student Satisfaction in Blended Learning.
- 2) To investigate the significant impact of students' expectations on Student Satisfaction in Blended Learning.
- 3) To investigate the significant impact of course design on Student Satisfaction in Blended Learning.
- 4) To investigate the significant impact of perceived usefulness on Student Satisfaction in Blended Learning.
- 5) To investigate the significant impact of perceived ease of use on Student Satisfaction in Blended Learning.
- 6) To assess and analyze the levels of Teachers' Support, Students' Expectation, Course Design, Perceived Usefulness, Perceived Ease of Use, and Students' Satisfaction before strategic plan and after the strategic plan.

## Literature review

### 1. Teachers' Support

Teachers' support is a crucial factor in educational environments for student satisfaction. Research indicates that teachers' instrumental and emotional support can significantly influence students' learning efficiency and motivation. For example, Ryan and Patrick (2001) defined teachers' support as the level of trust students have in the values of teachers and the quality of their interpersonal relationships. Federici and Skaalvik (2014) argued that teachers' support includes behaviors that help students during the learning process, covering both learning environment provision and emotional encouragement. Shen and Guo (2022) proposed that teachers can provide social, emotional, and educational tool support to promote student participation in classroom activities. Lei et al. (2018) emphasized that teachers, as key agents in the school system, can create a conducive learning environment through information provision, tool support, and emotional backing, thereby enhancing student satisfaction. Jiang et al. (2013), through their longitudinal investigation, substantiated the affirmative influence of the rapport between teachers and students on overall school satisfaction. The role of positive emotions in bolstering mental well-being has been highlighted by Fredrickson and Branigan (2005), suggesting that constructive teacher engagement and responsive feedback can elevate students' school-related satisfaction. In summary, teachers' support not only meets students' emotional needs but also improves learning satisfaction by optimizing the learning environment.

Based on the mentioned literature, the following hypothesis can be formulated:





*H1: Teacher's Support has a significant impact on Student Satisfaction in Blended Learning.*

## **2. Students' Expectation**

Students' expectations refer to their preconceived notions about course content, difficulty, and interest before entering a class. Research shows that the gap between students' expectations and actual learning experiences directly affects satisfaction (Appleton-Knapp & Krentler, 2006). Lee and Anantharaman (2013) identified that student expectations include perceptions of university reputation, course design, and learning costs. Najimdeen et al. (2021) argued that students' expectations have both direct and indirect impacts on satisfaction. Tukiran et al. (2021) also supported this view, indicating a complex causal relationship between expectations and satisfaction. Additionally, Cicha et al. (2021) found that students' enjoyment and sense of competence in online learning are key factors influencing their transition from traditional to remote learning. Therefore, aligning student expectations with actual teaching is an essential strategy for improving satisfaction. Studies conducted by Berbergal-Mirabent (2015), as well as Kaye and Bates (2017), underscore the pivotal role that instructional excellence and social environment play in shaping student anticipations and contentment. The expectations of students are instrumental in mediating the link between the costs associated with learning and their satisfaction with higher education providers. The body of work by Patterson and Johnson (1993) and Voss et al. (2007) corroborates the notion that the level of satisfaction students experience is inherently connected to their expected criteria for choice, directly influencing their overall satisfaction.

Based on the mentioned literature, the following hypothesis can be formulated:

*H2: Students' Expectation has a significant impact on Student Satisfaction in Blended Learning.*

## **3. Course Design**

Course design is a key factor influencing student satisfaction. Research indicates that well-designed courses can significantly enhance students' motivation and engagement (Fink, 2007). Jaggars and Xu (2016) found that the quality of interpersonal interactions in course design is positively correlated with students' academic performance. Yang (2017) emphasized that effective course design helps students delve into complex topics through online experiments and peer interactions, improving their learning experience. Tham and Werner (2005) pointed out that course design should include strategic educational planning, comprehensive course introductions, and management of academic and student service issues. Martin et al. (2019) discovered through interviews that online educators use structured design approaches, focusing on learner needs and interaction design to improve course quality. Student assessments of online courses, the architecture, and the systematic arrangement of the curriculum are paramount in shaping student contentment with virtual education platforms. In an earlier survey, the graduate students enrolled in marketing programs revealed that learners engaged in remote learning environments frequently report diminished efficacy and satisfaction when juxtaposed with their counterparts in traditional classroom settings. In summary, course design should be goal-oriented, well-organized, and interactive to meet students' learning needs and thereby increase satisfaction.

Based on the mentioned literature, the following hypothesis can be formulated:

*H3: Course design has a significant impact on Student Satisfaction in Blended Learning.*

## **4. Perceived Usefulness**

Perceived usefulness refers to students' beliefs that using a particular system or technology can enhance their learning outcomes. Davis (1989) first proposed perceived usefulness as a core factor in the Technology Acceptance Model. Huang (2021) argued that perceived usefulness reflects students' expectations of improved learning performance through technology. Legris et al. (2003) viewed perceived usefulness as an evaluation of the practical value of technology in learning. Additionally, Baccarella et al. (2021) found that perceived usefulness significantly influences users' acceptance of new technologies. In the educational context, Tao (2009) demonstrated that perceived usefulness is a key factor affecting students' acceptance of online learning platforms. Chavoshi and Hamidi (2019) delineated a quartet of influential





factors that shape the adoption of mobile learning initiatives, categorizing them into technological, pedagogical, social, and personal dimensions. Their investigation underscored the preeminence of perceived utility as the pivotal motivator for students in embracing mobile learning modalities. Reddy et al. (2022) conducted an inquiry into the readiness and cognitive capabilities of students in the context of mobile-assisted learning, uncovering a positive correlation with the evolution of learning endeavors and the students' inclination and affirmative stance towards self-directed educational pursuits. In summary, perceived usefulness is essential for student satisfaction, and educators should highlight the practical value of technology to enhance this perception.

Based on the mentioned literature, the following hypothesis can be formulated:

*H4: Perceived Usefulness has a significant impact on Student Satisfaction in Blended Learning.*

### 5. Perceived Ease of Use

Perceived ease of use refers to students' subjective evaluation of how easy it is to use a particular system or technology. Davis (1989) introduced perceived ease of use as an important component of the Technology Acceptance Model, reflecting users' beliefs about the simplicity of system operations. Venkatesh and Davis (2000) further argued that perceived ease of use not only affects technology acceptance but also influences usage frequency. Research has shown that perceived ease of use is closely related to user satisfaction with technology (Akbari et al., 2020). In the educational field, Wilson et al. (2021) indicated that perceived ease of use is a significant factor affecting students' acceptance of online learning platforms. Dong et al. (2017) also suggested that perceived ease of use involves the difficulty of learning technology and the availability of supportive resources. Arbaugh's (2000) research demonstrated a substantial positive influence of perceived utility on overall satisfaction levels. Building on this, earlier investigations by Chang and Wang (2008) and Stoel and Lee (2003) corroborated the existence of a positive linkage between the ease with which individuals perceive using a technology and their favorable attitudes or levels of satisfaction. In summary, perceived ease of use is a key factor influencing student satisfaction, and educators should optimize technology platforms and provide support to enhance this perception.

Based on the mentioned literature, the following hypothesis can be formulated:

*H5: Perceived Ease of Use has a significant impact on Student Satisfaction in Blended Learning.*

### 6. Student Satisfaction

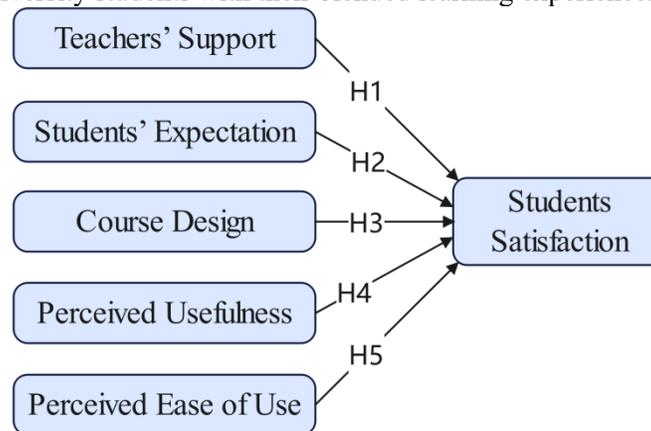
Student satisfaction refers to students' overall subjective evaluation of their learning experiences. Cardozo (1965) first introduced the concept of "customer satisfaction" into the educational field, defining student satisfaction as an emotional response to the learning process. Martin et al. (2019) argued that student satisfaction is the degree of alignment between learning expectations and actual experiences. Gao (2012) suggested that student satisfaction includes evaluations of teaching quality, course design, and learning resources. Research also shows that student satisfaction is closely related to learning motivation, outcomes, and loyalty (Qi et al., 2021). Additionally, Hwang and Choi (2019) pointed out that service quality is a key factor influencing student satisfaction and institutional image. In summary, student satisfaction is an important indicator of educational quality, and educators should optimize the teaching process and improve service quality to enhance it.

### Conceptual Framework

Based on previous vital research, which was conducted by Suson (2024), Wang et al. (2023), Gopal, and Aggarwal (2021), Gashi and Krasniqi (2024), the conceptual framework of this study comprises six variables, categorized into independent and dependent variables. As contended by Hair et al. (2013), an independent variable is one that researchers utilize to gauge its effect on an outcome. Building on this, Clark (2010) noted that the independent variable is the one that exerts influence on other related variables. The independent variables in this study include Teachers' Support, Students' Expectation, Course Design, Perceived Usefulness, and Perceived Ease of Use. Within this framework, satisfaction stands as the sole



dependent variable, with the study's primary objective being to scrutinize the factors that shape the satisfaction of private university students with their blended learning experiences.



**Figure 1:** The Theoretical Research Framework of “Research on the Factors Impacting Universities Students’ Satisfaction in Blended Learning: A Case Study on Private University in Guangzhou, China”.

**Source:** Author

## Methodology

### 1. Research Approach

This study collected data through a questionnaire survey. The questionnaire design is based on literature review and related theoretical models, covering multiple dimensions such as teacher support, student expectations, Course design, perceived usefulness, and perceived ease of use. The effectiveness of the research tool was verified by the goal consistency index (IOC), and the reliability was evaluated by a pilot test and Cronbach's  $\alpha$  coefficient. The sample consisted of 80 students from a private university in Guangzhou. The data were collected through the online questionnaire tool "WenJuanxing". Data analysis uses descriptive statistics, correlation analysis, and multiple linear regression (MLR) methods to reveal the key factors affecting students' satisfaction with blended learning. At the same time, 10 students were interviewed to get suggestions on the strategic plan (SP). Then, 20 students who had participated in blended learning were selected as samples, and they were asked to fill in the same pre-SP and post-SP questionnaires, and the previous 10 students were interviewed again to evaluate the effect of the strategic plan by using a paired samples T-test.

### 2. Sample Size and Sampling Procedure

In regression analysis, many researchers say that there should be at least 10 observations per variable (Hair et. al., 2014). Therefore, the minimum sample size = 6 (number of variables in Proposed Conceptual Framework)  $\times$  10 = 60 respondents. Consequently, the selected sample size is 80 respondents. The research subject is students from a private university in Guangdong Province, China, who have received blended learning for at least one semester. The selected students mainly come from the following colleges: Department of Finance and Economics, Department of Computer Science, Department of Networking, and Department of Management.

First, for the IOC test, two associate professors and a PhD in management were invited to measure the quality of the questionnaire's structure and content. In the pilot test, 15 students were selected to conduct a questionnaire survey in order to verify the reliability of the questionnaire. Then, using the questionnaire collection APP “WenJuanXing”, the researchers distributed the questionnaire to 92 students. After reviewing the questionnaire, 80 valid responses were confirmed. Subsequently, in the main research stage, 80 students were randomly selected from different departments of a private university in Guangdong Province, including 19 from 220 students in the school of Finance and economics, 21 from 245 students in



the Department of network technology, 19 from 217 students in the Department of management, and 21 from 258 students in the Department of computer science, a total of 80 students. These students have received blended learning for at least one semester. After that, in order to further analyze, the author conducted a multiple linear regression (MLR) test to understand which factors are most helpful to improve students' satisfaction. These students are as follows:

**Table 1:** Research Population

Students from different departments	The total number of current students	The research population was randomly selected
Finance and economics department	220	19
Department of Network Technology	245	21
Management department	217	19
Department of Computer Science	258	21
Total	940	80

**Source:** Data from the Student Affairs Department of the Faculty of Education

In the strategic plan stage, 10 students were interviewed, including 5 from the author's class and 5 randomly selected from other classes to provide suggestions for the strategic plan. In the implementation phase of the strategic plan, 20 students are selected from one of the author's classes. These students have participated in blended teaching for at least one semester, because the author will implement the strategic plan in this class to verify its impact on student satisfaction. After the implementation of the strategic plan, the same 20 students were asked to fill in the questionnaire again, and 10 students who had been interviewed before were selected to participate in the interview again to evaluate the effect of the strategic plan by paired samples T-test.

### 3. Design of Questionnaire

The survey questionnaire for this study consisted of 34 questions. The homepage of the questionnaire is the introduction section, which mainly involves research topics, survey objectives, and confidentiality. The first part of the questionnaire consists of basic information such as gender, grade, major, and mixed education experience of the survey subjects; The second part is the core part of the questionnaire, covering a total of 30 questions. Among them, teacher support (9 questions), adapted from Gokuladas and Baby (2022). Student Expectations (4 Questions), adapted from Wang et al. (2023). Course design (6 questions), adapted from Gopal and Aggarwal (2021). Perceived usefulness (4 questions), adapted from Gashi et al. (2022). Perceived ease of use (4 questions), adapted from Gashi et al. (2022). Student Satisfaction (3 Questions), adapted from Guo and Zhang (2023). Evaluate the items in the questionnaire using the Likert 5-point scale, using numbers such as strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5) to measure the structure and its objectives.

**Table 2:** Design of Questionnaire

Variables	Number of items	References
Teachers' Support	9	Gokuladas & Baby (2022)
Students' Expectation	4	Wang et al. (2023)
Course Design	6	Gopal & Aggarwal (2021)
Perceived Usefulness	4	Gashi & Krasniqi (2022)
Perceived Ease of Use	4	Gashi & Krasniqi (2022)
Students Satisfaction	3	Guo et al. (2023)



Source: Created by the author.

#### 4. Strategic plan implementation Stage

The researchers implemented the eight-week strategic plan from October 10, 2024, and ended on December 10, 2024. The Strategic plan aims to improve students' satisfaction with blended learning through a paired sample T-test analysis of quantitative data collected before and after its implementation. The steps to realize the strategic plan are shown in Figure 2:



Figure 2: Strategic Plan Tool

Source: Author

### Results

#### 1. IOC Results

This study invited three experts to conduct a national assessment of IOC, including two Associate Professors and one PhD. If the score is below 0.67, the project needs to be reconsidered, and projects with a score of 0.67 or higher can be retained (Carlson & da Silva, 2003). According to IOC results, TS2 (My teachers treat me with respect in blended learning) and TS7 (My teachers care about me in blended learning) did not pass the IOC rating, which meant that when doing the pilot test, these 2 items should be removed from the questionnaire.

#### 2. Results of Pilot Test

After the IOC process, two items, TS2 and TS7, were deleted, so a questionnaire with 32 questions was delivered to 30 respondents for the reliability test. According to the results of the pilot test, 30 items passed the reliability test, and CD5 (Blended learning helped me to learn educational statistics more quickly. ), PU3 (I find blended learning useful in my study.) were removed. The testing results and the strength of association are shown in the following table:

Table 3 Number of Measurement Items and Cronbach's Alpha of Each Construct (n=15)

Variable	Before Pilot Test	After the Pilot Test	Cronbach's Alpha	Strength of association
Teachers' Support	7	7	0.813	Good
Students' Expectation	4	4	0.927	Excellent
Course Design	6	5	0.855	Good
Perceived Usefulness	4	3	0.684	Moderate
Perceived Ease of Use	4	4	0.856	Good

Students Satisfaction 3 3 0.887 Good

### 3. Results of Multiple Linear Regression

Multiple linear regression was used to verify the hypotheses. The following tables were the results of multiple linear regression methods in this study:

**Table 4** The MLR Results (n=80)

Predictor	Estimate	SE	t	p	R <sup>2</sup>
Intercept	0.0461	0.254	0.182	0.856	0.801
TS	0.1778	0.137	1.294	0.199	
SE	-0.3981	0.105	-3.803	<.001	
CD	0.4279	0.117	3.672	<.001	
PU	0.1181	0.120	0.980	0.330	
PEU	0.6443	0.146	4.423	<.001	

Through multiple linear regression (MLR) analysis, we explored the impact of five factors on students' blended learning satisfaction: teacher support, students' expectations, Course design, perceived usefulness, and perceived ease of use. The results show that the overall fitting degree of the model is high, and the R<sup>2</sup> value is 0.801, indicating that these factors can explain 80.1% of the variation of student satisfaction, indicating that the model has a strong ability to interpret the data.

Among the specific influencing factors, Course design (CD) has a significant positive impact on students' satisfaction, and its regression coefficient is 0.4279, P value is less than 0.001, which shows that good Course design can significantly improve students' satisfaction with blended learning. For example, clear course structure, attractive content, and effective learning activity design can enhance students' learning experience. Perceived ease of use (PEU) also has a significant positive impact on satisfaction, with a regression coefficient of 0.6443 and a p-value less than 0.001, indicating that the ease of use of learning tools and platforms is an important factor in improving students' satisfaction. The effect of students' expectation (SE) on satisfaction is relatively special, and its regression coefficient is -0.3981, P value is less than 0.001, indicating that too high expectation may significantly reduce students' satisfaction. This result suggests that educators should reasonably manage students' expectations when implementing blended learning, so as to avoid the decline in satisfaction caused by high expectations.

However, the impact of teacher support (TS) on satisfaction is not significant, with a regression coefficient of 0.1778 and a p-value of 0.199. This may be because the effect of teacher support is offset by other factors, or the change range of teacher support level in the sample is small. The effect of perceived usefulness (PU) on satisfaction is also not significant, with a regression coefficient of 0.1181 and a p-value of 0.330. This may be because students generally believe that blended learning itself has high practicality, which means this factor has limited room to improve satisfaction.

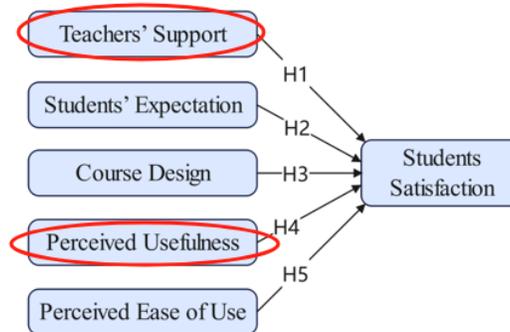
To sum up, the MLR analysis results of this study show that Course design and perceived ease of use are the key factors to improve students' satisfaction with blended learning, and it is also important to manage students' expectations. Although the impact of teacher support and perceived usefulness on satisfaction is not significant in this study, it does not mean that they are not important. Future research can further explore the role of these factors in different educational environments, and how to improve students' overall satisfaction with blended learning by optimizing Course design, improving technology ease of use, and reasonably managing students' expectations.

H1: Teacher's Support has no significant impact on Student Satisfaction in Blended Learning. ( $\beta=0.1778$ ,  $p<.199$ .)

H2: Students' Expectation has a significant impact on Student Satisfaction in Blended Learning. ( $\beta=-0.3981$ ,  $p<.001$ .)

H3: Course design has a significant impact on Student Satisfaction in Blended Learning. ( $\beta=0.4279$ ,  $p<.001$ .)

H4: Perceived Usefulness has no significant impact on Student Satisfaction in Blended Learning. ( $\beta=0.1181, p<330.$ )  
 H5: Perceived Ease of Use has a significant impact on Student Satisfaction in Blended Learning. ( $\beta=0.6443, p<.001.$ )



**Figure 2:** Research Framework for Significant Variables  
**Source:** Author

#### 4. Results comparison between the current situation and the expected situation

**Table 5** Paired Samples T-Test of Teachers' Support

Variables	N	Mean	Std. Deviation	t-value	df	p-value
Pair 1 Pre-TS	20	3.86	0.476	6.31	19.0	< .001
Post-TS	20	4.08	0.499			

Note. Created by the author.

Table 5, there was a significant difference in Teachers' Support between the Current situation ( $M=3.86, SD=0.476$ ) and the Expected situation ( $M=4.08, SD=0.499$ ) condition;  $t(19) = 6.31, p < 0.01$ , and the mean difference was  $-0.221$ .

**Table 6** Paired Samples T-Test of Students' Expectation

Variables	N	Mean	Std. Deviation	t-value	df	p-value
Pair 2 Pre-SE	20	3.74	0.393	-6.73	19.0	< .001
Post-SE	20	4.19	0.396			

Note. Created by the author.

From table 6, there was a significant difference in Students' expectations between the Current situation ( $M=3.74, SD=0.393$ ) and Expected situation ( $M=4.19, SD=0.396$ ) conditions;  $t(19) = -6.73, p < 0.01$ , and the mean difference was  $-0.450$ .

**Table 7** Paired Samples T-Test of Course Design

Variables	N	Mean	Std. Deviation	t-value	df	p-value
Pair 3 Pre-CD	20	3.74	0.291	-7.00	19.0	< .001
Post-CD	20	4.11	0.308			

Note. Created by the author

From table 7, there was a significant difference in Course Design and development between the Current situation (M=3.74, SD=0.291) and the Expected situation (M=4.11, SD=0.308) condition;  $t(19) = -7.00$ ,  $p < 0.01$ , and the mean difference was -0.370.

**Table 8** Paired Samples T-Test of Perceived Usefulness

Variables	N	Mean	Std. Deviation	t-value	df	p-value
Pair 4 Pre-PU	20	4.02	0.425	-7.03	19.0	< .001
Post-PU	20	4.42	0.417			

Note. Created by the author

From table 8, there was a significant difference in Perceived Usefulness between the Current situation (M=4.02, SD=0.425) and the Expected situation (M=4.42, SD=0.417) condition;  $t(19) = -7.03$ ,  $p < 0.01$ , and the mean difference was -0.401.

**Table 9** Paired Samples T-Test of Perceived Ease of Use

Variables	N	Mean	Std. Deviation	t-value	df	p-value
Pair 5 Pre-PEU	20	3.74	0.497	-3.56	19.0	0.002
Post-PEU	20	4.04	0.502			

Note. Created by the author

From table 9, there was a significant difference in Perceived Ease of Use between the Current situation (M=3.74, SD=0.497) and the Expected situation (M=4.04, SD=0.502) condition;  $t(19) = -3.56$ ,  $p = 0.002$  ( $< 0.05$ ), and the mean difference was -0.300.

**Table 10** Paired Samples T-Test of Students' Satisfaction

Variables	N	Mean	Std. Deviation	t-value	df	p-value
Pair 6 Pre-SS	20	3.92	0.561	-3.49	19.0	0.002
Post-SS	20	4.28	0.436			

Note. Created by the author

From table 10, there was a significant difference in Students' Satisfaction between the Current situation (M=3.92, SD=0.561) and the expected situation (M=4.28, SD=0.436) condition;  $t(19) = -3.49$ ,  $p = 0.002$  ( $< 0.05$ ), and the mean difference was -0.367.

In summary, the above quantitative results showed that there were significant differences between pre-SP and post-SP stages on teachers' support, students' expectations, course design, perceived usefulness, perceived ease of use, and student satisfaction.

## Discussion

Against the background of education informatization, blended learning has become an important teaching mode in colleges and universities, and students' satisfaction with blended learning is the key index to measure its teaching effect. With the help of the Unified Theory of Acceptance and Use of Technology (UTAUT) theory and customer satisfaction theory, this study makes an in-depth analysis of the MRL results and paired samples t-test results in the paper, which is helpful to understand the influence mechanism of various variables on student satisfaction.

UTAUT theory points out that factors such as performance expectation, effort expectation, social impact, and promotion conditions will affect individuals' acceptance and use of technology. In blended learning, these factors are closely related to student satisfaction. The customer satisfaction theory emphasizes the role of the gap between customer expectations and experience on satisfaction, which provides another important perspective to explain students' satisfaction in blended learning.



From the MRL results, course design has a significant positive impact on student satisfaction. According to UTAUT theory, course design belongs to the promotion condition. When the course design is reasonable, if it has a clear structure, rich interactive links, and content to meet the personalized needs, it can provide strong support for students' learning, enable students to achieve their learning goals more smoothly, and then improve their performance expectations for learning effect. From the perspective of customer satisfaction theory, well-designed courses can better meet students' expectations, effectively narrow the gap between expectations and experience, and significantly improve students' satisfaction. For example, a clear course structure can help students clarify their learning direction, interactive links can enhance students' sense of participation, and personalized learning resources can meet the learning styles of different students, all of which make students get a better experience in the learning process and naturally improve their satisfaction.

Perceived ease of use also has a significant positive impact on student satisfaction. This is closely related to the effort expectations in UTAUT. When learning tools and platforms are easy to operate, students' perceived effort expectation in the use process is reduced, and they are more willing to actively use these tools to participate in learning. Convenient tools and platforms can make it easier for students to obtain learning resources and participate in various learning activities, which is in line with students' expectations for the convenience of the learning process. According to customer satisfaction theory, this good experience will improve students' satisfaction with the learning experience. For example, if students can quickly start the learning platform and complete various learning tasks, they will have a positive feeling about the learning process and improve their satisfaction.

Students' expectation has a significant negative impact on satisfaction. According to customer satisfaction theory, if students' high expectations are not met in actual learning, the gap between expectations and experience will increase, leading to a decline in satisfaction. Under the framework of UTAUT, high expectations may make students underestimate the difficulties in the learning process. When they encounter practical problems, their performance expectations and effort expectations for learning will be affected, thereby reducing satisfaction. For example, students expect the course content to be simple, interesting, and easy to achieve good results, but the actual course is difficult, and many challenges are encountered in the learning process, which will disappoint students and reduce their satisfaction.

The influence of teacher support and perceived usefulness on satisfaction is not significant. For teacher support, it may be because the range of change in teacher support in the research sample is small, or its influence is covered by other factors. From the perspective of UTAUT, teachers' support can be classified as promotion conditions, but if teachers' support methods fail to effectively translate into students' expectation of learning performance, or do not play a significant role in social impact, it is difficult to have a significant impact on students' satisfaction. From the perspective of customer satisfaction theory, if teacher support does not change the gap between students' expectations and experience, its impact on satisfaction is not prominent. In terms of perceived usefulness, students generally believe that blended learning itself has high practicality, which limits the space for this factor to improve satisfaction. In UTAUT, when students' performance expectations for blended learning are already high, it is difficult to further improve, so the impact on satisfaction is not obvious.

Looking at the results of the paired samples t-test show that there are significant differences in teacher support, student expectations, course design, perceived usefulness, perceived ease of use, and student satisfaction before and after the implementation of the strategic plan. This shows that the strategic plan has changed the status of these factors to a certain extent. From the comprehensive analysis of UTAUT and customer satisfaction theory, the strategic plan may enhance its role as a promotion condition by optimizing the course design, better meeting students' expectations, and narrowing the gap between expectations and experience. It improves the usability of the technology platform and reduces the students' effort expectation; It reasonably guides students' expectations and reduces the negative effects of high expectations. These changes are finally reflected in the significant improvement of student satisfaction, which further verifies the above theory's explanation of the relationship between variables and student satisfaction.



## Conclusion

Based on the survey of students in a private university in Guangzhou, this study deeply analyzes the factors affecting the satisfaction of blended learning and draws the following conclusions:

Course design and perceived ease of use are the key factors to improve students' satisfaction with blended learning. Reasonable Course design, such as clear curriculum structure, attractive content, and effective learning activity design, can significantly enhance students' learning experience and have a positive impact on satisfaction. The ease of use of learning tools and platforms is equally important, as it can effectively improve students' satisfaction.

Students' expectation has a significant negative impact on satisfaction. High expectations may lead to a large gap in students' actual learning experience, and then reduce satisfaction. This shows that in the implementation of blended learning, educators need to reasonably guide and manage students' expectations to avoid the decline of students' satisfaction due to high expectations.

The influence of teacher support and perceived usefulness on student satisfaction is not significant. From the perspective of the unified theory of technology acceptance and use (UTAUT), it may be that students' expectations of teacher support are high, additional support is difficult to bring about significant changes, and students' perceptions of the usefulness of blended learning are relatively consistent, with limited room for improvement. At the same time, when other key factors such as technology ease of use are at a high level, the importance of teacher support and perceived usefulness is relatively reduced. From the perspective of customer satisfaction theory, as "customers", students' satisfaction is affected by the difference between expectation and actual learning experience. Teacher support and curriculum usefulness are only part of the overall learning experience, and have a limited impact on satisfaction.

Although teacher support and perceived usefulness have no significant impact in this study, they are still indispensable basic supports in blended learning. Through the analysis of paired sample t-test results before and after the implementation of the strategic plan, it is found that there are significant differences in teacher support, student expectations, course design, perceived usefulness, perceived ease of use, and student satisfaction before and after the implementation of the strategic plan. This shows that the implementation of the strategic plan has effectively improved these factors to a certain extent and played a positive role in improving students' satisfaction with blended learning.

## Recommendation

### 1. Optimize course design

Course design is one of the key factors affecting students' satisfaction with blended learning. The study found that reasonable course design can significantly improve students' satisfaction. Therefore, it is suggested that colleges and universities should pay attention to the following aspects in the course design: first, the course content should have a clear structure and clear learning objectives to help students better understand and master knowledge. Secondly, the course design should focus on interaction and participation, such as online discussion, group cooperation, case analysis, and other ways to enhance students' interest and participation in learning. In addition, the course design should also consider the personalized needs, provide learning resources with different difficulties and forms, and meet the learning styles and needs of different students. For example, an adaptive learning system can be introduced to dynamically adjust the learning content and difficulty according to the learning progress and performance of students. Finally, the course design should focus on the combination of practical application and help students transform theoretical knowledge into practical ability through project-based learning and practical operation. Through these measures, students' satisfaction with the course design can be effectively improved, and the overall learning experience can be improved.

### 2. Improve the usability of the technology platform

Perceived ease of use is another key factor affecting students' satisfaction with blended learning. The study found that the ease of use of the technology platform has a significant positive impact on students'



satisfaction. Therefore, colleges and universities should pay attention to the user experience design of the technology platform, ensure that the interface of the platform is simple and the operation process is clear, and reduce the technical barriers in the use process for students. For example, detailed operation instructions and online help documents can be provided to help students quickly familiarize themselves with the functions of the platform. At the same time, colleges and universities should regularly maintain and upgrade the technology platform to ensure the stability and compatibility of the platform and avoid affecting students' learning experience due to technical failures. In addition, the user feedback mechanism can be introduced to collect students' opinions and suggestions on the platform in time and continuously optimize the functions of the platform. Through these measures, students' satisfaction with the technology platform can be significantly improved, and their acceptance and participation in blended learning can be enhanced.

### 3. Reasonably manage students' expectations

Students' expectation has a significant negative impact on blended learning satisfaction. High expectations may lead to students' disappointment with the actual learning experience, thus reducing satisfaction. Therefore, colleges and universities and teachers should reasonably manage students' expectations before the beginning of the course. First of all, through course introductions, publicity materials, or online lectures, students can clearly explain the mode, objectives, advantages, and possible challenges of blended learning, and help students establish reasonable expectations. Secondly, teachers should maintain good communication with students, respond to students' problems and concerns, and avoid the expectation gap caused by information asymmetry. In addition, colleges and universities can regularly carry out satisfaction surveys to understand the gap between students' expectations and the experience of the course, and adjust teaching strategies according to feedback. Through these measures, we can effectively manage students' expectations and avoid the impact of high expectations on satisfaction.

### 4. Strengthen teacher support

Although the impact of teacher support on satisfaction is not significant in this study, it does not mean that it is not important. Teacher support is an important part of blended learning, which can provide emotional and academic support for students. Therefore, colleges and universities should strengthen the training of teachers and improve teachers' familiarity and application ability of the blended learning mode. Teachers should actively participate in online interaction, timely respond to students' questions, and provide personalized learning guidance and feedback. In addition, teachers can enhance interaction with students and create a positive learning atmosphere through online discussion areas, virtual offices, and other ways. Through these measures, the quality of teachers' support can be improved, and students' confidence and satisfaction with blended learning can be enhanced.

### 5. Improve perceived usefulness

Although the effect of perceived usefulness on satisfaction is not significant in this study, it is still an important aspect of blended learning. Students generally believe that blended learning is helpful to their learning, but this cognition still has room for improvement. Therefore, universities and teachers should show how blended learning can help students achieve their learning goals and career development through practical cases and successful experiences. For example, lectures or case studies by industry experts can be introduced to help students better understand the application scenarios of the knowledge. At the same time, the course content should be closely combined with students' professional needs and future career direction to ensure that students can feel the actual value of learning. Through these measures, students' perceived usefulness of blended learning can be further improved, and their learning motivation and satisfaction can be enhanced.

## References

- Akbari, M., Rezvani, A., Shahriari, E., Zúñiga, M. A., & Pouladian, H. (2020). Acceptance of 5G technology: Mediation role of trust and concentration. *Journal of Engineering and Technology Management*, 57, 101585.





- Appleton-Knapp, S. L., & Krentler, K. A. (2006). Measuring student expectations and their effects on satisfaction: The importance of managing student expectations. *Journal of Marketing Education*, 28(3), 254–264.
- Arbaugh, J. B. (2000). Virtual classroom characteristics and student satisfaction with internet-based MBA courses. *Journal of Management Education*, 24, 32–54.  
<https://doi.org/10.1177/105256290002400104>
- Baccarella, C. V., Wagner, T. F., Scheiner, C. W., Maier, L., & Voigt, K. I. (2021). Investigating consumer acceptance of autonomous technologies: The case of self-driving automobiles. *European Journal of Innovation Management*, 24(4), 1210–1232.
- Berbegal-Mirabent, J., Ribeiro-Soriano, D., & García, J. (2015). Can a magic recipe foster university spin-off creation? *Journal of Business Research*, 68, 2272–2278.  
<https://doi.org/10.1016/J.JBUSRES.2015.06.010>
- Cardozo, R. N. (1965). An experimental study of customer effort, expectation, and satisfaction. *Journal of Marketing Research*, 2(3), 244–249.
- Carlson, R., da Silva, C. A., Sadowski, N., Lefevre, Y., & Lajoie-Mazenc, M. (2003). Analysis of the effect of inter-bar currents on the performance of polyphase cage-induction motors. *IEEE Transactions on Industry Applications*, 39(6), 1674–1680.
- Chang, H. H., & Wang, I. C. (2008). An investigation of user communication behavior in computer-mediated environments. *Computers in Human Behavior*, 24(5), 2336–2356.
- Chavoshi, A., & Hamidi, H. (2019). Social, individual, technological, and pedagogical factors influencing mobile learning acceptance in higher education: A case from Iran. *Telematics and Informatics*, 38, 133–165.
- Cicha, K., Rizun, M., Rutecka, P., & Strzelecki, A. (2021). COVID-19 and higher education: First-year students' expectations toward distance learning. *Sustainability*, 13(4), 1889.
- Clark, J. S., Bell, D., Chu, C., Courbaud, B., Dietze, M., Hersh, M., & Wyckoff, P. (2010). High-dimensional coexistence based on individual variation: A synthesis of evidence. *Ecological Monographs*, 80(4), 569–608.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
- Dong, X., Chang, Y., Wang, Y., & Yan, J. (2017). Understanding usage of Internet of Things (IoT) systems in China: Cognitive experience and affect experience as moderators. *Information Technology & People*, 30(1), 117–138.
- Federici, R. A., & Skaalvik, E. M. (2014). Students' perceptions of emotional and instrumental teacher support: Relations with motivational and emotional responses. *International Education Studies*, 7(1), 21–36.
- Fink, L. D. (2007). The power of course design to increase student engagement and learning. *Peer Review*, 9(1), 13–17.
- Fredrickson, B. L., & Branigan, C. (2005). Positive emotions broaden the scope of attention and thought-action repertoires. *Cognition and Emotion*, 19(3), 313–332.  
<https://doi.org/10.1080/02699930441000238>
- Gao, G. (2012). Measuring the satisfaction of international postgraduate business students of a British university. *Journal of Higher Education Theory and Practice*, 12(4), 117–135.
- Gashi, A., Zhushi, G., & Krasniqi, B. (2024). Exploring determinants of student satisfaction with synchronous e-learning: Evidence during COVID-19. *The International Journal of Information and Learning Technology*, 41(1), 1–20.
- Gokuladas, V. K., & Baby Sam, S. K. (2022). Student satisfaction in secondary education: An empirical study of Indian expatriate students. *Journal of Research in International Education*, 21(1), 73–83.





- Gopal, R., Singh, V., & Aggarwal, A. (2021). Impact of online classes on the satisfaction and performance of students during the pandemic period of COVID-19. *Education and Information Technologies*, 26(6), 6923–6947.
- Guo, Q., Zeng, Q., & Zhang, L. (2023). What social factors influence learners' continuous intention in online learning? A social presence perspective. *Information Technology & People*, 36(3), 1076–1094.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial least squares structural equation modeling: Rigorous applications, better results, and higher acceptance. *Long Range Planning*, 46(1–2), 1–12.
- Hair, J. F. Jr., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2014). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage Publications.
- Huang, C. H. (2021). Using the PLS-SEM model to explore the influencing factors of learning satisfaction in blended learning. *Education Sciences*, 11(5), 249.
- Hwang, Y. S., & Choi, Y. K. (2019). Higher education service quality and student satisfaction, institutional image, and behavioral intention. *Social Behavior and Personality: An International Journal*, 47(2), 1–12.
- Jaggars, S. S., & Xu, D. (2016). How do online course design features influence student performance? *Computers & Education*, 95, 270–284.
- Jiang, X., Huebner, E. S., & Siddall, J. (2013). A short-term longitudinal study of differential sources of school-related social support and adolescents' school satisfaction. *Social Indicators Research*, 114, 1073–1086.
- Kaye, L. K., & Bates, E. A. (2017). The impact of higher fees on psychology students' reasons for attending university. *Journal of Further and Higher Education*, 41(3), 379–392.
- Lee, J., & Anantharaman, S. (2013). Experience of control and student satisfaction with higher education services. *American Journal of Business Education*, 6(2), 191–200.
- Legris, P., Ingham, J., & Colletette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & Management*, 40(3), 191–204.
- Lei, H., Cui, Y., & Chiu, M. M. (2018). The relationship between teacher support and students' academic emotions: A meta-analysis. *Frontiers in Psychology*, 8, 2288.
- Martin, F., Ritzhaupt, A., Kumar, S., & Budhrani, K. (2019). Award-winning faculty online teaching practices: Course design, assessment and evaluation, and facilitation. *The Internet and Higher Education*, 42, 34–43.
- Najimdeen, A. H. A., Amzat, I. H., & Ali, H. B. M. (2021). The impact of service quality dimensions on students' satisfaction: A study of international students in Malaysian public universities. *IJUM Journal of Educational Studies*, 9(2), 89–108.
- Patterson, P. G., & Johnson, L. W. (1993). Disconfirmation of expectations and the gap model of service quality: An integrated paradigm. *Journal of Satisfaction, Dissatisfaction and Complaining Behavior*, 6(1), 90–99.
- Pishdad, P., & Onungwa, I. O. (2024). Analysis of 5D BIM for cost estimation, cost control, and payments. *Journal of Information Technology in Construction (ITcon)*, 29, 525–548. <https://doi.org/10.36680/j.itcon.2024.024>
- Qi, L., Xu, L., Ma, S., Li, D., & Dou, N. (2021). The mediating effect of undergraduate learning engagement on online learning participation and learning satisfaction under the blended teaching model. *Chinese Journal of Rehabilitation Medicine*, 10, 1283–1286.
- Reddy, V., Winnaar, L., Arends, F., Juan, A., Harvey, J., Hannan, S., et al. (2022). The South African TIMSS 2019 Grade 9 results: Building achievement and bridging achievement gaps. Cape Town: HSRC Press.
- Ryan, A. M., & Patrick, H. (2001). The classroom social environment and changes in adolescents' motivation and engagement during middle school. *American Educational Research Journal*, 38(2), 437–460.





- Shen, Y., & Guo, H. (2022). Increasing Chinese EFL learners' grit: The role of teacher respect and support. *Frontiers in Psychology, 13*, 880220.
- Stoel, L., & Lee, K. H. (2003). Modeling the effect of experience on student acceptance of web-based courseware. *Internet Research, 13*(5), 364–374.
- Suson, R. L. (2024). Factors influencing student satisfaction in blended learning: A structural equation modelling approach. *International Journal of Learning, Teaching and Educational Research, 23*(7), 207–227.
- Teo, T., Lee, C. B., Chai, C. S., & Choy, D. (2009). Modelling pre-service teachers' perceived usefulness of an ICT-based student-centred learning (SCL) curriculum: A Singapore study. *Asia Pacific Education Review, 10*, 535–545.
- Tham, C. M., & Werner, J. M. (2005). Designing and evaluating e-learning in higher education: A review and recommendations. *Journal of Leadership & Organizational Studies, 11*(2), 15–25.
- Tukiran, M., Tan, P., & Sunaryo, W. (2021). Obtaining customer satisfaction by managing customer expectations, customer perceived quality, and perceived value. *Uncertain Supply Chain Management, 9*(2), 481–488.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186–204.
- Voss, R., Gruber, T., & Szmigin, I. (2007). Service quality in higher education: The role of student expectations. *Journal of Business Research, 60*(9), 949–959.
- Wang, X., Hassan, A. B., Pyng, H. S., & Ye, H. (2023). Development and empirical study of the international student satisfaction model of online course learning interaction in Chinese universities. *Education and Information Technologies, 28*(12), 16951–16977.
- Wilson, N., Alvita, M., & Wibisono, J. (2021). The effect of perceived ease of use and perceived security on satisfaction and repurchase intention. *Journal Muara Ilmu Ekonomi dan Bisnis, 5*(1), 145–159.
- Yang, D. (2017). Instructional strategies and course design for teaching statistics online: Perspectives from online students. *International Journal of STEM Education, 4*, 1–15.

