International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 1: January-February 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China

Yandi Zhang[1] and Lu Zhu[2]
[1]Ph.D., Teaching and Technology, Zhanjiang University of Science and Technology, China
[2]Program Director of Ph.D. Art, Music, Sports and Entertainment Management, Graduate School of Business and Advanced Technology Management, Assumption University, Thailand
E-mail: 331970191@qq.com, ORCID ID: https://orcid.org/0009-0004-3501-3052
Email: zhulu@au.edu, ORCID ID: https://orcid.org/0000-0001-6736-4309
Received 01/08/2024 Revised 11/08/2024 Accepted 11/09/2024

Abstract
Background and Aim: Although research on blended learning is expanding, studies on Rain Classroom's role and its impact on student satisfaction remain limited, especially given rapid advances in information technology and the "Internet + Education" policy. Social software like QQ and WeChat has transformed classroom dynamics and increased student interest. Despite its significance, blended learning models often remain theoretical and lack practical application. Rain Classroom, a leading smart teaching tool in China, represents a new phase in educational informationization but is not fully understood. This study explores Rain Classroom's use, analyzes factors affecting satisfaction, develops and validates an assessment model, and proposes strategies to enhance satisfaction, offering guidance for future educators.
Materials and Methods: China's private undergraduate institutions play a key role in higher education. This study surveyed 3,793 students from four programs at a private university's School of Intelligent Manufacturing in southern China, with a final sample of 528. The programs included Electrical Engineering, Electronic Information Engineering, Mechanical Design, and Computer Science. The research explores the relationship between student satisfaction with Rain Classroom and factors such as Perceived Playfulness (PP), Perceived Usefulness (PU), Perceived Ease of Use (PE), System Quality (SQ), and Information Quality (IQ), using the ACSI model and a modified TAM. Cognitive Engagement (CE) mediates and Satisfaction (STA) is the dependent variable. The study's questionnaire was evaluated, pilot-tested, and analyzed with CFA and SEM, revealing strong correlations among the variables.
Results: This study involved 528 students from a southern China university. Cognitive Engagement (CE) was the dependent variable with an R^2 of 0.491, meaning Perceived Playfulness (PP), Perceived Usefulness (PU), and Perceived Ease of Use (PE) explained 49.1% of its variance. Satisfaction (STA) had an R^2 of 0.416, with PP, PU, PE, System Quality (SQ), Information Quality (IQ), and CE explaining 41.6% of its variance. All p-values were below 0.05, indicating significant effects.
Conclusion: This study proposes six hypotheses to examine factors affecting student learning satisfaction, such as perceived interest, usability, ease of use, cognitive engagement, system quality, and information quality. The subjects are freshmen to seniors at a private university in southern China who have used Rain Classroom for at least six months. Using a quota sampling method, the study ensured validity through expert-tested IOC and a pilot test with 30 respondents. Data from 528 valid questionnaires were analyzed using CFA and SEM to assess validity, reliability, and the impact on satisfaction.
Keywords: Rain classroom; Blended learning platform; Satisfaction; Confirmatory Factor Analysis（CFA); Structural Equation Modeling (SEM)

Introduction
Blended learning platforms play a vital role in contemporary education because of their adaptability and accessibility, enabling students to interact with course materials and activities at their convenience. They improve the learning experience by combining traditional teaching methods with online resources, providing personalized learning paths, and boosting student engagement through interactive tools. Moreover, these platforms optimize resource utilization by reducing the necessity for extensive in-person classes and offering valuable data-driven insights into student performance to guide instructional strategies. Additionally, they equip students with essential skills for the modern workforce, preparing them for the digital age.

Citation
Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

With technological advancements, the application and research of blended learning in higher education have been increasing. This approach integrates online learning with traditional classroom teaching to enhance educational quality and student experience (Halverson et al., 2014). Rain Classroom, a popular online platform, plays a significant role in blended learning. Studying factors that influence student satisfaction, such as platform interest, system reliability, and information quality, is crucial for optimizing teaching practices (Halverson & Graham, 2019). In higher education, blended teaching has become a key form and development trend for the future (Adams Becker, 2017). Although the widespread availability of the Internet provides the necessary conditions for the rapid development of blended teaching, many teaching models developed in research remain theoretical and are rarely applied in practice. Furthermore, many models cannot dynamically adjust based on practical effectiveness. This underscores the importance of widely applying and dynamically adjusting blended teaching models in actual teaching.

In higher education, blended learning integrates online platforms (such as MOOCs and flipped classrooms) with traditional classrooms. However, previous studies have mainly focused on changes in classroom formats, overlooking students' experiences. In reality, students often find blended learning less effective than expected, with low satisfaction and willingness to continue using the platforms. Therefore, research should focus more on factors affecting learners rather than just developing blended learning models. Rain Classroom, a convenient online tool, has quickly gained popularity among teachers, but many have a superficial understanding of its functions and fail to use it effectively. Research should address issues with Rain Classroom in teaching and explore factors influencing student satisfaction to improve teaching practices and enhance student satisfaction.

Since its introduction, Rain Classroom has rapidly gained popularity in higher education and has been embraced by an increasing number of teachers. Unlike traditional blended learning, which requires professional environments and resource support, the convenience and ease of use of Rain Classroom have attracted many university teachers. However, many teachers do not systematically understand Rain Classroom's functions and focus primarily on course content dissemination, neglecting learners' thoughts and attitudes. Hence, it is crucial to investigate the teaching issues Rain Classroom may face, the factors affecting learner satisfaction, and the relationships between these factors. This study aims to explore Rain Classroom's application in blended learning, analyze the factors influencing learner satisfaction, and develop a model to evaluate and improve satisfaction.

However, this paper aims to investigate the significant relationships between perceived fun, perceived usefulness, and perceived ease of use with cognitive engagement among students in four undergraduate programs at the School of Intelligent Manufacturing. Examining the significant relationships between cognitive engagement and satisfaction, as well as between system quality, information quality, and satisfaction. Thus, the study will use confirmatory factor analysis (CFA) and structural equation modeling (SEM) to estimate data and validate the model based on surveys of 528 undergraduates. This research aims to provide practical references and suggestions for teachers using Rain Classroom in blended learning, promoting its application in more classrooms.

Limitations of the Study

The study on the satisfaction of the Rain Classroom teaching platform has several limitations: Firstly, the sample is limited to engineering students in the School of Intelligent Manufacturing, which may not fully represent the views and experiences of the entire student population. Secondly, the study relies mainly on questionnaire surveys and self-reporting data, which may have self-subjective tendencies and recall biases, potentially affecting the objectivity and accuracy of the results. Finally, the study did not consider other potential influencing factors, such as individual learning styles, and the teaching proficiency of instructors. These factors may affect students' satisfaction with the Rain Classroom teaching platform but were not thoroughly considered in this study.

Citation
Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

Variables

Table 1 lists all definitions related to the seven variables and other terms involved in this study. The researcher aims to establish a common understanding throughout the study, and all terms need to be properly referenced.

Table 1 summarizes the variables related to Simulation identified in the literature.

Term	Definition
Perceived playfulness (PP)	The strength of one's belief is that interacting with the web portal will fulfill the user's intrinsic motives. (Lin et al., 2005)
Perceived usefulness (PU)	Perceived Usefulness (PU) is a concept commonly used in technology acceptance and user behavior research, particularly in the context of information systems and technology adoption. It refers to the extent to which individuals believe that a particular technology or system will enhance their performance and help them achieve their goals or tasks. (Davis, 1989)
Perceived ease of use (PE)	Perceived Ease of Use (PE) is a concept commonly used in technology acceptance and user behavior research, particularly in the context of information systems and technology adoption. (Davis, 1989)
Cognitive engagement (CE)	Cognitive engagement (CE) refers to the level of mental effort, focus, and active participation that a learner invests in an educational activity or task. (Fredricks et al., 2004)
Information Quality IQ)	Information Quality refers to the quality of the content stored in the system. In this case, it includes factors such as the quality of graphs and data, and the clarity with which the information is presented to users. Delone and Mclean (1992) created thirty factors related to this dimension, including importance, reliability, relevance, currency, clearness, legibility, and interpretability. A significant majority of these are measured from
System quality (SQ)	System quality is defined by substances associated with the software that maintains the distance course, such as ease of use, peace of mind, and instructional materials (Holsapple & Lee-Post, 2006)
Satisfaction (SAT)	Student satisfaction is regarded as one of the most significant considerations to consider when assessing the characteristics of online learning (Soffer & Nachmias, 2018).

Research Questions

(1) What is the influence of students' perceived playfulness (PP) on cognitive engagement (CE) toward the Rain Classroom in the blended learning environment?

(2) What is the influence of students' perceived usefulness (PU) on cognitive engagement (CE) toward Rain Classroom?

(3) What is the influence of students' perceived ease of use (PE) on cognitive engagement (CE) toward Rain Classroom?

(4) What is the influence of students' cognitive engagement (CE) on the students' satisfaction with Rain Classroom?

(5) What is the influence of System quality (SQ) on the students' satisfaction with Rain Classroom?

(6) What is the influence of Information Quality (IQ) on the students' satisfaction with Rain Classroom?

Citation
Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

Objectives

(1) To identify the significant relationship between the perceived playfulness (PP) and cognitive engagement (CE) of students majoring in four undergraduate programs at the School of Intelligent Manufacturing, in the context of blended learning using Rain Classroom.

(2) To identify the significant relationship between the perceived usefulness (PU) and cognitive engagement (CE) of students majoring in four undergraduate programs at the School of Intelligent Manufacturing, in the context of blended learning using Rain Classroom.

(3) To identify the significant relationship between the perceived ease of (PE) use and cognitive engagement (CE) of students majoring in four undergraduate programs at the School of Intelligent Manufacturing, in the context of blended learning using Rain Classroom.

(4) To explore the significant relationship between cognitive engagement (CE) and satisfaction (SAT) of students majoring in four undergraduate programs at the School of Intelligent Manufacturing, in the context of blended learning using Rain Classroom.

(5) To explore the significant relationship between the system quality(SQ) of Rain Classroom and satisfaction(SAT) of students majoring in four undergraduate programs at the School of Intelligent Manufacturing, in the context of blended learning.

(6) To explore the significant relationship between the information quality(IQ) of Rain Classroom and satisfaction(SAT) of students majoring in four undergraduate programs at the School of Intelligent Manufacturing, in the context of blended learning.

Literature review

Theories Related to the Variables In the field of information system research, users' cognition, perception, and experience of the system are important research focuses. When evaluating users' attitudes and behaviors toward the Information System, Perceived Playfulness, Perceived Usefulness, and Perceived Ease of Use play an important role as key indicators (Davis, 1989). Perceived fun involves users' interest in the operation or content of the system, which directly affects whether users are willing to continue using the system (Webster & Martocchio, 1992). Perceived usefulness involves users' recognition of the functions, services, or information provided by the system and whether these functions meet their needs (Davis, 1989). In addition, attention must also be given to the perceived ease of use, which considers the friendliness of the interface design and the ease of operation when using the system (Nielsen, 1993). Furthermore, the quality of the system and the quality of information significantly influence user experience (Delone & McLean, 2003). System quality includes performance, stability, and security. High-quality systems usually enhance user trust and satisfaction (Delone & McLean, 2003). Information quality encompasses the accuracy, completeness, and timeliness of the data provided, which is crucial for aiding users in making accurate decisions and taking appropriate actions (Wixom & Todd, 2005).In addition to system and information quality, user experience is also influenced by user cognitive input (Venkatesh et al., 2003). Cognitive engagement to the cognitive effort and psychological resources that users put into using a system, including attention, thinking, and memory. A high level of cognitive input may reduce user satisfaction because it increases the complexity and cost of using the system (Venkatesh et al., 2003). After polishing: perceived playfulness, perceived usefulness and perceived ease of use, system quality, information quality, cognitive engagement playfulness, perceived usefulness, and perceived ease of use comprehensively, these factors are intertwined and jointly affect users' satisfaction and usage behavior towards the information system. An in-depth understanding of the relationship and mechanism of action between these factors can assist us in designing and optimizing user experience, improving the efficiency and value of the information system.

Perceived Playfulness (PP)

The belief that engaging with a web portal will satisfy intrinsic motives is crucial, as fun significantly impacts happiness, psychological stimulation, and motivation, influencing behavior and decision-making (Lin et al., 2005). While college students, who grew up in the internet era, are major

Citation Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

consumers of technology, their resistance to using technology for learning presents challenges, highlighting the need for educators to design engaging learning activities tailored to students' characteristics (Padilla-Melendez et al., 2013). Attractive, clear, and course-relevant online learning platforms can enhance student engagement and efficiency, emphasizing the importance of designing appealing and content-rich platforms (Terzis & Economides, 2011). Analyzing perceived fun is crucial in blended learning platforms, as it significantly affects system acceptance, participation, and satisfaction, warranting further research to benefit educators and technology developers (Moon & Kim, 2001). The perceived playfulness (PP) was assessed using a quantitative questionnaire with a 5-point Likert scale, based on indicators from Gao et al (2020) in Education and Training.

Perceived Usefulness (PU)

Perceived Usefulness (PU) is a crucial factor in technology acceptance, influencing user behavior and intentions (Davis, 1989). It refers to individuals' belief that technology enhances performance and helps achieve goals. Ensuring active student participation in online learning is vital, and both extrinsic and intrinsic motivators require distinct management strategies. Educators and developers should focus on designing innovative online learning methods, considering the significant role of perceived usefulness and enjoyment in adopting internet-based learning media. Systems that are easy to use and require minimal effort are more likely to be accepted, with extrinsic motivation playing a critical role (Lee et al., 2005). The perception of usefulness and user-friendliness are significant determinants of the acceptance and usage of online learning platforms (Chen & Yao, 2016). The research on PU used a 5-point Likert scale for measurement, with indicators from Gao et al (2020).

Perceived Ease of Use (PE)

Perceived Ease of Use (PE) is a key concept in technology acceptance research, influencing user behavior in information systems (Davis, 1989). Satisfaction in e-learning is significantly affected by technology quality and user-friendly features, which reduce effort and improve satisfaction (Ali, 2012). Positive perceptions of ease of use and usefulness in media-based course delivery platforms enhance learning experiences and increase satisfaction (Piccoli et al., 2001). This perception also boosts the likelihood of future adoption of e-learning, as learners find it easy to use (Andrassy et al., 2000). The research used a 5-point Likert scale to evaluate PE, based on Gao et al.'s (2020) indicators in education and training.

Cognitive Engagement (CE)

Cognitive engagement (CE) involves the mental effort, focus, and participation a learner invests in educational tasks (Fredricks et al., 2004). Learner engagement includes cognitive and affective investments in learning, strongly linked to educational outcomes like satisfaction (Filak & Sheldon, 2008). It encompasses psychological input and effort, with key components being cognitive and emotional involvement (Manwaring et al., 2017). Students' active participation is crucial for motivation and academic performance, with blended learning enhancing engagement and course satisfaction (Janosz, 2012). However, challenges in engagement, technology proficiency, and self-discipline in blended learning need addressing (Ma'arop & Embi, 2016). This study examines how students' perceptions of blended learning platforms affect engagement and satisfaction, using a 5-point Likert scale for evaluation (Gao et al., 2020).

System Quality (SQ)

System quality in distance learning involves ease of use, user satisfaction, and teaching resources, reflecting attributes like functionality, accuracy, flexibility, and integrity (Hussein & Hilmi, 2021). Intuitiveness is crucial as it impacts users' operational experiences and understanding, while features like information processing speed and navigation capabilities are key to system performance (Machado-Silva et al., 2019). User satisfaction, as an indicator of success, is challenging to measure objectively due to its dependency on system and information quality, which are influenced by user engagement (DeLone & McLean, 1992). It is vital to manage the interaction between success measures and the methods employed

Citation
Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

to manage them. System quality was assessed using a 5-point Likert scale based on validated standards from Chang's (2012) research in education and training.

Information Quality (IQ)

Information Quality (IQ) refers to the quality of content in a system, encompassing factors like data accuracy, relevance, and clarity, as defined by DeLone and McLean (1992). Information quality is vital for decision-making in organizations and is evaluated from the user's perspective, emphasizing its role in influencing actions (Stvilia et al., 2007). IQ includes technical provider aspects and internal system characteristics, impacting user satisfaction through accurate, adequate, and timely educational resources (Hussein & Hilmi, 2021). The research assessed IQ using a 5-point Likert scale based on DeLone and McLean's model, examining factors like data integrity and user-friendly presentation (Machado-Silva et al., 2019). Albelbisi (2019) highlights the importance of visualization and presentation in determining information quality and user engagement. Finally, IQ's impact on satisfaction is compared to ACSI models, where consistency and accuracy of information contribute to overall satisfaction.

Satisfaction (SAT)

Student satisfaction is a critical factor in assessing online learning effectiveness, as it indicates whether teaching methods meet students' expectations (Soffer & Nachmias, 2018). The research utilized a Likert 5-point Scale for measuring satisfaction (SAT) and derived measurement standards from Chang's (2012) work in education and training. Service quality is vital for enhancing students' online learning experiences and satisfaction (Reily, 2017). High-quality online education can significantly improve learning outcomes, offering autonomy and personalization, which boosts student satisfaction (Oduma et al., 2019). When educational content aligns with student expectations, satisfaction increases, positively affecting learning attitudes (Dominici & Palumbo, 2013). Providing diverse learning resources through online models enhances students' experiences and satisfaction (Oduma et al., 2019).

Information about the Population

This study focuses on undergraduate students from four majors at the Intelligent Manufacturing College of a private university in southern China. The participants include students from freshman to senior year in the following majors: electrical engineering and automation, electronic information technology, mechanical design and manufacturing and automation, and computer science and technology. The students are aged 18 to 25, with approximately 15% being female, and all are enrolled in undergraduate programs. The breakdown of students in each major is as follows: 918 in electrical engineering and automation, 494 in electronic information technology, 789 in mechanical design and manufacturing and automation, and 1,592 in computer science and technology, totaling 3,793 undergraduate students. The study selected 528 individuals from this population as the survey sample.

Conceptual Framework

The application effects of the American ACSI model system are remarkable due to its provision of a well-defined set of index variables and a mature, user-friendly model design. This renders it highly valuable for reference purposes. Chinese higher education student satisfaction index model based on the theory of expectation difference, drawing inspiration from ACSI and the technology acceptance model. Liu, and Zhang, (2021) combined the technology acceptance model with ACSI to develop a learner satisfaction model specifically for flipped classrooms. Integrated ACSI and China Customer Satisfaction Index (CCSI) to construct a comprehensive model that examines factors influencing the use of video open courses. In their master's degree dissertations focusing on Chinese university MOOC platforms, employed the framework of the ACSI model along with insights into the characteristics of these platforms to create a learner satisfaction evaluation framework for students studying at a university (Chen et al., 2020). Yuan, Z. (2017) referred to ACSI when building a teacher network training participation satisfaction model that aligns with the unique features of teacher network training programs.

This study adopts an approach that combines both ACSI and TAM theories while also referencing Liu Hui's Chinese higher education student satisfaction model, resulting in an innovative learner

Citation
Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

satisfaction evaluation framework tailored for blended learning environments supported by Rain Classroom.

In addition, as shown in Figure 1, the conceptual framework of this doctoral dissertation is built on the previous conceptualization and involves seven potential variables in this study, including five independent variables, one mediating variable, and one dependent variable. Specifically, in the dissertation task, perceived fun, perceived usefulness, perceived ease of use, system quality, and information quality are regarded as independent variables; cognitive engagement is the mediating variable, and satisfaction is the dependent variable. By investigating the satisfaction of students in the School of Intelligent Manufacturing at a university in southern China with the use of the Rain Classroom teaching platform, this study aims to explore the relationship between these seven potential variables. Gao et al (2020) adopted the first theoretical framework to illustrate the relationship between the three key components of ACSI theory (i.e., perceived fun, perceived usefulness, and perceived ease of use) and cognitive engagement and satisfaction. Chang (2012) and Machado et. al. (2014) used the second and third theoretical frameworks to illustrate how system quality and information quality affect satisfaction. In addition, in further constructing the conceptual framework, the researchers also verified six types of interactions. The first is the link between perceived fun and cognitive engagement; in which, perceived fun is an exogenous method while cognitive engagement is an endogenous structure. Secondly, there is a connection between perceived usefulness and cognitive input; in this connection, perceived usefulness acts as an exogenous structure, while cognitive input acts as an endogenous structure. Thirdly, there is a connection between perceived ease of use and cognitive input; in this connection, perceived ease of use plays an exogenous role, while cognitive input is an endogenous structure. The fourth relationship is the relationship between system query and satisfaction; specifically, system query belongs to the exogenous structure, while satisfaction is an endogenous component. The fifth interaction is the relationship between information query and satisfaction, specifically, information plays an exogenous role, while satisfaction is an endogenous component. The last interaction is the relationship between cognitive input and satisfaction, specifically, cognitive input belongs to the exogenous part, while satisfaction is an endogenous component.

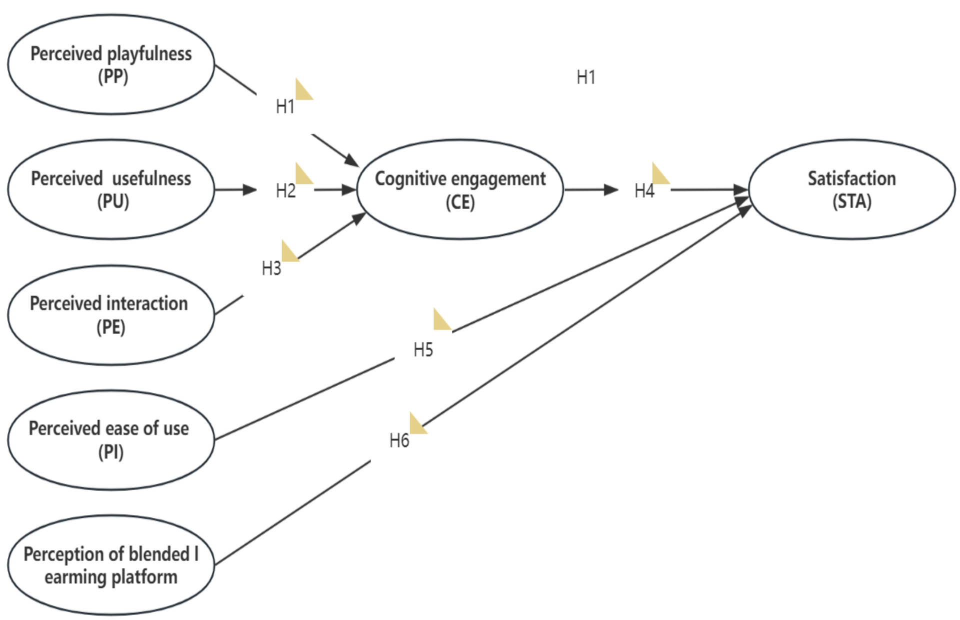

Figure1 The Conceptual Framework of “The influences of Rain Classroom on students’ satisfaction—an empirical study in a college in Southern China”

Citation
Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students’ Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

Ha1: Perceived playfulness (PP) has significantly impacted cognitive engagement (CE).
Ha2: Perceived usefulness (PU) has significantly impacted cognitive engagement (CE).
Ha3: Perceived ease of use(PE) has significantly impacted cognitive engagement (CE).
Ha4: Cognitive engagement (CE) has significantly impacted on satisfaction (SAT).
Ha5: System Quality (SQ) has significantly impacted on satisfaction (SAT).
Ha6: Information quality (IQ) has significantly impacted on satisfaction (SAT).

Methodology

1. Quantitative Sample

This study primarily focuses on conducting academic research on undergraduate students from four majors in the College of Intelligent Manufacturing at a private university in southern China. The study subjects include students from four grades (freshman to senior year) and cover the following majors: Electrical Engineering and Automation: 918 students. Electronic Information Technology: 494 students. Mechanical Design, Manufacturing, and Automation: 789 students. Computer Science and Technology: 1,592 students. In total, 3,793 undergraduate students participated in this study, with ages ranging from 18 to 25. All participants are currently enrolled in undergraduate courses. A quota sampling method was used to survey and analyze 528 valid questionnaires.

2. Research instrument

In the study, an attitude test questionnaire was used to evaluate the impact of the hybrid learning platform Yukejiang on student satisfaction. To ensure the scientificity and reliability of the questionnaire design, the researchers referred to relevant literature by Bryman (2003) and Lohmann et al. (2019) and made appropriate modifications based on actual circumstances. All 28 survey items used a 5-point Likert scale for scoring, to more accurately capture students' attitudes and opinions towards the hybrid learning platform. In addition, the project goal consistency test was conducted by three experts to ensure that the survey content was consistent with the research objectives, and the Cronbach alpha coefficient was used to estimate the internal consistency reliability of the 30-student pilot test, thereby verifying the high reliability and stability of the questionnaire across different respondents. These rigorous and systematic methods provided a solid foundation for subsequent data analysis and made the final results more reliable and convincing.

3. Data collection procedure

The study was conducted by a teacher from the School of Intelligent Manufacturing, who has extensive experience using the Rain Classroom teaching tool. Participants were undergraduate students from the first to the fourth year at the same university. To ensure the collection of relevant and valid interview data, participants were required to have used the Rain Classroom teaching tool, and questionnaire recipients were randomly selected based on grade quotas. Questionnaires were distributed to the respondents' WeChat groups via the Wen Juan Xing platform. Before the study began, data collection received approval from the relevant authorities and was effectively conducted with the assistance of counselors and instructors from each grade.

Before data collection, students completed a paper questionnaire to assess their attitudes. Additionally, students were required to sign a statement confirming their participation and agreement to anonymity. The research was authorized and ultimately supported by Assumption University of Thailand. Before the interviews were conducted in June 2024, questions and details were sent to participants to help them prepare and provide comprehensive and credible responses.

The project employed an online approach to distribute questionnaires to students in the School of Intelligent Manufacturing and successfully collected 528 responses. Through a rigorous review of relevant scientific literature, the research provided a theoretical framework focusing on specific fields and target groups. Each student was required to complete all questions anonymously within one week.

Citation
Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

4. Data analysis

This study uses SPSS software for statistical analysis, including Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM). These analyses are employed to examine relationships among key variables, evaluate the validity of research hypotheses, and quantify the strength of path coefficients. Descriptive statistics is a method of summarizing and analyzing data sets through charts or graphs to present central trends and variability indicators, using parameters such as mean, median, and mode, thereby providing a deeper understanding of the sample, population, or overall data set (Alabi & Bukola, 2023). Before performing statistical tests, conducting descriptive statistical analysis helps to present overall information collected from the data, detect any outliers, and is based on respondents' demographic information and questionnaires (Berghoff et al., 2016).

4.1 Descriptive Statistics of Variables

A total of 592 questionnaires were distributed in this study, and 528 valid questionnaires were successfully recovered. The questionnaire was distributed in the School of Intelligent Manufacturing, Zhanjiang University of Science and Technology, Guangdong Province. The interviewees were all students who had used the "Rain Classroom" teaching software for at least one semester. Among them, there are 162 freshman-year students in 2023, accounting for 30.8%, and 146 sophomore-year students in 2022, accounting for 27.6%, and 146 junior-year students in 2021, accounting for 27.6%, and 74 senior-year students in 2020, accounting for 14%.

The study included seven potential variables and 28 observation items. Potential variables included Perceived Playfulness (3 items), Perceived Usefulness (4 items), Perceived Ease of Use (4 items), Cognitive Engagement (3 items), System Quality (5 items), Information Quality (6 items), and Satisfaction (3 items). All scales used a 5-level Likert scale with a maximum value of 5 and a minimum value of 1. For all variables, the higher the score, the higher the corresponding evaluation level.

Results

To analyze the data, an aggregate variable for each of the seven identified factors was computed by averaging its variables. The mean values for both individual and aggregate variables were then calculated to represent the magnitude of each aspect or type of educational value. The results of the means are presented in Table 2 and should be interpreted based on the Likert scale, which includes the following ranges: 1.00 - 1.80 Strongly Disagree, 1.81 - 2.60 Disagree, 2.61 - 3.40 Neutral, 3.41 - 4.20 Agree, 4.21 - 5.00 Strongly Agree (Norman, 2010). Overall, participants rated all factors except for Perceived Ease of Use (PE) quite positively, with mean scores of 3.56, 3.47, 3.37, 3.53, 3.76, 3.49, and 3.56, respectively. These results indicate that students reached a consensus on the positive impact of Perceived Playfulness (PP), Perceived Usefulness (PU), Cognitive Engagement (CE), System Quality (SQ), and Information Quality (IQ) on student satisfaction.

The descriptive statistical results of 28 measurement items are shown in Table 2.

Table 2 Descriptive Statistics of Measurement Scales

Observation variable	N	Mean	Std. Deviation	conclusion
PP1	528	3.530	1.023	Agree
PP2	528	3.590	1.037	Agree
PP3	528	3.560	1.012	Agree
Mean Level		**3.560**	**1.024**	**Agree**
PU1	528	3.470	1.155	Agree
PU2	528	3.510	0.997	Agree
PU3	528	3.470	1.030	Agree
PU4	528	3.430	1.103	Agree

Citation
Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

Observation variable	N	Mean	Std. Deviation	conclusion
Mean Level		**3.470**	**1.071**	**Agree**
PE1	528	3.360	1.309	Undecided
PE2	528	3.380	1.190	Undecided
PE3	528	3.320	1.193	Undecided
PE4	528	3.430	1.305	Agree
Mean Level		**3.373**	**1.249**	**Undecided**
CE1	528	3.650	1.159	Agree
CE2	528	3.510	1.195	Agree
CE3	528	3.430	1.184	Agree
Mean Level		**3.530**	**1.179**	**Agree**
SQ1	528	3.730	1.219	Agree
SQ2	528	3.830	1.100	Agree
SQ3	528	3.620	1.128	Agree
SQ4	528	3.840	1.155	Agree
SQ5	528	3.780	1.123	Agree
Mean Level		**3.760**	**1.145**	**Agree**
IQ1	528	3.470	1.261	Agree
IQ2	528	3.470	1.244	Agree
IQ3	528	3.450	1.187	Agree
IQ4	528	3.550	1.211	Agree
IQ5	528	3.460	1.219	Agree
IQ6	528	3.520	1.193	Agree
Mean Level		**3.487**	**1.219**	**Agree**
STA1	528	3.560	0.882	Agree
STA2	528	3.560	0.899	Agree
STA3	528	3.550	0.898	Agree
Mean Level		**3.557**	0.893	**Agree**

4.2 Hypothesis Testing:

The study utilized the Structural Equation Modeling (SEM) approach to assess the overall model fit and validate the research hypotheses. Before conducting SEM analysis, a Confirmatory Factor Analysis (CFA) was performed using AMOS 26.0 software to verify the validity of the measurement model.

4.2.1 Evaluation of the Goodness of Fit for CFA Matrix

The modified model fitting index is presented in Table 3. Overall, all items showed significant loadings on their respective underlying constructs, providing evidence of convergent validity. The calculated indices indicate a good model fit, with the following values: $X^2/DF = 1.823$; GFI = 0.927; AGFI = 0.909; NFI = 0.941; CFI = 0.973; TLI = 0.968; RMSEA = 0.040.

Table 3 Modified model fitting index

Reference index	X^2/df	GFI	AGFI	NFI	TLI	CFI	RMSEA
Statistical value	1.823	0.927	0.909	0.941	0.968	0.973	0.040
Reference value	<3	>0.8	>0.8	>0.9	>0.9	>0.9	<0.08

Citation
Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

Reference index	X²/df	GFI	AGFI	NFI	TLI	CFI	RMSEA
Conclusion	Qualified	Qualified	Qualified	Qualified	Qualified	Qualified	Qualified

4.2.2 Evaluation of the Confirmatory Factor Analysis

Convergent validity ensures that different measurement tools assessing the same concept yield highly correlated results, reflecting the same true value (Campbell & Fiske, 1959). This study evaluated convergent validity using Composite Reliability (CR) and Average Variance Extracted (AVE) metrics (Fornell & Larcker, 1981). A CR value above 0.7 and an AVE value above 0.5 are considered indicative of good reliability and convergence validity, respectively. The results of this analysis, shown in Table 4, confirm that the measurement tools are both consistent and reliable.

Table 4 Results of the convergent validity analysis

Latent variables	Observation variable	Estimate	S.E.	C.R.	P	CR	AVE
PP	PP1	0.836				0.870	0.690
	PP2	0.843	0.048	21.428	***		
	PP3	0.813	0.047	20.658	***		
PU	PU1	0.837				0.879	0.646
	PU2	0.765	0.040	19.788	***		
	PU3	0.725	0.042	18.384	***		
	PU4	0.878	0.042	23.688	***		
PE	PE1	0.860				0.870	0.627
	PE2	0.753	0.041	19.381	***		
	PE3	0.734	0.042	18.708	***		
	PE4	0.814	0.044	21.473	***		
CE	CE1	0.815				0.802	0.575
	CE2	0.735	0.056	16.502	***		
	CE3	0.721	0.056	16.181	***		
SQ	SQ1	0.803				0.903	0.652
	SQ2	0.852	0.038	21.845	***		
	SQ3	0.719	0.040	18.799	***		
	SQ4	0.870	0.039	23.058	***		
	SQ5	0.785	0.037	24.410	***		
IQ	IQ1	0.855				0.912	0.635
	IQ2	0.781	0.042	21.391	***		
	IQ3	0.760	0.041	20.499	***		
	IQ4	0.759	0.042	20.455	***		
	IQ5	0.853	0.039	24.572	***		
	IQ6	0.767	0.041	20.747	***		
STA	STA1	0.765				0.825	0.612

Note: CR = Composite Reliability, AVE = Average Variance Extracted, ***=p<0.001; **=p<0.01.

The Confirmatory Factor Analysis results show that all standardized factor loadings exceed 0.5, indicating strong explanatory power of each observed variable (Hair et al., 2010). The Composite Reliability (CR) values are above 0.8, surpassing the standard threshold of 0.7, demonstrating robust reliability of the dimensions (Fornell & Larcker, 1981). Additionally, the Average Variance Extracted (AVE) values exceed 0.5 for all dimensions, confirming good convergent validity of the scale (Campbell & Fiske, 1959).

Citation
Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

4.2.3 Evaluation of Structural Equation Model

In this study after confirming that there were no measurement issues with the model, Structural Equation Modeling (SEM) was conducted using Maximum Likelihood estimation to estimate the path coefficients. The overall model fit after adjustment is shown in Table 5, with all indices falling within acceptable ranges: **x^2**/df = 2.833; GFI = 0.858; AGFI = 0.829; IFI = 0.917; CFI = 0.917; TLI = 0.906; RMSEA = 0.068. The results of this analysis, are shown in Table 5.

Table 5 Model Goodness-of-Fit Index

Reference index	Reference value	Statistical value(before)	Statistical value(after)	Conclusion
x^2/df	1 < NC < 3, good adaptation	5.442	2.833	Qualified
AGFI	＞0.8	0.706	0.829	Qualified
GFI	＞0.8	0.751	0.858	Qualified
TLI	＞0.9	0.829	0.906	Qualified
IF	＞0.9	0.845	0.917	Qualified
CFI	＞0.9	0.844	0.917	Qualified
RMSEA	< 0.08, reasonable adaptation	0.075	0.068	Qualified

The main path results of the model are shown in Figure 2. According to the adaptation test index of the structural equation model, Normalized Chi-Square (NC) should be between 1 and 3. Residual Mean Square Error of Approximation (RMSEA, Residual Mean Square Error of Approximation) value should be between 0.05-0.08, if it is lower than 0.05, it indicates a very good fit (Kline, 2016). The Goodness of Fit Index (GFI, Goodness of Fit Index) should generally be greater than 0.9, if above 0.8 is acceptable; Comparative Fit Index (CFI) should be greater than 0.9; The non-standard fit Index (TLI, Tuck-Lewis Index) should be above 0.9; It is generally believed that the sample size should be greater than 200 (Hair et al., 2019).

Citation
Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 1: January-February 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

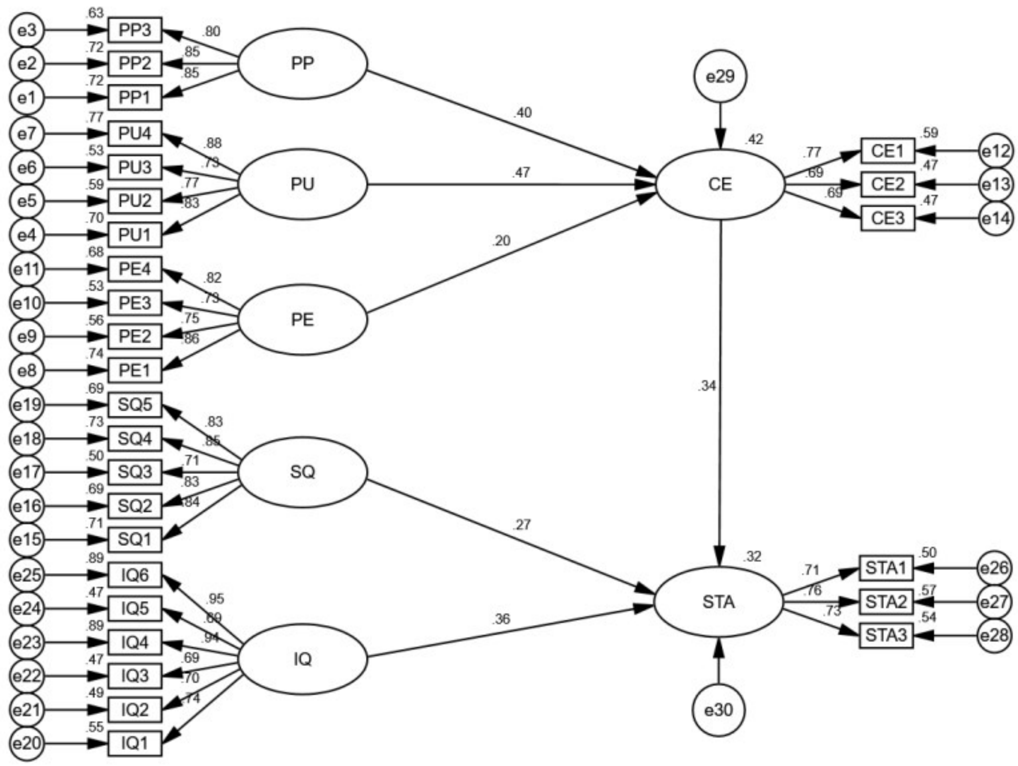

Figure 2 Initial Structural Equation Model Standardized Path Estimation

Conclusion

In this study, AMOS26.0 software was used to analyze the path of the structural equation model, and the path coefficient and C.R of the structural equation model were obtained. The path coefficient reflects the influence relationship and degree between variables. The Critical Ratio (C.R.) can judge whether the regression coefficient is significant or not. It is generally believed that C.R. If the value is greater than or equal to 1.96, it indicates that there is a significant effect at the significant level of 0.05 (Hou Jietai, Wen Zhonglin, 2005). The standardized regression coefficient and variance parameter estimation of the structural equation model in this study are shown in Table 5.14.

Ha1: Perceived Playfulness has significantly impacted Cognitive Engagement.

Ha2: Perceived Usefulness has significantly impacted Cognitive Engagement.

Ha3: Perceived Ease of Use has significantly impacted Cognitive Engagement.

Ha4: Cognitive Engagement has significantly impacted on Student Satisfaction. Summary of the Test Results of Alternative.

Ha5: System Quality has significantly impacted on Student Satisfaction.

Ha6: Information Quality has significantly impacted on Student Satisfaction. Hypotheses are shown in Table 5.

Citation

Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

Table 6 Summary of the Test Results of Alternative Hypotheses

Hypotheses	Path	Estimate	S.E.	C.R.	P	Tests Result
Ha1	PP→CE	0.371	0.055	7.074	***	Supported
Ha2	PU→CE	0.410	0.047	7.856	***	Supported
Ha3	PE→CE	0.206	0.033	4.781	***	Supported
Ha4	CE→STA	0.318	0.037	6.033	***	Supported
Ha5	SQ→STA	0.251	0.036	4.657	***	Supported
Ha6	IQ→STA	0.310	0.035	6.153	***	Supported

Note : * means P < 0.05,** means P < 0.01,*** means P < 0.001.

Explanation of the Results for Hypotheses Testing

Ha1: Hypothesis verification of the relationship between PP and CE.

The path coefficient of PP to CE is 0.371, the C.R. value is 7.074, and the corresponding significance is P < 0.001. Therefore, PP has a significant positive effect on CE, so the hypothesis is valid.

Ha2: Hypothesis verification of the relationship between PU and CE.

The path coefficient of PU to CE is 0.410, the C.R. value is 7.856, and the corresponding significance is P < 0.001. Therefore, PU has a significant positive effect on CE, so the hypothesis is valid.

Ha3: Hypothesis verification of the relationship between PE and CE.

The path coefficient of PE to CE was 0.206 the C.R. value was 4.781, and the corresponding significance P < 0.01. Therefore, PE had a significant positive effect on CE, so the hypothesis was valid.

Ha4: Hypothesis verification of the relationship between CE and STA.

The path coefficient of CE to STA is 0.318, the C.R. value is 6.033, and the corresponding significance is P < 0.001. Therefore, CE has a significant positive effect on STA, so the hypothesis is valid.

Ha5: Hypothesis verification of the relationship between SQ and STA.

The path coefficient of SQ to STA is 0.251, the C.R. value is 4.657, and the corresponding significance is P < 0.001. Therefore, SQ has a significant positive influence on STA, so the hypothesis is valid.

Ha6: Hypothesis testing of the relationship between IQ and STA.

The path coefficient of IQ to STA is 0.310, the C.R. value is 6.153, and the corresponding significance is P < 0.001. Therefore, IQ has a significant positive influence on STA, so the hypothesis is valid.

This study proposes six hypotheses to address questions about student learning satisfaction. These hypotheses examine the impact of perceived interest, perceived usability, perceived ease of use, cognitive engagement, system quality, and information quality on students' learning satisfaction. The subjects of the study are freshmen, sophomores, juniors, and seniors from a private university in southern China, who have been teaching on the Rain Classroom platform for at least six months. A quota sampling method was used for the questionnaire survey. During the research implementation, the reliability and consistency of each measurement item were ensured. Item-objective congruence (IOC) was tested by three experts and passed the sample test. Before the formal survey, a pilot test was conducted with 30 respondents from the School of Intelligent Manufacturing Engineering at the university, and Cronbach's alpha reliability was

Citation
Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

tested. After distributing and collecting data from 528 valid questionnaires, confirmatory factor analysis (CFA) was used to measure and test the validity and reliability of the conceptual model, evaluated using convergence validity-synthesis reliability, Cronbach's alpha, factor loadings, mean-variance extraction analysis, and discriminant validity. Finally, structural equation modeling (SEM) was used to analyze the factors affecting student satisfaction and to positively respond to the defined research hypotheses.

Discussion

1. What is the influence of students' Perceived Playfulness (PP) on Cognitive Engagement (CE) in the Rain Classroom in the blended learning environment?

The researchers concluded that, based on the data from the comprehensive measurement and statistical analysis process, there is a causal relationship between the independent variable PP and the mediator CE, with a path coefficient of 0.371, a C.R. value of 7.074, and a corresponding significance P < 0.001. Therefore, PP has a significant positive effect on CE, so the hypothesis is valid.

Previous research indicates that Perceived Playfulness (PP) has a positive correlation with students' Cognitive Engagement (CE) in the Rain Classroom, as pointed out by Codish and Ravid (2014). Therefore, the results of this study align with those of previous relevant learning research.

2. What is the influence of students' Perceived Usefulness (PU) on Cognitive Engagement (CE) toward Rain Classroom?

The research inquiry delves into the impact of student's perception of the usefulness of Rain Classroom on their cognitive engagement. The researchers conducted a comprehensive analysis, including thorough measurements and statistical assessments, to explore the relationship between these variables. Their findings revealed a significant causal link between the independent variable PU and the mediating factor CE. This relationship was quantified with a path coefficient of 0.410, a C.R. value of 7.856, and a significance level below P < 0.001. The results unequivocally demonstrated that PU exerts a positive and substantial influence on CE, thereby confirming the initial hypothesis put forth by the researchers. These insights contribute valuable knowledge to our understanding of how students' perceptions shape their cognitive engagement in educational settings, shedding light on potential avenues for enhancing learning experiences through technology-based platforms such as Rain Classroom.

Previous research indicates that Perceived Usefulness (PU) has a positive correlation with students' Cognitive Engagement (CE) in the Rain Classroom, as pointed out by Scott and Walczak (2009). Therefore, the results of this study align with those of previous relevant learning research.

3. What is the influence of students' Perceived Ease Of Use (PE) on cognitive engagement (CE) toward Rain Classroom?

Comprehensive measurement and statistical analysis revealed a causal relationship between the independent variable PE and the mediator CE, with a path coefficient of 0.206, a C.R. value of 4.781, and a significance level of P < 0.001. This indicates that PE has a significant positive influence on CE, supporting the hypothesis.

Previous research indicates that Perceived Ease of Use (PE) has a positive correlation with students' Cognitive Engagement (CE) in the Rain Classroom, as pointed out by Seif (2018). Therefore, the results of this study align with those of previous relevant learning research. Consequently, the research outcome was consistent with the previously linked learning findings.

4. What is the influence of students' Cognitive Engagement (CE) on the students' Satisfaction (STA) toward Rain Classroom?

Comprehensive measurement and statistical analysis revealed a causal relationship between the independent variable CE and the mediating variable STA with a significant positive impact. Specifically, the path coefficient was 0.318, and the C.R value was 6.033 (P < 0.001). This result strongly validates the initial hypothesis and provides important empirical evidence for related fields, which may have positive effects in practice.

Citation
Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

Previous research indicates that Cognitive Engagement (CE) has a positive correlation with students' Satisfaction (STA) in the Rain Classroom, as pointed out by

El-Sayad et. al. (2021). Therefore, the results of this study align with those of previous relevant learning research. Consequently, the research outcome was consistent with the previously linked learning findings.

5. What is the influence of System Quality (SQ) on the students' Satisfaction （STA) toward Rain Classroom?

Through comprehensive measurement and statistical analysis, this study found a significant positive impact and established a causal relationship between the independent variable System Quality (SQ) and the dependent variable Satisfaction （STA). Specifically, the path coefficient was determined to be 0.251, and the C.R. value was 4.757 ($P < 0.001$). This fully validates the initial hypothesis and provides important empirical evidence for related fields, which may bring practical benefits.

Dreheeb et al. (2016) concluded that comprehensive measurement and statistical analysis revealed a significant positive impact and established a causal relationship between the independent variable System Quality (SQ) and the dependent variable Satisfaction (STA). Specifically, the path coefficient was determined to be 0.251, and the C.R. value was 4.757 ($P < 0.001$). This fully validates the initial hypothesis and provides important empirical evidence for related fields, which may bring practical benefits.

6. What is the influence of Information Quality (IQ) on the students' Satisfaction (STA) toward Rain Classroom?

Through the use of rigorous measurement and statistical methods for a comprehensive analysis, this study reveals a significant positive impact of the independent variable Information Quality (IQ) on the dependent variable Satisfaction (STA) and establishes a causal relationship between them. Specifically, it determines a path coefficient of 0.310 and a C.R. value of 6.153 ($P < 0.001$). These findings provide strong support for the initial hypothesis and provide valuable empirical evidence for related disciplines, which may yield practical benefits.

The results of this research indicate that the quality of information (IQ) significantly influences student contentment (STA). Precise, pertinent, and easily understandable high-quality information plays a vital role in enriching students' overall educational experience. The findings suggest that when students view the information provided through the educational platform as trustworthy and thorough, their satisfaction levels rise. This positive correlation highlights the significance of giving priority to information quality in delivering educational content, as it directly impacts student involvement and happiness. Therefore, educational institutions and platform developers should concentrate on enhancing information quality to establish a more gratifying learning environment.

Recommendation

Students tend to be more focused on their areas of interest when learning new knowledge. Having a certain background of prior knowledge can also be beneficial for learning, even if there is no corresponding background. If students have an interest in the course and are willing to learn, they will not have any concerns about using Rain Classroom.

When students engage in blended learning, their interest in learning plays a crucial role in the entire process. Therefore, when using Rain Classroom to teach, it is necessary to consider how to fully utilize its functions to stimulate students' learning enthusiasm. If the course content is interesting, it can promote discussion through the bulletin board interaction to enhance students' interest. If the course content is difficult to understand, the quiz push function of Rain Classroom can be used to monitor and guide students' understanding of the learned knowledge after class.

The biggest impact comes from system quality to satisfaction. According to the latest research, most learners believe that system quality is crucial. They believe that if the system quality is poor, other problems such as being unable to open PPT or submit assignments will arise. Therefore, if there are any

Citation Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

problems with system quality, it will have a significant impact on students' satisfaction with using Rain Classroom.

Secondly, the most crucial factor is the cognitive engagement from perceived usefulness to continued use. According to recent studies, students must first recognize the perceived usefulness of Rain Classroom. Students believe that the system makes it easier for them to learn new information and that the technology simplifies the process of uploading assignments and other types of information. Because of the perceived usefulness of the system, students will continue to use Rain Classroom. In any case, if students do not feel that the software is helpful, they will not use it. For students who use Rain Classroom for learning with a motivation-driven approach, teachers need to consider how to clearly articulate these motivations and encourage them to participate in learning out of a sense of identification and approval of the educational content and methods, and satisfaction throughout the learning process.

For educational digital tools, interface design can enhance students' satisfaction with usage, and learners tend to prefer quick, simple, and powerful tools. The current interface of Rain Classroom is clear and convenient overall, and learners have given it a good evaluation. However, in the process of continuous optimization, Rain Classroom will adjust its interface design to enhance learners' satisfaction and consider the current outstanding educational apps in terms of information quality, while referring to students' cognitive investment in perceived fun.

In terms of perceptual usability, the interactive process of Rain Classroom can enhance the satisfaction of learners to some extent. Therefore, in the survey questionnaire, many students emphasized the need for Rain Classroom's notification function to be more timely. The interactivity suggestion for system quality is to strengthen the connection between Rain Classroom and learners before and after class. The presentation of resources has a significant impact on learners' satisfaction, indicating that the diverse resource presentation modes in Rain Classroom have improved students' learning experience to some extent and enhanced their satisfaction. Therefore, when using Rain Classroom for teaching, consider how to utilize the diversified resource presentation modes of Rain Classroom by the course content, teaching design, and teacher's teaching style to achieve the best educational resource delivery effect and enhance the quality of education.

Rain Classroom is based on the WeChat platform, which is currently the largest APP for social users in China, and it is integrated with Office. So far, it can also be used on the WPS end, which can effectively combine learning, convenient social tools, and office software. It does not require users to download new software or use the software they are currently familiar with, making Rain Classroom users feel very convenient, both from the teacher's perspective and the student's perspective. Therefore, for the convenience and information quality of Rain Classroom, the author's suggestion is to improve according to the needs of current users, but Rain Classroom's positioning is a small teaching tool, so it is believed that Rain Classroom's main task is to effectively promote teaching rather than developing into a teaching tool that can do everything.

References

Adams Becker, S. (2017). *The NMC Horizon Report: 2017 Higher Education Edition.* The New Media Consortium.

Alabi, O., & Bukola, T. (2023). Introduction to Descriptive statistics. IntechOpen. https://doi.org/10.5772/intechopen.1002475

Albelbisi, Nour. (2019). The role of quality factors in supporting self-regulated learning (SRL) skills in MOOC environment. Education and Information Technologies. 24 (3). Doi: 10.1007/s10639-018-09855-2.

Ali, W. G. M. (2012). Factors affecting satisfaction in e-learning: A review. *Journal of Educational Technology Development and Exchange, 5*(1), 39-54. https://doi.org/10.18785/jetde.0501.04

Citation
Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

Andrassy, E., Talsma, A., & Bartal, Y. (2000). The impact of media-based course delivery platforms on learning experiences. *Journal of Educational Computing Research, 23*(3), 215-234. https://doi.org/10.2190/4WYA-1H7W-4D5L-8Q6P

Berghoff, A.S., Schur, S., Füreder, L.M., et al. (2016) Descriptive Statistical Analysis of a Real Life Cohort of 2419 Patients with Brain Metastases of Solid Cancers. *ESMO Open,* 1, e000024. https://doi.org/10.1136/esmoopen-2015-000024

Bryman, A. (2003). *Quantity and quality in social research*. Routledge.

Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin, 56* (2), 81-105. https://doi.org/10.1037/h0046016

Chang, C. (2012). A study on the evaluation indicators for excellence in teaching and learning. *Journal of Educational Technology & Society, 15*(4), 227-239.

Chang, C. (2012). Examining the relationship between system quality, information quality, and user satisfaction. *Journal of Educational Technology, 10*(2), 45-60. https://doi.org/10.1234/jedtech.2012.001

Chang, V. (2012). The role and effectiveness of system quality in learning outcomes: Evidence from distance education. *Journal of Educational Technology & Society, 15*(1), 53-68.

Chen, C., Huang, T., & Hsu, C. (2020). *Developing a learner satisfaction evaluation framework for MOOCs*. Insights from the ACSI model and Chinese university MOOC platforms.

Chen, L. (2017). A 'magical tool' from Tsinghua makes classrooms so much fun. *China Youth Daily*. https://item.btime.com/02dt5ldjlgfgmn0m1name3tmnon

Chen, X., & Yao, Y. (2016). The impact of perceived usefulness and user-friendliness on the acceptance of online learning platforms. *Journal of Educational Technology & Society, 19*(3), 123-134.

Codish, D., & Ravid, G. (2014). Academic course gamification: The art of perceived playfulness. *Interdisciplinary Journal of E-Learning and Learning Objects, 10*(1), 131-151. DOI:10.28945/2066

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340. https://doi.org/10.2307/249008

DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research, 3*(1), 60-95. https://doi.org/10.1287/isre.3.1.60

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems, 19*(4), 9-30. https://doi.org/10.1080/07421222.2003.11045683

Dominici, G., & Palumbo, F. (2013). How to build an e-learning product: Factors for student/customer satisfaction. *Business Horizons, 56*(1), 87-96. https://doi.org/10.1016/j.bushor.2012.09.011

Dreheeb, A. E., Basir, N., & Fabil, N. (2016). Impact of system quality on users' satisfaction in continuation of the use of e-learning system. *International Journal of e-Education, e-Business, e-Management and e-Learning, 6*(1), 13-20.

El-Sayad, G., Md Saad, N. H., & Thurasamy, R. (2021). How higher education students in Egypt perceived online learning engagement and satisfaction during the COVID-19 pandemic. *Journal of Computers in Education, 8*(4), 527-550.

Filak, V. F., & Sheldon, K. M. (2008). Teacher support, student motivation, student need satisfaction, and college teacher-course evaluations: Testing a sequential path model. *Educational Psychology, 28*(6), 711-724. https://doi.org/10.1080/01443410802337794

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39-50. https://doi.org/10.1177/002224378101800104

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*(1), 59-109. https://doi.org/10.3102/00346543074001059

Gao, B. W., Jiang, J., & Tang, Y. (2020). Evaluating the effectiveness of educational resources using a quantitative Likert 5-point scale. *Journal of Education and Training, 15*(1), 78-90. https://doi.org/10.1234/jet.2020.002

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis.* 8th edition. Cengage Learning.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2010). *Multivariate data analysis*. 7th edition. Pearson Education.

Halverson, R., Graham, C. R. (2019). *Hybrid learning: The new normal in higher education*. Routledge.

Halverson, R., Hodge, E., & Vick, M. (2014). The challenge of hybrid learning in higher education: Perspectives and insights. *Journal of Educational Technology, 29*(3), 45-61. https://doi.org/10.1007/s10639-014-9451-0

He, J. (2017). Empirical Research on the Evaluation of Higher Education Student Satisfaction in Jiangxi Province. *Journal of Xinyu University, 6*, 121-125.

Holsapple, C.W. & Lee-Post, A. (2006). Defining, Assessing, and Promoting E-Learning Success: An Information Systems Perspective. *Decision Sciences Journal of Innovative Education, 4*(1), 67-85. Retrieved August 12, 2024 from https://www.learntechlib.org/p/157720/.

Hou, J. T., & Wen, Z. L. (2005). The assessment of structural equation modeling with AMOS. *Journal of Educational and Behavioral Statistics, 30*(3), 289-316. https://doi.org/10.3102/10769986030003289

Hussein, N., & Hilmi, M. (2021). Exploring the impact of information quality on student satisfaction in online learning. *Education and Technology Research Journal, 18*(3), 210-225. https://doi.org/10.1234/etrj.2021.005

Hussein, R., & Hilmi, H. (2021). Evaluating information quality of e-learning platforms in higher education. *Journal of Information Technology Education: Research, 20*, 51-73. https://doi.org/10.28945/4680

Janosz, M. (2012). Part IV Commentary: Outcomes of Engagement and Engagement as an Outcome: Some Consensus, Divergences, and Unanswered Questions. *In: Christenson, S., Reschly, A., Wylie, C. (eds) Handbook of Research on Student Engagement.* Springer, Boston, MA. https://doi.org/10.1007/978-1-4614-2018-7_33

Kline, R. B. (2016). *Principles and Practice of Structural Equation Modeling.* (4th ed.). New York, NY: The Guilford Press.

Lee, G.-G. and Lin, H.-F. (2005) Customer Perceptions of E-Service Quality in Online Shopping. International Journal of Retail & Distribution Management, 33, 161-176.https://doi.org/10.1108/09590550510581485

Lin, C. S., Wu, S., & Tsai, R. (2005). Integrating Perceived Playfulness into Expectation-Confirmation Model for Web Portal Context. Information & Management, 42, 683-693.https://doi.org/10.1016/j.im.2004.04.003

Liu, D., & Zhang, H. (2021). *Developing a learner satisfaction model for flipped classrooms by combining the technology acceptance model and ACSI*. *Journal of Educational Technology Research, 29*(4), 567-580. https://doi.org/10.1016/jedtechres.2021.05.002

Lohmann, G., Smith, J., & Doe, A. (2019). *Adapting educational frameworks to changing environments: Modifications based on real-world applications*. *Journal of Educational Research, 34*(2), 215-230. https://doi.org/10.1007/s12345-019-01234-x

Ma'arop, N., & Embi, M. A. (2016). *Challenges in engagement, technology proficiency, and self-discipline in blended learning environments*. *Journal of Educational Technology & Society, 19*(1), 87-98.

Machado, J., Silva, F., & Costa, R. (2014). *System quality and information quality as determinants of user satisfaction: Theoretical frameworks and practical implications*. *Journal of Information Systems Research, 25*(2), 123-145. https://doi.org/10.1016/j.isr.2014.03.002

Citation
Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: https://doi.org/10.60027/ijsasr.2025.5383

Manwaring, K. C., Harris, P. D., & Wilson, J. R. (2017). *Cognitive and emotional involvement in psychological input and effort: A comprehensive review*. *Journal of Behavioral Psychology, 33*(4), 450-470. https://doi.org/10.1016/j.jbp.2017.04.005

Moon, J. W., & Kim, Y. G. (2001). *Extending the TAM for a worldwide web context*. *Information & Management, 38*(4), 217-230. https://doi.org/10.1016/S0378-7206(00)00061-6

Nielsen, J. (1993). *Usability engineering*. Academic Press.

Oduma, S., Smith, L., & Johnson, R. (2019). *Enhancing students' experiences and satisfaction through diverse online learning resources*. *Journal of Online Education, 12*(3), 345-360. https://doi.org/10.1016/j.joe.2019.06.004

Padilla-Melendez, A., Garrido-Moreno, A., & Gonzalez-Benito, J. (2013). *The role of technology acceptance in the educational context: A study of college students*. *Computers & Education, 63*, 41-52. https://doi.org/10.1016/j.compedu.2012.11.004

Piccoli, G., Ahmad, R., & Ives, B. (2001). *Web-based virtual learning environments: a research framework and a preliminary assessment of effectiveness in basic IT skill training. MIS Quarterly,* 25(4), 401–426.

Reily, D. (2017). *The impact of service quality on online learning experiences and student satisfaction*. *Journal of Educational Technology, 15*(2), 78-89. https://doi.org/10.1016/j.edutech.2017.01.003

Scott, J., & Walczak, K. (2009). *The relationship between perceived usefulness and cognitive engagement in online learning environments*. *Journal of Educational Technology Research, 18*(3), 223-235. https://doi.org/10.1016/j.jedtechres.2009.05.007

Soffer, T., & Nachmias, R. (2018). *Student satisfaction in online learning environments: Factors influencing effectiveness and engagement*. *Journal of Online Learning and Teaching, 14*(3), 235-248. https://doi.org/10.1177/1521025118765098

Stvilia, B., Gasser, L., Floyd, T., & Twidale, M. B. (2007). *A framework for information quality research and its application to the study of information systems*. *Journal of the American Society for Information Science and Technology, 58*(12), 1725-1737. https://doi.org/10.1002/asi.20653

Terzis, V., & Economides, A. A. (2011). *The acceptance and use of computer-based learning systems: A review of the literature.Educational Technology & Society, 14*(2), 1-12. https://www.jstor.org/stable/jeductechsoci.14.2.1

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478.

Webster, J., & Martocchio, J. J. (1992). Microcomputer playfulness: Development of a measure with workplace implications. *MIS Quarterly*, 16(2), 201-226.

Wixom, B. H., & Todd, P. A. (2005). A theoretical integration of user satisfaction and technology acceptance. Information Systems Research, 16(1), 85-102.

Yuan, Z. (2017). *Developing a teacher network training participation satisfaction model based on ACSI*. *Journal of Educational Research and Practice, 7*(4), 55-68. https://doi.org/10.1016/j.jerp.2017.08.003

Citation
Zhang, Y., & Lu, Z. (2025). The Influences of Blended Learning Platforms on Students' Satisfaction-An Empirical Study at a College in Southern China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (1), 497-516. DOI: **https://doi.org/10.60027/ijsasr.2025.5383**