An Investigation on Science Students' Behavioral Intention and Self-Learning Attitude of Internet Base E-Learning in Chengdu, China

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Abstract

Purpose: This study investigates the factors influencing the behavioral intention and attitude toward self-learning among science students in Chengdu, China, including perceived usefulness, perceived ease of use, perceived enjoyment, self-learning attitude, behavioral intention, system quality, information quality, and service quality. **Research design, data, and Methodology:** A total of 500 students from the first to third year in the science program participated in this study. A questionnaire was meticulously designed, investigated, and subjected to statistical analysis. The sample selection utilized judgmental, quota, and convenience sampling techniques. Prior to data collection, the index of item-objective congruence and the Cronbach's Alpha test were conducted to ensure the instrument's validity and reliability. Subsequent data analysis employed confirmatory factor analysis and structural equation modeling techniques. **Results:** The findings revealed that system quality and information quality significantly influence percived usefulness. Perceived ease of use and perceived usefulness have a significant influence on self-learning attitude. Perceived ease of use has a significant influence on perceived usefulness and perceived enjoyment. Perceived usefulness significantly influences behavioral intention. In contrast, service quality has no significant influence on perceived usefulness. **Conclusions:** The study's findings unveiled important insights, particularly regarding the impact of perceived usefulness on the behavioral intention to engage in self-learning.

Keywords : Perceived Usefulness, Perceived Ease of Use, Perceived Enjoyment, Self-Learning Attitude, Behavioral Intention

JEL Classification Code: E44, F31, F37, G15

1. Introduction

At this stage, the blended learning model developed by most schools in our country is based on the Lanmoyun class. Students log in to the Lanmoyun class on the mobile terminal. The electronic textbooks, instructional design, and many other learning materials released by teachers on Lanmoyun can be read. Students use these materials to complete independent learning and their homework on time. After the assignment is completed, upload it to Lanmoyun. Students can discuss topics on Lanmoyun and share their learning experiences in dynamic, social, independent learning, and

personalized learning. During lesson preparation, teachers must collect teaching materials, make teaching courseware and corresponding digital learning resources, and upload them to Lanmo Cloud for students to use for the first time. Under the Lanmoyun hybrid teaching mode, classroom teaching has changed how teaching content is expressed and presented in traditional education. Thnmoyun effectively cooperates with the classroom in face-to-face knowledge transfer and the development of teaching activities. Teachers can also use the blue ink cloud to help students answer questions after class, interact and communicate between teachers and students, and grasp students' situations in time.

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Create a better learning environment, actively display students' subjective initiative, promote effective collaboration between teachers and students, and help students build a complete knowledge system (Tao & Wen, 2015).

E-learning is a necessary product of the current development of the Internet. Studying the factors that affect online learning platforms can effectively improve the platform's functionality and learning outcomes, which has specific practical significance. The results of the current research are also different. Whether the influencing factors will change during COVID-19, this research investigates the factors that impact learners' utilization and engagement with online learning platforms amidst the epidemic, identifying specific determinants to enhance platform usage and attain improved learning outcomes (Wei, 2011).

In the rapidly evolving landscape of science education in Chengdu, China, the integration of self-learning through various platforms demands an in-depth exploration of the factors that shape students' behavioral intentions and attitudes toward self-learning. The dynamics involved in this process are complex and multifaceted, encompassing elements such as perceived usefulness, perceived ease of use, perceived enjoyment, self-learning attitude, behavioral intention, system quality, information quality, and service quality. Understanding how these factors interact and influence the learning experiences of science students in Chengdu is crucial for the development of effective educational strategies.

While previous studies have delved into aspects of self-learning and its determinants, there is a noticeable research gap in the context of science education in Chengdu, China. The existing literature lacks a comprehensive investigation into the combined influence of perceived usefulness, perceived ease of use, perceived enjoyment, self-learning attitude, behavioral intention, system quality, information quality, and service quality on the behavioral intentions and attitudes toward self-learning among science students in Chengdu. Consequently, this study aims to bridge this gap by providing a nuanced understanding of the intricate relationships among these factors, contributing valuable insights for the enhancement of science education in the era of self-learning.

2. Literature Review

2.1 Perceived Ease of Use

For instance, individuals who use e-cigarettes may perceive the experience as enjoyable (Lee et al., 2005; Sánchez-Muros et al., 2014). The convenience offered by mashup DL information services should manifest in users' perceptions of their usability. Users who find information service mashups easy to comprehend and utilize are more inclined to adopt this technology. It is worth mentioning that studies like the one conducted by Sun et al. (2007) have not found a significant correlation between perceived usability and perceived usefulness. Furthermore, the usability of operating systems also falls under the umbrella term "perceived usability" (Venkatesh et al., 2003).

Based on the research conducted by Davis et al. (1989), users' perception of usability is associated with the degree of challenges faced while utilizing a system or technology. According to a study by Davis et al. (1989), if users perceive a system or technology as valuable, they might encounter challenges when utilizing the design or technology. Therefore, the degree of convenience may impact the perceived degree of usefulness.

Perceived enjoyment refers to the internal psychological motivation of an individual, as stated by Davis et al. (1989). Atkinson and Kydd (1997) suggest that the enjoyment one derives from exercise is a key factor in determining whether it brings about feelings of happiness. Hence, this research hypothesizes that:

H1: Perceived ease of use has a significant influence on perceived usefulness of e-learning.

H2: Perceived ease of use has a significant influence on perceived enjoyment of e-learning.

2.2 Perceived Usefulness

Perceived usefulness assumes that potential users have an external motivation to benefit from employing the system. Numerous empirical studies have investigated the role of polyurethanes in work environments. The findings indicate significant benefits among current non-Arab region users (Al-Gahtani & King, 1999; Atkinson & Kydd, 1997; Davis et al., 1989; Igbaria et al., 1996). Perceived usefulness represents how much users perceive the effectiveness of a system. It reflects how information systems usage enhances performance (Park, 2009).

Perceived usefulness pertains to the user's conviction that technology facilitates achieving the goal, as Davis (1989) stated. Perceived usefulness means the evaluation of users on whether new technology can improve their performance, as studied by Davis (1989), Bhattacherjee and Premkumar (2004), Wu and Chen (2017), and others. Medical data analysis professionals believe that the effective utilization of technology for processing extensive medical data can successfully extract valuable information to achieve its goals and responsibilities. Hence, this research hypothesizes that:

H3: Perceived usefulness has a significant influence on self-learning attitude of e-learning.

2.3 Perceived Enjoyment

The notion of perceived satisfaction (PS) was initially introduced by Davis et al. (1992) to unveil the delight individuals experience from the tangible advantages of mobile education. Perceived enjoyment is an intrinsic psychological driver (Davis et al., 1989). While PEU and PU capture external drivers influencing IS/IT adoption, PE reveals internal factors driving individual behavior (Davis et al., 1992).

Personal conscious activities can be enjoyable (Atkinson & Kydd, 1997). Early studies have shown that perceived enjoyment of online technology can enhance users' emotional attitudes and promote their intention to use it (Lee, 2009; Wu & Liu, 2007). Users may develop intrinsic motivation when using a system for pleasure (Davis et al., 1992; Van der Heijiden, 2003).

2.4 Self-Learning Attitude

Autonomous learning behavior pertains to how individuals conduct themselves, whereas subjective norms encompass an individual's perception of whether influential individuals endorse or discourage said behavior (Fishbein & Ajzen, 1975). A self-learning attitude denotes the user's favorable or unfavorable sentiments toward utilizing technology (Fishbein & Ajzen, 1975). Technical attitude refers to the user's subjective perspective and emotional response towards technology, encompassing their assessment of its level of preference or aversion (Davis, 1989).

An individual's perception regarding the minimum level of effort needed to utilize a specific system is referred to as perceived ease of use (Davis, 1989). The extent to which individuals are willing to adopt new technology greatly depends on their perception of the system's usability, as it indicates their belief that minimal effort is required when using the system (Davis, 1989; Venkatesh, 2000). Hence, this research hypothesizes that:

H4: Perceived ease of use has a significant influence on self-learning attitude of e-learning.

2.5 Behavioral Intention

External incentives influence an individual's behavior to initiate and sustain it (Ajzen, 1991). Willingness to sustain denotes the degree to which individuals intend to persist in utilizing the information system in forthcoming instances and advocate it to others (Chang, 2013). Previous research has suggested that users' satisfaction with the design of information systems and their intention to continue using them are positively influenced by the perceived usability of these systems (Limayem et al., 2007; Lin et al., 2005). When

evaluating a learning management system (LMS), user satisfaction is important in determining their willingness to continue using the system for online education facilitation (Chiu et al., 2007; Hung et al., 2009; Ismail et al., 2012).

Perceived usefulness pertains to the conviction of learners that U-learning could enhance their academic achievement. This scenario illustrates that providing support systems can foster learners' inclination to engage and actively partake in U-learning environments. Hence, students with a greater appreciation for U-learning are more inclined to actively participate in the U-learning setting (Davis, 1989; Lederer et al., 2000; Venkatesh et al., 2003). Hence, this research hypothesizes that:

H5: Perceived usefulness has a significant influence on behavioral intention to self-learning

2.6 System Quality

The popularity of information systems theory can be explained by the agreement that user contentment, utilization of information systems, and overall organizational achievement are impacted by the caliber of systems and quality of information (DeLone & McLean, 1992). The plan covers the inquiry function of the quality system, in addition to file transfer speed, response time, and the rate of accessing software and hardware (DeLone & McLean, 1992). System quality is an online information system that evaluates a website's performance. Users have expressed their worries regarding the system's stability, ease of use, speed of response, and adaptability. (DeLone & McLean, 2003; Nelson et al., 2005).

Furthermore, the significance of system quality within a virtual community setting was highlighted by Yoo et al. (2002), as individuals are less inclined to utilize the platform if they encounter issues such as unavailability, challenges in navigation, frequent interruptions, or disruptions. A website of superior quality can establish a user-friendly virtual environment, enabling users to effortlessly recognize functional elements and navigation tools while facilitating efficient data interchange. Consequently, this research suggests that the excellence of system performance positively influences the perceived usability and usefulness within online communities. Hence, this research hypothesizes that:

H6: System quality has a significant influence on perceived usefulness of e-learning.

2.7 Information Quality

The results obtained from the theory of information systems suggest that user contentment and usage of the information system are directly impacted by the system's quality management and the calibre of the provided

information. Consequently, these factors subsequently impact the organization's overall performance (DeLone & McLean, 1992). In the theory derived from the achievements of information systems by DeLone and McLean (2003), the success achieved is influenced by the calibre of systems, the excellence of services, and the accuracy of information. Recent empirical evidence has shown that information quality, system quality, and work efficiency significantly influence students' satisfaction with the M-application library.

The quality of information on a mobile website can indicate the user's perception. These factors will affect how users evaluate the usability and effectiveness of a mobile website. Subpar quality of the system may lead to frequent service interruptions for users. More efficient navigation and clearer layout can make users spend more time finding the necessary information. (Cenfetelli et al., 2008). Hence, this research hypothesizes that:

H7: Information quality has a significant influence on perceived usefulness of e-learning.

2.8 Service Quality

The fundamental measurements comprise system quality, information excellence, and service excellence. DeLone and McLean (1992, 2003) highlighted that the effectiveness of an information system is impacted by its inherent quality, the caliber of the communicated information, and the level of services provided. Gefen (2002) defines quality of service as the sympathy, reliability, responsiveness, assurance, and services delivered to the users. The quality of service is determined by the comprehensive support provided on a website, including dependability, timeliness, and personalization. This understanding is based on research conducted by Keating et al. (2003) and Lee and Lin (2005).

Therefore, it is recommended that online businesses and service providers offer various forms of useful assistance to customers within these communities, including trustworthy mechanisms, timely customer service, and personalized attention. Previous studies have shown that usability is closely associated with service quality and can predict the success of a website (Cao et al., 2005). Hence, this research hypothesizes that:

H8: Service quality has a significant influence on perceived usefulness of e-learning.

3. Research Methods and Materials

3.1 Research Framework

This research involved conducting a comprehensive literature review to establish eight hypotheses related to eight

distinct factors. The main objective of these hypotheses was to explore and analyze the relationships among these factors. The research framework focused on four key factors: perceived usefulness, information quality, system quality, and service quality. These factors were the primary focus of the study. A recent investigation by Chang (2013) placed specific emphasis on three factors: perceived ease of use, perceived usefulness, and enjoyment. Their study examined the interconnectedness of these factors. In another study, Letchumanan and Tarmizi (2011) proposed a novel theoretical framework to explore the relationships among perceived usefulness (PU), perceived ease of use, attitude towards self-directed learning, and intention to engage in self-directed learning behavior.
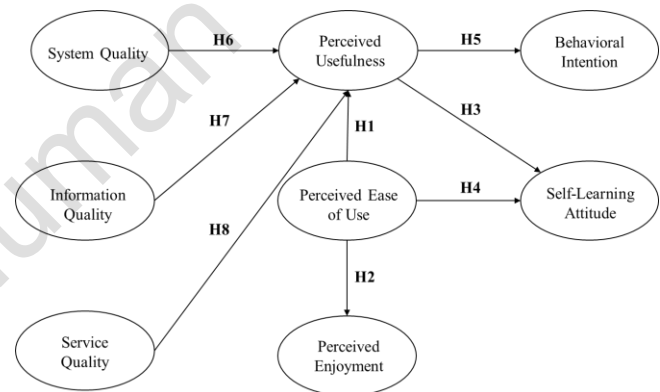
Figure 1: Conceptual Framework

H1: Perceived ease of use has a significant influence on perceived usefulness of e-learning.
H2: Perceived ease of use has a significant influence on perceived enjoyment of e-learning.
H3: Perceived usefulness has a significant influence on self-learning attitude of e-learning.
H4: Perceived ease of use has a significant influence on self-learning attitude of e-learning.
H5: Perceived usefulness has a significant influence on behavioral intention to self-learning
H6: System quality has a significant influence on perceived usefulness of e-learning.
H7: Information quality has a significant influence on perceived usefulness of e-learning.
H8: Service quality has a significant influence on perceived usefulness of e-learning.

3.2 Research Methodology

In this research, a quantitative methodology was applied, utilizing a questionnaire-based research design to gather data from a specific subset of the designated population. To ensure the content validity of the research instrument, three experts

were engaged to assess all questionnaire items using the index of item-objective congruence (IOC), considering an IOC higher than 0.6 as indicative of content validity. Initial testing involved the distribution of the questionnaire to 50 participants who shared characteristics with the target population, although they did not constitute the final sample. This phase aimed to evaluate reliability through the Cronbach's Alpha test variable, with an alpha value of 0.7 or higher indicating greater item reliability.

Data analysis employed validated factor analysis (CFA) and structural equation modeling (SEM) techniques. These analytical approaches were applied to scrutinize the data, assess the model's goodness of fit, explore relationships between variables, and evaluate the validity of the eight proposed hypotheses.

3.3 Population and Sample Size

Israel (2003) emphasized that methods like analysis of covariance, multiple regression, and log-linear analysis require sizable sample sizes, commonly falling within the range of 200 to 500.The study was conducted at Sichuan Vocational College of Cultural Industries and involved 500 science students.

3.4 Sampling Technique

First, judgment sampling enables researchers to selectively choose participants according to their judgment to meet the research goals (Polonsky & Waller, 2011). Scholars have noted that purposeful sampling grants researchers more control over the specific details of the selected sample (Kervin, 1992). Secondly, quota sampling allows the study to be conducted quickly and efficiently. Furthermore, convenience sampling is widely used because it allows the researcher to obtain an adequate number of respondents quickly and easily (Hair et al., 2010).

Table 1: Sample Units and Sample Size

Sample	Population Size	Proportional Sample Size
Freshman	674	165
Sophomore	667	165
Junior	686	170
Total	**2027**	**500**

Source: Constructed by author

4. Results and Discussion

4.1 Demographic Information

According to the data presented in Table 2, out % of the 500 respondents, 31.6% were male, while 68.4% were female. Regarding age groups, the largest proportion of respondents, accounting for 37.8%, were aged 18. This was followed by 26.6% of respondents aged 19, 20.2% aged 20, and 15.4% over 21. Regarding the frequency of E-learning usage, 65.8% of students reported using E-learning for 3 hours or less per week. 19.2% reported using it for 4-6 hours per week, and 15% reported using it for more than 7 hours per week.

Table 2: Demographic Profile

Demographic and General Data (N=500)		Frequency	Percentage
Gender	Male	158	31.6%
	Female	342	68.4%
Age	18 Years Old	189	37.8%
	19 Years Old	133	26.6%
	20 Years Old	101	20.2%
	21 Years Old and above	77	15.4%
Frequency of Study	3 hours or less/week	329	65.8%
	4-6 hours/week	96	19.2%
	7 hours or above	75	15%

4.2 Confirmatory Factor Analysis (CFA)

This study used statistical software to construct a suitable Confirmatory Factor Analysis (CFA) matrix based on the research purpose and model. The goodness-of-fit test was conducted to assess the degree of fit between the model and the actual data, determining whether the model aligns with the observed data.

Table 3 presents the factor loadings, Average Variance Extracted (AVE), and Composite Reliability (CR) values for the questionnaire data of Japanese learners (non-Japanese majors). Hair et al. (2010) considers a factor loading value of 0.50 or higher appropriate. A factor loading with an absolute value greater than or equal to 0.5 indicates significance, suggesting a strong correlation between the observed variable and the underlying factor.

Table 3: Confirmatory Factor Analysis Result, Composite Reliability (CR) and Average Variance Extracted (AVE)

Variables	Source of Questionnaire (Measurement Indicator)	No. of Item	Cronbach's Alpha	Factors Loading	CR	AVE
Perceived Usefulness (PU)	Buabeng-Andoh (2018)	3	0.839	0.772-0.815	0.840	0.637
Perceived Ease of Use (PEOU)	Buabeng-Andoh (2018)	3	0.903	0.861-0.876	0.903	0.757
Perceived Enjoyment (PE)	Lee et al. (2005)	3	0.811	0.712-0.800	0.810	0.588
Self-Learning Attitude (SA)	Sánchez-Muros et al. (2014)	3	0.901	0.852-0.895	0.901	0.753
Behavioral Intention to Self-Learning (BI)	Lin (2013)	4	0.944	0.885-0.913	0.945	0.811
System Quality (SYQ)	Cho et al. (2009)	4	0.909	0.825-0.894	0.910	0.717
Information Quality (IQ)	Lee (2006)	3	0.919	0.852-0.919	0.919	0.792
Service Quality (SEQ)	Cho et al. (2009)	3	0.870	0.789-0.879	0.872	0.695

According to Hair et al. (2010), the confirmation factor analysis (CFA) matrix is considered the most effective approach for assessing and evaluating the performance of variables. This study employed seven criteria to evaluate and determine the model's fit. These criteria include the relative Chi-square (CMIN/df), Goodness of Fit Index (GFI), approximate root mean square error (RMSEA), Comparative Fit Index (CFI), structured fit index (NFI), Tuck-Lewis index (TLI), and Adjusted Goodness of Fit Index (AGFI).

Table 4: Goodness of Fit for Measurement Model

Fit Index	Acceptable Criteria	Statistical Values
CMIN/DF	< 3.00 (Hair et al., 2006)	435.650/271 = 1.608
GFI	≥ 0.85 (Kline, 2011)	0.937
AGFI	≥ 0.85 (Kline, 2011)	0.918
NFI	≥ 0.85 (Kline, 2011)	0.955
CFI	≥ 0.85 (Kline, 2011)	0.982
TLI	≥ 0.85 (Kline, 2011)	0.979
IFI	≥ 0.85 (Kline, 2011)	0.983
RMSEA	≤ 0.08 (Hooper et al., 2008)	0.035
Model Summary		**Acceptable Model Fit**

Remark: CMIN/DF = The ratio of the chi-square value to degree of freedom, GFI = Goodness-of-fit index, AGFI = Adjusted goodness-of-fit index, NFI = Normed fit index, CFI = Comparative fit index, TLI = Tucker-Lewis index, IFI = Incremental Fit Index and RMSEA = Root mean square error of approximation

According to Fornell and Larcker (1981), testing for discriminant validity was evaluated by computing the square root of each AVE. Based on this study, the value of discriminant validity is larger than all inter-construct/factor correlations. Therefore, the discriminant validity is supportive. The convergent and discriminant validity were proved. Consequently, the evidence is sufficient for establishing construct validity.

Table 5: Discriminant Validity

	SEQ	SYQ	IQ	PEOU	PE	SA	BI
SEQ	**0.834**						
SYQ	0.485	**0.846**					
IQ	0.566	0.538	**0.890**				
PEOU	0.428	0.426	0.552	**0.870**			
PE	0.476	0.595	0.523	0.421	**0.767**		
SA	0.367	0.468	0.574	0.440	0.603	**0.868**	
BI	0.271	0.442	0.286	0.226	0.318	0.373	**0.900**
PU	0.329	0.383	0.391	0.436	0.440	0.368	0.275

Note: The diagonally listed value is the AVE square roots of the variables
Source: Created by the author.

4.3 Structural Equation Model (SEM)

In this section, following the CFA matrix analysis, a structural equation model was employed to examine the correlation between exogenous and endogenous potential variables. Hair et al. (2010) suggested that the reliability, convergent validity, and discriminant validity of the model were assessed at the structural model level.

To evaluate the fit of the structural equation model, the following indices were utilized: CMIN/DF, GFI, AGFI, RMSEA, CFI, and TLI. These indices were employed to assess the degree of fit between the model and the actual data, helping to determine the level of agreement between the two.

Table 6: Goodness of Fit for Structural Model

Index	Acceptable	Statistical Values
CMIN/DF	< 3.00 (Hair et al., 2006)	839.341/282 = 2.976
GFI	≥ 0.85 (Kline, 2011)	0.896
AGFI	≥ 0.85 (Kline, 2011)	0.870
NFI	≥ 0.85 (Kline, 2011)	0.913
CFI	≥ 0.85 (Kline, 2011)	0.940
TLI	≥ 0.85 (Kline, 2011)	0.931
IFI	≥ 0.85 (Kline, 2011)	0.941
RMSEA	≤ 0.08 (Hooper et al., 2008)	0.063
Model Summary		**Acceptable Model Fit**

Remark: CMIN/DF = The ratio of the chi-square value to degree of freedom, GFI = Goodness-of-fit index, AGFI = Adjusted goodness-of-fit index, NFI = Normed fit index, CFI = Comparative fit index, TLI = Tucker-Lewis index, IFI = Incremental Fit Index and RMSEA = Root mean square error of approximation

4.4 Research Hypothesis Testing Result

The correlation magnitude among the independent and dependent variables proposed in the hypothesis is measured by regression coefficients or standardized path coefficients. As presented in Table 7, seven proposed hypotheses were supported.

Table 7: Hypothesis Results of the Structural Equation Modeling

Hypothesis	(β)	t-value	Result
H1: PEOU→PU	0.280	5.755*	Supported
H2: PEOU→PE	0.448	8.276*	Supported
H3: PU→SA	0.194	3.977*	Supported
H4: PEOU→SA	0.356	7.491*	Supported
H5: PU→BI	0.315	6.182*	Supported
H6: SYQ→PU	0.203	3.368*	Supported
H7: IQ→PU	0.146	2.284*	Supported
H8: SEQ→PU	0.064	1.017	Not Supported

Note: * $p < 0.05$
Source: Created by the author

H1: The standardization coefficient between perceived ease of use and perceived usefulness is 0.280, and the T-value is 5.755*, which indicates that perceived ease of use has a significant positive effect on perceived usefulness in this part of the data.

H2 has shown a significant impact of perceived ease of use on perceived enjoyment. This structural pathway results in the standard coefficient value of 0.448 and the t-value of 8.276*.

H3 has shown a significant impact of perceived usefulness on the self-learning attitude of e-learning. This structural pathway results in the standard coefficient value of 0.194 and t-value of 3.977*

H4 is 0.356, demonstrating that perceived ease of use has a substantial and beneficial influence on PU. The survey shows that user accomplishment and self-learning attitude have a powerful connection.

H5 has confirmed that perceived usefulness is an important component in behavioral intention, with the standardized route coefficient value in the structural approach being 0.315.

H6 shows that system quality is one of the major factors driving perceived usefulness, as shown by the standardized path coefficient (β) of 0.203.

H7 suggests that, in comparison to other determinants, information quality has relatively little impact on perceived usefulness. Scores: The standardized path coefficient (β) is 0.146.

H8 has confirmed that service quality is not one of the important factors of perceived usefulness, with a normalization coefficient of 0.067, so H8 is not supported.

5. Conclusion and Recommendation

5.1 Conclusion and Discussion

The findings of the study revealed several significant insights. Firstly, perceived usefulness was identified as a crucial factor influencing the behavioral intention to self-learning. Students who perceived the e-learning system as useful were likelier to have a positive attitude towards self-learning and expressed a higher intention to engage in self-learning activities.

Secondly, perceived ease of use significantly shaped students' self-learning attitudes and behavioral intentions. When the e-learning system was perceived as easy to use, students were more inclined to have a positive self-learning attitude. They showed a stronger intention to participate in self-learning activities.

Additionally, perceived enjoyment emerged as an important factor influencing students' self-learning attitude. Students who found the e-learning system enjoyable were likelier to develop a positive attitude towards self-learning and exhibit a higher behavioral intention to engage in self-learning activities.

Furthermore, the study highlighted the influence of system, information, and service quality on students' self-learning attitudes and behavioral intentions. When the e-learning system was perceived to have high quality in functionality, content, and service provision, students were more likely to develop a positive self-learning attitude and express a higher intention to participate in self-learning activities.

In conclusion, the study provided valuable insights into the factors influencing the behavioral intention to self-learning and the self-learning attitude of internet-based e-learning for college science students. The findings emphasized the importance of perceived usefulness, perceived ease of use, perceived enjoyment, system quality, information quality, and service quality in promoting positive attitudes towards self-learning and encouraging students to engage in self-learning activities actively. Educational institutions can utilize these findings to improve the design and implementation of e-learning systems, thereby enhancing the effectiveness of self-learning for college science students.

5.2 Recommendation

Based on the findings of the study on factors influencing the behavioral intention to self-learning and the self-learning attitude of internet-based e-learning for college science students in Sichuan Vocational College of Cultural Industries in Chengdu, China, the following recommendations can be made to promote self-learning among college science students; it is essential to highlight the usefulness of the e-learning system. Educators and administrators should emphasize the practical benefits and advantages of self-learning, such as improved understanding of subject matter, enhanced problem-solving skills, and increased knowledge retention.

Efforts should be made to ensure the e-learning system is user-friendly and easy to navigate. Clear instructions, intuitive interfaces, and accessible resources can help students perceive the system as easy to use. Additionally, offering technical support and training sessions can assist students in overcoming any challenges they may face while using the e-learning platform.

Creating a positive and engaging learning environment is crucial for promoting self-learning attitudes. Incorporating interactive elements, multimedia content, gamification, and collaborative activities can enhance students' enjoyment and motivation to participate in self-learning. Regular feedback and rewards can also contribute to a more enjoyable learning experience.

5.3 Limitation and Further Study

The study relied on a limited sample size, which could affect the generalizability of the findings. Conducting the research with a larger and more diverse sample could provide a more representative understanding of the factors influencing self-learning attitudes in college science students.

The study focused on college science students at Sichuan Vocational College of Cultural Industries in Chengdu, China. It is important to recognize that the results may be influenced by unique contextual factors such as cultural norms, educational practices, and institutional characteristics. Replicating the study in different contexts and regions would help determine the generalizability of the findings.

While the study focused on perceived usefulness, perceived ease of use, perceived enjoyment, system quality, information quality, and service quality, other variables could influence self-learning attitudes and behavioral intentions. Exploring additional factors, such as learner motivation, self-efficacy, and social interaction, could provide a more comprehensive understanding of the dynamics involved in self-learning.

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