

Research on the influencing factors of continuous use behavior of users of digital library platform based on TAM

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Abstract: This paper aims to evaluate and analyze the factors affecting the behavioral intention of fine arts undergraduates in Chengdu University in their continuous use of digital library after using digital library platform. The conceptual model constructed in this study is based on the digital acceptance model (TAM), and five potential variables, namely perceived ease of use (PEOU), perceived usefulness (PU), satisfaction (SA), effort expectation (EE) and convenience (FC), are set in the hypothesis section to have a significant impact on behavioral intention (BI). In this paper, quantitative research is carried out, and small-scale internal consistency reliability is analyzed by extracting fine arts undergraduates from Chengdu University.

Keywords: technology acceptance model; digital library; behavioral intention

1. Introduction

Education informationization is an important strategic measure to carry out education modernization in our country at present. Education informationization includes the following two aspects: First, information literacy is included in the educational goal, the purpose is to train the information society talents; The second is to integrate information technology means into education, teaching and scientific research to promote education dissemination and education mode informatization. Based on the above strategic measures and the large-scale rise of digital resource platforms, digital libraries have experienced the transformation from traditional libraries to mobile digital libraries. NOHY believes that the information services of digital libraries not only rely on the network and information technology, but also constantly innovate^[1] under the influence of external pressure. In order to accelerate the upgrading of digital libraries to adapt to the pace of education modernization and informatization, it is inevitable to accurately investigate and extract the factors affecting users' continuous use and tap users' hidden needs. In recent years, in order to solve the educational challenges brought by the epidemic, China has launched a lot of reform work for the implementation of education informatization, such as mobile learning platform, mixed teaching mode, digital library and so on. However, as far as digital library is concerned, its information delivery service is still in the early stage of development, and user feedback information cannot be processed in time during the use of digital library. Therefore, satisfaction and behavioral tendency based on the technology acceptance model are users' evaluation and emotional response^[2] to the whole experience process of digital library intelligent service. The analysis of the factors of continuous use of digital library users is conducive to improving the service quality of digital library platform and the accuracy of information delivery; It is helpful for users to improve learning efficiency and learning quality, and achieve a win-win situation for both sides.

In the Government Work Report of 2017, artificial intelligence was elaborated for the first time, and the application of new technologies related to it has also been highly concerned, including the field of digital library, so the academic research on digital library is important. College students, as the main target group used by the digital library platform, have a certain reference for the study of the connection between the two. However, as of March 2023, there are 41,217 literatures related to digital libraries that can be searched on CNKI, of which only 841 are related to university digital libraries. The research and research based on technology acceptance model are even more scarce.

There are two outcome variables in the technology acceptance model (TAM), namely behavioral intent (BI) and actual use (AU), and behavioral intent (BI) is defined as the behavioral tendency^[3] to continue using a certain technology in the future. Some scholars have shown that behavioral intention

(BI) is affected by perceived ease of use (PU) ^[4] and perceived usefulness (PEOU), and BI is the dependent variable in this paper. Therefore, it is feasible to select representative groups as research samples and conduct a rigorous quantitative analysis on their experience of using digital libraries.

1.1 Research objective

Firstly, the paper constructs a model of sustainable use of "digital library" and designs a scale according to the theoretical model and hypothesis as a measuring tool to study the factors of sustainable use of fine arts undergraduates in Chengdu University.

Secondly, according to the investigation and data collation, the main factors of the continuous use of digital library by fine arts undergraduates in Chengdu University are explored.

Finally, combining the main variables that affect the continuous use of digital library by fine arts undergraduates of Chengdu University, this paper provides directional suggestions for the making of renewal strategy plan for the person in charge of digital library platform.

1.2 Research Questions

Based on the above research objectives, two research questions are raised in this paper through hypothesis and demonstration ^[5]: First, what are the main motivations that influence the continuous use of digital maps by art majors in target universities? Second, the digital library management platform depends on the use of users, so from what aspects should the platform update the mechanism to achieve the continuous use of college students?

2. Related concepts and assumptions

2.1 Perceived Ease of Use

Davis(1989) pointed out that TAM includes other external variables to measure a particular technology, because other external variables may affect the perceived ease of use and perceived usefulness of the technology. Ease of use can be defined as the user's subjective perception that it does not require much effort^[6] to use a particular system. PU and PEOU are generally considered to be the two most important configurations in a TAM. The existing literature proves that users tend to use a system if they think it is easy to use. TAM research also shows that PEOU has a positive impact ^[7] on PU, such as foreign scholars Chang chingter.^[8], and domestic scholars Xu Shun and Tian Xiaoxiang^[9]. Based on the above literature research, the following hypotheses can be made:

H1: Perceived ease of use has a significant impact on perceived usefulness.

H2: Perceived ease of use has a significant impact on satisfaction.

2.2 Perceived Usefulness

Perceived usefulness (PU) refers to the extent^[6] to which users subjectively believe that using a system can improve their work performance. In most cases, PU is considered to be the most decisive role ^[10] in influencing a user's attitude. PU has been shown to be a necessary structure ^[11] for improving learners' self-regulation in an e-learning environment. TAM proposed that both PU and PEOU have a significant effect on SA. In addition, scholars Teo,T.^[12], and Wong,G,K.^[13], pointed out in their article that PU also has direct and indirect effects on behavioral intention. Therefore, in response to previous studies, this paper proposes the following hypothesis:

H3: Perceived usefulness has a significant effect on satisfaction.

H4: Perceived usefulness has a significant effect on behavioral intent

2.3 Satisfaction (Satisfication)

Attitude refers to the positive or negative feelings that an individual has in the process of performing a certain behavior. Satisfaction is often defined as the sum of a person's feelings or attitudes toward the various factors that influence a person's decision-making. For the purposes of this study, SAT refers to a person's willingness to use a digital library system on an ongoing basis. Wang,W.; Zhao,Y.; Goh,M. In

their research, three scholars proved that learner satisfaction is one^[14] of the important factors affecting the effect of hybrid online courses.

In addition, scholar Al-Sadhan, surveyed college students and faculty members on their perceptions^[15] of blackboard systems. Scholar lilaw studied learner satisfaction, behavior control, and the efficiency of Canvas learning system, and the results all showed that both the usefulness and satisfaction of the lesson plan affect the learners' behavioral intention^[16] of using the lesson plan. The existence of the satisfaction factor has important reference value for educators to improve the course design or managers to improve the service quality. Based on the above literature research, the following assumptions can be made:

H5: Satisfaction has a significant effect on behavioral intention.

2.4 Effort Expectancy

According to scholar Yoo et al., effort expectancy (EE) is an intrinsic characteristic^[17]. Early studies have found that there is a significant positive relationship between perceived ease of use (PEOU) and effort expectation (EE), and the variables that promote users' willingness to continue to use a certain technology for a long time include effort expectation (EE)^[18]. Based on the above literature research, the following hypotheses can be made:

H6: Effort expectation has a significant effect on perceived usefulness.

H7: Effort expectation has a significant effect on perceived ease of use.

2.5 Facilitating Conditions

According to Venkatesh et al. (2003), in his research, whether there are enough resources or conditions to support users' continuous use of technology is called facilitating conditions variable. In the study on online teaching, convenience (FC) is defined as the organizational infrastructure that supports the availability and use of technology. Scholar Ain et al believes that the availability of conditions is conducive to the usability of technology use, and finally the two variables will have a positive impact on the attitude of continuous use. Based on the above literature research, the following assumptions can be made:

H8: Convenience conditions have a significant impact on perceived ease of use.

2.6 Behavior Intention

BI describes a person's behavior tendency when he engages in a certain activity in the future, and it can be the direct premise of a certain behavior. In this study, BI includes the behavior tendency of undergraduates majoring in fine arts in Chengdu University to use digital library again. Scholar Bhattacharjee believes that if users think that a certain technology is useful, it will have a positive impact on the continuous use behavior.

2.7 Conceptual Framework

Based on the above extensive achievements, the conceptual framework is constructed with the Technology Acceptance Model as the guide. First of all, based on Xiulan Chen's academic research results, the author identifies four potential variables: perceived ease of use (PU), perceived usefulness (PEOU), satisfaction (SAT) and behavioral intent (BI), among which three mediating variables and one dependent variable. Secondly, according to Abeer S. Almogren's previous research, the author identified two independent variables, effort expectation (EE) and convenience condition (FC), which constitute the conceptual framework model of this study. Through the integration of the above models and the extraction of causality, the conceptual model includes two independent variables (EE and FC); Three mediating variables (PU, PEOU, SAT); And the only dependent variable (BI). The exact details are shown in Figure 1:

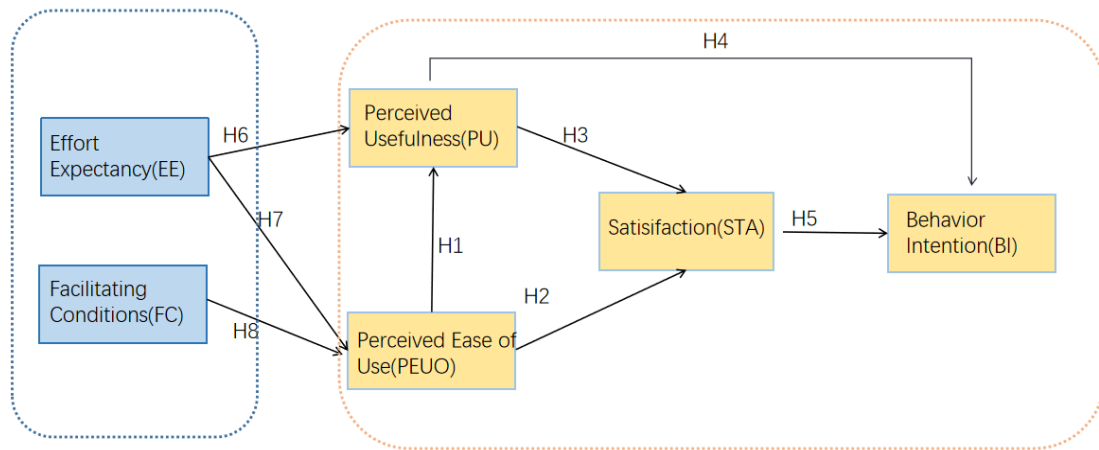


Figure 1 Conceptual framework model

3. Research Methods

In the research method, this study chooses the quantitative research method, aiming to analyze the influencing factors of the behavior intention of fine arts undergraduates in Chengdu University who continue to use digital library after using digital library platform. Firstly, the quantitative research method can improve the reliable, effective and objective results of the research, and the whole research group is summarized according to the quantitative method of Fraenkel et al. Secondly, the researcher completed the corresponding questionnaire based on the conceptual model, the specific details are shown in Table 1:

Table 1 Research scale of behavioral intention factors for continuous use of digital library.

Latent Variables	Number	Observed variables
Strive for expectations	EE1	I can easily and skillfully use the digital library to expand and study
	EE2	I know very well how to use digital library to study
	EE3	I am confident that I can find useful knowledge on digital library platform
Convenience	FC1	I have the necessary resources (Internet or access device) to use the digital library
	FC2	I have the necessary knowledge and skills to use the digital library
	FC3	When I encounter problems in using the digital library for study, I can find a helper in time
Perceived Ease of use	PEOU1	I often get confused when using digital libraries to look up materials
	PEOU2	I often find it very easy to look things up in a digital library
	PEOU3	I often make mistakes when looking up materials in the digital library
	PEOU4	Using the digital library, I can easily access the materials I need
Perceived Usefulness	PU1	Using the digital library allows me to complete more learning tasks
	PU2	Using digital library can improve my performance in study
	PU3	The digital library fulfills my study-related needs
	PU4	All in all, digital library is beneficial to me
Satisfaction	SA1	I am very happy with using the digital library platform
	SA2	I am very confident in using the digital library platform
	SA3	I believe that using digital library platform will add more fun to learning
Behavioral intent	BI1	I intend to increase my use of digital libraries in the future
	BI2	I will add the digital library to my favorite way of learning
	BI3	I will encourage my friends and family to use the digital library
	BI4	I would highly recommend other people to use digital libraries

After the questionnaire was constructed, the researcher invited 3 experts to evaluate the content validity, and selected 40 undergraduate students majoring in fine arts from Chengdu University to evaluate the internal consistency reliability of the research scale through Krumbach coefficient. The specific research and evaluation rules will be detailed in the form of charts.

3.1 Content validity judgment

Before the actual test, the researcher conducted the validity and reliability test. Based on the research results of Rovinelli and Hambleton, it is concluded that: For the determination of content validity, ItemObjective Congruence test is an important evaluation criterion. The research scale should be evaluated by three or more experts with doctoral degree, and the score of each item should not be lower than 0.5. In this study, three experts were consulted to conduct IOC tests on the questionnaire. After the tests and scores of the three experts, the scores of all observed variables were no less than 0.67. Thus, it can be concluded that the questionnaire passed the IOC test and had certain validity.

3.2 Total group, sample size, sampling method

The target group of this study is the undergraduate students majoring in fine arts in Chengdu University, including the students majoring in painting, design, fine arts and other fine arts and design, including 460 freshmen; The total number of sophomore students is 445; 425 students in junior year; And 352 seniors. According to the previous study of Halabi and More-Esquivel, as well as the known sample indicators, there are 6 potential variables and 21 observed variables, and the minimum sample size of 403 people is obtained.

3.3 Internal consistency reliability judgment

For small-scale test and internal consistency reliability determination, scholars Isaac and Michael showed in their research that a small-scale test with a sample size of at least 30 people can obtain a relatively accurate reliability index^[19]. In this test, 40 people were selected as small scale test population. After data collection and calculation, Cronbach's α of all potential variables was greater than 0.821, as shown in Table 2 for specific details:

Table 2 Internal consistency reliability test (n = 40)

Latent variables	Number of questionnaires	Kronbach coefficient
Strive to expect	3	0.834
Convenience	3	0.821
Perceived ease of use	4	0.851
Perceived usefulness	4	0.843
Satisfaction	3	0.878
Behavioral intent	4	0.823

4. Conclusion

4.1 Research conclusion

This paper analyzes the behavioral intention of fine arts undergraduates in Chengdu University in their continuous use of digital library, constructs a conceptual model based on the technology acceptance model (TAM), and conducts a small-scale test. In general: Perceived ease of use (PEOU), perceived usefulness (PU), effort expectation (EE), convenience (FC) and satisfaction (SA) all have direct or indirect influences on behavioral intention (BI), among which satisfaction (SA) has a significant positive influence on behavioral intention (BI).

Through this research, it is hoped that the composite library combining digital library and traditional library is the strategic direction of the development of university libraries at the present stage, While continuously enriching library collections. By focusing on serving users, the service means and methods of university library are adjusted according to the needs of university students. This paper points out that the digital library for college students needs to collect feedback information, give college students more information that meets their needs, and provide a variety of new network services by guiding a small group of undergraduate students of fine arts major colleges in Chengdu University.

4.2 Deficiencies and prospects

As the research target of this research only selects the undergraduate students majoring in fine arts of Chengdu University as the research group as the sample target, the sample size cannot adopt more strict

and objective sampling methods such as stratified random sampling. In the actual research, only small groups of people are analyzed. In the future research and exploration, the selection of research groups such as high-efficiency students in Chengdu can be expanded, and professional distinctions can be made without restrictions. Secondly, in addition to the above potential variables, potential variables such as social influence and attitude can be added to construct the conceptual model, so as to further deduce the model and further explore the factors of continuous use of university digital libraries

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