Research on the influencing factors of college students' intention to use online learning space

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Abstract. With the rapid development of information technology, the emergence of online learning space has changed the traditional education and teaching methods, and has become an important intelligent learning environment for students to learn independently. This paper uses the Technology Acceptance Model (TAM) to build the influencing factors model of college students' intention to use online learning space, and conducts an investigation and analysis of 280 college students to explore the main factors affecting college students' intention to use online learning space, The research results show that the perceived usefulness, learning experience, learning resources and community relations of college students positively affect their use intentions, perceived ease of use positively affects perceived usefulness, and perceived usefulness and community relations positively affect college students' behavior intentions in using online learning spaces. Based on the research results, this paper puts forward some suggestions on the construction of e-learning space to ensure that it can better serve the knowledge learning of learners and promote the sustainable development of e-learning space.

Keywords: e-learning space; college student; influence factor

1 Introduction

After the "Three Connections and Two Platforms" was put forward at the National Conference on Education Informatization, it received wide attention, and the construction of the "Three Connections and Two Platforms" was launched nationwide. As an important part of "three links", e-learning space Renrentong has become the focus of construction and promotion. In 2016, the 13th Five Year Plan for ICT in Education proposed to achieve full coverage of broadband networks and online teaching environments in schools at all levels and of all types. High quality digital education resource services basically meet the needs of IT based teaching and personalized learning. The application of online learning spaces is universal, so as to achieve "one space for life, and unique for life", and comprehensively improve the basic support capacity of ICT in education. [1] In 2018, the Ministry of Education issued the Guidelines for the Construction and Application of Online Learning Spaces, which requires promoting the in-depth development of online learning spaces, standardizing the construction and application of online learning spaces, promoting the reform of teaching methods and learning methods, and innovating educational service models and management mechanisms [2] As a digital environment for college students to learn independently, the construction and popularization of online learning spaces can improve the intelligent level of higher education.

This research takes a university student in a southwest normal university as the research object, constructs a structural equation model through TAM theory, analyzes the influencing factors of the intention to use the online learning space, which is of great significance for the improvement of college students' autonomous learning ability and the improvement of the service quality and service level of the construction of online learning space.

2 Researchbasis

2.1 Connotation of E-learning Space

As far as e-learning space is concerned, it can be divided into generalized e-learning space and narrow e-learning space according to the different functions of the main body of the operating platform of the e-learning space. Among them, the former believes that the online learning space is a professional and independent online learning system that can provide students with personalized services [3] [4], such as the Chinese University Muke Platform, Netease Cloud Classroom, Tencent Cloud Classroom and other application systems that support personalized learning services. The latter believes that e-learning is a virtual space supporting learners' learning activities [5] [6]. Although these are not special e-learning space systems, they also have some functions of e-learning space or provide some services belonging to e-learning space, which can also be classified as a kind of e-learning space.

2.2 TAM Model and Its Application

TAM model is a result of the development of a variety of theories, mainly based on the theory of rational behavior, and gradually developed by absorbing some theoretical knowledge from self-efficacy theory, expectation theory model, etc. In 1989, Davis applied the user's acceptance of information technology to the research through TRA theory, and proposed a technology acceptance model (TAM model) [7]. The TAM model has abandoned the path of subjective norms influencing behavior intention in rational behavior theory through development, and directly influenced behavior intention through use attitude [8]. On this basis, Davis also drew inspiration from various other theoretical models and extracted relevant theoretical basis. Get inspiration from the use performance cognition in expectation theory cognition, and propose perceived usefulness [9]; From the self-efficacy of the self-efficacy theory, the perceived ease of use is proposed; The TAM model is formed by replacing the abstract "belief" in the original TRA model with perceived usefulness and perceived ease of use. The TAM model believes that system use is determined by behavior intention, which is jointly determined by use attitude and perceived usefulness, and perceived usefulness is determined by perceived ease of use and external variables [10]. External variables include system design characteristics, user characteristics, task characteristics, essence of development and implementation process, policy impact, organizational structure, etc., which establish a connection between internal beliefs, attitudes, intentions, differences between different individuals, environmental constraints, and controllable interference factors in the technology acceptance model. Based on the TAM model and referring to the existing research, this study analyzes and discusses the relationship between the seven variables in the study by using the method of structural equation model, and obtains the key factors affecting the willingness to use web-based learning space, which provides a reference for the future construction and development of web-based learning space.

3 Research Design

3.1 Research hypothesis

Based on the TAM model, this study searches for TAM, online learning space, and willingness to use, and finds that the influencing factors of college students' intention to use online learning space mainly include: perceived usefulness, perceived ease of use, sense of learning experience, learning resources, community relations and other factors. The core variables finally determined through expert interviews include the following 7: perceived usefulness Perceived ease of use, learning experience, learning resources, community relations, use attitude, and behavior intention. Core variables.

3.2 Research tools

Tam davis scale was used in this study. The questionnaire is divided into two parts: the first part is the basic information, and the second part is the influencing factors for college students to use online learning space. There are 27 questions, which are divided into 7 variables: perceived utility (4 questions), perceived ease of use (4 questions), learning experience (4 questions), learning resources (4 questions), community relations (5 questions), use attitude (3 questions) and behavioral intention (3 questions). Likert five point scale was used to design, spss 24.0 software was used to statistically analyze the measured data, and amos 24.0 software was used to model, modify and interpret the model.

3.3 Modle construction

In order to explore the relationship among the factors influencing college students' intention to use online learning space, the correlation among the seven latent variables was considered based on the research hypothesis. Among the seven potential variables, perceived ease of use, community relations, learning experience, and learning resources are external potential variables, and there is no need to set residual items, while perceived usefulness, use attitude, and behavioral intention are internal potential variables, and residual items need to be set. Use AMOS24.0 software to build a structural equation model, and use the maximum likelihood method to estimate the model, as shown in Figure 1.
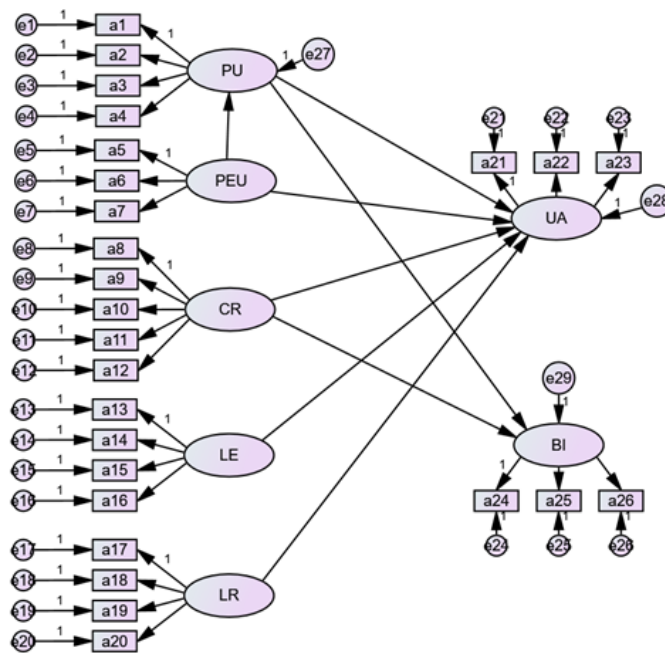
Fig. 1 The influencing factor model of intention to use e-learning space

4 Research Results And Analysis

4.1 Reliability and validity analysis

This study used spss 24.0 as the research tool to analyze the reliability and validity of 27 questions in the questionnaire, and used Cronbach coefficient α） And composition reliability (CR for short) as the reliability indicators of the questionnaire. If Cronbach α If it is greater than 0.9, it indicates that the questionnaire has good internal reliability. If Cronbach α Between 0.8 and 0.9, it indicates that the questionnaire has good internal reliability. If Cronbach α If it is greater than 0.7 and less than 0.8, the internal reliability of the questionnaire is not ideal. If Cronbach α If it is less than 0.7, the questionnaire should be reset. If the CR value is>0.7, it indicates that the internal consistency of each measurement problem is good. Cronbach of all potential variables in this study α All of them are greater than 0.8, and the CR value is greater than 0.7, indicating that the measurement model constructed has high reliability and good internal consistency of sample data. The validity test uses factor analysis to test the structural validity of the questionnaire. SPSS 24.0 uses factor analysis to test the structural validity of the questionnaire. Bartley ball test and KMO value are used to determine whether factor analysis is appropriate for the data. The sig result is lower than the significant level of 0.005, indicating that the data is suitable for factor analysis. The closer the KMO value is to 1, the stronger the correlation is. KMO>0.9 is very suitable for factor analysis; 0.8<KMO<0.9; Higher than 0.7 is acceptable, 0.6 indicates poor effect, and 0.5 or lower is not suitable for factor analysis. The results of this study show that KMO value is greater than 0.9 and Bartlett's spherical test results

show that sig is less than 0.005, which meets the theoretical requirements, indicating that the construct validity is good.

4.2 Model fit test

The structural equation model method is used to analyze the trajectory with amos 24.0 software, and the fitting degree of the search model is verified. The closer the model value is to the theoretical standard value, the better the model fitting is, the better the effect of the structural equation model is, and the higher the feasibility of the study is. The analysis results in AMOS 24.0 are shown in Table 1. The ratio of chi square to freedom cmin/df is less than 3, the RMSEA value is less than 0.08, and other relevant fitting indicators GFI, TLI, and CFI are greater than 0.9, which are within the theoretical requirements, proving that the research model has a good fit.

Table 1. Fitting indicators of path analysis model

Fitting index	CMIN/DF	RMSEA	GFI	TLI	CFI
Model	2.236	0.062	0.965	0.979	0.936
recommended value	1<CMIN/DF<3	<0.08	>0.9	>0.9	>0.9

4.3 Research hypothesis test

In order to prove whether the research hypothesis is valid, this study uses AMOS 24.0 to analyze the path of the structural equation model. Except that the path coefficient of perceived ease of use to attitude is negative, the path coefficient among other variables reaches a significant level, indicating that H2 fails the hypothesis test, and perceived ease of use has no positive impact on attitude to use, as shown in Table 2. Among them, resource optimization has the greatest impact on the standardized path coefficient of the use attitude, which indicates that the rational use of resources has a significant impact on the attitude of college students to use online learning space. Then perceived usefulness has a positive impact on "behavioral intention" and "perceived ease of use" on "perceived usefulness". Finally, perceived usefulness has the least impact on "use attitude".

Table 2. Model Significance and Hypothesis Test Results

Correspondence hypothesis	Path coefficient	P value	Validation results
H1	0.461	remarkable	Pass inspection
H2	-0.063	0.726	Failure to passinspection
H3	0.256	remarkable	Pass inspection
H4	0.683	remarkable	Pass inspection
H5	0.294	remarkable	Pass inspection
H6	0.725	remarkable	Pass inspection
H7	0.396	remarkable	Pass inspection
H8	0.285	remarkable	Pass inspection
H9	0.314	remarkable	Pass inspection

5 Conclusions And Suggestions

Based on the TAM model, this study investigates the influencing factors of college students' intention to use online learning space, analyzes the influence and path among various factors, and verifies the research hypothesis. The main conclusions are as follows.

First, perceived ease of use has a significant positive impact on perceived usefulness, and its path coefficient is 0.461, which indicates that the degree of difficulty of the characteristics of online learning space determines the extent to which college students think it is useful. The operation of online learning space is simple and convenient, and college students will subjectively think that online learning space can help them improve their learning efficiency, and will not create pressure and burden on the learning of online learning space; On the contrary, if the use of online learning space is complex and difficult, it will have a negative impact on college students' learning process, and college students' awareness of the usefulness of online learning space will be greatly reduced.

Secondly, perceived usefulness has a positive correlation with college students' attitudes towards the use of online learning spaces, indicating that college students feel that online learning spaces are highly useful, can bring convenience to their own learning, and can help them improve their learning efficiency. College students will be more willing to use online learning spaces in the learning process. From the data analysis, it can be concluded that college students generally believe that online learning space is useful, which requires that the construction of online learning space in colleges and universities should first be analyzed from the perspective of the needs of college students. Considering the actual needs of learners, the online learning space suitable for college students should be designed according to the characteristics and needs of college students. Specifically, the online learning space should fully meet the different needs of each college student, Let college students realize the advantages of online learning space in the learning process. In the concept of space design, we should respect the individual differences of college students, and build a network learning space with simple operation, comprehensive and diverse functions, convenient interaction and humanized interface; In the promotion and application of space, we should pay attention to the use of online learning space to improve the learning effect of college students, rather than just learning to use online learning space. Only in this way can we fundamentally strengthen college students' awareness of the usefulness of online learning space, form the value intention of online learning space, and generate the behavioral intention of further using online learning space.

Thirdly, perceived usefulness has a significant positive correlation with college students' behavioral intention to use online learning space, and its path coefficient is 0.683. Through the understanding of the actual situation of college students, college students' understanding of online learning space is only at the initial stage of understanding, they have not really used online learning space to learn, do not understand its system, the functions of each module and how to operate it. Although college students do not want to use online learning space for various reasons, online learning space actually brings great benefits. It can be used according to students' personalized needs to improve the learning efficiency of college students. Even if learners do not want to use it, they will also use it because of the actual effect brought by

using it, which shows why perceived usefulness positively affects college students' behavioral intentions to use online learning space.

Fourth, the sense of learning experience has a positive impact on college students' attitudes towards using online learning space, with a path coefficient of 0.294. The sense of learning experience is equally important when learners conduct learning activities in the environment of online learning space. The diversity of learning experience will improve learners' interest and enthusiasm in learning, and thus improve learning efficiency. The diversity of learning experience will also reduce learners' pressure, and learners will get a sense of pleasure in the learning process. Therefore, college students will have a positive attitude towards using online learning spaces. Colleges and universities need to consider the learning characteristics of learners in the construction process to develop a wide variety of online learning spaces suitable for learners, It includes recording learning behavior, analyzing learning process, personalized resource push, diversified evaluation methods, etc. This requires us to constantly update and develop new technologies, as well as cooperation between learners, teachers and online learning space designers.

Fifth, learning resources have a significant positive impact on the attitude towards the use of online learning spaces, with a path coefficient of 0.725. Online learning spaces have a wide range of learning resources. The accurate push and search of resources in online learning spaces can help learners get rid of the difficulties caused by the complexity of resources in the learning process. The reasonable arrangement and optimization of resources enable learners to easily and accurately obtain the required resources, This can solve the waste of time in the learning process when resources are complex and difficult to find, and improve learners' learning efficiency and willingness to use online learning space. Colleges and universities should pay attention to the optimization and rational use of resources in the process of building online learning space. The online learning space can track and record the whole learning behavior of learners in the learning process, and college students can monitor their learning at any time through these records. At the same time, it can also analyze the learning needs of college students through the records of these learning behaviors, and push personalized learning resources to update learning resources in a timely manner.

Sixthly, community relations positively affect college students' attitudes and behavioral intentions in using online learning spaces. The path coefficients are 0.396 and 0.285, respectively. During the learning process, most learners will determine their attitudes based on the use of online learning spaces by other peers. The communication, exchange and sharing of experience in using online learning spaces among learners will also affect other students' choices. Secondly, teachers guide learners to use online learning space in the learning process, which can help students broaden their horizons, solve the problems of learning knowledge, and have a positive impact on learners' attitudes and behavioral intentions. Finally, in the online learning space environment, individual learners and learning partners can overcome the problems in the learning process by exchanging and sharing knowledge content. The constant updating of online learning space technology makes communication between peers more simple and convenient, which has a positive effect on the use attitude of college students' online learning space. In the process of construction, it should be required that the online learning space can maximize the realization of multi-channel interactive communication, create more opportunities for communication and interaction between learners, and enable learners to get a full sense of belonging in the use of online learning space. In addition, online

learning space can also analyze students' learning situation through new technology, recommend learning partners, guide learners to cooperate in learning, help each other, and slowly develop their own online learning space community, so as to continuously improve students' autonomous learning ability.

This paper investigates the factors that affect college students' use of online learning space through TAM model, and analyzes the main factors that affect college students' use of online learning space through structural equation model, including the sense of learning experience, learning resources, community relations, etc. The purpose is to change traditional online learning methods, build intelligent online learning space for learners, and promote the sustainable development of online learning space. But at the same time, there are also some shortcomings. First, the factors are not comprehensive enough. In the future, we can continue to explore the specific elements; Second, in the future research, we should expand the research sample to get more comprehensive analysis and conclusions.

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