



Influencing Factors of Students' Acceptance of Blended Learning Based on Cognitive Neural Network

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ABSTRACT

In order to study the influencing factors of students' acceptance of blended learning, the structural equation model is used to establish a model of students' acceptance of blended learning, BP neural network is applied to analyze the effect strength of each factor on the acceptance of blended learning, and empirical study is conducted to verify the impact of perceived ease of use, perceived usefulness, learning atmosphere, and interactive behavior on the students' acceptance of blended learning. As the research results show, perceived ease of use and perceived usefulness are important factors affecting the acceptance of blended learning; Factors such as learning atmosphere and interactive behavior also affect the acceptance of blended learning, as the former can effectively enhance learning interest and stimulate learning enthusiasm, while the latter determines the frequency and intensity of blended learning exchanges and is an important influence factor for deepened learning; When learning background is introduced into the study of influencing factors, it is found that learners' learning background plays an important role in learning process and learning effect, and is also a key factor among many influencing factors; Learning background has a direct impact on the quality of learning. It has a clear role in adjusting perceived ease of use and learning atmosphere, but it does not have an obvious regulatory effect on perceived usefulness and interactive behavior.

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Key Words: Structural Equation Model, Neural Network, Blended Learning, Acceptance, Learning Effect

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Introduction

Blended learning is a new learner-centered education paradigm. The blended learning theories include connectivism learning theory, constructivist learning theory, cognitive learning theory, humanistic learning theory, educational technology theory and other theories. Thus it is not just based on a specific learning theory, but a mixture of multiple learning theories. This kind of mixture is not a simple superposition, but an innovative blending. It is the concentration and integration of various learning theories supported by internet and information technology, thus it is a

collective sublimation of learning theories, and a kind of expansionary innovation. Its value lies in constantly exploring how to provide more optimized solutions under more complicated circumstances, and combining the advantages of different learning methods, so as to continuously improve, summarize and progress in the teaching practice.

In China, the study on blended learning has been a hot topic in educational circles. Li Jiahou holds that the essence of blended learning is to optimize all kinds of teaching elements in the teaching process by means of information

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technology so as to achieve the teaching goal or the intended teaching target in the most effective way. Shi Xiaocen analyzes blended learning in the elementary education stage in the United States and sums up the related features, problems, and inspirations of blended learning.

The researches on blended learning abroad mainly focus on its theoretical analysis, application, practice and other aspects. Singh believes that blended learning emphasizes the innovation of teaching techniques, the importance of matching learning styles, and the development of learning habits; Kassab holds that when blended learning is used, learning objectives must be considered first, rather than the knowledge transfer platform; Bersin suggests that emphasis on the learner's learning experience is one of the important features of blended learning, which also includes learning strategies that support different learning styles and meet the needs of teachers and students (Singh and Reed, 2001; Kassab *et al.*, 2015; Bersin, 2016). Meyer believes that blended learning is a learner-centered approach, the biggest feature of which is to meet the learning needs of learners (Meyer and Zhu, 2013). As can be seen from the above literature, scholars at home and abroad hold different opinions on blended learning. Blended learning is a mixture of online learning and face-to-face learning from a shallow perspective, but in its essence and from a deeper perspective, the connotation of blended learning includes a mixture of various learning theories, various learning methods and various teaching methods, thus it even more of a deep integration caused by mixing. Therefore, if the advantages of online learning and face-to-face learning can be effectively exploited in the teaching process, the prospects for the future of blended learning will not be measurable.

At present, college students in China generally have great interest and willingness to apply blended learning. However, due to the lack of a unified technical guidance and a sound platform, blended learning is still in a process of spontaneous and random development, thus fails to promote learners' individualized learning, foster independent learning, and explore learning ability, not to mention to take on the responsibility in the reform and development of higher education informationization in the Internet era. In order to establish a comprehensive and optimized blended learning platform, it is necessary to accurately determine

the key factors affecting the blended learning and conduct in-depth exploration and analysis on their terms. In so doing, the characteristics and rules of blended learning can be obtained for the construction of a scientific, rational, and efficient learning platform so as to accelerate the promotion of blended learning and its effectiveness (Babič, 2017; Joo *et al.*, 2011; Liu and Kadirkamanathan, 1998; Kadri and Mouss, 2017; Poznyak, 1998; Sahin and Shelley, 2008).

Methods

Artificial neural networks inherit some of the characteristics of biological neural networks and simulate its working process in a simplified way. Simply speaking, it is a parallel distributed processing structure that consists of a processing unit (i.e., an artificial neuron) and an undirected signal channel that can be called a connection. With local memory, these processing units can perform local operations. Each unit has a single output connection that can be branched into a desired number of parallel connections as needed, and these connections all output the same signal, that is, the signal of the corresponding processing unit, whose size does not change along with the number of branches.

Error back propagation neural network is abbreviated as BP (Back Propagation) network, which is a teacher-guided feedforward network composed of nonlinear transformation units. BP network consists of input layer, hidden layer (which can be one or more layers) and output layer, and all layers are connected. In practical application, the statistical data obtained by the system are usually fuzzy and incomplete, which makes it difficult to satisfy the general fitting method. However, BP neural network utilizes the black box modeling mode and the data-driven mode, which free it from various statistical knowledge. When the BP neural network is incomplete in processing information sources, it can also tap the common characteristics of the existing data and predict the development trend of the research object by adjusting the operation steps and step lengths by itself.

The learning of BP neural network consists of the following four processes. First, the process of "mode forward propagation", during which the input mode is transmitted to the output layer through the intermediate layer from the input layer; second, the error backward propagation process, during which the connection weight is corrected by the error signal between

the desired output and the actual output of the network from the output layer through the intermediate layer to output layer successively; third, the process of network "memory training", a repeated alternation between "mode forward propagation" and "error backward propagation"; fourth, network convergence, a process of learning convergence in which the global error of the network tends to the minimum value. To sum up, it is a process of "mode forward propagation" → "error backward propagation" → "memory training" → "learning convergence".

The structural equation model (SEM) is a multivariate statistical analysis method proposed by Swedish statistician Joreskog in 1973 to analyze the structure of intricate and complex relationships among multi-index variables, which integrates path analysis and confirmatory factor analysis. It is mainly used to analyze the impact of influencing factors on the results, as well as the mutual influence of the influencing factors. It can not only study observable variables and latent variables, but also study the direct or indirect relationship between variables, and compare the advantages and disadvantages of theoretical models. For the relationship between the indexes and the latent variables in the structural equation model, the following measurement equations are used:

$$y = \Lambda_y \eta + \varepsilon \quad (1)$$

$$x = \Lambda_x \xi + \delta \quad (2)$$

where Λ_x is a factor loading matrix reflecting the direct relationship between the exogenous observable variable and the exogenous latent variable; Λ_y is a factor loading matrix which reflects the relationship between endogenous observable variables and endogenous latent variables; η is the endogenous latent variable; ξ is the exogenous latent variable; ε is the error term of the endogenous index y ; and δ is the error term of the exogenous index x .

For the relationship between the latent variables, the following structural equation is used.

$$\eta = B \eta + \Gamma \xi + \zeta \quad (3)$$

where, B is the path coefficient between endogenous latent variables; Γ is the path

coefficient of the influence of exogenous latent variables on endogenous latent variables; and ζ is the residual item. The establishment of the model shall meet the following conditions.

- 1) The mean values of the error terms, ε and δ , of the measurement equation are zero.
- 2) The mean value of the residual term of the structural equation, ζ , is zero.
- 3) There is no correlation between error terms, ε and δ , and the factors, η and ξ ; and there is no correlation between ε and δ .
- 4) There is no correlation between the residual term ζ and the factor ξ , and between the error terms, ε and δ .

Model Specification and Estimation Results

Hypothesis of influencing factors of blended learning

The research on the influencing factors of blended learning is mainly carried out from the two dimensions, students' individual factors and learning environment. In the blended learning embedded with information technology, the degree of students' acceptance directly affects the final blended learning effect, which is an important basis for the construction of a blended learning platform and the evaluation of its effects (Wu, 2013). Students' perceptual knowledge of blended learning content, methods and operational processes, dependence on learning atmosphere and interactive behavior, and the depth of the learning background determine the final learning effect. However, do these factors have a significant impact on the acceptance of blended learning? Is it positive or negative? Thus further assumptions and studies are necessary.

Perceived ease of use refers to the fact that a product is easy to understand and operate for the user, and can reduce his memory and enhance his satisfaction in use, which is embodied in the simple operation interface of the product and the low cognitive cost of the user. However, users with different learning backgrounds have different perceived ease of use due to their differences in cognitive ability, learning ability, and operational experience, etc. The relationship between perceived ease of use and learning acceptance can be measured in terms of students' learning pleasure and learning effects. Small (2012) believes that students' acceptance is affected by factors such as self-motivation, peer interaction, curriculum structure, and teacher feedback, and depends on whether the teacher can transfer knowledge according to the content



of the lecture and according to the student's preferences. The ease of use of blended learning and the students' learning background together determine the students' acceptance of blended learning (Wang, 2013). Sher finds that students with higher acceptance of blended learning score significantly higher than those with lower acceptance. In order to reveal the mechanism and influencing factors of students' acceptance of blended learning, Owston (2013) finds through research that students will have more flexible and independent learning time in blended learning, and they can download various learning resources anytime and anywhere so as to achieve higher-level and more autonomous learning. Besides, face-to-face discussion classes help students to share collaboratively and gain more knowledge outside the classroom. Through the above review and analysis, it can be assumed that:

Hypothesis 1: Perceived ease of use is positively related with students' acceptance.

The Chinese words "you yong de" ("usefulness" in English) also means "effectiveness", in which "you" ("have" in English) means existence, "yong" means efficacy, significance, influence and effect. Thus the term "you yong de" ("usefulness" in English) means existence of efficacy, meaning, influence and effect. Perceived usefulness refers to an effective, significant, influential and effective impression on blended learning obtained through senses. A study by Ertmer (2008) finds that the perceived usefulness of students play a positive role in promoting learning and participation. When students realize that the use of blended learning methods can improve or enhance themselves, when they begin to appreciate the usefulness of the content and methods they have learned, and when they are improved in terms of innovative thinking, collaborative cooperation, and problem-solving abilities, the effect of perceived usefulness on students' acceptance of blended learning is shown. In other words, their learning effects have been strengthened. From the above review and analysis, it can be assumed that:

Hypothesis 2: Perceived usefulness is positively related to students' acceptance.

Learning atmosphere is a kind of learning environment which is set up according to the needs of students' physical and mental development. It can influence the students' thinking mode and behavior. The blended learning atmosphere includes online and offline learning atmosphere. A favorable learning

atmosphere can motivate students to work harder, ensure the efficient operation of "teaching" and "learning", and enhance learning efficiency. The blended learning with the aid of Internet and information technology is different from the traditional face-to-face learning, as the former makes it possible to study on demand, study independently and study in real time. Prieto (2006) believes that the learning atmosphere should be studied from two aspects: the material environment and the spiritual environment. The traditional face-to-face teaching is performed in the lobby and the learning activities are concentrated in a single classroom, which makes it fundamentally different from the blended learning, for which the different types of personalized learning space are designed, to ensure the continuity of learning interaction. In addition, teachers' personal charm play a vital role in classroom atmosphere. Sher (2009) believes that collaboration and mutual assistance can improve students' acceptance of blended learning, encourage sharing of learning experience, and establish students' awareness of team collaboration, thus will have a positive effect on improving students' acceptance. As Tennyson holds, trust, collaboration, sharing, discussion and encouragement between students and those between teachers and students can stimulate students' potential interest in learning (Sun *et al.*, 2009; Wang, 2003). Learning atmosphere is a special living environment for both the online and offline learning, and creating a healthy and harmonious learning atmosphere can promote the exchange of ideas, opinions, information and knowledge, thus learning atmosphere has a significant positive relation to the acceptance of students. From the above review and analysis, it can be assumed that:

Hypothesis 3: Learning atmosphere is positively related to students' acceptance.

Picciano (2002) believes that blended learning with the introduction of information technology has higher requirements than face-to-face learning in terms of teacher-student interaction, and that teachers shall encourage students to actively carry out exploratory learning, guide students to participate in the "offline" and "online" discussions, and to stimulate the potential of students to the greatest extent. According to Small, teachers are the soul in the teaching process, and are regarded as experts and authority. (Detilleux *et al.*, 2012) This kind of interaction between teachers and students has a



positive influence on the acceptance of students. Sher emphasizes that teacher-student interaction plays a crucial role in students' acceptance. Mutual trust and psychological compatibility between teachers and students immerse teaching and learning in a pleasant atmosphere. The interaction between teachers and students is natural and deep. Students' learning styles and habits determine the thought on interactive teaching design. From the above review and analysis, it can be assumed that:

Hypothesis 4: Interactive behavior is positively related to students' acceptance.

Olives (1981) believes that acceptance is a mental state after the user's needs are satisfied, and a comparative relationship between expectations and actual experience. Pearson (2010) believes that acceptance is a user's overall comparative evaluation of various emotional factors, psychological factors, environmental factors, and attitude factors that affect acceptance. This article defines the acceptance as a comprehensive assessment of students' adoption of the method of learning after experiences. The study of Roca (2008) has proved that acceptance is an important factor affecting learning efficiency. From the above review and analysis, it can be assumed that:

Hypothesis 5: Acceptance of blended learning is positively related with learning effect.

The learning background includes learners' exposure to blended learning and their ability to use Internet information technology, which is positively related to the learner's own abilities. It can be a variable that regulates the change of acceptance and has a significant impact on students' learning effects in a blended learning environment. Students with a rich learning background have advantages in perceived ease of use, which make it easier for them to adopt blended learning for knowledge acquisition and exploration, thus they are more receptive to blended learning. Students with less learning background may be more likely to be affected by the active online and offline learning atmosphere, and to gain more positive learning experiences from it, so that their acceptance of blended learning can be improved. From the above review and analysis, it can be assumed that:

Hypothesis 6: The learning background has a regulatory effect on students' acceptance.

To sum up, the theoretical framework model for the influencing factors of blended learning is shown in Figure 1:

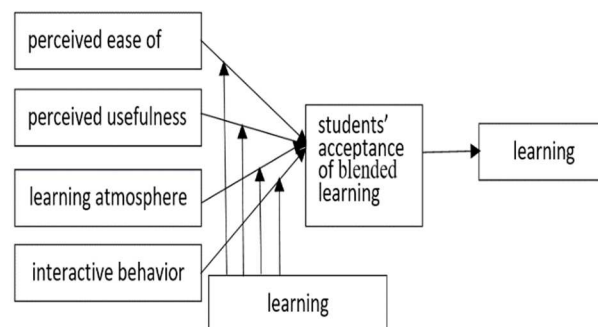


Figure 1. The theoretical framework model of the influencing factors of blended learning

Methods for measuring the influencing factors of blended learning

(1) Variable Measurement

This paper used a closed questionnaire design and adopted the Likert5 scoring method to measure variables. In order to guarantee the reliability and validity of the questionnaire, the variables were modified and adjusted according to the characteristics of blended learning on the basis of references. A total of 24 items were designed for the five aspects, perceived ease of use, perceived usefulness, learning atmosphere, interactive behavior, and learning background. Through expert surveys and interviews, after removing the items with a load factor less than 0.5, the remaining 22 items were further studied and analyzed. Table 1 shows the sources and items of each variable.

(2) Research object and data collection

This paper adopted quantitative research and design, and took the students in a China university as objects. The course adopted blended learning mode, and was conducted face-to-face off the line. The teaching platform was open online, using teaching materials the same with those used offline. A total of 219 questionnaires were distributed and 212 questionnaires recovered. After removing the invalid questionnaires with incomplete or wrong answers, 203 valid questionnaires were finally obtained, with an effective rate of 92%, which met the test requirements.



Table 1. The measuring variables and item of the influencing factors of blended learning

Variable	Source	Item
Perceived ease of use	Wu and Liu, 2013	1. The blended learning platform is easy to operate
		2. The blended learning takes less time and gets more knowledge
		3. The blended learning is faster than traditional learning
Perceived usefulness	McGill, 2014	1. The blended learning can acquire the latest and richest knowledge
		2. The blended learning can meet the personalized learning needs of students
		3. The blended learning is more conducive to the understanding and mastery of knowledge
		4. The blended learning is more conducive to self-improvement
learning atmosphere	Sher, 2009	1. The off-line topic atmosphere of blended learning helps to understand and master knowledge
		2. The online interactive discussion of blended learning helps to understand and master knowledge
Interactive behavior	Ali, 2011	1. The interactive behavior of blended learning is more conducive to the sharing of collaboration among students
		2. The interactive behavior of blended learning is more conducive to the communication between teachers and students
		3. The interactive behavior of blended learning is more conducive to the interaction between students and the platform
Students' acceptance	Rocawear, 2008	1. I (dislike - like) use blended learning
		2. Using blended learning I feel (poor -good)
		3. The use of blended learning feels (poor -good) for me
		4. Using blended learning to feel attractive to me (weak-strong)
Learning effect	McGill, 2009	1. Teamwork ability
		2. Creative ability
		3. Problem-solving ability
Learning background	Li, 2016	1. I use information technology at a high level
		2. I have been exposed to blended learning for a long time
		3. I use blended learning platforms very frequently

Measurement and analysis on influencing factors of blended learning

(1) Measurement evaluation

In this paper, AMOS22.0 is used for confirmatory factor analysis. All Cronbach's α and CR values are greater than 0.75, showing good reliability and high internal consistency. The analytical results are shown in Table 2. Both RMSEA and SRMR are less than the critical value of 0.08, GFI, AGFI, NFI, and CFI are all greater than the critical value of 0.9, and $\chi^2/df < 2$, indicating that the model established in this paper has good fitness. In addition, the standard factor load of each variable is between 0.681-0.876. The value of t is much larger than the critical value and the load factor is significant, which shows that the conceptual model and the questionnaire established in this paper have good convergence validity. According to Harman's single factor test, the cumulative variance contribution rate of five factors is 82.45%, and the maximum variance contribution rate is 22.31%. Therefore, there is no need to consider the common method variation.

(2) Path effect test

The relation path is analyzed by AMOS 22.0, and the results of path effect test are given in Table 3.

As shown in Table 3, perceived ease of use, perceived usefulness, learning atmosphere and interactive behavior all have significant positive effects on students' acceptance ($P < 0.05$), so all of Hypotheses 1 to 4 are valid. The influence of the acceptance of blended learning on the learning effect is also positively significant, thus Hypothesis 5 is also valid.

(3) Test of the regulatory effect

Hypothesis 6 deals with the regulatory effect of learning background on the acceptance of blended learning, and multi-group causal analysis approach is adopted for its analysis. The research process is divided into the following 4 stages. In the first stage, the adjusting variables are sorted and divided equally, so that two subsamples (rich/lack) of high and low values of the adjusting variables are obtained. In the second stage, all path coefficients of the above two sets of subsample path models are defined as free estimation, and the resulting fitted model is used as an unconstrained model. In the third stage, the coefficients of all possible adjusted paths are restricted to be constant among groups, and the path models of two groups of sub-samples are estimated in 4 times (Perceiving ease of



use→learning acceptance, perceived usefulness→learning acceptance, learning atmosphere→learning acceptance, interactive behavior→learning acceptance). The resulting fitting model is used as a constrained model. In the fourth stage, the constrained and unconstrained models established in the second and third stages are tested for chi-square difference, and the unconstrained models are compared with each other. If an increase in the freedom per unit of the constrained model leads to a prominent increase in the chi-square value, it can be assumed that the learning background has a regulatory effect on the path set to be equal in the model.

As can be found from Table 4 below, although students with a rich learning backgrounds have a higher acceptance of blended learning in terms of perceived usefulness and interactive behavior

than those with a poor learning background (The path coefficients of group with the rich learning background are 0.331 and 0.147 respectively, and those of the group lacking learning background are 0.311 and 0.121 respectively.), the chi-square difference between the constrained model and the unconstrained model is not obvious. In addition, it can be found from Table 4 that among the students with a rich learning background, the learning atmosphere has the strongest influence on the acceptance of blended learning (its path coefficient is 0.417), and the chi-square difference test reveals prominent difference ($\Delta\chi^2=8.543$ and $\Delta d.f.=1$). Among the students with a lack of learning background, their perceived ease of use has a stronger influence on the acceptance of blended learning (its path coefficient is 0.329), and the chi-square difference test shows a significant difference ($\Delta\chi^2=5.012$ and $\Delta d.f.=1$).

Table 2. The attribute values for model measures

Variable	Item	Standard factor load	t	CR	Cronbach's α
perceived ease of use	1	0.785	16.784	0.791	0.790
	2	0.763	16.615		
	3	0.681	14.543		
perceived usefulness	1	0.789	18.004	0.819	0.816
	2	0.821	17.905		
	3	0.788	15.613		
	4	0.791	15.982		
learning atmosphere	1	0.732	14.987	0.789	0.796
	2	0.767	16.346		
interactive behavior	1	0.806	17.683	0.819	0.816
	2	0.876	18.786		
	3	0.768	15.897		
students' acceptance	1	0.796	18.987	0.892	0.894
	2	0.765	18.273		
	3	0.807	17.435		
	4	0.789	17.573		
learning effect	1	0.871	15.096	0.874	0.838
	2	0.870	19.374		
	3	0.783	17.281		
learning background	1	0.786	15.941	0.841	0.826
	2	0.876	18.981		
	3	0.794	18.010		

Table 3. The test results of hypothesis the relationship path effect

Hypothesis	Path	Standardized path coefficients	t	P	Result
H1	perceived ease of use→students' acceptance	0.398	6.891	***	valid
H2	perceived usefulness→students' acceptance	0.121	2.197	*	valid
H3	learning atmosphere→students' acceptance	0.287	5.249	***	valid
H4	interactive behavior→students' acceptance	0.387	5.735	***	valid
H5	Students' acceptance→learning effect	0.901	13.635	***	valid

Notes: *, **and*** represent $p\leq 0.05$, $p\leq 0.01$ and $p\leq 0.001$, respectively

Table 4. The results of regulatory effect test

Path	Learning background (t value)		$\Delta\chi^2$
	Poor	Rich	
perceived ease of use→students' acceptance	0.329***(4.101)	0.105***	5.012*
perceived usefulness→students' acceptance	0.311***(3.398)	0.331***	0.794
learning atmosphere→students' acceptance	0.238**(2.989)	0.417***	8.543**
interactive behavior→students' acceptance	0.121*(2.016)	0.147*	0.201

Notes: *, **and*** represent $p\leq 0.05$, $p\leq 0.01$ and $p\leq 0.001$, respectively



The above shows that the learning background can adjust the influence of perceived ease of use and learning atmosphere on the acceptance of blended learning. Therefore, the learning background has a significant regulatory effect on the acceptance of blended learning and the learning effect, and Hypothesis 6 holds true.

(4) Effect strength analysis of the influencing factors

100 sample data are selected, the weight values of each influencing factor calculated using the above BP neural network, and calculations performed to obtain the simulated value with the greatest relative strength of each influencing factor. The error value is obtained by comparing the actual measurement value with the simulated calculation value. According to the error value analysis, it is found that the ratio of error is less than 5%, which indicates that the effect strength of each factor obtained by using BP neural network to analyze the effect of blended learning acceptance is completely credible. The effect strength of each influencing factor calculated by BP neural network is shown in Table 5.

Table 5. The effect strength of the influencing factors

Influence factors	The effect strength of calculate	Relative strength
perceived ease of use	0.365	0.962
perceived usefulness	0.231	0.791
learning atmosphere	0.258	0.861
interactive behavior	0.146	0.896

According to Table 5, the effect strength of the four influencing factors on the acceptance of blended learning are as follows: effect strength of perceived ease-of-use is the maximum of 0.962, followed by interactive behavior with an effect strength of 0.896, then the effect strength of learning atmosphere is 0.861. The effect strength of the perceived usefulness is a relative minimum of 0.791.

Measurement results of the influencing factors of blended learning

From the perspective of learners, this paper explores the influencing factors affecting the learning effect of blended learning, and verifies the regulatory role of learning background. The following conclusions are drawn:

First of all, in blended learning, the perceived ease of use, perceived usefulness, learning atmosphere and interactive behavior are

all positively related to students' acceptance of blended learning. The convenient and easy utilization of the blended learning platform, usefulness of the transferred knowledge to the students, the carefully designed online and offline courses, the active online and offline learning atmosphere, and the barrier-free platform interaction between teachers and students all have a significant positive impact on the acceptance of the hybrid learning. Secondly, student' acceptance of blended learning is positively related to its leaning effect. Blended learning strives to integrate Internet online learning technology into the traditional teaching classroom, which makes it to become a powerful approach to optimizing teaching results. It greatly improves the participation and flexibility of students' learning, and makes students' acceptance significantly and positively affects the learning effect and provides an opportunity for teachers to rethink their teaching method and optimize their teaching practice. Thirdly, the learning background significantly adjusts the relationship between perceived ease of use and learning atmosphere and blended learning acceptance. However, the learning background does not play a significant role in terms of perceptual usefulness and interactive behavior. For students with a lack of learning background, perceived ease of use has the greatest impact on their acceptance of blended learning, showing that the humanized design of the platform can improve the acceptance of blended learning for those students with shallow learning experience and low abilities in information technology. For students with a rich learning background, the learning atmosphere has the greatest influence on their acceptance of blended learning, in other words, the learning atmosphere can improve the acceptance of blended learning for those students who are proficient in Internet technology and have rich learning experience. Therefore, for students with different learning backgrounds, the mechanisms influencing their acceptance are different.

Conclusions

This paper introduces the learning background into the study of blended learning acceptance, and explores the effects of perceived ease of use, perceived usefulness, learning atmosphere and interactive behavior on blended learning acceptance, and the regulatory effect of learning background. The actual survey data in universities



are sampled for analysis and research, a theoretical model is constructed, and hypotheses verified. The results are shown as follows. Perceived ease of use, perceived usefulness, learning atmosphere and interactive behavior have a significant positive influence on students' acceptance, and these four aspects positively influence the effect of blended learning through students' acceptance. The learning background regulates the relationship between perceived ease of use and learning atmosphere and blended learning acceptance in a significant and positive way. However, the learning background does not play an obvious regulatory role in terms of perceived usefulness and interactive behavior. For the students with a lack of learning background, perceived ease of use has the greatest influence on their acceptance of blended learning, while for those with a rich learning background, learning atmosphere has the greatest influence on their acceptance of blended learning. On this basis, in the actual teaching design, we should start from the students' motivation to accept blended learning, and improve their perceived utility and value in blended learning, so as to improve their acceptance of blended learning.

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