

Research on Factors Influencing University Teachers' Acceptance of Blended Learning in a Selected University in China

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Abstract—Teachers are considered to play a key role in implementing the blended learning method. This study intends to explore the factors that will influence teacher's acceptance of blended learning based on the theory of innovation diffusion. 191 teachers from a selected university in China participated in the study. The data collected were analyzed using SPSS 24.0. The results of regression analysis show that school support, perceived ease of use, compatibility, relative advantage, and communication channels contribute to university teachers' acceptance of blended learning. Recommendations and suggestions are proposed to promote the level of teachers' acceptance of blended learning in Chinese universities.

Keywords—blended learning acceptance; university teachers; innovation diffusion

I. INTRODUCTION

With the rise of micro-course, MOOC and flipped classroom, blended learning has been accepted by an increasing number of university teachers. Graham (2006) proposes that blended learning combines traditional face-to-face teaching and technology-based teaching. Chinese scholar He Kekang (2004), the first scholar who introduced the concept of blended learning to China, considers that blended learning is the combination of traditional teaching and online learning.

Blended learning not only takes advantage of traditional classroom teaching such as the in-depth communication between teachers and students, but also gives play to the unique advantages of online learning, such as sharing learning resources and not being restricted by time and space. Chinese Ministry of Education issued *The 13th Five-year Plan* for the Development of National Education which states that "Teachers should be encouraged to utilize information technology to improve the quality of teaching and innovate teaching models. Flipped classroom, blended learning and other innovative methods should be utilized to form a new model that combines online learning and offline learning" (http://www.stdaily.com/zhuanti01/guojia/2018-01/04/content_617866.shtml). In recent years, scholars worldwide predict that blended learning will become the "new normal" of university teaching. Studies on blended learning have been carried out, but most of them focus on the construction and implementation of blended learning models

and the effects of blended learning. A limited number of studies focus on teachers' acceptance of blended learning.

It is widely acknowledged that teachers are the decision makers and they play a key role in promoting blended learning in universities. Only when teachers recognize and actively apply their ideas can blended learning become an innovative mode of traditional teaching. Based on the theory of innovation diffusion, this study will explore the influencing factors of university teachers' acceptance of blended learning and put forward relevant promotion strategies, so as to provide feasible suggestions for university administrators to push forward blended learning.

II. THEORETICAL FRAMEWORK

Rogers, the scholar who propose the theory of innovation diffusion, believes that innovation is a novel concept or practice that is adopted by individuals or other groups (Rogers, 2010). Innovation diffusion is the process by which innovation is spread in specific communities through certain channels within a period of time. The innovation diffusion theory divides people who adopt it into five groups based on the time people use innovative products: ① innovators: adventurous people who are the earliest pioneer to accept innovation; ② early adopters: highly respectable people who accept innovation after the innovators; ③ early majority: those thoughtful persons who need more time to accept decisions than innovators and early adopters; ④ Late majority: they are cautious and suspicious and accept innovation only when most of the rules within the system are accepted explicitly; ⑤ Laggards: the last group in the social system to accept innovation. The five groups accounted for 2.5%, 13.5%, 34%, 34% and 16% of the population, respectively.

Innovation diffusion theory holds that the diffusion of innovative products mainly depends on the following factors:

(1) Relative advantage: it is defined by Rogers as "the degree to which an innovation is perceived as being better than the idea that it supersedes" (Rogers, 2010, p. 229); (2) Compatibility: it refers to the degree to which the innovation is consistent with the current value system, past experience and the needs of potential adopters; (3) Complexity (perceived ease of use): it refers to the relative difficulty of understanding

and using an innovation; (4) Trialability: it refers to the degree to which innovation can be tested on a limited basis; (5) Observability: it refers to the degree to which innovations can be seen by others. In addition, the innovation types, communication channels and social support will also affect the diffusion of innovation. Up to date, research based on innovation diffusion theory is mainly about the use of WeChat, the use of mobile payment and the application of mobile library, etc. The number of studies on university teachers acceptance of blended learning from the perspective of innovation diffusion theory is rather limited. The present study will try to fill this gap by investigating factors that influence teachers' acceptance of blended learning.

III. RESEARCH QUESTIONS AND HYPOTHESE

The study intends to investigate the following research questions:

1. Is there significant relationship between university teachers' perception of relative advantage of blended learning and their acceptance of blended learning?
2. Is there significant relationship between university teachers' perception of the compatibility of blended learning and their acceptance of blended learning?
3. Is there significant relationship between university teachers' perceived ease of use of blended learning and their acceptance of blended learning?
4. Is there significant relationship between communication channel and university teachers' acceptance of blended learning?
5. Is there significant relationship between school support and university teachers' acceptance of blended learning?

The independent variables are relative advantages, compatibility, perceived ease of use, communication channels and school support. Teachers' acceptance of blended learning serves as the dependent variable. The hypotheses are formed as follows.

H1: University teachers' perception of relative advantage of blended learning is significantly associated with their acceptance of blended learning.

H2: University teachers' perception of the compatibility of blended learning is significantly associated with their acceptance of blended learning.

H3: University teachers' perceived ease of use of blended learning is significantly associated with their acceptance of blended learning.

H4: Communication channel is significantly associated with university teachers' acceptance of blended learning.

H5: School support significantly is significantly associated with university teachers' acceptance of blended learning.

IV. INSTRUMENT

This study use Chinese scholar Liu Mei's (2018) instrument as the guiding instrument. Based on the above model, the author adapted the items from the questionnaires validated by Moor et al. (1991) and Porter et al (2016). The adapted instrument is divided into two parts: geographic information and influencing factors. The Likert 5-point scale is adopted. 5 stands for strongly agree, 4 stands for agree, 3 stands for neutral, 2 stands for disagree and 1 stands for strongly disagree.

Before the actual study, the reliability and validity of the instrument are tested using SPSS 24.0. The overall reliability Cronbach 's coefficient of the questionnaire is 0.890, and the Cronbach 's coefficients of each dimension are between 0.797 and 0.891, which proves that the questionnaire has good reliability and high internal consistency. In addition, the exploratory factor analysis of the questionnaire was conducted. The KMO value is 0.902 and Bartlett's spherical test $P = 0.000 < 0.05$, which indicate that the questionnaire is suitable for factor analysis. Principal component analysis method was conducted and six factors were extracted. The eigen value of each item of each factor was above .45, indicating that the validity of the questionnaire was good.

V. DATA COLLECTION AND ANALYSIS

The questionnaires were distributed online through Wechat or QQ group, the most popular social media tool in China. 191 teachers from a selected university in Hubei Province participated in the survey. 11 teachers reported that they are not familiar with blended learning and their questionnaires are excluded accordingly. 180 questionnaires remain valid for the data analysis. Among the 180 teachers, there are 108 female teachers and 72 male ones.

SPSS 24.0 was used to analyze the data collected. Descriptive statistics are shown in Table 1. The Mean value of school support is 3.743, indicating that the current school facilities can support the development of blended learning, but there is still large room for improvement. The M value of perceived ease of use is 3.784. Many teachers report that implementing blended learning is not easy, and they need the training of technology and teaching methods. The M value of compatibility is 3.436. Most teachers believe that previous classroom teaching experience can be borrowed from blended learning. The M value of relative advantage is 3.64, indicating that most teachers recognize the advantages of blended learning. Communication channel, especially recommendation of colleagues, has the most influence on their acceptance of blended learning, with an M value of 3.744.

Table 1 Descriptive statistics

Descriptive Statistics			
	Mean	Std. Deviation	N
Teachers' acceptable of blended learning	3.76913580200000	.702085761000000	180
School support	3.74393939400000	.633817368000000	180
Perceived ease of use	3.78403	.611635	180
Relative advantage	3.64365079400000	.632148500000000	180
Compatibility	3.43611111100000	.681919325000000	180
Communication channel	3.74400	.7411000	180

The results of regression analysis are shown in Table 2. As is shown in the table, School support, perceived ease of use, compatibility, relative advantage, and communication channels are significantly associated with university teachers' acceptance of blended learning. Among them, school support contributes most to teachers' acceptance of blended learning ($r=.636$), followed by perceived ease of use, communication channel, compatibility and relative advantage ($r=.607, .545, .522, .513$ respectively).

Table 2 Correlations between dimensions and teachers' acceptance of blended learning

		Teachers' acceptance of blended learning	compatibility	Relative advantage	Perceived ease of use	School support	Communication channel
Pearson Correlation	Teachers' acceptable of blended learning	1.000	.513	.522	.607	.636	.545
	Compatibility	.513	1.000	.581	.623	.484	.330
	Relative advantage	.522	.581	1.000	.678	.416	.447
	Perceived ease of use	.607	.623	.678	1.000	.471	.464
	School support	.636	.484	.416	.471	1.000	.319
	Communication channel	.545	.330	.447	.464	.319	1.000
Sig. (1-tailed)	Teachers' acceptable of blended learning	.	.000	.000	.000	.000	.000
	Compatibility	.000	.	.000	.000	.000	.000
	Relative advantage	.000	.000	.	.000	.000	.000
	Perceived ease of use	.000	.000	.000	.	.000	.000
	School support	.000	.000	.000	.000	.	.000
	Communication channel	.000	.000	.000	.000	.000	.

VI. DISCUSSIONS AND RECOMMENDATIONS

Based on the results of the above analysis, the hypotheses proposed in this study have been verified. School support, perceived ease of use, compatibility, relative advantage and communication channels are significantly associated with university teachers' acceptance of blended learning. The coefficients are .636, .607, .545, .522, .513 respectively. The result is different from previous studies conducted by other scholars (such as WeChat and application of mobile payment based on the theory of innovation diffusion, etc.). Previous studies generally reveal that relative advantage contribute most to university teachers' acceptance of blended learning (Liu Mei, 2018; Porter et al., 2016). Since blended learning is a combination of online learning and classroom learning, the preparation of online courses, which requires energy and equipment, is demanding for teachers. Without the strong technical and policy support of the school, most teachers are unwilling to accept this new method. In this sense, school support is particularly important.

Based on the research results, the researcher proposed the following suggestions and recommendations.

1. Universities should give strong support for blended learning

School support is the most important factor influencing university teachers' acceptance of blended learning. Therefore, universities should strengthen support in terms of technical equipment and incentive policies (Cai Jiandong & Duan Chunyu, 2016). As for technical equipment, in addition to conventional hardware facilities, schools are required to construct an online learning platform and ensure the stable operation of the platform. Both teachers and students can download learning resources without limit. Besides, Wi-Fi coverage should be guaranteed throughout the campus, so that students can use mobile phones, laptops and other electronic devices for online learning. In terms of policies, schools are supposed to issue guiding documents on blended learning, which specify the models, evaluation standards and time schedules of blended learning so that teachers can rely on the guidance to implement blended learning step by step. At the

same time, schools should issue encouraging policies for blended learning, such as providing certain financial support to teachers who implement blended learning, reducing the workload of teachers after class.

2. Carry out regular blended learning training program for teachers

As is shown in the research result, perceived ease of use is an important factor influencing university teachers' acceptance of blended learning. Without the knowledge of information technology and teaching pedagogy, it would be difficult for teachers to implement blended learning and affect acceptance level. Therefore, universities should conduct training program for teachers. The training should include information technology and teaching pedagogy. As for information technology, teachers are expected to be proficient in the various functions of online learning platforms and be familiar with the operation of the micro-class production software so that they can record micro-classes by themselves. In terms of teaching pedagogy, schools should help teachers to design online course and blended learning course so that they can connect online learning and classroom teaching seamlessly (Liu Mei, 2018). It is advisable for schools to invite experts or professional teachers who have implemented blended learning smoothly to share their experience. Both face-to-face training and online lectures can be provided in the training program.

3. Create positive learning culture of blended learning in the campus

Culture is a way to work together towards a common goal. If schools encourage a culture of blended learning, teachers' enthusiasm for implementing blended learning will be greatly enhanced. Policy makers and administrators can help to shape the culture of blended learning. Firstly, the advantages of blended learning and the necessity of implementing blended learning should be publicized through lectures and expert reports. Secondly, it is necessary to encourage research activities of blended learning in departments. Thirdly, it is advisable to give raise and reward to those teachers who have implemented blended learning actively so as to form a positive atmosphere of blended learning throughout the school.

4. Promote blended learning in stages according to the type of teacher innovators

When promoting blended learning, schools can draw lessons from innovation diffusion and gradually spread from innovators, early adopters, early majority, late majority and laggards. Since the proportion of the early majority and the late majority accounted for nearly 70% of the total population, so special support and training should be given to this group of people. Early adopters are generally those with higher social status in the group who are respected and admired by others, the role of early adopters (elite teachers) should be brought into full play (Xu Chenghuan, 2015). According to

the research result, communication channel has the desirable effect. The elite teachers can be encouraged to introduce their successful experiences to other teachers so as to guide early majority and late majority, thus accelerating the diffusion process of blended learning. For the laggards, they are small in number. As the number of people receiving blended learning increases in the group, laggards will eventually accept blended learning.

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