Multidimensional Decoding of Teachers' Behavioral Intention in online Education-- Based on the Empirical Research of Young Teachers in Chinese Universities

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Abstract. Online education is one of the directions of education reform, and teachers' behavioral intention in online education is the key to promote the development of online education and improve the quality of online education. This study explores the multi-dimensional factors of young teachers' behavioral intention to online education in Chinese universities, and analyzes the factors that can affect the perceived usefulness and perceived ease of use. Questionnaire survey was conducted on 169 young teachers in universities in different regions of China and found that expectation confirmation, subjective norm, perceived usefulness and perceived ease of use had positive effects on young teachers' behavioral intention in online education. Therefore, this study suggests establish an online education evaluation mechanism and strengthen positive incentives. Clarify the strategic direction of online education and actively promote and strengthen practice. Choose mature and reliable online education platforms. Strengthen in-service training and continuing education.

Keywords: Young teachers in universities; Online education; Behavioral intention; TAM

1 Introduction

Advances in science and technology have had a remarkable and innovative impact on the way people learn. On the one hand, in the context of knowledge globalization, the traditional education mode is faced with the dilemma of high economic cost and time cost, which is difficult to meet the needs of modern education. It is urgent to promote the reform of the traditional education mode to conform to the operation law of modern society. On the other hand, the popularization and improvement of network quality provide a foundation for the development of online education, and the rise of online education has become the direction of traditional education reform.

According to the American Association for Training and Development, online education is a form of education that relies on computers, the Internet and other related information and communication technologies. In 2013, international well-known online education platforms such as Khan Academy and Coursera sought to explore the intrinsic value of online education, and Chinese universities also tried to explore web-based teaching methods[1]. The sudden outbreak of COVID-19 in 2020 has greatly affected people's normal learning, and most schools around the world have to shift from offline traditional education to online education overnight.

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People regard online education as the main teaching method in the special period and assume more teaching tasks. In this regard, the Chinese government issued the "Guiding Opinions on Promoting the Healthy Development of Online Education" to build a team of information-based teaching application teachers based on different mission requirements and functional positioning. Thus, the mission requirements and practical needs of educational development are the reason for the existence of online education. In addition to continuing to fulfill the task of making up for the lack of flexibility in offline education, online education in the new era needs to assume more main functions of education, and create a Chinese road of online education.

However, the results of online education practice are not ideal. Online education puts forward higher requirements and challenges for teachers' teaching ability and teaching activities . Therefore, teachers have very low intention to use online education continuously and effectively. It is widely believed that video recording and broadcasting is regarded as a supplement to traditional educational methods, and online live teaching is difficult to cope with some unexpected situations outside the teaching content. As the main participant and practitioner of online education, whether the advantages and potential of online education can be effectively utilized depends largely on teachers[2]. Teachers' satisfaction with online teaching also affects their teaching self-efficacy[3], which in turn affects the results of online education practice.

Existing literature lacks due commonality research on online education and young university teachers, and the internal logical relationship of behavioral intention of online education has not received due attention. The research on behavioral intention of online education is insufficient, and the literature focuses on the transformation of technology and educational paradigm, deep interactive learning and teaching quality. Mainly from the Technology Acceptance Model (TAM) , Expectation Confirmation Theory (ECT), Information System Continuance (ISC)[4] discusses the popularity of online education, the construction of online education platforms. From the perspective of teachers, the research mainly focuses on the teaching ability of informatization and the behavioral intention of informatization, with insufficient attention paid to the teaching subjects of online education and lack of research on the influence of teachers' own characteristics on the behavioral intention.

Based on the ideas of university teachers' age structure and acceptance of information technology, this study takes behavioral intention as the starting point to sort out the influencing factors of young university teachers' behavioral intention to online education and the relationship between them, which has practical significance for promoting the innovation of higher education teaching methods and cultivating talents with high-level comprehensive literacy. Make up the theoretical gap of behavioral intention orientation in online education.

2 Literature review

2.1 Theoretical background

As a new teaching mode, online education uses Internet technology to carry out online real-time learning, so as to achieve the process of creating knowledge and improving the performance brought by knowledge[5]. Online education is essentially teachers' use of information systems that integrate multiple technologies. The combination of learning management system, course

management system and content management system can significantly improve the problems encountered in the teaching process[6].

Quality Matters and Eduventures Research, a higher education research consulting firm, jointly released The Changing Landscape of Online Education in the United States Education points out that asynchronous interactive learning has become the mainstream of online education. "Live broadcasting + online interaction" and "video + online interaction" are the two main models for young university teachers to carry out online teaching at present. However, only a small number of young teachers have opened online courses and received professional training on online education ability, and most young teachers still lack practical experience in online education. This has influenced teachers' confidence in online education and the use of methods which in turn has an impact on teaching quality[7]. So many studies have tried to find the factors affecting teachers' online education from mature theoretical models .

Fishbein and Ajzen proposed the Theory of Reasoned Action (TRA), arguing that motivation is the main factor for a person to take action and is often used to explain and predict individual behavior. Davis believed that TRA only considered individual subjective norms and attitudes and ignored external environmental factors, thus proposing a Technology Acceptance Model (TAM).

On the basis of TAM, Bhattacherjee combined with the Expectation-Confirmation Theory (ECT) to propose an Expectation-Confirmation Model (ECM). Venkatesh combines social influence with cognitive tools, in which social influence includes subjective norms, voluntariness and image. Then Venkatesh and Hillol Bala add personal differences and system characteristics. System characteristics include technical possibilities. At present, ECM and TAM are widely cited in research related to online teaching.

Since TAM was proposed, the original model is often improved and expanded in the researches based on TAM to meet the needs of the actual situation. According to the summary of extended TAM in several literatures[8], the main improvement and expansion methods can be divided into four categories: external factors, factors introduced in other theories, result factors and situational factors. On the basis of previous studies, according to the characteristics of online education for young teachers in universities, this study retains the core four elements of perceived usefulness, perceived ease of use, subjective norms and behavioral intention in TAM model, selects three external elements of self-efficacy, infrastructure and technical support, and the expectation confirmation in ECM model, and tests each potential influencing factor separately. To find out the factors that affect young teachers' intention to use online education and the causal relationship between them.

2.2 Research variables

2.2.1 Core variable

In this study, expectation confirmation refers to the perceived comparison between young teachers' experience of conducting online education and their pre-use expectations. Perceived usefulness refers to their subjective judgment on whether online education can improve their work effectiveness. Perceived ease of use refers to their subjective judgment of the difficulty of online education. Behavioral intention is the willingness of young teachers to carry out online teaching, which directly affects the actual behaviors and plays a decisive role in these behaviors

that will actually occur. In addition, the perceived ease of use of the platform by young teachers in universities has a significant positive impact on the perceived usefulness of the platform, and the profits generated by teachers' experience attempts will also have a positive view of online education[9]. Therefore, this study assumes:

H1:Expectation confirmation significant positive influence on perceived usefulness.

H2: Expectation confirmation significantly positively affects behavioral intention.

H3: Perceived ease of use significantly positively affects perceived usefulness.

H4: Perceived ease of use significantly positively affects behavioral intention.

H5: Perceived usefulness significantly positively influences behavioral intention.

2.2.2 Subjective norm

Subjective norm refer to the influence of people with certain influence on individual behavior. The opinions of people who have influence on the individual can positively influence the perceived usefulness and behavioral intention of the individual towards the technology, and the individual may believe that the technology is actually useful. And then form the intention to use it. Administrative intervention and peer influence are the key factors to promote the behavioral intention of young teachers, and may also have a positive impact on individual self-efficacy. This study mainly considers the influence of education administrative departments, leaders and universities on young teachers. Therefore, this study assumes:

H6: Subjective norms significantly positively influence perceived usefulness.

H7: Subjective norms significantly positively influence the behavioral intention.

H8: Subjective norms significantly positively influence self-efficacy.

2.2.3 Self-efficacy

The concept of self-efficacy comes from Social Cognitive Theory (SCT), which refers to an individual's confidence in completing a certain behavior. Its application in online education refers to teachers' confidence in whether they can carry out online education and whether they have the ability to achieve the expected goals. This study believes that teachers with high self-efficacy will be more focused on specific task situations, motivate themselves to make the greatest efforts to explore the advantages of information technology to improve teaching efficiency and effect, and in this process, they are more likely to find the usefulness and ease of use of technology, so as to continue to use information technology in teaching. Therefore, this study assumes:

H9: Self-efficacy significantly positively affects perceived ease of use;

H10: Self-efficacy significantly positively influences perceived usefulness.

2.2.4 Infrastructure

Infrastructure is the hardware condition to ensure that young teachers can carry out online education normally, including a series of basic teaching support such as network quality, information equipment and online education platform. Obviously, a high level of infrastructure

can improve the comprehensive quality of online education and effectively improve the perceived ease of use of online education by young teachers[10]. Therefore, this study assumes:

H11: Infrastructure significantly positively impacts perceived ease of use.

H12: Infrastructure has a significant positive impact on self-efficacy.

2.2.5 Technical support

As one of the precursor factors to promote the use of online education by young teachers, technical support is the support and training provided by the technical department. In this study, it refers to the subjective evaluation of young teachers on the technical support provided by the government and universities to help them improve the information skills necessary for online education. Several studies have shown that the more support for teachers, the stronger their perceived ease of use of online education, technical support can only make them feel that the platform is easy to use and improve self-efficacy, but cannot make them feel that the platform is useful .Therefore, this study assumes:

H13: Technical support significantly positively affects perceived ease of use.

H14: Technical support has a significant positive impact on self-efficacy.

In summary, the influencing factor model of this study is shown in Figure 1.

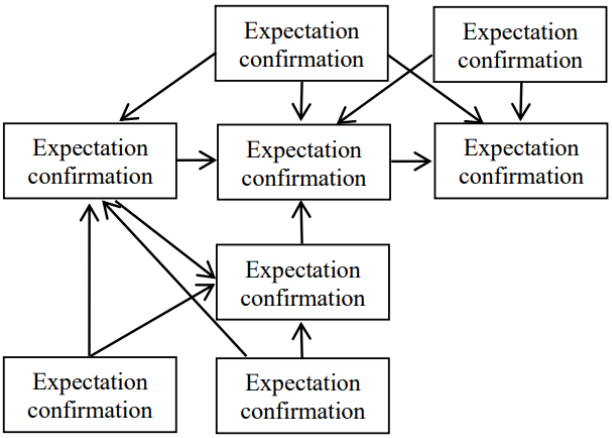

Figure 1. Research model

3 METHOD

3.1 Questionnaire preparation

This study draws on the mature scale, the reference source of questionnaire compilation is shown in Table 1, and the questionnaire is appropriately modified according to the characteristics of young teachers in Chinese universities, and the questionnaire is revised on the basis of the guidance of the three experts. The questionnaire adopts five-level Likert scale as a

whole, which investigate the teachers' basic information and subjective views on online education respectively.

Table 1 Theoretical sources of the items

Each dimension test item	Question reference source
Behavioral intention (UB)	Venkatesh V., Bala H.
	Davis F
Perceived Ease of Use (PEU)	Liao et al.
	Venkatesh V, Davis F D.
	Saadé R, Bahli B
Perceived Usefulness (PU)	Bhattacherjee
	Venkatesh V, Davis F D.
	Saadé R, Bahli B
Expectation Confirmation (CON)	Bhattacherjee
Subjective Norm (SN)	Venkatesh V, Davis F D.
Self-efficacy (SE)	Hatlevik
Infrastructure (INF)	Aburagaga et al.
Technical Support (TS)	Graham et al.

3.2 Data collection

This questionnaire survey was conducted through the questionnaire Star system to formally issue questionnaires for data collection. A total of 176 questionnaires were collected. After analysis, people over 40 years old were excluded, and 169 valid questionnaires were finally collected, with an effective recovery rate of 96%. There are 10 teachers who have never used online education to teach, and the teachers are distributed throughout China, including 106 in Southwest China. Demographic data are shown in Table 2.

Table 2 Basic data table(n=169)

Group	Item	Frequency	Percent
Sex distribution	Male	70	41.40%
	Female	99	58.60%
Age distribution	Under 30 years old	51	30.20%
	30-35 years old	86	50.90%
	36-40 years old	32	18.90%
Title distribution	Teaching assistant	55	32.50%
	Lecturer	81	47.90%
	Associate professor	30	17.80%
	Professor	3	1.80%
Regional distribution	North China	16	9.50%
	Northeast China	3	1.80%
	East China	16	9.50%
	South China	11	6.50%
	Central China	11	6.50%
	Northwest China	6	3.60%
	Southwest China	106	62.70%
Use online education distribution	Yes	159	94.10%
	No	10	5.90%

4 Data analysis and results

In this study, structural equation model was used to verify the research hypothesis, and SPSS 24.0 and Amos 23.0 software were used to process and analyze the data.

4.1 Reliability and validity analysis

Crobach's α Kronbach coefficient test was used to estimate the reliability of the questionnaire. When α>0.7, the reliability of the questionnaire can be considered high. Through the reliability analysis of this questionnaire, the overall Klonbach's coefficient Crobach's α of this questionnaire is 0.864, and the α values of each dimension are shown in Table 3. It can be seen that the α coefficients of each dimension are greater than 0.7, indicating that the questionnaire has high reliability.

Table 3 Theoretical sources of the items

Dimensionality	Question	Standard load factor	Average Variance Extraction AVE	Composition reliability CR	Crobach's α coefficient
UB	UB1	0.777	0.662	0.854	0.853
	UB2	0.86			
	UB3	0.802			
PU	PU1	0.731	0.548	0.828	0.825
	PU2	0.732			
	PU3	0.829			
	PU4	0.66			
PEU	PEU1	0.755	0.598	0.817	0.815
	PEU2	0.753			
	PEU3	0.811			
SN	SN1	0.784	0.61	0.824	0.822
	SN2	0.807			
	SN3	0.751			
CON	CON1	0.774	0.533	0.773	0.77
	CON2	0.768			
	CON3	0.64			
SE	SE1	0.745	0.531	0.772	0.772
	SE2	0.744			
	SE3	0.696			
TS	TS1	0.845	0.624	0.831	0.812
	TS2	0.851			
	TS3	0.658			
INF	INF1	0.771	0.616	0.828	0.828
	INF2	0.787			
	INF3	0.796			

In terms of convergence validity, standard load coefficient is commonly used to describe the correlation between factors and analysis items. In addition, the commonly used criteria for judging convergence validity include mean variance extraction AVE value and component reliability CR value. CFA validation factor analysis was performed on 8 factors and 25 analysis items of the questionnaire data, and the values of standard load coefficient, convergence validity AVE and component reliability CR were obtained, as shown in Table 3. According to

the data, AVE values of each dimension were greater than 0.5 and CR values were greater than 0.7, which proved that the data had good internal convergence validity.

Secondly, the square root of AVE of each latent variable shown in the results of the differential validity test using the Fornell-Larcker standard should be greater than the correlation coefficient between this latent variable and other latent variables. As shown in Table 4, the measurement model has good internal reliability, convergence validity and differential validity, and all dimensions of the measurement model are of good quality.

Table 4 Discriminative validity of the model

	INF	TS	SE	CON	SN	PEU	PU	UB
INF	0.814							
TS	0.694	0.740						
SE	0.102	0.211	0.773					
CON	0.066	0.119	0.088	0.781				
SN	0.138	0.261	0.167	0.045	0.730			
PEU	0.331	0.633	0.152	0.154	0.162	0.729		
PU	0.240	0.517	0.183	0.287	0.324	0.378	0.790	
UB	0.261	0.408	0.112	0.253	0.273	0.342	0.667	0.785

4.2 Model fitting degree analysis

AMOS 23.0 was used to test the fit degree of the constructed model, as shown in Table 5. CMIN/DF value was 1.592, less than reference value 3; GFI value was 0.849, greater than reference value 0.8; RMSEA value was 0.059, less than reference value 0.1; CFI, TLI and IFI were 0.920 and 0.903, respectively. 0.923, both greater than the reference value of 0.9. According to the fit degree reference standard, the fit degree values of the model in this study are all within the reference range, indicating that the model has a good fit degree and can be further analyzed.

Table 5 Model adaptability test table

Index	Reference standard	Measured result
CMIN/DF	1-3 is excellent, 3-5 is good	1.592
RMSEA	<0.05 is considered excellent and <0.08 is considered good	0.059
GFI	>0.9 is considered excellent and >0.8 is considered good	0.849
IFL	>0.9 is considered excellent and >0.8 is considered good	0.920
TLI	>0.9 is considered excellent and >0.8 is considered good	0.903
CFI	>0.9 is considered excellent and >0.8 is considered good	0.920

4.3 Results of structural model analysis

The validation criteria for structural model analysis should specifically include the path coefficient and its significance level, R2 and Q2. Firstly, bootstr-apping was used to evaluate the size of the path coefficient and its significance level to verify various association assumptions in the structural model. The regression coefficient is shown in Table 6. When P < 0.05, the research hypotheses H1, H2, H3, H4, H5, H6, H7, H11, H13 and H14 are all valid. H8 Subjective Specification - Self-efficacy, H9 self-efficacy - Perceived ease of use, H10 self-efficacy - Perceived usefulness, H12 infrastructure - self-efficacy Although the standardized path coefficients of the four hypotheses of self-efficacy are all greater than zero, but their P >

0.05, indicating that these four hypotheses are not valid, that is, their positive impact results are not significant.

Table 6 Model adaptability test table

Hypothesis	Path	Standardized Path Coefficient	Standard Error (SE)	C.R.	P	Result
H1	CON->PU	0.287	0.031	2.816	0.005	TRUE
H2	CON->UB	0.253	0.035	2.555	0.011	TRUE
H3	PEU->PU	0.378	0.027	3.619	0.000	TRUE
H4	PEU->UB	0.342	0.030	3.401	0.000	TRUE
H5	PU->UB	0.667	0.039	5.460	0.000	TRUE
H6	SN->PU	0.324	0.029	3.216	0.001	TRUE
H7	SN->UB	0.273	0.033	2.815	0.005	TRUE
H8	SN->SE	0.167	0.025	1.692	0.091	FALSE
H9	SE->PEU	0.152	0.022	1.536	0.124	FALSE
H10	SE->PU	0.183	0.023	1.853	0.064	FALSE
H11	INF->PEU	0.331	0.027	3.255	0.001	TRUE
H12	INF->SE	0.102	0.024	1.050	0.294	FALSE
H13	TS->PEU	0.633	0.037	5.449	0.000	TRUE
H14	TS->SE	0.211	0.029	2.151	0.031	TRUE

5 Discussion

First, young teachers' expectation of online education has a significant positive impact on their perceived usefulness and behavioral intention, and perceived usefulness has a significant positive impact on behavioral intention. It shows that if they think online education can meet their expectations in the actual experience, then they will tend to think online education is useful, and will have more willingness to use it, so as to conduct more online education. At the same time, perceived usefulness is the main motivation for them to use online education. The key for them to decide whether to carry out online education is whether it can obtain the improvement of teaching effectiveness, the increase of academic achievements and the organizational rewards. It can be said that the stronger the perceived usefulness, the more it can offset the pressure brought by online education.

Second, perceived ease of use has a significant impact on perceived usefulness and behavioral intention. If the difficulty curve of using online education is too steep, or the courseware video production technology in online education is too complex, young teachers in universities will think that online education technology is too difficult, the requirement for personal ability is too high, and the effect achieved by spending the same energy is far less than traditional education, and the practicability is not strong, thus reducing the intention to carry out online education. Hinder the development and development of online education.

Third, subjective norms significantly positively affect perceived usefulness and behavioral intention. It shows that the administrative call, encouragement and the influence of colleagues can promote the cognition of the usefulness of online education and stimulate their intention to use online education. In the real environment, whether university teachers carry out online education or not is still free, but if positive incentives are used as a precondition, compulsory

use can promote their online education. They will not only adapt to the change of teaching mode as soon as possible, but also use the platform to try more teaching innovation.

Fourth, infrastructure significantly positively affects perceived ease of use. From the perspective of diminishing marginal utility, this means that the current online education infrastructure is not perfect, and network factors and online education platform functions are difficult to meet the basic needs of young teachers in universities to use online education. Further improving and maintaining a high level of infrastructure can significantly improve their perceived ease of use of online education.

Fifth, technical support for young teachers in universities can significantly positively affect their perceived ease of use and self-efficacy. It shows that the stronger the external technical support of young teachers in universities, such as the technical training provided by the university and the timely answer to the problems encountered, the lower the difficulty of carrying out online education, and it will bring them confidence in carrying out online education.

Sixth, teachers' self-efficacy has no influence on perceived usefulness and perceived ease of use. However, the average score of self-efficacy in all samples shows that young teachers in universities have the highest self-efficacy. The possible explanation for this finding is that most of the samples in this study are teachers with a certain teaching age and information teaching experience. They believe that the usefulness and ease of use of online education have nothing to do with their confidence, and the ease of use should be attributed to the convenience and technical support of the infrastructure of online education platform. Usefulness comes more from their experience with online education, peer reviews, and student feedback.

6 Implications

6.1 Establish an online education evaluation mechanism and strengthen positive incentives

The government and universities should make up for the problems existing in online education from the bottom logic as soon as possible, establish the competent department of information teaching, formulate a set of scientific and flexible performance evaluation system, and closely link online education with the application of teaching and research projects and the evaluation of professional titles, so as to form a close connection between high-quality online education and personal development.

6.2 Clarify the strategic direction of online education and actively promote and strengthen practice

The government and universities should fully investigate the actual needs, clarify the historical mission of online education development at the strategic level, reasonably formulate specific goals and tasks according to the specific conditions of universities in each region, and give young teachers correct guidance in the direction and process. Create a good online education atmosphere in the campus, give full play to the demonstration role of efficient young teachers, form a demonstration effect on other young teachers, cultivate online education teaching teams, gather to form a learning community, and jointly carry out online education.

6.3 Choose mature and reliable online education platforms

Because the online education infrastructure has a great impact on the online education of young teachers in universities, it is necessary to choose a platform with good comprehensive quality and carry out personalized customized services. At the same time, in order to avoid teachers' excessive expectations and wrong judgments on online education, and to help them establish a correct understanding of the usability and usefulness of online education, information-based teaching departments and platform service providers should honestly inform the actual capabilities and limitations of the platform, prepare and issue standard user manuals, and reduce the difficulty and workload of online education for teachers.

6.4 Strengthen in-service training and continuing education

In addition to the application of computer network technology, the educational technology level based on information technology should also be increased in the general teacher qualification examination subjects in China, and information education ability courses should be added to the pre-job training of new teachers. At the same time, organize in-service young teachers to participate in the systematic training of online education teaching knowledge and ability, and regularly carry out teaching observation and discussion to help young teachers improve their online education ability. Hold online education teaching competition, gain teaching experience through frequent application of online education, and obtain substantial teaching ability improvement and personal development.

7 Conclusion

This study explores the influencing factors of online education by young teachers in Chinese universities. Young teachers should pay attention to the most advanced information technology and the development trend of international education informatization, and make full use of the new characteristics of information technology teaching, so as to rapidly improve their personal ability and teaching quality. This study puts forward specific suggestions to promote the development of online education. With positive feedback as incentive, good infrastructure and technical support are provided to form young teachers' awareness of the usefulness and ease of use of online education, and promote them to better carry out online education. In the future, we need to deeply understand the specific problems they encounter in the process of online education, expand the sample size, and thus expand the scope of promotion and application of research results. At the same time, we should strengthen their information collection on the specific ways of online education and analyze the impact of different forms of online education on behavioral intention.

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