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Exploring Teacher Intentions in Rural Faku County Middle School, Shenyang City, Liaoning Province, China

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Abstract

Purpose: This study aims to investigate the influence of six independent variables—constructivist teaching beliefs, perceived ease of use, self-efficacy, social influence, subjective norm, and value beliefs—on one dependent variable: behavioral intention to use technology. **Research design, data, and methodology:** The research employed the Index of Objective Consistency (IOC) to assess effectiveness and used Cronbach's Alpha to evaluate the reliability of the pilot scale (n=30). A multiple linear regression analysis was conducted to examine the effective responses of 100 teachers from three junior high schools in Faku County, confirming the significant relationships between the variables. Following this, a cohort of 30 teachers participated in a 14-week strategic plan (SP). The quantitative results from the post-strategic plan and pre-strategic plan were then compared using paired sample t-tests. **Results:** The multiple linear regression analysis revealed that constructivist teaching beliefs, perceived ease of use, value beliefs, and social influence significantly affect teachers' behavior regarding the use of educational technology. Conversely, subjective norm and self-efficacy did not show a significant impact. Finally, the paired sample t-test comparisons demonstrated significant differences in teachers' behavioral intentions to use technology between the post-strategic planning and pre-strategic planning phases. **Conclusions:** The findings promote deeper understanding and application of knowledge, highlighting the importance of intuitive and accessible digital tools in the learning process.

Keywords: Behavioral Intention, Perceived Ease of Use, Value Beliefs, Self-Efficacy, Social Influence

JEL Classification Code: I23, J28, L2

1. Introduction

Educational technology evolves alongside educational activities and adapts to advancements in the field. The emergence of modern computer technology has significantly transformed the global environment, production methods, lifestyles, and talent requirements. Many countries recognize these changes and opportunities, asserting the need to cultivate skilled individuals to drive technological progress. However, in the vast agricultural regions of China, numerous schools and teachers continue to face substantial challenges in implementing educational technology.

Faku County serves as a typical agricultural area with three middle schools: East Lake No. 1 Middle School, No. 2 Middle School, and No. 3 Middle School. In 2013, the county government initiated a unified effort to equip classrooms with electronic whiteboards. Despite having high-quality hardware, teachers still encounter several difficulties when utilizing educational technology:

First, many older teachers did not receive training on the use of educational technology during their teacher education programs. As a result, they experience challenges and inconveniences in applying and maintaining the equipment, coupled with a lack of targeted and systematic support when faced with difficulties.

Second, following the pandemic, most teachers have adopted online teaching methods; however, the effectiveness of instruction in several challenging subjects has declined. This decline has led many teachers with stringent assessment requirements to question whether educational technology

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can genuinely enhance teaching effectiveness.

Third, teachers often lack clarity about how educational technology can facilitate student learning, improve their teaching practices, and what advantages it can provide for them personally. Additionally, there is no dedicated organization to promote and oversee the use of this technology.

Therefore, this study focuses on East Lake Middle School in Faku County as a sample to explore the factors influencing 100 teachers' use of educational technology. A 14-week strategic plan was designed to address these influencing factors and enhance teachers' utilization of educational technology.

2. Literature Review

2.1 Behavioral intention to use technology

Ajzen and Fishbein (1980) characterized the term as the likelihood of a user adopting a technological system. By 1989, Davis defined behavioral intention to use technology as the degree to which individuals plan to utilize technology in the future. There are three primary theories associated with the intention to accept technology: the Technology Acceptance Model (TAM), the Theory of Reasoned Action (TRA), and the Theory of Planned Behavior (TPB). Technology is understood as a collection of various tools rooted in modern computer technology, including wireless classrooms, interactive whiteboards, digital videos, online media, and online learning tools. These resources can be utilized by both teachers and students to enhance the learning experience (Richey & Klein, 2007).

2.2 Constructivist teaching belief

Constructivist learning theory is a subset of cognitive psychology that evolved from its foundational principles. Initially rooted in philosophical thought, the concept of constructivism was introduced by Swiss psychologist Piaget in 1972. Piaget (1972) argued that as individuals engage with their environment, they gradually construct knowledge about it, develop their own knowledge systems, and continually enhance their cognitive structures by integrating new experiences with their existing knowledge.

H1: Constructivist teaching belief has a significant influence on teachers' behavioral intention to use technology.

2.3 Perceived Ease of Use

In 1989, renowned American scholar Davis introduced the Technology Acceptance Model (TAM), building on the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB). Davis (1989) defined perceived ease of use as the simplicity with which a specific information system technology can be utilized. Sharma and Srivastava (2020) elaborated that perceived ease of use refers to users feeling that the technology is very easy to operate without any additional strain or significant effort. Ou (2022) described it as the degree to which teachers believe that smart classroom teaching technology is user-friendly. Teo (2013) found that in the TAM model, perceived ease of use positively influences perceived performance; in other words, the easier individuals find the system to use, the less time and effort they expend during the process, enabling them to accomplish more tasks under the same conditions.

H2: Perceived ease of use has a significant influence on teachers' behavioral intention to use technology.

2.4 Self-Efficacy

Self-efficacy is a significant concept introduced by Albert Bandura, a prominent psychologist at Stanford University, during the 1970s. Bandura (1977) defined self-efficacy as the level of confidence an individual possesses in their ability to accomplish tasks. He argued that human behavior is influenced not only by actions but also by one's beliefs regarding their capabilities and the outcomes of those actions. Self-efficacy affects human activities by shaping individual cognitive processes, motivational factors, emotional responses, and decision-making processes (Zhong & Wang, 2008).

H3: Self-efficacy has a significant influence on teachers' behavioral intention to use technology.

2.5 Social Influence

Social influence refers to an individual's perceptions of how others will view their decision to use a particular technology, both in the present and in the future (Ajzen, 1985). It is also a variable in the UTAUT model, which seeks to explain users' adoption of information technology. Within the UTAUT framework, social influence is described as the belief that peers, family, and social networks play a significant role in the adoption of information technology (Venkatesh et al., 2003). This can manifest in conversations with friends or in situations where using the Internet for teaching isn't seen as essential, yet those around you are using it or believe you should. Such dynamics can significantly impact teachers. Furthermore, cross-cultural studies have revealed that individuals from different cultures and ethnic backgrounds experience varying degrees of social influence.

Bottom of Form

H4: Social influence has a significant influence on teachers' behavioral intention to use technology.

2.6 Subjective Norm

In 1975, the Social Psychology Research Center introduced the concept of subjective norms (Fishbein & Ajzen, 1975). Subjective norms refer to an individual's perception that the majority of significant people in their life believe they should or should not engage in a particular behavior. This concept highlights how individuals view the expectations of important people or institutions regarding specific actions. For instance, teachers may feel it is essential to use educational technology if their school administration endorses its use (Teo & Lee, 2010). Armitage and Conner (2001) argue that individuals are influenced by the groups around them when making decisions about certain behaviors, which is connected to factors like imitation and obedience. Therefore, if key figures such as parents and teachers endorse a behavior, an individual may be more inclined to adopt it.
Bottom of Form
H5: Subjective norm has a significant influence on teachers' behavioral intention to use technology.Top of Form
Bottom of Form

2.7 Value Beliefs

According to Pajares (1992), teachers' beliefs encompass the convictions educators hold regarding various aspects of education, including their roles, the nature of the curriculum, students' roles, and the learning process within a school setting. Kagan (1992) emphasized that these beliefs are stable and resistant to change. Consequently, in order to modify teachers' behaviors in response to advancements in science and technology, it is essential to first alter their underlying beliefs. Miller (2017) further noted that the intrinsic value that community college instructors place on using technology in the classroom significantly influences their attitudes toward implementing teaching technologies.
H6: Value beliefs have a significant influence on teachers' behavioral intention to use technology.Top of Form

3. Research Methods and Materials

3.1 Research Framework

Cooper and Schindler (2014) identified conceptual frameworks as graphical representations of the connections between various variables. An explanation of conceptual framework can be found in Hair et al.'s (2013) study, which established that a conceptual framework is a model used to present variables and their relationships between independent and independent variables in a study.

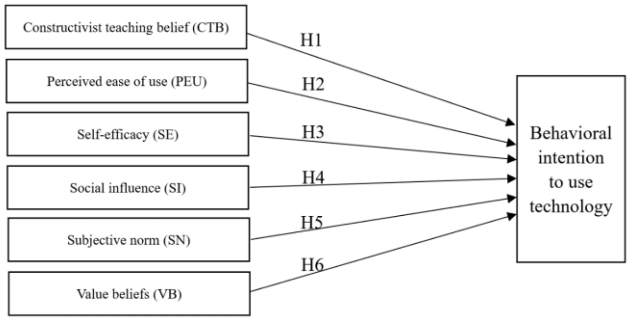

Figure 1: Conceptual Framework

H1: Constructivist teaching belief has a significant influence on teachers' behavioral intention to use technology.
H2: Perceived ease of use has a significant influence on teachers' behavioral intention to use technology.
H3: Self-efficacy has a significant influence on teachers' behavioral intention to use technology.
H4: Social influence has a significant influence on teachers' behavioral intention to use technology.
H5: Subjective norm has a significant influence on teachers' behavioral intention to use technology.
H6: Value beliefs have a significant influence on teachers' behavioral intention to use technology.

3.2 Research Methodology

The research process consists of four distinct stages. In the first stage, a survey was administered to the entire study population (n=100) to gather data on the proposed conceptual framework. Following this, rigorous testing of all hypotheses was performed using multiple linear regression, with a significance level set at a p-value of <0.05. Supported hypotheses were retained, while those that did not meet the criteria were discarded.

The second stage involved conducting a pre-strategic plan survey among 30 teachers who voluntarily agreed to participate in the plan based on the supported assumptions.

The third stage marked the implementation phase of the strategic plan, during which the 30 teachers engaged in a 14-week program.

In the fourth stage, these teachers completed another survey, providing data for paired sample t-test analysis to compare the pre-strategic plan and post-strategic plan results. This comprehensive approach facilitates a thorough examination of the research objectives and hypotheses.

3.3. Research Population, Sample Size, and Sampling Procedures

3.3.1 Research Population

The research subjects for this study were drawn from three middle schools in Faku County, Shenyang City, Liaoning Province, China: East-Lake No.1 Middle School, East-Lake No.2 Middle School, and East-Lake No.3 Middle School.

A random survey was administered to teachers at East Lake Middle School, and its reliability was established through a pilot test. The researchers then conducted a survey with 112 teachers from the three schools, resulting in 100 valid responses. Ultimately, 30 teachers from East Lake No.2 Middle School were selected to voluntarily participate in the strategic plan intervention.

3.3.2 Sample size

The researcher carried out multiple sampling procedures, which are detailed as follows:
Sampling 1: Sampling for the pilot survey and pilot test
Sampling 2: Sampling for the pre-survey
Sampling 3: Sampling for the strategic planning

3.3.3 Sampling Procedures

This study employed cluster sampling for the questionnaire. Two classes with comparable majors, grade distributions, and scores were selected during the educational knowledge and ability course. The questionnaire was distributed to 118 students via the Questionnaire Star app. The findings from the questionnaire will inform the development of subsequent interventions.

3.4 Research Instruments

3.4.1 IOC Results

The researchers enlisted three independent experts to assess the project goal consistency index. Among them was a Thai professor, while the other two were Chinese experts. Each expert has extensive teaching experience and has published numerous educational articles. During the IOC process, the independent experts used a marking system where +1 indicated consistency, 0 indicated uncertainty, and -1 indicated inconsistency. In this study, all questionnaire items received scores greater than 0.67, leading the researchers to retain all items.

3.4.2 Pilot survey and Pilot test results

The researchers randomly conducted a pilot survey involving 30 teachers, who were asked to complete a survey questionnaire and provide feedback. Following this, the researchers performed a Cronbach's Alpha internal consistency reliability test, which should yield a value of 0.7 or higher (Nunnally & Bernstein, 1994). Consequently, the subsequent table displays the high reliability approval results for each construct.

Table 1: Pilot Test Result

Variables	No. of Items	Sources	Cronbach's Alpha	Strength of Association
Behavioral intention to use technology.	3	Huang et al. (2021)	0.702	Acceptable
Constructivist teaching belief	7	Sharma and Srivastava (2019)	0.822	Good
Perceived ease of use	4	Huang et al. (2021)	0.821	Good
Self-efficacy	4	Sharma and Srivastava (2019)	0.722	Acceptable
Social influence	5	Sharma and Srivastava (2019)	0.749	Acceptable
Subjective norm	6	Timothy et al. (2018)	0.856	Good
Value beliefs	5	Sharma and Srivastava (2019)	0.869	Good

4. Results and Discussion

4.1 Results

4.1.1 Demographic Profile

The researcher provided a demographic overview of the full research population (n=100), and then detailed the selection of 30 middle school participants who voluntarily took part in the strategic plan intervention stage, as outlined in Table 2.

Table 2: Demographic Profile

Entire Research Population (N=100)		Frequency	Percent
Gender	Male	56	56%
	Female	44	44%
Middle schools	East-Lake No.1 Middle School	25	25%
	East-Lake No.2 Middle School	30	30%
	East-Lake No.3 Middle School.	45	45%
Total		**100**	**100%**
Strategic Plan Participants (n=30)		**Frequency**	**Percent**
Gender	Male	2	6.67%
	Female	28	93.33%
Year	East-Lake No.1 Middle School	0	0%

Entire Research Population (N=100)		Frequency	Percent
	East-Lake No.2 Middle School	30	100%
	East-Lake No.3 Middle School.	0	0%
Total		**30**	**100%**

4.1.2 Results of multiple linear regression

The researchers performed multiple linear regression (MLR) analysis on 100 completed survey questionnaires to determine whether each hypothesis was supported. There are six research hypotheses, and the variance inflation factor (VIF) analysis indicated that multicollinearity is not an issue, as all VIF values were below 5 (Hair et al., 1995). In the multiple linear regression model comprising six independent variables, the R-squared (R^2) value accounted for 80.6% of the variability in creativity.

Table 3: The multiple linear regression of five independent variables on behavioral intention to use technology.

Variables	Standardized Coefficients Beta value	t-value	p-value	R	R^2
Constructivist teaching belief	0.242	3.314	0.001	0.898	0.806
Perceived ease of use	0.224	2.530	0.013		
Self-efficacy	-0.067	-0.959	0.340		
Social impact	0.301	3.101	0.003		
Subjective norm	0.007	0.111	0.912		
Value beliefs	0.285	3.435	<.001		

Note: p-value <0.05*, p-value <0.001**

Consequently, H3 states that self-efficacy (SE) does not affect teachers' behavioral intention to use technology ($\beta = -0.067$, $P < 0.340$), while H5 asserts that subjective norm (SN) has no effect on this behavioral intention ($\beta = 0.007$, $P < 0.912$). Both of these hypotheses were not supported in the multiple linear regression (MLR) analysis, leading to their rejection. In contrast, H1 indicates that constructivist teaching belief (CTB) significantly influences teachers' behavioral intention to use technology ($\beta = 0.242$, $P < 0.001$). H2 suggests that perceived ease of use (PEU) also significantly influences this intention ($\beta = 0.224$, $P < 0.013$). H3 claims that social influence (SI) significantly affects teachers' behavioral intention ($\beta = 0.301$, $P < 0.003$), and H6 states that value beliefs (VB) have a significant impact as well ($\beta = 0.285$, $P < 0.001$). These four hypotheses were supported by the MLR results. Based on these findings, additional hypotheses were formulated for the Strategic Planning phase, which include:

H7: A significant mean difference exists in behavioral intention to use technology between the Pre-Strategic Plan and Post-Strategic Plan stages.

H8: A significant mean difference exists in constructivist teaching belief between the Pre-Strategic Plan and Post-Strategic Plan stages.

H9: A significant mean difference exists in perceived ease of use between the Pre-Strategic Plan and Post-Strategic Plan stages.

H10: A significant mean difference exists in social influence between the Pre-Strategic Plan and Plan stages.

4.2 Self-development Plan Intervention Stage

This strategic plan spans 14 weeks. During weeks 1 to 3, the focus is on enhancing teachers' values and beliefs while strengthening constructivist teaching principles. Activities include recognizing the honors received by the school and individuals for their work with educational technology, as well as watching exemplary courses that utilize this technology. Weeks 5 to 7 are dedicated to improving teachers' perceived ease of use, employing both group explanations and individualized support to clarify the use of technology and assist each teacher in addressing their specific challenges. From weeks 8 to 12, the plan shifts to fostering social influence through group collaboration, encouraging teachers to form mutual support networks for timely assistance with future issues. Finally, weeks 13 to 14 serve as the achievement showcase, displaying the lesson preparation outcomes from the strategic plan and utilizing these results to bolster teachers' appreciation for educational technology. The detailed weekly implementation schedule is presented in the table below:

Table 4: Specific Implementation Table of Strategic Plan

No.	Time and Duration	Implementation Keywords
1	Week1	Explain the importance of educational technology by school leaders. Announce the honors received by the school for using educational technology within 1-2 years. Overall explanation of what assistance this study can provide to teachers and the steps to be taken.
2	Week2	Observing, learning, and discussing excellent educational technology public courses
3	Week3	Guide teachers to recognize the advantages and disadvantages of using educational technology. Teachers share their confusion and unforgettable events in teaching

No.	Time and Duration	Implementation Keywords
4	Week4	Donate educational technology tools to schools to reduce teachers' burden of lesson preparation, and explain their usage methods for teachers to apply in practice.
5	Week5	Recommend practical educational network resources and guide teachers to use them
6	Week6-7	Provide separate guidance for teachers' questions and difficulties.
7	Week8-12	Group communication, and each member optimizes their own courseware.
8	Week13-14	Teachers share excellent courses and summarize them

4.3 Results Comparison between Pre-IDI and Post-IDI

The researchers performed a paired sample t-test analysis on the four variables to assess any differences between the pre-strategic plan and post-strategic plan stages. The table below summarizes the results of the paired sample t-test analysis for the four variables, as detailed below:

Table 4: Paired-Sample T-Test Results

Variables	Mean	SD	SE	p-value
Behavioral intention to use technology				
Pre-SP	3.36	0.632	0.1153	<0.01
Post-SP	4.43	0.412	0.0752	
Constructivist teaching belief				
Pre-SP	3.89	0.441	0.0804	<0.01
Post-SP	4.56	0.388	0.0708	
Perceived ease of use				
Pre-SP	3.45	0.562	0.1027	<0.01
Post-SP	4.21	0.496	0.0906	
Social influence				
Pre-SP	3.58	0.588	0.1074	<0.01
Post-SP	4.48	0.429	0.0783	
Value beliefs				
Pre-SP	3.53	0.828	0.1511	<0.01
Post-SP	4.41	0.497	0.0907	

Based on the paired-sample t-test results presented above, the researcher drew the following conclusions: First, all five variables exhibited a significant mean difference between the pre-SP and post-SP stages. Second, the researcher identified a significant increase in teachers' behavioral intention to use technology between the pre-SP and post-SP phases.

5. Conclusions, Recommendations and Limitations

5.1 Conclusions & Discussions

The study of factors influencing learning outcomes in flipped classrooms at X University in Yunnan, China, reveals a complex interplay between various elements that shape students' behavioral intentions to use technology effectively. The findings indicate that constructivist teaching beliefs play a pivotal role in fostering an engaging learning environment, promoting deeper understanding and application of knowledge. Additionally, perceived ease of use significantly impacts students' willingness to adopt technology, highlighting the importance of intuitive and accessible digital tools in the learning process.

Self-efficacy emerged as a crucial determinant of student success, as those who believe in their ability to utilize technology are more likely to engage with flipped classroom practices. Furthermore, value beliefs and social influence were found to enhance students' motivation and commitment to the learning experience. The strategic plan of the institution also serves as a foundation for implementing and sustaining effective flipped classroom models, ensuring that technological resources and pedagogical strategies align with the needs and preferences of both students and educators.

The findings of this study emphasize the importance of understanding the diverse factors that contribute to effective learning outcomes in flipped classrooms. The integration of technology in education requires more than just access to digital tools; it necessitates a shift in teaching philosophy toward constructivism, where students actively participate in their learning journey. This aligns with previous research that underscores the significance of pedagogical approaches in influencing student engagement and achievement.

Moreover, the role of perceived ease of use highlights the necessity for institutions to invest in user-friendly technologies that facilitate learning. When students find technology easy to navigate, they are more likely to engage with the flipped classroom model. This aspect is particularly relevant in the context of X University, where varying levels of technological proficiency among students may exist.

Self-efficacy remains a critical factor in promoting a positive attitude toward technology use. Institutions should focus on building students' confidence through training sessions and workshops that empower them to use technology effectively. Additionally, fostering a supportive social environment, where peer influence encourages technology adoption, can enhance the overall learning experience.

Finally, the strategic plan of X University must be continuously evaluated and adapted to align with the

evolving educational landscape. By integrating feedback from students and educators, the university can refine its approach to flipped classrooms, ensuring that it meets the diverse needs of its academic community. Overall, this study contributes to the growing body of literature on flipped classrooms by identifying key factors that influence learning outcomes, providing valuable insights for educators and policymakers in enhancing the educational experience.

5.2 Recommendations

Although many Chinese teachers transitioned to online courses during the pandemic, numerous rural areas with limited resources were unprepared for this sudden shift. While the pandemic will eventually subside, the information age is unavoidable. It is essential for both students and teachers to be proficient in using advanced electronic teaching tools and software. This article explores the factors influencing teachers' adoption of educational technology and how to address these factors to enhance their acceptance of such tools.

Regular optimization of electronic teaching equipment in schools is crucial. Since the maintenance of this equipment often requires specialized knowledge, many teachers may feel overwhelmed when issues arise, negatively impacting their perceived ease of use. Therefore, schools should employ dedicated personnel to regularly maintain and optimize teaching equipment.

Training programs for teachers on educational technology should be thorough and detailed. For older teachers, it is important to provide clear prompts and annotations for each step of the training, with content broken down into manageable segments starting with the basics. Any challenges faced during the training process should be addressed promptly, and repetition of key steps is vital.

Establishing support groups can significantly benefit teachers. Given their need for camaraderie and recognition in their work, teachers are influenced by their peers. If these groups are led by teachers skilled in educational technology, others may feel they have access to support and assistance, which can boost motivation, reduce anxiety, and enhance their confidence in problem-solving.

Training should emphasize results-oriented outcomes. Workshops could focus on helping teachers design micro-courses suitable for competitions, develop exemplary courses at various levels using educational technology, or create effective teaching plans. This approach allows teachers to witness tangible improvements and outcomes, reinforcing their commitment to using educational technology.

Finally, it is important to promote constructivist teaching beliefs, which prioritize a student-centered approach that encourages active exploration, discovery, and appreciation of knowledge. Teachers should act as facilitators and supporters of student learning. Fostering these values can help teachers move away from a traditional focus on mere knowledge transmission and encourage them to experiment with new teaching methods and techniques.

5.3 Limitations for Future Research

While this study offers valuable insights into the factors that influence teachers' use of educational technology and ways to enhance their willingness to adopt it, certain limitations should be acknowledged to inform future research in this area.

Sample Size and Demographics: This research collected 100 valid samples, which is relatively small for capturing the diverse population of Chinese teachers. Therefore, future studies should aim to increase the sample size and include a broader range of teachers from various educational backgrounds, age groups, and cultural contexts to assess the generalizability of the findings.

Variables and Relationships: This study focuses on six specific independent variables and one dependent variable. Future research could investigate additional independent variables and their potential interactions, offering a more comprehensive understanding of the factors that influence teachers' behavioral intentions to use technology.

References

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action control: From cognition to behavior* (pp. 11-39). Springer.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior* (1st ed.). Prentice-Hall.

Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behavior: A meta-analytic review. *British Journal of Social Psychology, 40*(4), 471-499. https://doi.org/10.1348/014466601164939

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Advances in Be haviour Research and Therapy, 84*(2), 191-215. https://doi.org/10.1037/0033-295x.84.2.191

Cooper, D. R., & Schindler, P. S. (2014). *Business research methods* (12th ed.). McGraw-Hill Education.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly, 13*(3), 19-340. https://doi.org/10.2307/249008

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: an introduction to theory and research* (1st ed.). Addison-Wesley.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1995). *Multivariate data analysis* (4th ed.). Prentice Hall.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). *Multivariate data analysis* (7th ed.). Pearson.

Huang, F., Teo, T., Sánchez-Prieto, J. C., & García-Peñalvo, F. J. (2021). A cross-cultural study on the influence of cultural values and teacher beliefs on university teachers' information and communications technology acceptance. *Education Tech Research Dev, 69*,1271-1297.

Kagan, D. M. (1992). Implications of research on teacher belief. *Educational Psychologist, 27*(1), 65-90. doi:10.1207/s15326985ep2701_6 .

Miller, E. R. (2017). *Predicting the use of instructional technology among community college instructors: An extension of the technology acceptance model (TAM)* [Doctoral dissertation]. ProQuest LLC.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.

Ou, Y. (2022). *A study on the influential factors of middle school teachers' smart classroom teaching behavior based on the technology acceptance model: Taking P District of Shenzhen City as an example* [Master's thesis]. East China Normal University.

Pajares, F. (1992). Teacher beliefs and educational research: Clearing up a messy construct. *Review of Educational Research, 62*(3), 307-332. https://doi.org/10.3102/00346543062003307

Piaget, J. (1972). *The principles of genetic epistemology* (1st ed.). Routledge & Kegan Paul.

Richey, R. C., & Klein, J. D. (2007). *Design and development research: Methods, strategies, and issues* (1st ed.). Routledge. https://doi.org/10.4324/9780203826034

Sharma, L., & Srivastava, M. (2020). Teachers' motivation to adopt technology in higher education. *Journal of Applied Research in Higher Education, 21*(4), 673-692.

Sharma, S., & Srivastava, A. (2019). Understanding the factors influencing the acceptance of technology in education: A study of Indian higher education. *Journal of Educational Technology & Society, 22*(1), 1-14.

Teo, T. (2013). Influences of contextual variables on the intention to use technology in education: A latent variable modeling approach. *Campus-Wide Information Systems, 30*(2), 95-105. https://doi.org/10.1108/10650741311306282

Teo, T., & Lee, C. (2010). Explaining the intention to use technology among student teachers: An application of the Theory of Planned Behavior. *Campus-Wide Information Systems, 27*(2), 60-67. https://doi.org/10.1108/10650741011033035.

Timothy, J. W. S., Klas, N., Sanghani, H. R., & Al-Mansouri, T. (2018). Circadian Disruptions in the Myshkin Mouse Model of Mania Are Independent of Deficits in Suprachiasmatic Molecular Clock Function. *National Library of Medicine, 84*(11), 827-837.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: toward a unified view. *MIS Quarterly, 27*(3), 425-478.

Zhong, Y., & Wang, W. (2008). An Empirical Study on Non major Students' self-efficacy in English Learning under Multimedia Environment. *Journal of Sichuan University of Foreign Languages, 24*(6), 142-144.