Pre-service Bilingual Teachers' Perception on the Application of WeChat in the Training Process

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Abstract

This study examines how pre-service bilingual teachers at Changchun Normal University view the use of WeChat in their training. It uses a mixed-method approach, with a survey based on TAM and UTAUT for the quantitative part and semi-structured interviews for the qualitative part. The research includes 481 participants and uses CFA and SEM to test hypotheses. Findings show that factors like performance expectancy, effort expectancy, technical efficiency, digital divide, perceived usefulness, and perceived enjoyment positively affect teachers' behavioral intention. Perceived ease of use boosts both behavioral intention and perceived usefulness, while motivation significantly influences perceived learning. Behavioral intention is a strong predictor of perceived learning. The study offers insights for technology integration in bilingual teacher training and points to future research directions.

Keywords: WeChat, Pre-service bilingual teachers, Perception, Training Process

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Introduction

In the digital age, IT is essential in society, particularly for education, communication, and work (Aheto et al., 2024). WeChat, a vital digital tool, has transformed how we interact with information and is crucial for learning and connectivity (Sun & Suthers, 2024; Amin et al., 2023). This study investigates pre-service bilingual teachers' perceptions of WeChat in training, an under-explored area. As globalization drives bilingual education, these teachers are key to preparing students for a globalized world (Callahan & Gándara, 2014). The research evaluates WeChat's effects on teacher learning and factors for successful educational integration.

WeChat, a Tencent product with 1.359 billion users as of Q1 2024 (Tencent, 2024), is integral to digital life in China. Its design, lacking "offline" indicators, supports continuous connectivity, aligning with cultural norms (Sun & Suthers, 2024). The platform's educational features, like group chats and document sharing, boost student engagement and language learning (Amin et al., 2023). Guided by TAM and UTAUT, this study examines WeChat's influence on pre-service bilingual teachers' learning experiences, focusing on perceived usefulness, ease of use, performance expectancy, effort expectancy, social influence, perceived enjoyment, and motivation (Legris et al., 2013; Fan & Wang, 2023; Singh et al., 2023).

Pre-service bilingual teachers integrate classroom and practical training to connect theory with practice (Kaminski et al., 2023). WeChat enhances this with asynchronous learning, enabling engagement with materials, discussions, and feedback, and fostering flexibility and continuous learning beyond traditional settings (Zeng et al., 2016). Its use in training not only prepares teachers for classroom technology but also promotes a collaborative community of practice, underscoring the importance of technological proficiency in education (Fan & Wang, 2023). WeChat’s features facilitate communication, information sharing, and collaborative learning, enhancing pre-service bilingual teachers' learning experiences (Amin et al., 2023). The platform’s design, like the absence of status indicators, promotes constant connectivity and reflects cultural values affecting user behavior (Sun & Suthers, 2024). Incorporating WeChat into training is expected to improve communication, collaboration, and resource sharing (Sun & Suthers, 2024), and the study uses TAM and UTAUT to explore teachers' views on WeChat as a professional development tool, influencing their usage intentions, to guide technology integration in bilingual teacher education.

The research questions guiding this inquiry are:

(1) What are the perceptions of pre-service bilingual teachers regarding the use of WeChat in their training process?

(2) What factors influence these perceptions, and how can WeChat be optimally integrated into the training curriculum to enhance the learning outcomes of pre-service bilingual teachers?

The study aims to enhance understanding of how WeChat, as a contemporary technology, aids in the education of pre-service bilingual teachers, potentially revealing its capacity to enrich traditional training and provide extended learning experiences outside the classroom.

Research Objectives

This study aims to deeply understand WeChat's role in training pre-service bilingual teachers, with objectives to analyze its impact on bilingual education, assess motivation, explore determinants, and formulate evidence-based recommendations, thereby enriching bilingual education and improving technology use in teacher training.

(1) To determine pre-service bilingual teachers' perception of WeChat in the training process.

(2) To identify the influencing factors that affect pre-service bilingual teachers' perception of WeChat in the training process.

Scope of the Research

This study seeks to investigate the use of WeChat in training prospective bilingual teachers and assess its effects on their learning experiences. The research scope is defined by the following aspects:

Content scope

The study examines WeChat's integration into pre-service bilingual teacher training, specifically its use for sharing resources (Gan & Li, 2018), communication (Sun & Suthers, 2024), and collaborative learning. It assesses WeChat's impact on language proficiency, pedagogical skill development, and overall learning experiences among these teachers.

Technical scope

The research evaluates WeChat's technical features for educational use, including messaging, group functionality, file sharing, and educational mini-programs or official accounts (Sun & Suthers, 2024). It explores the utilization of these features by pre-service bilingual teachers and their influence on teaching and learning.

Variables used in the research

The variables involved in the study include the frequency of WeChat use, perceived usefulness s(PU), perceived ease of use (PEOU), behavioral intentions (BI), performance expectancy (PE), effort expectancy(EE), technical efficiency (TE), digital divide (DD), perceived enjoyment (PEM), motivation (M), and perceived learning (PL) (Arness & Ollis, 2023; Singh et al., 2023; Sun et al., 2024).

Geographical scope

This study's scope is limited to pre-service bilingual teachers in Jilin Province, China, with a focus on Changchun Normal University, the sole institution in China training bilingual teachers in multiple disciplines in both Chinese and English. The findings are specific to this region and may not be extrapolated to other areas without additional research.

Population and sample

The research targets pre-service bilingual teachers from Changchun Normal University in Jilin Province, specifically third and fourth-year students in seven fields: mathematics, physics, chemistry, biology, geography, primary education, and preschool education. For SEM, a sample size calculation with an effect size of 0.3, 10 latent variables, 56 observed variables, a p-value of 0.05, and power of 0.8 suggests a minimum sample size of 190. A quantitative survey of about 500 teachers and qualitative interviews with 30 participants are conducted to ensure a representative and diverse perspective on WeChat in their training.

Research Methodology

Research Design

This research uses a mixed-methods approach, integrating TAM and UTAUT, to deeply understand the topic. The quantitative component surveys dimensions influencing pre-service bilingual teachers' intentions to use WeChat in training, such as performance expectancy, effort expectancy, technical efficiency, digital divide, perceived usefulness, ease of use, enjoyment, and motivation. The qualitative component involves semi-structured interviews to explore subjective experiences with WeChat

integration, offering deeper insights into the survey findings. This design examines the interplay between these variables and their impact on behavioral intention and perceived learning, as per TAM and UTAUT frameworks (Singh et al., 2023).

Research Instruments

The research instruments include a questionnaire and semi-structured interviews to gather demographic data and perceptions of WeChat in training, as well as participants' attitudes and experiences with WeChat. Items are measured on a 5-point Likert scale to assess constructs like performance expectancy, effort expectancy, technical efficiency, digital divide, perceived usefulness, ease of use, enjoyment, motivation, behavioral intention, and perceived learning (Figure 1).

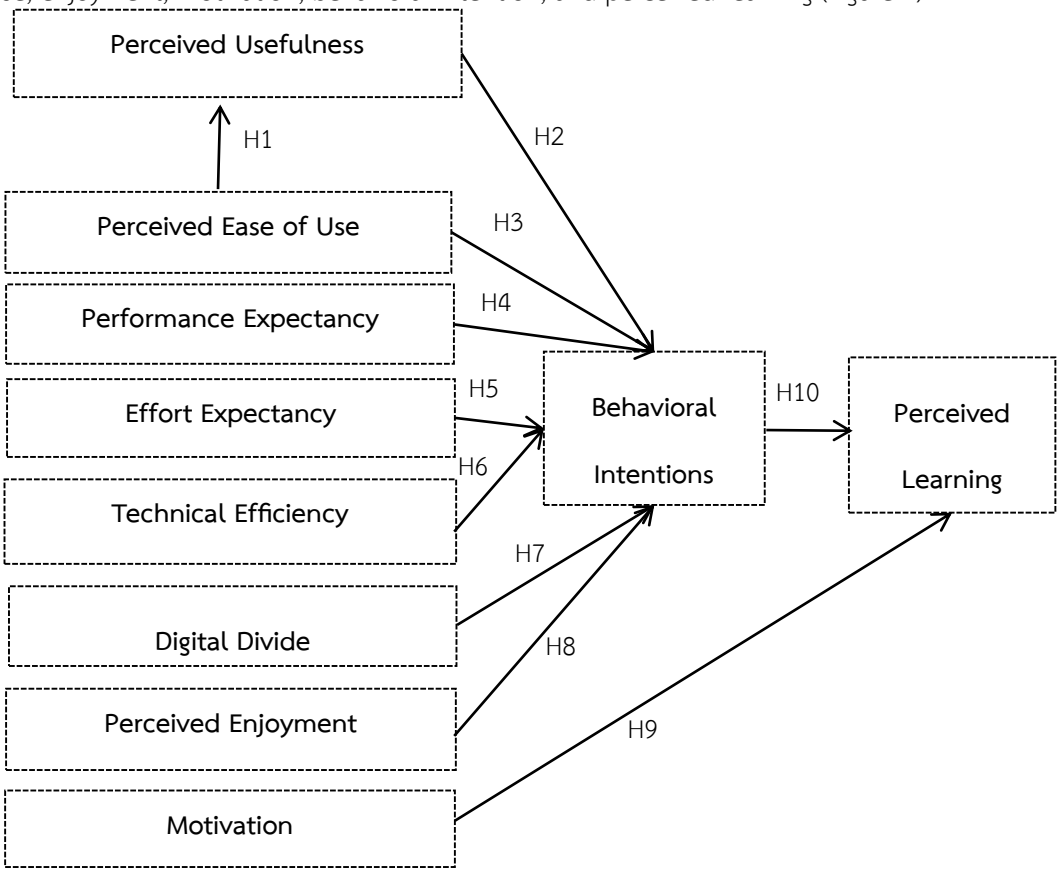

Figure 1 Conceptual Framework

Table 1 Questionnaires and Interview Forms

Variables	Operationalization
Perceived Usefulness	1. Using the WeChat platform improves the performance of my learning. 2. Using the WeChat platform in my learning Increases my productivity. 3. Using the WeChat platform enhances my effectiveness in my learning. 4. I find the WeChat platform to be useful in my learning. 5. The quality of the learning work I get from the WeChat platform is high. 6. I have no problem with the quality of the using WeChat platform for peer feedback's learning work. 7. I rate the learning work from the WeChat platform to be excellent. 8. The results of using the WeChat platform are apparent to me.

Table 1 Questionnaires and Interview Forms (Continue)

Variables	Operationalization
Perceived Ease of Use	1. My interaction with the WeChat platform is clear and understandable. 2. Interacting with the WeChat platform does not require a lot of my mental effort. 3. I find the WeChat platform to be easy to use. 4. I find it easy to get the WeChat platform to do what I want it to do. 5. I have control over using the WeChat platform. 6. I have the resources necessary to use the WeChat platform. 7. Given the resources, it takes to use the WeChat platform, it would be easy for me to use the WeChat platform. 8. Given the opportunities, it takes to use the WeChat platform, it would be easy for me to use the WeChat platform. 9.Given the knowledge, it takes to use the WeChat platform, it would be easy for me to use the WeChat platform.
Performance Expectancy	1. I find WeChat very useful in my learning. 2. I find WeChat increases my chance in achieving my educational goal. 3. WeChat helps me in accomplishing things ore fast. 4. WeChat enhances my productivity.
Effort Expectancy	1. Study with WeChat is easy for me. 2. My interactivity in WeChat is clear and understandable. 3. I comfortable in using WeChat. 4. It is easy for me to enhance my skill and competency through WeChat.
Technical Efficiency	1. WeChat through new technology is compatible with other technologies I use. 2. The use of technology is easy for my WeChat. 3. I can get help from others when I have difficulties using WeChat. 4. Technology brings large benefits to education. 5. Technology enables a good cooperation between students.
Digital Divide	1. It is easy to access and process course materials because of technology devices. 2. I have the necessary resources needed from WeChat. 3. Good internet connectivity affects me most in accessing online education facility through WeChat at home. 4. It is easy for me to enhance my skill and competency through WeChat. 5. My technical competence affect me most in accessing WeChat. 6. Optimized software for mobile devices and security protection affect my accessibility of WeChat.
Perceived Enjoyment	1. I find learning through the WeChat platform to be enjoyable. 2. The actual process of using the WeChat platform is pleasant. 3. I have fun using the WeChat for my learning.
Motivation	1. I prefer course material that really challenges me so I can learn new things. 2. I prefer courses that spark my curiosity, even if they are difficult to learn. 3. When I have the opportunity, I choose course assignments that I can learn from even if they don't guarantee a good grade. 4. Getting a good grade in this class is the most satisfying thing to me. 5. If I can, I want to get better grades in this class than most of the other students. 6. I want to do well in this class because it is important to show my ability to my family, friends, teachers, or others.

Table 1 Questionnaires and Interview Forms (Continue)

Variables	Operationalization
Behavioral Intentions	1. Assuming I had access to the WeChat platform in the future, I intend to use it. 2. Given that I currently have accessed to the WeChat platform, I predict that I would use it. 3. I plan to use WeChat platform in the next 6 months.
Perceived Learning	1. When study through WeChat, the learning process is easier to grasp. 2. My learning style has shifted significantly as a result of using WeChat. 3. I am not worried about examination through WeChat. 4. My academic performance has improved as a result of using WeChat. 5. I intend to fulfil my academic objectives through WeChat learning. 6. My technological abilities have increased as a result of WeChat learning. 7. I have increased my use of the WeChat for enjoyment. 8. WeChat learning is a positive experience.

Hypotheses

Hypotheses Ha1 through Ha10 posit that perceived ease of use (Ha1, Ha3), perceived usefulness (Ha2), performance expectancy (Ha4), effort expectancy (Ha5), technical efficiency (Ha6), digital divide (Ha7), perceived enjoyment (Ha8), and motivation (Ha9) all positively influence pre-service bilingual teachers' behavioral intentions towards using WeChat in their training. Additionally, Ha10 suggests that behavioral intention positively affects perceived learning in the training process.

Data Collection and Analysis

Ethical guidelines ensure informed consent and secure data collection. Reminders and incentives are used to improve response rates. Quantitative data is analyzed using SPSS for descriptives and SEM, while qualitative data is thematically analyzed with software like Nvivo.

Research Results

Participants' Demographic Background

Of the 481 students surveyed in Changchun Normal University's bilingual class, 99 (20.58%) were male and 382 (79.42%) were female. By year of study, 397 (78.79%) were in Year 3 and 102 (21.21%) in Year 4. Age distribution was as follows: 66 (13.72%) aged 18-19, 209 (43.45%) aged 20-21, 190 (39.5%) aged 22-23, and 16 (3.33%) aged 24-25. Major-wise, the distribution was: Mathematics (12, 2.49%), Physics (123, 25.57%), Chemistry (45, 9.36%), Biology (82, 17.05%), Geography (12, 2.7%), Primary Education (49, 10.19%), and Preschool Education (157, 32.64%) (Table 2).

Table 2 Demographic Information of Samples

Variable	Category	Frequency	Percentage
Gender	Male	99	20.58%
	Female	382	79.42%
Year of Study	Year 3	397	78.79%
	Year 4	102	21.21%
Age	18-19	66	13.72%
	20-21	209	43.45%
	22-23	190	39.5%
	24-25	16	3.33%

Table 2 Demographic Information of Samples (Continue)

Variable	Category	Frequency	Percentage
Majors	Mathematics	12	2.49%
	Physics	123	25.57%
	Chemistry	45	9.36%
	Biology	82	17.05%
	Geography	12	2.7%
	Primary Education	49	10.19%
	Preschool Education	157	32.64%

Descriptive Statistics of Variables

Table 3 summarizes pre-service bilingual teachers' positive perceptions on integrating WeChat into their learning, with mean scores indicating agreement that WeChat boosts utility (3.794 for performance expectancy), ease of use (3.771 for effort expectancy), and enjoyment (3.882). Technical efficiency scored 4.006, perceived usefulness 3.899, and motivation 3.934. Behavioral intention to use WeChat for learning was strong (4.309), and perceived learning outcomes were positive (3.933), indicating WeChat supports an enjoyable and effective learning process and skill enhancement (Table 3).

Table 3 Descriptive Statistics of Relative Advantage of Variables

	Variables	Mean	SD	Interpretation
1	Perceived usefulness	3.899	1.041	Agree
2	Perceived ease of use	3.949	1.026	Agree
3	Performance expectancy	3.794	1.077	Agree
4	Effort expectancy	3.771	1.102	Agree
5	Technical efficiency	4.006	1.022	Agree
6	Digital divide	3.703	0.806	Agree
7	Perceived enjoyment	3.882	0.996	Agree
8	Motivation	3.934	1.042	Agree
9	Behavioral intention	4.309	0.892	Agree
10	Perceived learning	3.933	0.993	Agree

Confirmatory Factor Analysis (CFA)

A CFA confirmed the research model's structural integrity, with fit indices showing a $\chi 2/df$ ratio of 1.833, RMSEA of 0.042, and NFI, IFI, TLI, and CFI all above 0.90, indicating excellent model fit (Table 4). Convergent validity was established with standardized path coefficients above 0.7, AVE values ≥ 0.5, and CR values > 0.7 (Table 4). Discriminant validity was confirmed as the absolute value of correlation coefficients between factors was less than the square root of their respective AVE, ensuring the scale's reliability.

Table 4 Confirmatory Factor Analysis Fit Indices

Parameters	$\chi 2$	df	$\chi 2/df$	RMSEA	NFI	IFI	TLI	CFI
Excellent threshold			<3	<0.08	>0.9	>0.9	>0.9	>0.9
Model Value	3181	1459	1.833	0.042	0.877	0.940	0.935	0.940

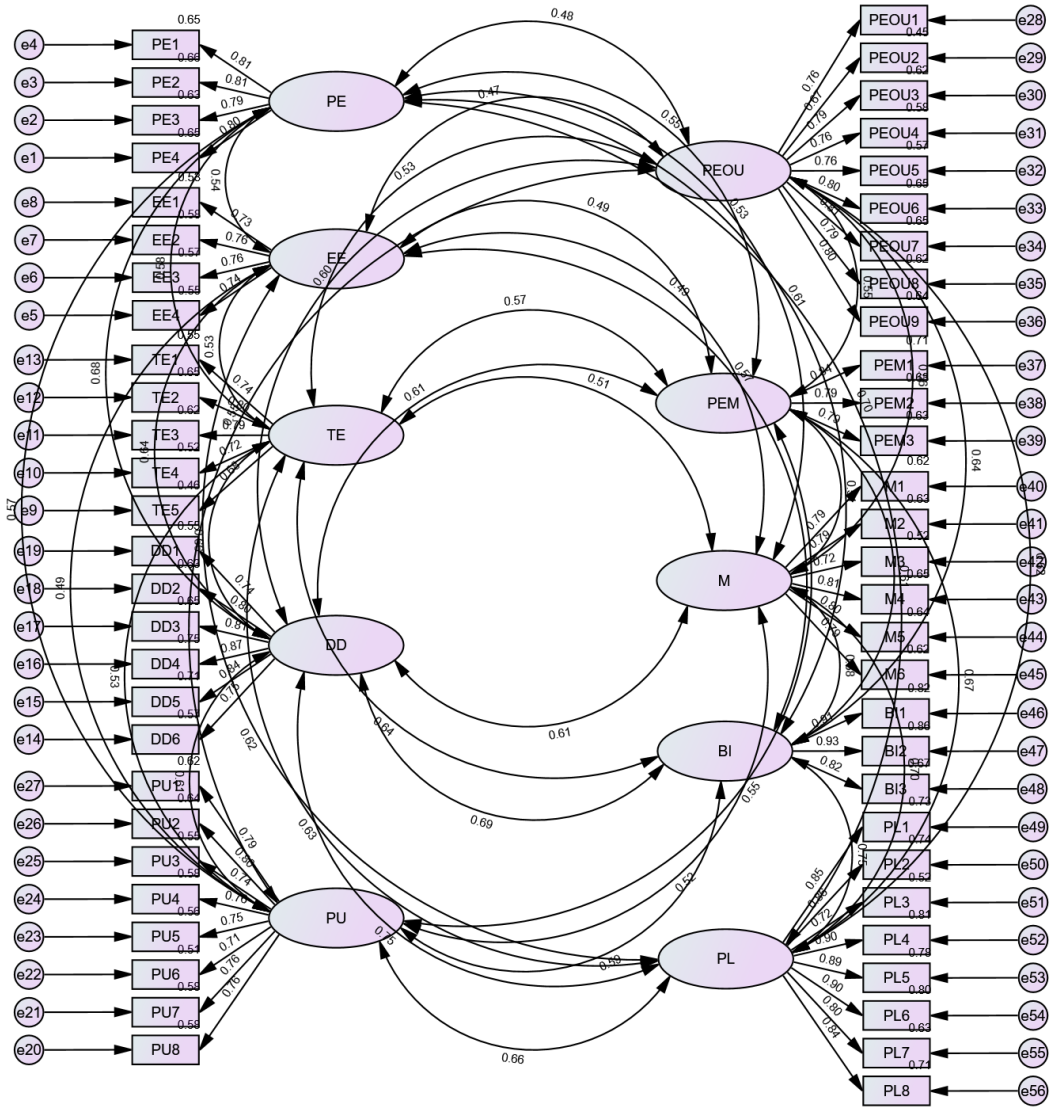

Figure 2 Confirmatory Factor Analysis Model

Table 5 Discriminant Validity

	PL	BI	M	PEM	PEOU	PU	DD	TE	EE	PE
PL	0.846									
BI	0.751	0.886								
M	0.705	0.681	0.784							
PEM	0.669	0.613	0.507	0.810						
PEOU	0.622	0.643	0.558	0.554	0.772					
PU	0.657	0.595	0.521	0.552	0.550	0.760				
DD	0.751	0.691	0.612	0.608	0.600	0.614	0.802			
TE	0.632	0.640	0.509	0.569	0.534	0.527	0.662	0.749		
EE	0.618	0.568	0.490	0.488	0.466	0.495	0.639	0.530	0.748	
PE	0.696	0.614	0.534	0.547	0.479	0.574	0.683	0.582	0.540	0.804

Note: The diagonal represents the square root of the AVE for the corresponding dimension.

Structural Equation Modeling

SEM was used to assess latent variable causality, with fit indices showing a well-fitting model: χ^2/df of 2.181, RMSEA of 0.050, and IFI, TLI, and CFI values above 0.9, indicating the model's explanatory power (Table 6).

Table 6 Structural Equation Modeling Fit Indices

Parameters	χ2	df	χ2/df	RMSEA	NFI	IFI	TLI	CFI
Excellent threshold	--	--	<3	<0.08	>0.9	>0.9	>0.9	>0.9
Model Value	2637	1459	2.181	0.050	0.851	0.914	0.908	0.913

Hypotheses H1 to H10 showed significant relationships, supporting the model's reliability and explanatory power (Table 7). Specifically, H1 (PE ⟶ BI) had path coefficients of 0.137 (standardized) and 0.129 (unstandardized), with C.R. = 2.723 and P = 0.006. H2 (EE ⟶ BI) had coefficients of 0.099 and 0.097, with C.R. = 2.069 and P = 0.039. H3 (TE ⟶ BI) had coefficients of 0.158 and 0.185, with C.R. = 3.087 and P = 0.002. H4 (DD ⟶ BI) had coefficients of 0.179 and 0.202, with C.R. = 2.93 and P = 0.003. H5 (PU ⟶ BI) had coefficients of 0.113 and 0.115, with C.R. = 2.809 and P = 0.005. H6 (PEOU ⟶ PU) had coefficients of 0.576 and 0.577, with C.R. = 11.076 and P < 0.001. H7 (PEOU ⟶ BI) had coefficients of 0.225 and 0.229, with C.R. = 4.321 and P < 0.001. H8 (PEM ⟶ BI) had coefficients of 0.139 and 0.133, with C.R. = 2.861 and P = 0.004. H9 (M ⟶ PL) had coefficients of 0.358 and 0.333, with C.R. = 9.219 and P < 0.001. H10 (BI ⟶ PL) had coefficients of 0.667 and 0.619, with C.R. = 15.825 and P < 0.001.(Table 7).

Table 7 Model Path Coefficient

Path	Standardized Path Coefficient	Unstandardized Path Coefficient	S.E.	C.R.	P	R2	Result
PEOU⟶PU	0.576	0.577	0.052	11.07	***	0.33	YES
PU⟶BI	0.113	0.115	0.041	2.809	0.005	0.66	YES
PEOU⟶BI	0.225	0.229	0.053	4.321	***		YES
PE⟶BI	0.137	0.129	0.048	2.723	0.006		YES
EE⟶BI	0.099	0.097	0.047	2.069	0.039		YES
TE⟶BI	0.158	0.185	0.06	3.087	0.002		YES
DD⟶BI	0.179	0.202	0.069	2.930	0.003		YES
PEM⟶BI	0.139	0.133	0.046	2.861	0.004		YES
M⟶PL	0.358	0.333	0.036	9.219	***	0.57	YES
BI⟶PL	0.667	0.619	0.039	15.82	***		YES

Analysis of Interview

This study interviewed 30 participants on WeChat's role in teaching, using Nvivo for thematic analysis. Findings highlighted benefits such as anytime communication, personalized learning, resource richness, and group cooperation, alongside drawbacks like student distraction and mobile dependence. WeChat use in teaching was influenced by school policy, teacher tech proficiency, and parental and student views. Teachers prioritized guidance and resources, while students emphasized communication and cooperation. Analysis linked WeChat's advantages and disadvantages to influencing groups and factors, offering a comprehensive view of its application in teaching, including experiences and future considerations.

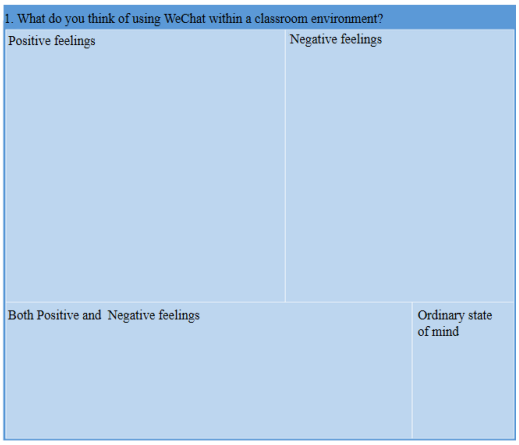

Figure 3 Thematic Analysis (1)

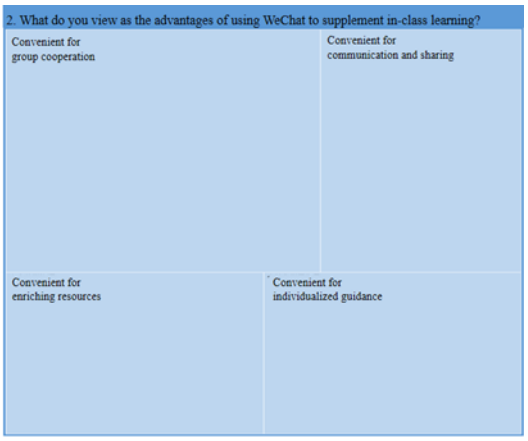

Figure 4 Thematic Analysis (2)

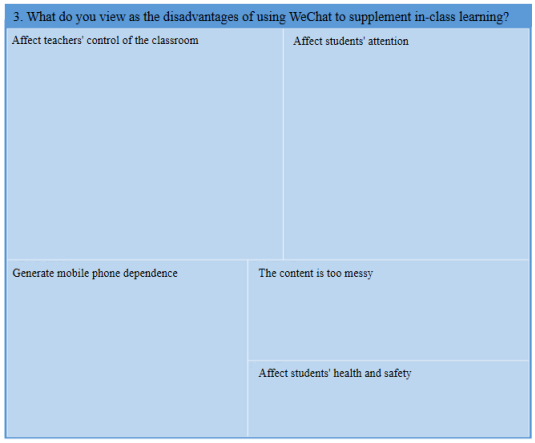

Figure 5 Thematic Analysis (3)

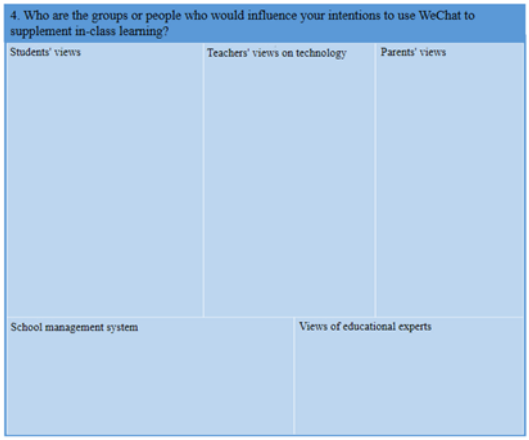

Figure 6 Thematic Analysis (4)

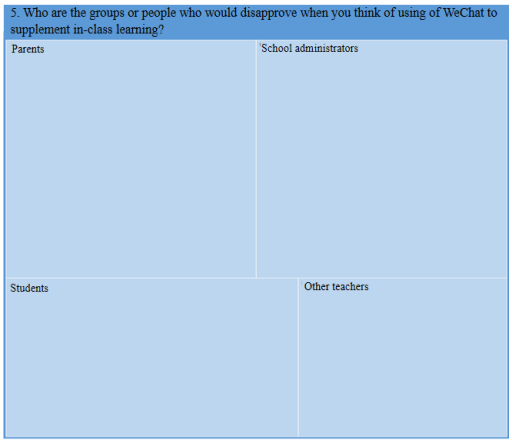

Figure 7 Thematic Analysis (5)

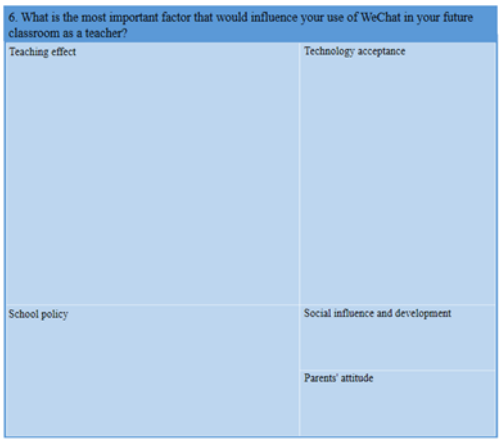

Figure 8 Thematic Analysis (6)

Conclusion

This study utilized CFA, SEM, and interviews to investigate pre-service bilingual teachers' views on WeChat in education, uncovering variable interrelationships. Key variables like performance expectancy, effort expectancy, technical efficiency, digital divide, perceived usefulness, and enjoyment positively influenced behavioral intention, while motivation notably affected perceived learning, and behavioral intention predicted perceived learning. The findings underscore the complexity of integrating WeChat into teacher training, indicating future research needs, including longitudinal studies, technology interactions, and comparative analyses across contexts. The study provides valuable insights for crafting effective tech strategies in bilingual teacher training.

Discussion

Perceptions of Pre-service Bilingual Teachers towards WeChat in Training

This study assesses pre-service bilingual teachers' perceptions of WeChat in their training, finding a generally positive attitude. They view WeChat as advantageous for communication (Sun & Suthers, 2024), resource sharing (Gan & Li, 2018), and collaborative learning, enhancing interaction and cooperation. However, challenges include potential distractions (Fox & Moreland, 2015) and managing information overload, with some noting complex information as a distraction and difficulty in filtering and organizing content on WeChat.

Factors Affecting Perceptions and Their Effects

The second research question delves into factors influencing pre-service bilingual teachers' perceptions of WeChat in training, noting direct, indirect, and total effects among perceived ease of use, effort expectancy, technical efficiency, perceived usefulness, perceived enjoyment, motivation, and the digital divide. Perceived ease of use influences perceived usefulness, which in turn affects behavioral intention, with total effects combining both direct and indirect influences (Venkatesh et al., 2023). Teachers view WeChat more positively if they find it enhances performance (Chao, 2019), is user-friendly, and beneficial for learning (Singh et al., 2023). Enjoyment and motivation (Wei et al., 2023) also foster positive attitudes, with perceived enjoyment being pivotal in technology acceptance and use (Fan & Wang, 2023).

The Influence of Digital Divide on Pre-service Bilingual Teachers

The study highlights the significant impact of the Digital Divide on pre-service bilingual teachers' perceptions and intentions regarding WeChat use (Singh et al., 2023). This divide can lead to challenges such as difficulties accessing and processing materials (Burton-Jones & Grange, 2023), lack of resources (Parker, Morris, & Hofmeyr, 2020), and inadequate technical skills (Van Deursen & Van Dijk, 2023), potentially reducing teachers' intentions to use WeChat and impacting their training effectiveness. Thus, the Digital Divide is a crucial factor in considering pre-service bilingual teachers' perceptions of WeChat.

Debate on the Role of Technology in Education

The debate on technology in education, like WeChat, underscores its potential to boost learning experiences but also raises concerns about distractions and impacts on student attention (Singh et al., 2023), highlighting the need for a nuanced approach to tech integration.

Research Limitations

This study's limitations include a sample confined to pre-service bilingual teachers in Jilin Province, China, potentially limiting generalizability. The qualitative interviews with 30 participants may not capture

all perspectives, and the surveys, focusing on specific variables, might miss other factors influencing WeChat's perception in training. These constraints are important to consider when interpreting results .

Notable Findings

The study uncovered additional insights beyond the research questions. It found varying WeChat usage frequencies among pre-service bilingual teachers, indicating individual differences in adoption and utilization. Teachers with more technology experience and familiarity with WeChat features had a more favorable view of its use in training .

Recommendations

Educators and institutions should acknowledge WeChat's value in bilingual teacher training, promote its curriculum integration, and offer training for effective feature use. To tackle issues like distraction and information overload, students should be taught strategies for goal setting and information organization. Tailoring WeChat use to students' individual differences and experiences can boost its effectiveness. Institutions should also establish secure, appropriate WeChat use policies in training, safeguarding data privacy and integrating guidelines.

Recommendations for Future Research

Future research should track pre-service bilingual teachers' perceptions and use of WeChat longitudinally to understand shifts with experience. Studies on WeChat's effects on language proficiency and pedagogical skills in training are also needed. Research on WeChat's synergy with other educational technologies can optimize tech use in bilingual education. Investigating long-term sustainability and integration of WeChat in teaching is valuable. Comparative studies may uncover regional or contextual factors impacting WeChat's effectiveness in bilingual teacher training.

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