

Siying Li\*

# Exploring pre-service foreign language teachers' intention to adopt technology: an investigation from the perspective of Situated Expectancy-Value Theory

<https://doi.org/10.1515/jccall-2024-0012>

Received July 2, 2024; accepted September 19, 2024; published online December 4, 2024

**Abstract:** The intention of pre-service foreign language teachers to adopt technology (PIAT) reflects their willingness to integrate educational technology tools into their teaching practices, which is essential for the digital transformation of language education and the professional development of teacher candidates. Drawing upon the Situated Expectancy-Value Theory, this study utilizes a structural equation model to analyze the factors influencing the intention of pre-service foreign language teachers to adopt technology. The results reveal that: (1) four motivational factors (i.e., self-efficacy, perceived enjoyment, perceived importance, and perceived usefulness) significantly predict PIAT, while perceived anxiety negatively correlates with, but does not significantly predict PIAT; (2) mindset significantly impacts perceived enjoyment, perceived importance, perceived usefulness, and perceived anxiety; (3) social influence exerts a significant influence on self-efficacy and mindset. The study concludes with implications for enhancing the digital literacy of foreign language teacher candidates.

**Keywords:** pre-service teachers' intention to adopt technology; Situated Expectancy-Value Theory; social influence; motivation; mindset

## 1 Introduction

Educational technology-empowered foreign language teaching, characterized by the multi-modal learning materials and the interactive and engaging learning environments, continues to innovate and drive the ongoing development of digital education and a learning-oriented society (An et al. 2023; Nikou and Economides 2019). The integration of technology in foreign language education has become increasingly vital in the modern educational landscape. The advantages of utilizing

---

\*Corresponding author: Siying Li, School of Foreign Languages and Literature, Beijing Normal University, Beijing, China, E-mail: siyinglee@126.com. <https://orcid.org/0000-0002-3676-8949>

 Open Access. © 2024 the author(s), published by De Gruyter and FLTRP on behalf of BFSU.  This work is licensed under the Creative Commons Attribution 4.0 International License.

technology in this field are manifold. Firstly, educational technologies such as virtual classrooms, interactive whiteboards, and digital textbooks provide diverse input modes that cater to various learning styles, thereby facilitating a more multisensory and appealing context of the target language (Plonsky and Ziegler 2016). Secondly, educational technology fosters communication and collaboration among students, both within the classroom and across geographical boundaries, through online discussion forums, group projects, and language exchange platforms, which provide access to ubiquitous learning (Gan et al. 2022). Lastly, educational technologies also advanced the evaluative process. Tools such as automated scoring systems provide students with prompt feedback on their linguistic proficiency. This swift feedback is crucial as it cultivates learners' self-awareness, enabling them to pinpoint areas for enhancement, thus allowing for a more dynamic and effective learning experience (Huang et al. 2023).

Foreign language teachers play a pivotal role in the successful implementation of educational technology in the classroom. Their intention to adopt and utilize technology directly influences the outcomes of language teaching and the achievement of educational goals (Sánchez-Mena et al. 2019). This is particularly true for pre-service teachers, whose attitudes and intentions towards technology use can shape their future teaching practices and further determine how effectively they will integrate technological tools into their pedagogical strategies. Teacher education programs have emphasized the necessity of training pre-service teachers to effectively integrate digital technology into their classrooms, while ensuring that its use goes beyond superficial and instrumental activities (Alfadda and Mahdi 2021; Baydas and Goktas 2017). Some scholars argue that by 2025, all teacher education programs should prepare candidates to teach proficiently with technology (Hodges et al. 2022). Therefore, it is essential to understand the factors influencing pre-service foreign language teachers' intentions to adopt technology. This understanding can promote positive attitudes towards technology adoption, leading to more innovative and effective teaching methods and thereby enhancing the overall quality of foreign language education. Analyzing these factors can also offer valuable insights into how to better prepare pre-service teachers for the technologically advanced educational environments they will encounter.

Research indicates that pre-service teachers' training experiences with digital technology are crucial for its successful implementation in schools. However, most studies focus on in-service teachers' intentions to use technology, with less attention given to pre-service teachers (Bai et al. 2019; Ranellucci et al. 2020). Existing research predominantly employs models such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Huang et al. 2023; Scherer et al. 2019; Teo et al. 2017). Although empirically validated, these models have limitations. They emphasize external and functional aspects of technology use (e.g., facilitating conditions, ease of use) while neglecting internal, psychological, and

motivational factors such as enjoyment, anxiety, and individual mindsets towards technology (Gan et al. 2022). This oversight leads to an incomplete understanding of the factors influencing technology adoption, particularly in educational settings where personal and emotional factors significantly impact teachers' behaviors (Vongkulluksn et al. 2018). Additionally, TAM and UTAUT conceptualize technology acceptance as a linear progression, failing to capture the complex interplay of factors influencing teachers' willingness to embrace educational technology. The adoption process is characterized by cycles of trial, reflection, and adjustment, involving the dynamic interaction between teachers' professional identities, personal beliefs about competence, motivations, and their evolving relationship with technology. This cyclical nature of adoption, which influences peers' perceptions and overall school culture, is not well-addressed by these models, potentially oversimplifying the nuanced factors involved (Colognesi and Hanin 2023; Sun and Mei 2020).

Therefore, this study employs the Situated Expectancy-Value Theory (SEVT) to explore factors influencing pre-service foreign language teachers' intentions to adopt educational technologies (e.g., interactive whiteboards, online collaboration tools, English learning apps), considering both external factors (situation) and internal psychological factors (e.g., motivational factors, mindset). By understanding these influences, teacher education programs can design targeted interventions to foster positive attitudes towards technology and equip pre-service teachers with the necessary skills and confidence for effective integration into future classrooms. This proactive approach aims to prepare teacher candidates to embrace technological advancements, thereby enhancing the overall quality of language education.

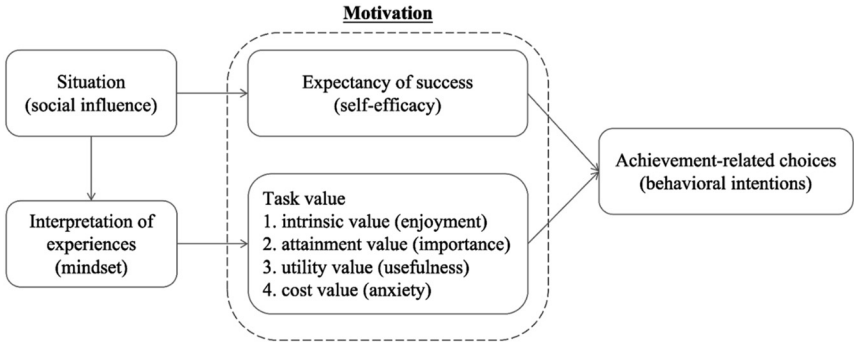
## 2 Situated Expectancy-Value Theory (SEVT)

SEVT is a psychological theory that integrates the cognitive processes involved in decision-making and behavior. It posits that a higher intention to engage in a specific action (behavior intention) increases the likelihood that the action will be carried out. As the core outcome variable of SEVT, behavior intention is influenced by the interplay of three key elements: situation, motivation and mindset (Eccles and Wigfield 2020, 2023), where individuals' mindsets shape their expectations and perceived values of a certain behavior within specific contexts, ultimately guiding their intentions and actions.

In SEVT, motivational factors are the critical driving force of behavioral intentions, consisting of one expectancy-related variable and four value-related variables (Loh 2019; Richardson et al. 2020). The expectancy-related variable, synonymous with self-efficacy, refers to an individual's belief in their ability to successfully perform a specific task. Higher self-efficacy leads to greater confidence in one's capabilities, thereby increasing the likelihood of forming a strong behavioral intention to undertake and persist in the

desired action (Alfadda and Mahdi 2021; An et al. 2023). The other four motivational factors (i.e., intrinsic value, utility value, attainment value, and cost value) are value-related. Intrinsic value refers to the inherent enjoyment or satisfaction derived from engaging in a behavior, reflecting personal interest or pleasure in the activity itself, independent of external rewards or recognition (Gan et al. 2022; Teo et al. 2017); Attainment value pertains to the importance placed on the outcomes of a behavior in terms of personal goals or standards, reflecting the degree to which accomplishing a behavior contributes to a sense of competence or mastery (Sun and Mei 2020); Utility value captures the perceived usefulness or practicality of a behavior in relation to broader goals or needs, emphasizing the efficiency or effectiveness of the behavior in achieving these objectives (Cheng et al. 2020); Cost value involves the perceived sacrifices associated with engaging in a behavior, considering potential negative aspects such as time, effort, or resources expended, as well as social or psychological costs like worries of failure or anxiety (Bai et al. 2019). According to SEVT, individuals are more willing to invest time and energy in a specific task when they have a stronger motivation to engage in that behavior. In other words, when they have greater confidence in their ability to perform the behavior, perceive it as bringing a higher sense of pleasure and lower anxiety, and consider it to be useful and applicable for personal development (Eccles and Wigfield 2023; Nolen 2020).

Mindset is a crucial component of SEVT, referring to the beliefs and attitudes individuals hold about their abilities, intelligence, and potential for growth (Dweck and Yeager 2019). These beliefs stem from how individuals interpret their past experiences and how they perceive these experiences will impact their future development. Those with a fixed mindset view their abilities as innate and unchangeable, attributing failures to inherent deficiencies (e.g., lack of talent). Consequently, they are more likely to give up when faced with obstacles and are less inclined to take on challenges. In contrast, individuals with a growth mindset see their abilities as malleable, believing that all experiences, successful or not, contribute to their development. They view challenges as opportunities to improve, leading to enhanced engagement, sustained effort, and improved performance (Richardson et al. 2020). Mindset influences intrinsic value, utility value, attainment value, and cost value by shaping perceptions and responses to tasks and challenges (Ozdemir and Papi 2022). SEVT suggests that a growth mindset enhances intrinsic value by finding joy in learning, increases utility value by recognizing the long-term benefits of effort, raises attainment value by viewing challenges as essential for personal growth, and reduces perceived cost value by seeing effort and setbacks as investments in development. Conversely, a fixed mindset can lower these values by promoting a fear of failure and reluctance to engage in challenging activities (Lou and Noels 2019).



**Figure 1:** Salient aspects of SEVT (adapted from Eccles and Wigfield 2020, 2023).

Situation, synonymous with social influence, refers to the perception of external support for a targeted behavior within a social context, including external support, role models, and cultural norms. Positive contextual feedback and recognition enhance self-efficacy by boosting individuals’ confidence when they perceive their social environment encourages certain behaviors. Cultural values and supportive environments also pave the way for a growth mindset by framing challenges as learning opportunities. This enhanced self-efficacy and growth mindset further increase individuals’ intention to engage in specific tasks (Alfadda and Mahdi 2021).

In conclusion, SEVT provides a robust framework for understanding individual behavior by examining how motivational factors, mindset, and situation interact to shape behavioral intention. In this framework, motivational factors exert a direct impetus on the intention to perform a behavior, serving as a key driver in the decision-making process. The interpretation of experiences (mindset) modulates the individual’s valuation of the task, thereby influencing their motivational level to engage with it. The situation serves as a contextual backdrop, exerting a dual influence on the expectancy-value interplay. It molds the individual’s expectancy of success – the conviction of task accomplishment, and concurrently shapes the mindset, dictating the manner in which tasks are approached and engaged. These interwoven components of SEVT synergistically contribute to the anticipation and elucidation of human action, illustrating the nuanced interdependencies that must be considered to fully grasp the motivational mechanisms prompting behavior (see Figure 1).

### 3 Research model and hypothesis

A research framework based on SEVT was developed to guide the study, which synthesized the core constructs in the SEVT as well as the interaction between different constructs.

#### 3.1 Pre-service foreign language teachers' intentions to adopt technology (PIAT)

PIAT refers to the subjective probability or inclination of teachers to utilize educational technologies in teaching. This approach works as a prerequisite for digitalized teaching (Scherer et al. 2019). A comprehensive survey among Chinese K-12 foreign language educators has indicated that, despite possessing high levels of digital literacy, teachers demonstrate a relatively lower inclination to integrate technological tools into their instruction (Li 2014; Li and Walsh 2011). This discrepancy highlights a gap between teachers' digital capabilities and their actual adoption of educational technology, underscoring the need for a deeper exploration into the factors contributing to this divergence. Thus, it is imperative for the academic community to delve into these reasons to better support teachers in converting their digital literacy into concrete educational outcomes (Huang et al. 2023).

Existing literature has thoroughly investigated the factors that influence teachers' intentions to adopt educational technology, yielding substantial insights. Nonetheless, the field has certain gaps that necessitate deeper exploration. Currently, research predominantly targets in-service teachers, while the intentions of pre-service teachers to utilize technology, particularly in foreign language education where such integration is indispensable, have been somewhat neglected (An et al. 2023; Baydas and Goktas 2017). Unraveling the factors that propel these future educators to adopt technological tools is crucial, as it allows for targeted professional development that shapes their integration attitudes. Gaining early clarity on these factors is vital for crafting curricula that will ready pre-service teachers for a future of technology-enriched instruction, instilling a proactive approach to technology use in their classrooms. Additionally, while existing studies often rely on models such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) to examine external factors influencing teachers' intentions, such as technology availability and facilitative conditions, there is a notable absence of research on how these external elements interact with internal motivational factors (Cheng et al. 2020; Gan et al. 2022). The need to understand the combined effect of various factors on classroom technology integration by teachers is pressing. Lastly, the inconsistent findings across studies concerning the

impact of different factors on pre-service teachers' technology adoption intentions call for a more cohesive understanding (Colognesi and Hanin 2023; Sun and Mei 2020). Essentially, bridging these research gaps is critical for transforming the digital literacy of pre-service teachers into tangible educational achievements, ensuring they are adept at using technology to enhance teaching and learning.

### **3.2 Self-efficacy (SE), perceived enjoyment (PE), perceived importance (PI), perceived usefulness (PU), perceived anxiety (PA)**

SEVT posits that motivational factors are pivotal in shaping behavioral intentions regarding educational technology use. However, empirical findings on the predictive efficacy of these factors are inconsistent (Bai et al. 2019; Teo et al. 2017). Cheng et al. (2020) discovered that SE significantly predicts the extent of American in-service teachers' intention to integrate technology into teaching, particularly for "highly integrated" behaviors such as personalized instructional processes. Conversely, PI and PA were only linked to "low-integrated" behaviors like instructional presentations. PU showed no significant predictive power for teachers' intention in the study. In contrast, Yusop (2015) found no significant relationship between SE and the willingness of Malaysian pre-service teachers to adopt educational technology in their teaching practices. Affective factors, such as PE, have been shown to increase the appeal of technology integration (Huang et al. 2021), while PA can hinder it (Ranellucci et al. 2020; Sharma and Srivastava 2019). However, some studies didn't present the significant effect of those affective factors within motivation in predicting intention, indicating that the influence of enjoyment may not always be pronounced (Salleh 2016), and that pre-service teachers can overcome the negative effects of PA through accumulated teaching experience (Sun and Mei 2020; Tran et al. 2023). Two instrumental values, including PU and importance, also play a role in teachers' intentions to adopt educational technologies (Sánchez-Mena et al. 2019). Studies indicate that teachers are less likely to engage with educational technology if they do not see its relevance to their professional growth or personal goals (Hughes et al. 2020; Kale and Akcaoglu 2018), and that recognizing the contribution of technology to personal or instructional objectives significantly influences the quality and frequency of audio-visual instruction (Vongkulluksn et al. 2018). The inconsistent result in relevant research calls for a more holistic approach to understanding the multifaceted influences on teachers' intentions to integrate technology into their teaching. Considering the role of motivational factors in developing PIAT, the following hypothesis is established:

**H1:** *SE significantly influences PIAT.*

**H2:** *PE significantly influences PIAT.*

**H3:** *PI significantly influences PIAT.*

**H4:** *PU significantly influences PIAT.*

**H5:** *PA significantly influences PIAT.*

### 3.3 Mindset (MS)

The essence of MS lies in individuals' perceptions of the malleability of their abilities, reflecting whether they believe practice and experience can enhance their skills (Dweck and Yeager 2019; Ozdemir and Papi 2022). Richardson et al. (2020) indicate that MS reflects students' self-awareness of their future profession. They found that university students with a growth MS exhibit strong resilience in developing professional skills and are more likely to form a professional identity related to their major. These studies suggest a linear relationship between MS and students' professional outlook but do not explore pre-service teachers' MS. Bai et al. (2019) analyzed in-service Foreign language teachers' MSs, finding that those with a growth MS quickly identify areas for improvement, engage in valuable pedagogical tasks, and are proactive in facing instructional technology challenges. Conversely, teachers with a fixed MS often feel anxious about using educational technologies and resist adapting to digital teaching challenges, seeing less value in such technologies. Haukas and Mercer (2022) highlighted that MS is domain-specific and varies with professional stage and context. Therefore, whether pre-service foreign language teachers' MS can explain their intentions toward technology adoption requires further empirical validation. In alignment with SEVT and the inconsistent conclusions from previous studies, the following hypotheses are established:

**H6:** *MS significantly influences PE.*

**H7:** *MS significantly influences PI.*

**H8:** *MS significantly influences PU.*

**H9:** *MS significantly influences PA.*

### 3.4 Social influence (SI)

The SEVT underscores the pivotal role that SI plays in bolstering the confidence of pre-service teachers regarding the integration of technology into their teaching practices. According to the theory, positive vicarious experiences and constructive feedback from peers, mentors, and other educational stakeholders can significantly enhance an individual's SE and foster a MS conducive to the effective use of educational technologies. This, in turn, shapes their attitudes and intentions toward technology integration (Sharma and Srivastava 2019). However, empirical evidence regarding the impact of SI on pre-service teachers' intentions to adopt technology is not uniform. Some studies emphasize the substantial impact of social persuasion and support in building in-service teachers' confidence and reinforcing their intentions to integrate technology (Bai et al. 2019; Sadaf and Gezer 2020). In contrast, other research suggests that the influence of social norms on pre-service teachers' intentions to use technology for instructional purposes may be more nuanced, with both direct and indirect effects being less pronounced (Ranellucci et al. 2020; Salleh 2016; Yusop 2015). This divergence in findings could be attributed to the different stages of career development (i.e., pre-service, in-service) and the intricate interplay between SI and individual psychological factors, which are further complicated by cultural contexts and the educational stages of the teachers. In the case of China, a country with a collectivist cultural background, it is plausible that the pre-service teachers' intention to adopt technology is significantly influenced by various social agents, including faculty advisors, peers, students, and educational policies (Tran et al. 2023).

Given the potential influence of social factors on PIAT within a collectivist cultural framework, the following hypothesis is proposed: The integration of technology by pre-service teachers in a collectivist culture is likely to be shaped by the SI of their educational environment, including the attitudes and expectations of their faculty advisors, peers, students, and the broader educational policy landscape. This hypothesis posits that understanding and leveraging SI could be key to enhancing pre-service teachers' confidence and motivation to adopt and integrate technology in their future teaching careers. As a result, considering the importance of SI in developing PIAT, the following hypothesis is established:

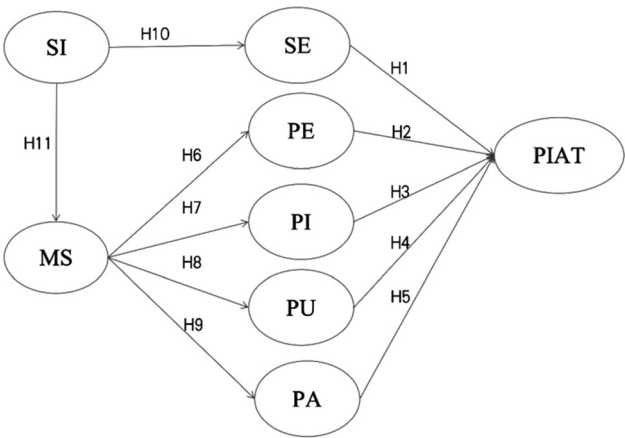
**H10:** *SI significantly influences SE.*

**H11:** *SI significantly influences MS.*

The preceding literature review suggests several implications for the present study. First, considering the significance of pre-service foreign language teachers' intention

to adopt educational technologies for providing insights into a more systematic enhancement of teachers' information literacy, it is noteworthy that less academic attention has been given to pre-service teachers than to their in-service counterparts. Second, the existing research presents conflicting results regarding the predictive effects of influential factors on PIAT. For instance, relevant research yielded inconsistent results in terms of whether certain factors (e.g., PE, PA) significantly predicting PIAT. Additionally, there is a notable gap in the literature concerning a comprehensive model that explores the interaction between different factors contributing to PIAT. Drawing upon the SEVT, this study seeks to construct a model encompassing predictors of PIAT. The goal is to delve into the predictive effects of the involved factors and examine the interactions among them. By doing so, we aim to provide insights that can inform the training of a cohort of teacher candidates capable of meeting the teaching demands of the digital age. We believe that the knowledge derived from this investigation will contribute to the design of educational interventions intended to integrate technology-enhanced teacher training into university teacher training programs.

Drawing on SEVT, the following research model (see Figure 2) was proposed to examine pre-service foreign language teachers' intention to adopt technology. The final research model includes one dependent variable (PIAT) and seven independent variables (SE, PE, PI, PU, PA, SI, and MS).



**Figure 2:** Proposed research model. Notes: PIAT = pre-service foreign language teachers' intentions to adopt technology; SI = social influence; SE = self-efficacy; PE = perceived enjoyment; PI = perceived usefulness; PU = perceived importance; PA = perceived anxiety; MS = mindset.

## 4 Methodology

### 4.1 Research design

The study is a quantitative study with the intent to investigate factors influencing pre-service teachers' intention to utilize technologies for instructional purposes as well as exploring the relationship among variables such as SI, SE, PE, PI, PU, PA, MS, PIAT. Moreover, structural equation modeling (SEM) is used to examine the path relationships among these variables.

### 4.2 Participants

This study involved 453 undergraduate students of English major (81.2 % female, 18.8 % male) preparing to teach in primary or secondary schools. These participants were in their final year of an English language education program at two normal universities in Southwest China. They assumed responsibilities as English teachers during their teaching practicum in local secondary schools, guided by a supporting school teacher and supervised by a staff member from the Department of Foreign Languages and Literature. This study specifically explored the factors influencing their intentions to adopt educational technology during their practicum.

### 4.3 Instrument

#### 4.3.1 Reliability of the questionnaire

For this study, a two-section online questionnaire was developed. Section 1 was self-reported demographic information, which included the gender, age, and university of the pre-service teachers. Seven construct scales from previously validated instruments made up Section 2. Each item on the survey was scored on a Likert scale from 1 to 7, representing answers ranging from completely disagree to completely agree. The construct of SI was examined by 4 items assessing external attitudes towards pre-service foreign language teachers' use of educational technology and their perception of these external subjective norms (An et al. 2023). The SE dimension was surveyed with 4 items assessing pre-service foreign language teachers' confidence in using educational technology (Sharma and Srivastava 2019). Two emotion-related constructs, namely, PE and PA, were evaluated through 5 and 6 items, respectively, gauging the level of interest and anxiety perceived by pre-service foreign language teachers in the process of technology-assisted teaching (Baydas and

**Table 1:** The source and reliability of the instrument.

| Construct | Sources                              | Number of items | Cronbach's $\alpha$ |
|-----------|--------------------------------------|-----------------|---------------------|
| SE        | Sharma and Srivastava (2019)         | 4               | 0.90                |
| PE        | Ranellucci et al. (2020)             | 4               | 0.90                |
| PI        | Huang et al. (2023)                  | 3               | 0.89                |
| PU        | Gan et al. (2022)                    | 5               | 0.92                |
| PA        | Baydas and Goktas (2017)             | 3               | 0.88                |
| MS        | Bai et al. (2019)                    | 3               | 0.83                |
| SI        | An et al. (2023)                     | 3               | 0.90                |
| PIAT      | An et al. (2023), Sun and Mei (2020) | 7               | 0.96, 0.88          |
| Total     | –                                    | 32              | –                   |

Notes: PIAT = pre-service foreign language teachers' intentions to adopt technology; SI = social influence; SE = self-efficacy; PE = perceived enjoyment; PI = perceived usefulness; PU = perceived importance; PA = perceived anxiety; MS = mindset.

Goktas 2017; Ranellucci et al. 2020). The last motivational factor, UI, was examined by 6 items to investigate pre-service foreign language teachers' assessment and acknowledgment of the role of technology in enhancing their professional development and realizing their career ambition (Gan et al. 2022). MS was assessed through 4 items probing teacher candidates' attitudes toward whether educational technology contributes to their teaching or other professional skills (Bai et al. 2019). The PIAT was evaluated through 4 items exploring pre-service foreign language teachers' inclination to use technological means in teaching practices (An et al. 2023; Sun and Mei 2020). With high Cronbach's  $\alpha$  coefficients ranging from 0.88 to 0.90, all the original constructs were demonstrated to be internally consistent (see Table 1). The adapted items of the scales are listed in Appendix A.

4.3.2 Content validity of the questionnaire

After translating the original English questionnaires into Chinese and carefully reviewing the translated version to ensure accurate conveyance of each item's meaning, we engaged two educational technology experts to refine all instruments, ensuring no critical components were overlooked given the current online teaching context. Subsequently, a pilot study was conducted among five undergraduate students specializing in English Education. Based on the pre-survey results and subsequent interviews, additional linguistic adjustments were implemented.

To ensure the content validity of the questionnaire. We employed an expert rating method, inviting six researchers to assess the relevance of each item to its corresponding dimension using a 4-point scale (see Table 2). The scale ranged from 1 to 4, representing “irrelevant”, “weakly relevant”, “moderately relevant”, and “highly

Table 2: Expert ratings and content validity index.

| Construct | Item  | Expert ratings |   |   |   |   |   | I-CVI | Pc   | K*   | Result |
|-----------|-------|----------------|---|---|---|---|---|-------|------|------|--------|
|           |       | A              | B | C | D | E | F |       |      |      |        |
| SE        | SE1   | 4              | 4 | 4 | 3 | 4 | 3 | 1.00  | 0.02 | 1.00 | Good   |
|           | SE2   | 3              | 4 | 3 | 4 | 4 | 3 | 1.00  | 0.02 | 1.00 | Good   |
|           | SE3   | 4              | 3 | 4 | 4 | 4 | 3 | 1.00  | 0.02 | 1.00 | Good   |
|           | SE4   | 4              | 4 | 3 | 4 | 4 | 3 | 1.00  | 0.02 | 1.00 | Good   |
| PE        | PE1   | 4              | 4 | 3 | 4 | 3 | 4 | 1.00  | 0.02 | 1.00 | Good   |
|           | PE2   | 3              | 4 | 4 | 4 | 4 | 4 | 1.00  | 0.02 | 1.00 | Good   |
|           | PE3   | 4              | 3 | 4 | 3 | 4 | 3 | 1.00  | 0.02 | 1.00 | Good   |
|           | PE4   | 4              | 3 | 4 | 4 | 4 | 4 | 1.00  | 0.02 | 1.00 | Good   |
| PI        | PI1   | 3              | 4 | 3 | 3 | 4 | 4 | 1.00  | 0.02 | 1.00 | Good   |
|           | PI2   | 3              | 3 | 4 | 3 | 3 | 4 | 1.00  | 0.02 | 1.00 | Good   |
|           | PI3   | 3              | 4 | 3 | 4 | 3 | 3 | 1.00  | 0.02 | 1.00 | Good   |
| PU        | PU1   | 3              | 4 | 4 | 4 | 3 | 4 | 1.00  | 0.02 | 1.00 | Good   |
|           | PU2   | 3              | 4 | 4 | 3 | 4 | 3 | 1.00  | 0.02 | 1.00 | Good   |
|           | PU3   | 3              | 3 | 3 | 3 | 4 | 4 | 1.00  | 0.02 | 1.00 | Good   |
|           | PU4   | 3              | 4 | 3 | 4 | 2 | 4 | 0.83  | 0.09 | 0.82 | Good   |
|           | PU5   | 4              | 4 | 4 | 3 | 3 | 3 | 1.00  | 0.02 | 1.00 | Good   |
| PA        | PA1   | 4              | 4 | 4 | 4 | 3 | 4 | 1.00  | 0.02 | 1.00 | Good   |
|           | PA2   | 4              | 4 | 3 | 4 | 3 | 4 | 1.00  | 0.02 | 1.00 | Good   |
|           | PA3   | 3              | 4 | 4 | 2 | 4 | 4 | 0.83  | 0.09 | 0.82 | Good   |
| MS        | MS1   | 4              | 4 | 3 | 3 | 4 | 4 | 1.00  | 0.02 | 1.00 | Good   |
|           | MS2   | 4              | 3 | 4 | 4 | 3 | 3 | 1.00  | 0.02 | 1.00 | Good   |
|           | MS3   | 4              | 4 | 3 | 3 | 4 | 4 | 1.00  | 0.02 | 1.00 | Good   |
| SI        | SI1   | 3              | 4 | 4 | 4 | 4 | 4 | 1.00  | 0.02 | 1.00 | Good   |
|           | SI2   | 4              | 3 | 4 | 3 | 4 | 4 | 1.00  | 0.02 | 1.00 | Good   |
|           | SI3   | 4              | 4 | 4 | 3 | 3 | 3 | 1.00  | 0.02 | 1.00 | Good   |
| PIAT      | PIAT1 | 4              | 4 | 4 | 3 | 3 | 3 | 1.00  | 0.02 | 1.00 | Good   |
|           | PIAT2 | 3              | 4 | 4 | 3 | 4 | 4 | 1.00  | 0.02 | 1.00 | Good   |
|           | PIAT3 | 4              | 4 | 4 | 3 | 3 | 3 | 1.00  | 0.02 | 1.00 | Good   |
|           | PIAT4 | 3              | 4 | 3 | 4 | 3 | 3 | 1.00  | 0.02 | 1.00 | Good   |
|           | PIAT5 | 4              | 4 | 4 | 4 | 3 | 4 | 1.00  | 0.02 | 1.00 | Good   |
|           | PIAT6 | 4              | 4 | 4 | 3 | 3 | 3 | 1.00  | 0.02 | 1.00 | Good   |
|           | PIAT7 | 4              | 4 | 4 | 3 | 4 | 3 | 1.00  | 0.02 | 1.00 | Good   |

Notes: SE = self-efficacy; PE = perceived enjoyment; PI = perceived usefulness; PU = perceived importance; PA = perceived anxiety; MS = mindset; SI = social influence; PIAT = pre-service foreign language teachers' intentions to adopt technology.

relevant”, respectively. The expert ratings indicated excellent content validity indexes for both the overall scale and individual items ( $S-CVI = 0.94 \geq 0.90$ ,  $I-CVI = 0.83-1.00 \geq 0.78$ ,  $K^* = 0.82-1.00 > 0.74$ ), suggesting that there was no need to exclude any item (Hambleton et al. 1978; Polit et al. 2007).

## 4.4 Data collection

We reached out to several English course instructors to gauge their willingness to involve their students in the survey. Instructors who expressed interest were subsequently invited to distribute the online survey link via the questionnaire collection platform (Wenjuanxing). To ensure the objectivity of the data, a submission requirement was implemented: each questionnaire could only be submitted once from the same IP address. Participants were informed that their involvement in the study was entirely voluntary and that they could withdraw at any time. It was also emphasized to all student teachers that their responses would remain anonymous and that all data collected would be used exclusively for research purposes.

## 4.5 Data analysis

All the data were analyzed by SPSS 26 and AMOS 25 for the study. First, the descriptive statistics and reliability of the questionnaire was analyzed. A preliminary data analysis was carried out to check for missing data, normal distribution, and multicollinearity, followed by descriptive statistics. Next, the proposed correlations were evaluated using structural equation modeling (SEM). SEM was employed because it allows for the estimation of measurement errors while concurrently analyzing the integrated relationships between latent and observed variables and the interactions among latent variables. This method facilitates a more precise assessment of the survey items and their underlying structures. After this, a two-step SEM procedure was utilized in this study: the measurement model (confirmatory factor analysis: CFA) and the structural model. The measurement model was used to validate the relationships between the observable indicators and their underlying constructs, whereas the structural model examined the hypothesized relationships and determined the interactions among the latent variables within the model.

# 5 Findings

## 5.1 Preliminary analysis

Initially, it is confirmed that the study's dataset is complete, with no missing data. Additionally, the assumption of univariate normality is upheld. Specifically, the skewness indices for all items fall within the acceptable range from  $-0.92$  to  $0.91$  (within  $\pm 2$ ), and the kurtosis indices span from  $-0.65$  to  $1.05$  (within  $\pm 7$ ), aligning with the criteria set forth by Hair et al. (2014). The multivariate normality of the observed

**Table 3:** Descriptive statistics and reliability of the questionnaire ( $N = 453$ ).

| Variable | Mean | S.D. | Variance | Skewness | Kurtosis |
|----------|------|------|----------|----------|----------|
| SE       | 5.29 | 1.04 | 1.09     | −0.10    | −0.46    |
| PE       | 5.61 | 1.03 | 1.06     | −0.30    | −0.65    |
| SI       | 5.31 | 0.97 | 0.94     | −0.05    | −0.43    |
| PI       | 5.80 | 0.99 | 0.97     | −0.46    | −0.68    |
| PU       | 5.56 | 0.92 | 0.85     | −0.25    | −0.55    |
| PA       | 2.68 | 1.51 | 2.29     | 0.81     | 0.00     |
| MS       | 5.37 | 1.00 | 1.00     | −0.17    | −0.32    |
| PIAT     | 5.42 | 0.98 | 0.96     | −0.16    | −0.51    |

variables was subsequently assessed using Mardia’s normalized multivariate kurtosis value. Also, the tolerance values of the factors were all greater than the cutoff threshold of 0.10 (ranging from 0.28 to 0.88), and the variance inflation factor (VIF) values were all below the threshold of 5 (ranging from 1.14 to 3.63). These findings, in line with Hair et al. (2014), suggest that multicollinearity is not a concern within the data. As to the seven potential variables, the analysis revealed that all mean scores, with the exception of PA ( $M = 2.68$ ), surpassed the neutral value of 4.00, manifesting a range from 5.29 to 5.80. This finding indicates a predominantly affirmative perception towards the factors under investigation. The standard deviations (S.D.), which varied from 0.92 to 1.51, demonstrated a relatively concentrated distribution of responses among participants. The skewness indices, ranging between −0.46 and 0.81, and the kurtosis indices, from −0.68 to 0, were found to be within the acceptable thresholds as outlined by Hair et al. (2014), signifying adherence to univariate normality assumptions.

The results of the descriptive statistics and reliability tests in Table 3 indicate that pre-service teachers assigned moderate to high scores on several dimensions, including the SE, PE, SI, PI, PU, and MS ( $M = 5.29\text{--}5.80$ ), while the PA received a lower rating ( $M = 2.68$ ).

5.2 Evaluation of the measurement model

For this part, the model fit of the measurement model was assessed, followed by the use of confirmatory factor analysis (CFA) to validate the relationships between items and factors. Specifically, the convergent validity and discriminant validity – two crucial aspects of CFA – were evaluated to assess the measurement model using the maximum likelihood estimation (MLE) procedure, which is considered a robust method in SEM (Hair et al. 2014; Hu and Bentler 1999).

**Table 4:** Summary of fit indices of measurement mode.

| Fit indices                      | CMIN              | df               | CMIN/<br>df | CFI   | TLI   | IFI   | RMSEA | SRMR  |
|----------------------------------|-------------------|------------------|-------------|-------|-------|-------|-------|-------|
| Recommended criteria             | Smaller is better | Bigger is better | <3          | >0.90 | >0.90 | >0.90 | <0.08 | <0.08 |
| Results of the measurement model | 1,086.38          | 430              | 2.53        | 0.95  | 0.95  | 0.95  | 0.06  | 0.04  |

Notes: CMIN = Chi-square value; df = degree of freedom;  $\chi^2/df$  = the ratio of CMIN and its degree of freedom; CFI = comparative fit index; TLI = Tucker–Lewis’s index; IFI = incremental fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

**5.2.1 Model fit of measurement model (CFA)**

To assess model fit, several indices were utilized, including the Chi-square value (CMIN), degrees of freedom (df), the ratio of CMIN to its degrees of freedom (CMIN/df), standardized root mean square residual (SRMR), root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker–Lewis index (TLI). According to the commonly recommended criteria (see Table 4), these fit indices indicate a good fit for the measurement model (Hu and Bentler 1999).

**5.2.2 Convergent validity**

To evaluate the convergent validity of the measurement items in this study, we employed item reliability, composite reliability (CR), and average variance extracted (AVE). Item reliability indicates how well an item represents its underlying construct. A factor loading (Std.) of 0.70 or higher is recommended, with square multiple correlations (SMC) ideally being 0.50 or above (Hair et al. 2014; Cheung et al. 2023). In this study, factor loadings (Std.) for all items ranged from 0.72 to 0.93, and the lowest SMC was 0.52, indicating good reliability for each item. CR assesses the internal consistency of items within a construct, with a recommended threshold of 0.70 (Hair et al. 2014). AVE, an essential indicator of convergent validity, measures the overall amount of variance in the items accounted for by the construct. An AVE value of 0.50 or higher is considered acceptable. The AVE values for all constructs ranged from 0.64 to 0.83, indicating adequate convergent validity for each construct. All CR values in this study exceeded 0.80, demonstrating strong internal consistency (see Table 5).

**5.2.3 Discriminant validity**

Discriminant validity ensures that a measure is distinct from other measures. According to Henseler et al. (2015), a construct demonstrates discriminant validity

Table 5: Summary of the measurement model results.

| Construct | Indicator | Sig. test of parameters |      |       |     | Std. | SMC  | AVE  | CR   |
|-----------|-----------|-------------------------|------|-------|-----|------|------|------|------|
|           |           | Unstd.                  | S.E. | Z     | p   |      |      |      |      |
| SE        | SE1       | 1.00                    | –    | –     | –   | 0.93 | 0.86 | 0.79 | 0.94 |
| SE        | SE2       | 1.01                    | 0.03 | 35.07 | *** | 0.93 | 0.87 |      |      |
| SE        | SE3       | 0.96                    | 0.03 | 29.73 | *** | 0.88 | 0.77 |      |      |
| SE        | SE4       | 0.88                    | 0.04 | 24.91 | *** | 0.81 | 0.66 |      |      |
| PE        | PE1       | 1.00                    | –    | –     | –   | 0.86 | 0.73 | 0.76 | 0.93 |
| PE        | PE2       | 1.06                    | 0.05 | 23.55 | *** | 0.85 | 0.72 |      |      |
| PE        | PE3       | 1.05                    | 0.04 | 26.36 | *** | 0.90 | 0.81 |      |      |
| PE        | PE4       | 1.03                    | 0.04 | 25.60 | *** | 0.89 | 0.79 |      |      |
| PI        | PI1       | 1.00                    | –    | –     | –   | 0.75 | 0.55 | 0.58 | 0.80 |
| PI        | PI2       | 1.04                    | 0.05 | 21.27 | *** | 0.77 | 0.59 |      |      |
| PI        | PI3       | 1.11                    | 0.07 | 16.25 | *** | 0.77 | 0.59 |      |      |
| PU        | PU1       | 1.00                    | –    | –     | –   | 0.76 | 0.58 | 0.68 | 0.91 |
| PU        | PU2       | 1.00                    | 0.05 | 21.42 | *** | 0.82 | 0.67 |      |      |
| PU        | PU3       | 1.16                    | 0.06 | 18.47 | *** | 0.81 | 0.66 |      |      |
| PU        | PU4       | 1.04                    | 0.06 | 18.18 | *** | 0.80 | 0.65 |      |      |
| PU        | PU5       | 1.13                    | 0.05 | 21.02 | *** | 0.91 | 0.82 |      |      |
| PA        | PA1       | 1.00                    | –    | –     | –   | 0.88 | 0.78 | 0.83 | 0.94 |
| PA        | PA2       | 1.08                    | 0.04 | 29.19 | *** | 0.93 | 0.86 |      |      |
| PA        | PA3       | 1.04                    | 0.04 | 29.19 | *** | 0.93 | 0.86 |      |      |
| MS        | MS1       | 1.00                    | –    | –     | –   | 0.84 | 0.70 | 0.68 | 0.86 |
| MS        | MS2       | 1.01                    | 0.05 | 20.78 | *** | 0.81 | 0.65 |      |      |
| MS        | MS3       | 1.01                    | 0.05 | 21.26 | *** | 0.82 | 0.67 |      |      |
| SI        | SI1       | 1.00                    | –    | –     | –   | 0.82 | 0.66 | 0.64 | 0.84 |
| SI        | SI2       | 0.92                    | 0.06 | 16.54 | *** | 0.72 | 0.52 |      |      |
| SI        | SI3       | 1.08                    | 0.05 | 20.51 | *** | 0.85 | 0.72 |      |      |
| PIAT      | PIAT1     | 1.00                    | –    | –     | –   | 0.84 | 0.70 | 0.70 | 0.94 |
| PIAT      | PIAT2     | 1.01                    | 0.04 | 23.55 | *** | 0.87 | 0.75 |      |      |
| PIAT      | PIAT3     | 1.01                    | 0.04 | 24.02 | *** | 0.88 | 0.77 |      |      |
| PIAT      | PIAT4     | 0.97                    | 0.04 | 23.68 | *** | 0.87 | 0.75 |      |      |
| PIAT      | PIAT5     | 1.04                    | 0.04 | 23.93 | *** | 0.87 | 0.76 |      |      |
| PIAT      | PIAT6     | 1.05                    | 0.06 | 19.01 | *** | 0.76 | 0.57 |      |      |
| PIAT      | PIAT7     | 0.96                    | 0.05 | 19.26 | *** | 0.76 | 0.58 |      |      |

Notes: \*\*\* $p < 0.001$ ; SE = self-efficacy; PE = perceived enjoyment; PI = perceived usefulness; PU = perceived importance; PA = perceived anxiety; MS = mindset; SI = social influence; PIAT = pre-service foreign language teachers' intentions to adopt technology; Unstd. = unstandardized estimates; S.E. = standard error; Std. = standardized estimates; SMC = square multiple correlations; CR = composite reliability; AVE = average variance extracted; \* $p < 0.001$ .

if its square root of AVE is greater than its correlations with other constructs. In this study, the correlations of variables off the diagonal were lower than the square root of AVE for each construct on the diagonal (see Table 6), indicating that the selected constructs had adequate discriminant validity.

**Table 6:** Discriminant validity of the constructs.

|      | SE          | PE          | PI          | PU          | PA          | MS          | SI          | PIAT        |
|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| SE   | <b>0.89</b> |             |             |             |             |             |             |             |
| PE   | 0.59        | <b>0.87</b> |             |             |             |             |             |             |
| PI   | 0.60        | 0.72        | <b>0.76</b> |             |             |             |             |             |
| PU   | 0.59        | 0.77        | 0.78        | <b>0.82</b> |             |             |             |             |
| PA   | −0.30       | −0.30       | −0.30       | −0.24       | <b>0.91</b> |             |             |             |
| MS   | 0.62        | 0.75        | 0.63        | 0.73        | −0.22       | <b>0.82</b> |             |             |
| SI   | 0.52        | 0.66        | 0.60        | 0.69        | −0.19       | 0.77        | <b>0.80</b> |             |
| PIAT | 0.67        | 0.69        | 0.67        | 0.73        | −0.24       | 0.79        | 0.72        | <b>0.84</b> |

Notes: PIAT = pre-service foreign language teachers’ intentions to adopt technology; SI = social influence; SE = self-efficacy; PE = perceived enjoyment; PI = perceived usefulness; PU = perceived importance; PA = perceived anxiety; MS = mindset; diagonal elements in bold are the square root of the AVE.

5.3 Evaluation of structural model

5.3.1 Model fit of structural model

As a whole, the research model exhibited an ideal model fit (see Table 7). All fit indices met the recommended acceptance level of structural model fitness (CMIN/df < 3; CFI, TLI, IFI > 0.90, RMSEA, SRMR < 0.08) (Hu and Bentler 1999).

5.3.2 Tests of hypothesis

Eleven hypotheses out of twelve were supported (i.e., H1, 2, 3, 4, 6, 7, 8, 9, 10, 11), except for H5. Among the original variables in the SEVT, PIAT was positively influenced by four motivational factors, namely, SE ( $\beta = 0.17^{***}$ ), PE ( $\beta = 0.39^{***}$ ), PI ( $\beta = 1.38^{***}$ ), and

**Table 7:** Summary of fit indices of structural model.

| Fit indices                      | CMIN              | df               | CMIN/<br>df | CFI   | TLI   | IFI   | RMSEA | SRMR  |
|----------------------------------|-------------------|------------------|-------------|-------|-------|-------|-------|-------|
| Recommended criteria             | Smaller is better | Bigger is better | <3.00       | >0.90 | >0.90 | >0.90 | <0.08 | <0.08 |
| Results of the measurement model | 1,298.73          | 447              | 2.91        | 0.94  | 0.93  | 0.94  | 0.07  | 0.05  |

Notes: CMIN = Chi-square value; df = degree of freedom;  $\chi^2/df$  = the ratio of CMIN and its degree of freedom; CFI = comparative fit index; TLI = Tucker–Lewis’s index; IFI = incremental fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

Table 8: Summary of structural model.

| Hypothesis | Path                  | Path coefficient ( $\beta$ ) | S.E. | Z     | Results       |
|------------|-----------------------|------------------------------|------|-------|---------------|
| H1         | SE $\rightarrow$ PIAT | 0.17***                      | 0.03 | 4.85  | Supported     |
| H2         | PE $\rightarrow$ PIAT | 0.39***                      | 0.09 | 4.08  | Supported     |
| H3         | PI $\rightarrow$ PIAT | 1.38***                      | 0.23 | 7.39  | Supported     |
| H4         | PU $\rightarrow$ PIAT | 0.24*                        | 0.13 | 2.10  | Supported     |
| H5         | PA $\rightarrow$ PIAT | -0.01                        | 0.02 | -0.26 | Not supported |
| H6         | MS $\rightarrow$ PE   | 0.90***                      | 0.05 | 18.72 | Supported     |
| H7         | MS $\rightarrow$ PI   | 1.00***                      | 0.06 | 15.82 | Supported     |
| H8         | MS $\rightarrow$ PU   | 0.92***                      | 0.05 | 16.39 | Supported     |
| H9         | MS $\rightarrow$ PA   | -0.30***                     | 0.08 | -5.97 | Supported     |
| H10        | SI $\rightarrow$ SE   | 0.67***                      | 0.06 | 13.89 | Supported     |
| H11        | SI $\rightarrow$ MS   | 0.93***                      | 0.05 | 17.09 | Supported     |

Notes: \* $p < 0.05$ ; \*\*\* $p < 0.001$ ; SE = self-efficacy; PE = perceived enjoyment; PI = perceived usefulness; PU = perceived importance; PA = perceived anxiety; MS = mindset; SI = social influence; PIAT = pre-service foreign language teachers' intentions to adopt technology.

PU ( $\beta = 0.24^*$ ). MS had a significant influence on PE ( $\beta = 0.90^{***}$ ), PI ( $\beta = 1.00^{***}$ ), PU ( $\beta = 0.92^{***}$ ), and PA ( $\beta = -0.30^{***}$ ). Both SE and MS were significantly influenced by SI ( $\beta = 0.67^{***}$ ,  $\beta = 0.93^{***}$ ). All the path results of the research model are presented in Table 8 and Figure 3.

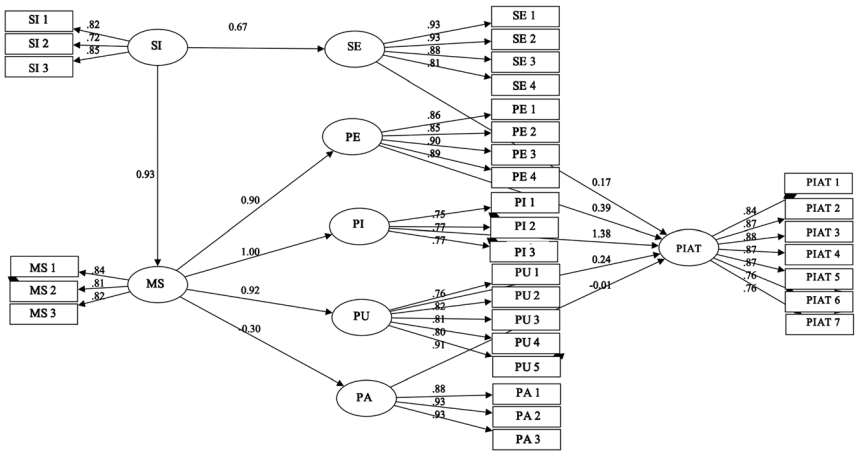


Figure 3: Parameter estimates of the research model:  $R^2$  (PIAT = 0.89). Notes: \* $p < 0.05$ ; \*\*\* $p < 0.001$ ; PIAT = pre-service foreign language teachers' intentions to adopt technology; SI = social influence; SE = self-efficacy; PE = perceived enjoyment; PI = perceived usefulness; PU = perceived importance; PA = perceived anxiety; MS = mindset.

The  $R^2$  were checked to assess the extent to which the proportion of variance in endogenous variables could be explained by the proposed model. According to Figure 3, the model could explain 89 % of the variance in PIAT, suggesting the proposed model in the current study has a stronger explanatory power.

## 6 Discussion

The empirical study explored the factors influencing Chinese pre-service English language teachers' intentions to adopt technology to assist teaching. The relations among the factors were examined by a proposed research model based on SEVT, including SE, PE, PI, PU, PA, MS, SI, and PIAT.

### 6.1 Supported relationships

#### 6.1.1 Motivational factors (SE, PE, PU, PI) and PIAT

This study affirms the hypothesis that motivation serves as a driving force for PIAT (Eccles and Wigfield 2023; Huang et al. 2021). However, the predictive effects of motivational factors vary. Specifically, four motivational factors (SE, PE, PU and PI) significantly and positively predict pre-service teachers' intentions, while PA, though negatively correlated with PIAT, does not play a significant role in predicting pre-service teachers' intentions. It is reasonable to infer that when English language teacher candidates have a strong motivation towards technology enhanced teaching, their intentions to take part in those tasks requiring the integration of educational technologies will be reinforced (Sharma and Srivastava 2019; Teo et al. 2017). SE pertains to the confidence that pre-service teachers have in their ability to effectively integrate technology into their language teaching practices. It influences both cognitive processes (e.g., decision-making, problem-solving) and the way pre-service teachers engage with professional development opportunities. Pre-service teachers with high SE are better equipped to overcome potential barriers, such as technical difficulties or resistance from students, because they believe in their ability to manage and adapt to these challenges. These confident student teachers are also more likely to seek out and benefit from training programs that enhance their technological skills, further solidifying their intention to adopt technology. Descriptive data suggest that pre-service foreign language teachers demonstrate a high level of technology SE, which paves the way for their trials to apply technological tools (Li 2014; Li and Walsh 2011). To further boost pre-service teachers' SE, teacher educators and training institutions can provide targeted technology training courses and assign pedagogical tasks requiring technology use. By providing more opportunities for practical application

of educational technology, it is probably for the teacher candidates to overcome anxiety and psychological barriers associated with instructional technology use.

The intrinsic motivation of PE is characterized by a desire to engage in technology-enhanced teaching for its inherent satisfaction rather than seeking external rewards. A significant positive relationship between PE and PIAT has been established, reflecting the idea that when pre-service teachers experience positive affective responses – such as pleasure and interest – in educational technology, they are more likely to view its integration into language teaching as an enjoyable and active pursuit (Huang et al. 2021). This positive perception can inspire them to delve deeper into understanding the potential of technology-assisted language teaching, thereby enhancing the overall teaching experience and creating a more engaging and dynamic learning environment. Such an environment can, in turn, increase their intention to adopt technology (Bai et al. 2019; Plonsky and Ziegler 2016). Furthermore, PE is associated with deep concentration and heightened engagement with an activity, potentially leading to cognitive absorption. This state of absorption can result in pre-service teachers becoming so engrossed in using technology that they are more likely to continue using it and express an intention to do so in the future (Teo et al. 2017). Descriptive data from this study indicated that pre-service foreign language teachers possess a high level of PE when it comes to adopting educational technology. This suggested that, those pre-service English teachers involved in our study find utilizing educational technologies in teaching is an appealing and fulfilling practice. To foster interest-driven adoption of technology, it is imperative for educational institutions and teacher educators to create diverse practice platforms, design realistic teaching scenarios, and formulate challenging tasks that necessitate the instructional use of technology. These measures can stimulate enthusiasm among pre-service teachers for participating in the interest-driven adoption of educational technologies, and explore its potential applications in their future teaching practices (Hughes et al. 2020).

Two instrumental motivational factors (i.e., PU and PI) also proved to be significant predictors of PIAT. This can be explained by technology's positive impact on pedagogical effectiveness and professional development. From a theoretical standpoint, this positive causal relationship between PU and PIAT echoes the proposed path within technology acceptance models and SEVT. These theoretical frameworks suggest that when individuals believed the utilization of technology will enhance their teaching performance, improve the quality of their work, or provide other pedagogical and professional benefits, they are more likely to adopt it (Eccles and Wigfield 2020). For example, if pre-service foreign language teachers perceive that adopting technologies (e.g., digital teaching tools, online resources) will help them better adapt to future education trends or enhance their competitiveness in the job market, they would embrace the adoption of technology in a more willing manner. From a pedagogical perspective, technology facilitates personalized learning, instant feedback, and

access to diverse resources, crucial for language acquisition. When pre-service teachers recognize these benefits (PU), their intention to integrate technology increases (Hughes et al. 2020; Teo et al. 2017). Additionally, technology makes learning more interactive and engaging, and if teachers perceive it can make lessons more appealing (PI), they are more inclined to use it. From a professional perspective, PU encompasses the belief that technology enhances teaching skills, classroom management, and overall effectiveness, while PI highlights the importance of keeping up with educational trends and future demands to win more opportunities in the future professional development. When teachers see the importance and usefulness of being technologically adept, their intention to adopt technology rises (Kale and Akcaoglu 2018; Sun and Mei 2020). The descriptive data show that most teachers recognized the value of technology tools in helping them achieve teaching goals and the indispensable role of digital and information-based teaching models in teacher professional development ( $M_{PI} = 5.80$ ;  $M_{PU} = 5.56$ ). This highlights the necessity of supporting teacher candidates in conducting technology-assisted language teaching practices to enhance their rational recognition of educational technology so that teachers can fully tap into the potential of educational technology to enhance teaching efficiency (Gan et al. 2022).

### 6.1.2 MS and motivational factors (PE, PI, PU, PA)

In line with the relationships explained in the SEVT, a significant effect of MS was found on PE, PI, PU, and PA, where MS was positively associated with PE, PI, and PU, and negatively with PA. Pre-service teachers with a growth MS tend to view challenges as opportunities for growth, thus leading to greater PE from using technology, as they are more likely to embrace the learning process involved in mastering new tools. The positive MS and open-mindedness also lead to a broader recognition of technology in education (PI), such as its role in preparing students for the modern world. In terms of PA, when teachers view challenges as surmountable, they are less likely to feel anxious about using new technologies and more likely to seek out and overcome initial difficulties. The more positive the teachers' mindsets are, the more anxiety will be mitigated (Dweck and Yeager 2019). This finding aligns with the research hypothesis based on the SEVT, suggesting that rather than directly leading to a strong intention to apply educational technology, MS influences teachers' intentions to participate in technology-assisted language teaching by activating their motivation (Haukas and Mercer 2022). Consistent with other empirical studies (Bai et al. 2019; Teo et al. 2017), the MS of pre-service foreign language teachers significantly influenced the motivational factors

(i.e., PE, PI, PU, PA). Specifically, MS acts as teachers' psychological resilience and ability to handle pressure, reflecting their attitude toward challenges in pedagogical practice and their capacity for self-regulation in the face of setbacks. This was found to be closely associated with teachers' confidence, enjoyment and evaluation of the importance and usefulness of the educational technologies (Sharma and Srivastava 2019). In the context of digitalized teaching, pre-service teachers with a growth MS (more positive) are more likely to proactively enhance their motivation to adopt technology (Nikou and Economides 2019; Richardson et al. 2020). In contrast, teachers with fixed MS often resist attempting to use technology due to demotivation (Lou and Noels 2019; Ozdemir and Papi 2022).

### 6.1.3 SI and SE

The SEVT highlights the importance of observation and modeling in shaping the learning process. For pre-service teachers, witnessing the adept integration of technology by experienced educators can significantly boost their SE, reinforcing their belief in their ability to emulate such successful practices. Such observations provide a blueprint for prospective teachers, allowing them to envision themselves effectively utilizing technology through role-taking, which subsequently strengthens their self-efficacy and their commitment to technological integration. Research indicates that SI in the form of observed proficiency with technology offers informational support that alleviates concerns about adopting new tools (Gan et al. 2022; Sun and Mei 2020). Normative SI can motivate pre-service teachers to adopt technology to conform to group norms and achieve social validation. When there is a collective recognition of the educational value of technology, it is likely to cultivate a stronger intention among pre-service teachers to integrate it into their instructional repertoire. The encouragement and support from educational peers, mentors, and leaders can further enhance the self-efficacy of these prospective educators. This support provides the confidence necessary to overcome the challenges associated with technology adoption (Sharma and Srivastava 2019; Teo et al. 2017). By drawing on the experiences of their peers, pre-service teachers can assess the potential benefits and obstacles of technology use, which can further reinforce their self-efficacy. The positive correlation between SI and SE suggests that the shared values, knowledge, and practices within an educational community represent a form of cultural capital that promotes the adoption of technology. When pre-service teachers are part of an environment that embraces technological innovation, they are more likely to develop heightened self-efficacy and a stronger intention to adopt educational technology. This cultural context serves as a foundation that nurtures the integration of technological advancements in education, preparing pre-service teachers to effectively leverage these tools in their future teaching practices.

#### 6.1.4 SI and MS

The study's findings underscore the substantial and affirmative impact of SI on the MS of pre-service foreign language teachers concerning the adoption of educational technology. SI, predicated on the tenets of observational learning, facilitates the acquisition of skills through the observation, imitation, and emulation of others' behaviors (Sun and Mei 2020). For novice educators, the sight of seasoned peers or mentors adeptly merging technology into their pedagogy sets a compelling and constructive precedent. Such witnessing not only exemplifies the tangible benefits of technology in education but also inculcates a positive mental posture toward its adoption (Baydas and Goktas 2017). This learning through observation is amplified by the attribution of success to the efficacy of technology or to the individual's capability to adeptly harness it, thereby reinforcing a favorable inclination toward technological integration (Vongkulluksn et al. 2018).

Descriptive statistical analysis from the study reveals that prospective English teachers exhibit a heightened sensitivity to SI, with an average score of 5.31, denoting a pronounced vulnerability to the sway of SI in the realm of technology adoption. This pronounced susceptibility is attributable to their developmental phase, marked by a propensity for novel concepts and methodologies. The nascent stage of their professional journey is replete with the quest for mentorship and exemplary teaching paradigms, rendering them particularly open to SI's impact (Colognesi and Hanin 2023). Moreover, the informational scaffolding proffered by their social networks aids in diminishing apprehensions regarding technology and augments their affinity for its application. Within the collectivist cultural milieu of China, which prioritizes communal endeavor and shared objectives, the collective endorsement of technology by educational communities molds a MS that acknowledges its significance in advancing collective interests in educational instruction (Huang et al. 2023).

In summation, SI emerges as a pivotal catalyst in sculpting the MS of prospective foreign language teachers toward the adoption of technology. The amalgam of observational learning, the attribution of successful outcomes, and the supportive cultural milieu of educational communities collectively cultivate a positive MS (Hodges et al. 2022). Once this MS acknowledges the practicality and accessibility of technology, it propels these teachers to assimilate it into their pedagogical strategies, underscoring the cardinal role of SI in equipping educational professionals to embrace technology as a potent teaching instrument. It is imperative for teacher educators and institutions to foster the engagement of pre-service teachers in technology-enriched teaching environments, supplying them with vital technical and psychological support. By nurturing a community of practice among pre-service

teachers, there lies an opportunity to not only amplify the allure of technological learning but also to diversify digital learning experiences. Such initiatives hold the potential to markedly bolster pre-service teachers' zeal and proclivity toward language teaching augmented by technology (Salleh 2016).

## 6.2 Unsupported relationships

One hypothesis out of eleven was not supported according to the research results, which is  $PA \rightarrow PIAT$ . While  $PA$  is negatively correlated with pre-service foreign language teachers' intention to adopt technology, its predictive effect is not significant. This finding implies that anxiety and worry during technology application do not have a direct linear relationship with teachers' willingness to engage in information technology teaching practices, which echoes the findings of Ranellucci et al. (2020). Descriptive statistics showed that the pre-service foreign language teachers enrolled in this study had a low level of anxiety about technology use ( $M = 2.68$ ), far from reaching a threshold that would make teachers take an evasive attitude toward technology. The above conclusions suggest that although overwhelming anxiety may diminish teachers' sense of achievement in the process of technology application or inhibit their willingness to engage in teaching practices that require the use of technology (Huang et al. 2021), moderate anxiety may motivate teachers to actively seek adaptive strategies to overcome difficulties in the application of technology (Dewaele and MacIntyre 2014). Therefore, the non-significant predictive effect of  $PA$  on pre-service teachers' technology integration intentions may reflect the balancing effect of anxiety's facilitating and inhibiting effects on teachers' motivations (MacIntyre 2017).

## 7 Limitations and implications

Although this study was meticulously planned, it encountered several limitations. The sample was confined to pre-service English teachers from two universities within a single province in China, reflecting a specific social and economic context. Consequently, the generalizability of the findings is limited. Future research can expand the sample size to include participants from various regions, facilitating comparative analyses and offering a more holistic view of pre-service teachers' technology adoption intentions. Second, since individual differences are not the focus of the study, factors such as aptitudes, temperaments, sex, or ethnic groups, are not addressed herein. Future investigations could consider these variables to better understand the nuanced perspectives on educational technology adoption. Besides, the quantitative approach was adopted and the self-reported questionnaires were employed for its efficiency in

engaging a large number of respondents and for maintaining consistency in questioning to minimize interviewer bias. The anonymity of the questionnaires likely encouraged participants to disclose sensitive information candidly. However, this method's limitation lies in the absence of immediate follow-up questions, which are essential for resolving ambiguities and enriching the depth of the data. Future studies could integrate qualitative data (e.g., interviews, teachers' logs) to address this limitation and achieve a more comprehensive understanding of the phenomena under investigation.

Despite these limitations, the study offers valuable theoretical and practical contributions. It affirms the applicability of the SEVT framework in evaluating the technology adoption intentions of pre-service foreign language teachers within the Chinese educational context. The research has uncovered that SE, PE, PI, and PU significantly and directly predict pre-service foreign language teachers' intentions to integrate technology into their instructional practices. Moreover, the study reveals that MS exerts an influence PE, PI, PU, and PA. As to SI, it not only shapes MS which in turn influences PE, PI, and PU respectively, funneling down to PIAT, but also influences the individuals' SE, which is one of the prerequisites of PIAT.

The study's findings, revealing an unexpected lack of influence from PA on PIAT, challenge the traditional SEVT pathways and underscore the context-dependent nature of model variables. The empirical evidence further highlights the intricate interplay among SI, motivational factors, and MS, indicating that a range of cognitive, social, and psychological factors significantly shape behavioral intentions. These insights yield valuable implications for the cultivation of foreign language teachers in the digital era. Firstly, it is crucial for teacher educators to understand the psychological profiles of pre-service teachers to create opportunities that not only allow them to explore technology's transformative potential in language education but also foster a constructive perspective on its application. Secondly, respecting the intrinsic motivation and willingness of teachers to engage with educational technologies is essential to prevent negative sentiments stemming from a perceived lack of autonomy or coercion. Lastly, leveraging the pivotal role of growth mindset is vital to inspire pre-service teachers to embrace the challenges of digital education, encouraging continuous knowledge renewal and the balanced development of professional competencies and information literacy. By integrating these insights, teacher training programs can be enhanced to prepare foreign language teacher candidates for the technologically advanced landscape of modern education, fostering an environment that promotes exploration, respects individual motivation, and emphasizes the development of a robust and adaptable mindset to meet the evolving demands of educational technology.

**Acknowledgments:** I would like to express my greatest gratitude for my supervisor, Professor Shaoqian Luo at Beijing Normal University, for providing tons of suggestions and answering with unfailing patience numerous questions.

**Research funding:** This study was supported by the project “School Age Cohort Study of Brain and Mind Development in China,” funded by Beijing Normal University (2021ZD0200500).

## Appendix A Constructs and responding items

Self-efficacy (自我效能)

1. I can easily use technology to assist in classroom teaching independently.  
我能够轻松地独立使用技术辅助课堂教学。
2. I possess the relevant abilities to assist in classroom teaching with technology.  
我具备技术辅助课堂教学的相关能力。
3. I can choose appropriate technological aids based on specific teaching needs.  
我能够根据教学具体需求选择合适的技术辅助课堂教学。
4. I can create an enjoyable learning experience in the classroom with multimedia technology.  
我能在课堂中借助多媒体技术创造愉快的学习体验。

Perceived enjoyment (感知愉悦)

5. I am very interested in using technology to assist in classroom teaching.  
我对技术辅助课堂教学很感兴趣。
6. I enjoy keeping up with the latest trends in technological assistance in classroom teaching.  
我喜欢保持对技术辅助课堂教学方面的最新趋势的关注。
7. I find using educational technology to assist in language teaching interesting.  
我觉得使用教育技术辅助语言教学很有意思。
8. I like trying out educational technology to assist in language teaching.  
我喜欢尝试使用教育技术辅助语言教学。

Perceived importance (感知重要性)

9. It is important to provide training on technological assistance in classroom teaching for teachers during their teaching practice.  
为教师在教学实习中提供技术辅助课堂教学方面的培训是很重要的。
10. It is very important for me to attempt to use technology to assist in classroom teaching.  
对我来说尝试技术辅助课堂教学是非常重要的。
11. Compared to other teaching skills, attempting to use technology to assist in classroom teaching is very important to me.  
与其他的教学技能相比, 尝试技术辅助课堂教学对我来说是很重要的。

Perceived usefulness (感知有用性)

12. Technological assistance in classroom teaching helps to understand students' learning progress.  
技术辅助课堂教学有助于了解学生的学习进展。
13. Technological assistance in classroom teaching aids students in better learning of materials.  
技术辅助课堂教学会帮助学生更好地学习材料。
14. Technological assistance in classroom teaching has improved my work efficiency.  
技术辅助课堂教学提高了我的工作效率。

(continued)

---

**Perceived usefulness (感知有用性)**

---

15. Technological assistance in classroom teaching can help students improve their academic performance.

技术辅助课堂教学能够帮学生提高学业成绩。

16. Technological assistance in classroom teaching has enhanced the quality of my teaching.

技术辅助课堂教学提升了我的教学质量。

---

**Perceived anxiety (感知焦虑)**

---

17. The use of technology to assist in classroom teaching makes me feel uncomfortable.

课堂上技术辅助教学使我感觉到不适。

18. Using educational technology to assist in language teaching makes me feel anxious.

使用教育技术辅助语言教学使我感到焦虑

19. Using educational technology to assist in language teaching intimidates me.

使用教育技术辅助语言教学令我感到害怕。

---

**Mindset (思维模式)**

---

20. I can gain a lot of experience from the mistakes made in the process of attempting technological teaching assistance.

我能从尝试技术辅助教学过程中所犯的错误里获取很多经验。

21. I enjoy challenging myself in the process of technological teaching assistance.

我喜欢在技术辅助教学过程中自我挑战。

22. I can improve my ability to assist in teaching with technology by putting in more effort.

我能够通过付出更多努力, 来提升自己进行技术辅助教学的能力。

---

**Social influence (社群影响)**

---

23. My classmates are all trying to use educational technology to assist in language teaching.

我的同学们都在尝试使用教育技术辅助语言教学。

24. My mentor supports me in making full use of educational technology to assist in language teaching.

我的带指导教师支持我充分利用教育技术辅助语言教学。

25. My students have a positive attitude towards my use of educational technology to assist in language teaching.

我的学生们对我使用教育技术辅助语言教学持积极态度。

---

**Pre-service foreign language teachers' intention to adopt technology (职前外语教师教育技术采纳意向)**

---

26. I am willing to let students participate in learning activities that require the use of technological resources.

我愿意让学生参与一些需要使用技术资源的学习活动。

27. I am willing to use educational technology to help students learn more about language and culture.

我愿意利用教育技术帮助学生了解更多关于语言和文化的知识。

28. I am willing to use educational technology to help students achieve their language learning goals.

我愿意利用教育技术帮助学生达到他们的语言学习的目标。

(continued)

---

**Pre-service foreign language teachers' intention to adopt technology** (职前外语教师教育技术采纳意向)

---

29. I am willing to use educational technology to maintain/improve students' motivation and interest in learning.

我愿意利用教育技术来保持/提高学生学习的动机和兴趣。

30. I am willing to use technological resources to try innovative teaching methods.

我愿意利用一些技术资源尝试创新性的教学。

31. I am willing to use technological resources (such as WeChat, QQ, etc.) to understand students' learning situations.

我愿意利用一些技术资源(比如微信, qq等)了解学生的学习情况。

32. I am willing to use educational technology to create an environment for language learning.

我愿意利用教育技术创造语言学习的环境。

---

## References

- Alfadda, Hind Abdulaziz & Hassan Saleh Mahdi. 2021. Measuring students' use of Zoom application in language course based on the technology acceptance model (TAM). *Journal of Psycholinguistic Research* 50(5). 881–900.
- An, Xin, Ching Sing Chai, Yushun Li, Ying Zhou, Xi Shen, Chunping Zheng & Mengyuan Chen. 2023. Modeling English teachers' behavioral intention to use artificial intelligence in middle schools. *Education and Information Technologies* 28. 5187–5208.
- Bai, Barry, Jing Wang & Ching Sing Chai. 2019. Understanding Hong Kong primary school English teachers' continuance intention to teach with ICT. *Computer Assisted Language Learning* 34. 528–551.
- Baydas, Ozlem & Yuksel Goktas. 2017. A model for pre-service teachers' intentions to use ICT in future lessons. *Interactive Learning Environments* 25. 930–916.
- Cheng, Sheng-Lun, Lin Lu, Kui Xie & Vanessa W. Vongkulluksn. 2020. Understanding teacher technology integration from expectancy-value perspectives. *Teaching and Teacher Education* 91. 1–14.
- Cheung, Gordon W., Helena D. Cooper-Thomas, Rebecca S. Lau & Linda C. Wang. 2023. Reporting reliability, convergent and discriminant validity with structural equation modeling: A review and best-practice recommendations. *Asia Pacific Journal of Management* 1. 1–39.
- Colognesi, Stéphane & Vanessa Hanin. 2023. Using digital technology in the classroom adds new professional tasks for (student) teachers. *Technology, Pedagogy and Education* 33(2). 201–217.
- Dewaele, Jean-Marc & Peter MacIntyre. 2014. The two faces of Janus? Anxiety and enjoyment in the foreign language classroom. *Studies in Second Language Learning and Teaching* 4. 237–274.
- Dweck, Carol S. & David S. Yeager. 2019. Mindsets: A view from two eras. *Perspectives on Psychological Science* 14. 481–496.
- Eccles, Jacquelynne S. & Allan Wigfield. 2020. From expectancy-value theory to situated expectancy-value theory: A developmental, social cognitive, and sociocultural perspective on motivation. *Contemporary Educational Psychology* 61. 1–13.
- Eccles, Jacquelynne S. & Allan Wigfield. 2023. Expectancy-value theory to situated expectancy-value theory: Reflections on the legacy of 40+ years of working together. *Motivation Science* 1. 1–12.

- Gan, Zhengdong, Christopher Fulton & Siying Li. 2022. Pre-service foreign language teachers' motivational beliefs about instructional use of technology: Development and validation of a scale. *Computer Assisted Language Learning* 7. 1–28.
- Hair, Joseph F., William C. Black, Barry J. Babin & Rolph E. Anderson. 2014. *Multivariate data analysis*, 8th ed. Upper Saddle River: Prentice Hall.
- Hambleton, Ronald K., Hariharan Swaminathan, James Algina & Douglas Bill Coulson. 1978. Criterion-referenced testing and measurement: A review of technical issues and developments. *Review of Educational Research* 48. 1–47.
- Haukas, Asta & Sarah Mercer. 2022. Exploring preservice language teachers' mindsets using a sorting activity. *Innovation in Language Learning and Teaching* 16. 221–233.
- Henseler, Jorg, Christian M. Ringle & Sarstedt Marko. 2015. A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science* 43. 115–135.
- Hodges, Charles B., Michael K. Barbour & Richard. Ferdig. 2022. A 2025 vision for building access to K-12 online and blended learning in pre-service teacher education. *Journal of Technology & Teacher Education* 30(2). 201–216.
- Hu, Li-tze & Peter M Bentler. 1999. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling* 6. 1–55.
- Huang, Fang, Timothy Teo & Jiayi Guo. 2021. Understanding English teachers' non-volitional use of online teaching: A Chinese study. *System* 101. 1–11.
- Huang, Fang, Timothy Teo & Xueyu Zhao. 2023. Examining factors influencing Chinese ethnic minority English teachers' technology adoption: An extension of the UTAUT model. *Computer Assisted Language Learning* 102. 1–23.
- Hughes, Joan E., Yin Hong Cheah, Yi Shi & Kuei-Hui Hsiao. 2020. Preservice and inservice teachers' pedagogical reasoning underlying their most-valued technology-supported instructional activities. *Journal of Computer Assisted Learning* 36. 810–824.
- Kale, Ugur & Mete Akcaoglu. 2018. The role of relevance in future teachers' utility value and interest toward technology. *Educational Technology Research and Development* 66. 283–311.
- Li, Li. 2014. Understanding language teachers' practice with educational technology: A case from China. *System* 46. 105–119.
- Li, Li & Steve Walsh. 2011. Technology uptake in Chinese Foreign language classes. *Language Teaching Research* 15. 99–125.
- Loh, K. Y. Elizabeth. 2019. What we know about expectancy-value theory, and how it helps to design a sustained motivating learning environment. *System* 86. 1–27.
- Lou, Nigel Mantou & Kimberly A Noels. 2019. Promoting growth in foreign and second language education: A research agenda for mindsets in language learning and teaching. *System* 86. 1–12.
- MacIntyre, Peter. 2017. An overview of language anxiety research and trends in its development. In C. Gkonou, M. Daubney & J. M. Dewaele (eds.), *New insights into language anxiety: Theory, research and educational implications*, 11–30. Multilingual Matters.
- Nikou, Stavros A. & Anastasios A. Economides. 2019. Factors that influence behavioral intention to use mobile-based assessment: A STEM teachers' perspective. *British Journal of Educational Technology* 50. 587–600.
- Nolen, Susan Bobbitt. 2020. A situative turn in the conversation on motivation theories. *Contemporary Educational Psychology* 61. 101866.
- Ozdemir, Esra & Mostafa Papi. 2022. Mindsets as sources of L2 speaking anxiety and self-confidence: The case of international teaching assistants in the US. *Innovation in Language Learning and Teaching* 16. 234–248.
- Plonsky, Luke & Nicole Ziegler. 2016. The CALL–SLA interface: Insights from a second-order synthesis. *Language Learning & Technology* 20(2). 17–37.

- Polit, Denise F., Cheryl Tatano Beck & Steven V. Owen. 2007. Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health* 30(4). 459–467.
- Ranellucci, John, Joshua M. Rosenberg & Eric G. Poitras. 2020. Exploring preservice teachers' use of technology: The technology acceptance model and expectancy-value theory. *Journal of Computer Assisted Learning* 36. 810–824.
- Richardson, Deborah South, Robert S. Bledsoe & Zaraly Cortez. 2020. Mindset, motivation, and teaching practice: Psychology applied to understanding teaching and learning in STEM disciplines. *CBE Life Sciences Education* 19(3). 1–7.
- Sadaf, Ayesha & Tuba Gezer. 2020. Exploring factors that influence teachers' intentions to integrate digital literacy using the decomposed theory of planned behavior. *Journal of Digital Learning in Teacher Education* 36(2). 124–145.
- Salleh, Sallimah. 2016. Examining the influence of teachers' beliefs toward technology integration in the classroom. *The International Journal of Information and Learning Technology* 33(1). 17–35.
- Sánchez-Mena, Antonio, José Martí-Parreño & Joaquín Aldás-Manzano. 2019. Teachers' intention to use educational video games: The moderating role of gender and age. *Innovations in Education and Teaching International* 563. 318–329.
- Scherer, Ronny, Siddiq Fazilat & Tondeur Jo. 2019. The technology acceptance model TAM: A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. *Computers & Education* 128. 13–35.
- Sharma, Lavina & Srivastava Mallika. 2019. Teachers' motivation to integrate technology in higher education. *Journal of Applied Research in Higher Education* 124. 1–20.
- Sun, Peijian Paul & Bing Mei. 2020. Modeling preservice Chinese-as-a-second/foreign-language teachers' adoption of educational technology: A technology acceptance perspective. *Computer Assisted Language Learning* 36(4). 1–24.
- Teo, Timothy, Fang Huang & Cathy Ka Weng Hoi. 2017. Explicating the influences that explain intention to use technology among English teachers in China. *Interactive Learning Environments* 26(4). 460–475.
- Tran, Huong Thi Thu, Nga Thuy Nguyen & Thuy Thi Tang. 2023. Influences of subjective norms on teachers' intention to use social media in working. *Contemporary Educational Technology* 15(1). 385–400.
- Vongkulluksn, Vanessa W., Xie Kui & Margaret A. Bowman. 2018. The role of value on teachers' internalization of external barriers and externalization of personal beliefs for classroom technology integration. *Computers & Education* 118. 70–81.
- Yusop, Farrah Dina. 2015. A dataset of factors that influence preservice teachers' intentions to use Web 2.0 technologies in future teaching practices. *British Journal of Educational Technology* 46(5). 1075–1080.

## Bionote

### Siying Li

School of Foreign Languages and Literature, Beijing Normal University, Beijing, China

siyinglee@126.com

<https://orcid.org/0000-0002-3676-8949>

Siying Li is a PhD candidate of Applied Linguistics at the School of Foreign Languages and Literature, Beijing Normal University. Her research areas focus on second language acquisition, English language teacher education and computer-assisted language learning. She has publications in *Computer Assisted Language Learning*, *Foreign Language World*, *Foreign Language Education*, and *Foreign Language Education in China*.