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How Chinese EFL teachers worried about AI? A study on AI anxiety, working engagement and teacher resilience

Fang Liu
College of Education and Human Development, University of North Dakota, Grand Forks, North Dakota, USA and
School of Foreign Studies, Guilin University of Electronic Technology, Guilin, China, and
Siyu Wang
Greensboro College, Greensboro, North Carolina, USA

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Abstract

Purpose – The present study seeks to explore the level of AI anxiety among Chinese EFL teachers, with consideration for age, gender, years of teaching, experience of blended teaching and educational background as potential influential variables. The aim is to gain a better understanding of the various factors that contribute to individuals' attitudes towards AI integration into language education. This study also seeks to understand whether AI anxiety predicts Chinese EFL teachers' work engagement and teacher resilience. Also, how is the association between work engagement and resilience under the context of the AI era?

Design/methodology/approach – This study aimed to reveal the relationships between EFL teachers' AI anxiety, work engagement and teacher resilience. It used a quantitative method. The convenient sample and snowball sample were used in the study. The participants of the study are 206 EFL teachers from different levels of educational institutions and cities in China.

Findings – Chinese EFL teacher AI anxiety is low to moderate level. AI anxiety manifestation was remarkably consistent regardless of teachers' gender, blended teaching experience, educational background or years of professional experience. The AI anxiety of Chinese EFL teachers was not significantly correlated with work engagement or teacher resilience, suggesting that apprehensions about artificial intelligence may not currently disrupt educators' job-related motivation or adaptive capacities.

Research limitations/implications – While our preregistered analysis provided strong evidence for the null hypothesis, future studies might explore nonlinear relationships or moderator effects using larger, cross-cultural samples. Cross-sectional design precludes causal inferences, and longitudinal studies could track how AI anxiety evolves with increased classroom integration. Moderators unexplored variables like EFL teacher digital literacy or institutional leadership support might clarify boundary conditions for AI anxiety's effects. For future studies, sample specificity should also be concerned. Generalizability may be limited if participants had low AI exposure. Replication in tech-intensive settings (e.g. schools adopting AI tutors) is warranted. Future studies should also explore different types of AI anxiety (e.g. ethical concerns vs. fear of obsolescence).

Originality/value – While AI anxiety did not emerge as a salient factor in this study, its negligible role may reflect contemporary conditions rather than inherent irrelevance. As educational AI adoption accelerates, monitoring its psychological impact – particularly alongside protective factors like engagement – will be critical to supporting teacher well-being.

Keywords AI anxiety, Working engagement, Teacher resilience, EFL

Paper type Brief report

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1. Introduction

Technology has brought many challenges to life in every field, including education, and the challenges can result in anxiety. Johnson and Verdicchio (2017) defined AI anxiety as the fear and trepidation being expressed about out-of-control AI. According to Kaya *et al*. (2024), AI anxiety is excessive fear arising from problems originating from changes formed by AI technologies in personal or social life.

The role of AI in education and its implications for teachers remain ambiguous, thereby leading to varying levels of anxiety towards AI among teachers (Sanusi *et al*., 2022). Emotion has influences on teacher adaptability and teacher AI anxiety may predict lower technology integration and (Henderson and Corry, 2021). According to Seyri and Ghiasvand (2025), teachers' emotionality has gained less attention in AI-based education, and their qualitative research on 21 Iranian EFL teachers revealed a series of positive as well as negative AI-induced teacher emotions. The negative emotions include "anxiety", "worry"," stress"," apprehension" and "frustration". Similarly, a qualitative study based on thematic analysis by Shen and Guo (2024) revealed that Chinese EFL teachers experienced the negative emotions mentioned above in AI-based L2 teaching. A further study by Wang *et al*. (2021) showed that AI anxiety of teachers in China is negatively correlated to teacher self-efficacy and predicted the intentions of teaching with AI. The study by Seyri and Ghiasvand (2025) corroborated that the emotions have effects on teachers' perspectives and instructional approaches in L2 settings. As teachers are the most important stakeholders in AI-integrated education, the teacher emotions in AI educational settings are worth further exploration. In addition, empirical study on EFL teacher AI anxiety and its relationship with work engagement and teacher resilience remained in the margin.

The present study seeks to explore the level of AI anxiety among Chinese EFL teachers, with consideration for age, gender, years of teaching, experience of blended teaching and educational background as potential influential variables. The aim is to gain a better understanding of the various factors that contribute to individuals' attitudes towards AI integration into language education. This study also seeks to understand whether AI anxiety predict Chinese EFL teachers' work engagement and teacher resilience. Also, how is the association between work engagement and resilience under the context of AI era?

2. Literature review

2.1 EFL teacher AI anxiety, source, related variables

AI anxiety is considered as a form of state anxiety that may vary in response to changing conditions (Bolliger and Halupa, 2012). Wang and Wang (2022) depicted AI anxiety and referred it to the uneasiness or fear that individuals may experience due to the anticipated negative outcomes and risks associated with the deployment of AI across various societal domains (Wang and Wang, 2022). Wang and Wang (2022) asserted that AI anxiety, as a psychological factor, can lead to behavioral intentions, influencing attitudes.

Many educators experience significant anxiety regarding AI, often rooted in concerns about its broader societal and professional ramifications. The rapid development and application of AI could disrupt employment, compromise privacy and security and even challenge individual professional autonomy (Zawacki-Richter *et al*., 2019; Tîru *et al*., 2025). Within education, these fears manifest in various ways. Some teachers worry about AI's potential to facilitate deception and plagiarism, undermining the integrity of traditional learning environments (Dilzhan, 2024). Others, particularly preservice teachers, exhibit moderate levels of apprehension, fearing AI's impact on future job prospects and social dynamics (Falebita, 2025; Eyüp and Kayhan, 2023; Hopcan *et al*., 2024; Tîru *et al*., 2025).

EFL teachers demonstrated more immediate concerns on difficulty of discerning student-generated work from AI-produced content, raising questions about the validity of authentic assessment (De Guzman *et al*., 2024). Compounding these issues is the uncertainty surrounding AI's capacity to replicate the nuanced aspects of teaching, such as fostering student relationships or adapting to diverse learning needs (Ouyang *et al*., 2022).

The ambiguity of AI integration further exacerbates these anxieties (Sanusi *et al*., 2022). Many instructors feel overwhelmed by the technical demands of these systems and struggle to implement them effectively (Huang, 2021; Liu, 2025). Additionally, ethical concerns persist, as opaque or biased algorithmic decision-making could perpetuate inequities in education (Wang *et al*., 2022).

Studies have revealed genders and ages could be significant variables affecting AI anxiety. Zhang *et al*. (2023) conducted research on pre-service teachers in a German university and found out that the paths from AI anxiety to perceived ease of use and from perceived ease of use to perceived usefulness are moderated by gender. A study by Falebita (2025) found that gender is a significant different variable in the AI anxiety assessment among pre-service teachers. Alternatively, age could be identified as a significant demographic variable worth exploring further to gain a deeper understanding of the perspectives and issues faced by teachers and teacher candidates (Wang *et al*., 2022).

Studies have shown interest in AI anxiety and its relationship with self-efficacy, perception of AI, teacher emotional experience. According to Wang *et al*. (2021), AI anxiety of teachers in China is negatively correlated to teacher self-efficacy and predicted the intentions of teaching with AI. As AI provides effective and adaptive learning outcomes for students, teachers' perception of AI and their positive and negative emotions on AI become critical. Zhou and Hou (2024) studied the impacts of AI on the behavioral, cognitive and emotional engagement of EFL teachers and learners in Chinese mainland. The emotional engagement showed complex attitudes with concerns about job displacement and emotional impact on teachers, students and teacher student relationships. A qualitative study by Liu and Chang (2024) explored the diverse development trajectories of EFL teachers' emotional experiences as they navigate AI-integrated language teaching. The study showed that teachers' social connection and professional background significantly influenced the emotional interplay.

2.2 Work engagement

Work engagement has been widely conceptualized as a positive, motivational work-related state characterized by vigor, dedication and absorption, reflecting employees' energetic and emotional involvement in their professional roles (Schaufeli *et al*., 2002). Engaged teachers persistently invest their mental and physical resources in instruction, display enthusiasm and pride in their work and become deeply immersed in daily tasks, such that time at work seems to pass quickly (Noesgaard and Hansen, 2018). Empirically, work engagement is associated with enhanced performance, job satisfaction and commitment; employees who invest cognitive, emotional and behavioral resources are more likely to achieve positive organizational outcomes (Christian *et al*., 2011). In educational contexts, high levels of teacher engagement contribute directly to instructional quality and learner outcomes, as engaged teachers are better positioned to sustain effective pedagogy and supportive classroom environments with higher levels of optimism and commitment (Dong and Xu, 2022).

Recent research continues to highlight the importance of personal psychological resources and contextual supports in shaping work engagement. For example, a study involving 537 Chinese EFL teachers reported that resilience and perseverance of effort significantly predicted work engagement, with resilience explaining a substantial proportion of variance in engagement outcomes (Qu *et al*., 2025). Likewise, evidence from Zhou and Hou (2025) showed that self-efficacy, grit and metacognition positively predicted work engagement among Chinese EFL teachers, suggesting that individual belief in one's capacities and self-regulatory strategies are critical motivators of teacher engagement. Beyond individual resources, perceived school climate and environmental support have also been shown to moderate engagement outcomes; for example, perceived school climate support amplifies the positive association between growth mindset and teacher work engagement, underscoring the role of contextual resources (Salanova *et al*., 2006).

Additionally, research on professional identity and organizational support indicates that ego-resilience and perceived support can strengthen the positive effects of professional identity on engagement, suggesting that affective and social dimensions interact with personal resources to sustain engagement among teachers (Yu *et al*., 2025). These findings align with broader models such as the Job Demands–Resources (JD-R) framework, wherein personal and organizational resources mitigate job demands and promote engagement (Whitsed *et al*., 2025; Um and Bardhoshi, 2025).

The empirical linkage between resilience and work engagement is well-established: resilient teachers are better equipped to navigate challenges and sustain engagement, while positive emotions such as joy and pride enhance engagement and negative affect such as fatigue diminishes it (Burić and Macuka, 2018). In the Chinese EFL context specifically, self-efficacy, reflection and resilience have been shown to directly and indirectly predict work engagement, with self-efficacy exerting indirect effects via teacher reflection and resilience (Heng and Chu, 2023). These studies collectively illuminate how personal beliefs, emotional experiences and contextual facilitation coalesce to foster or hinder work engagement.

2.3 Teacher resilience

Teacher resilience has been widely recognized as a critical psychological resource in second language (L2) teaching. Hiver (2018) conceptualized resilience as a core characteristic that enables L2 teachers to sustain professional functioning amid pedagogical and contextual challenges. Similarly, Beltman (2020) defined teacher resilience as the capacity to draw upon both individual and contextual resources to navigate adversity effectively. In this sense, resilience is not merely the ability to withstand difficulties but reflects teachers' capacity for continued professional growth and positive adaptation in demanding educational environments.

Rather than being a fixed trait, teacher resilience has been increasingly understood as a dynamic and context-sensitive construct. Greenfield (2015) described resilience as emerging from the ongoing interaction among teachers' cognitions, relationships, actions and perceived challenges. Empirical evidence further supports this dynamic perspective. A four-year national study of teachers in England demonstrated that resilience is neither innate nor stable but fluctuates in response to personal, relational and organizational working conditions (Gu and Day, 2013). These findings underscore the importance of situating resilience within broader ecological and institutional contexts.

As a personal psychological resource, teacher resilience has been consistently linked to positive professional outcomes. Resilient teachers are better positioned to cope with occupational stressors, maintain motivation and sustain work engagement, thereby contributing to more effective and fulfilling teaching experiences (Day, 2014). Prior research has documented strong associations between resilience and teacher effectiveness (Gu and Day, 2007), motivation and self-efficacy (Beltman *et al*., 2011), suggesting that resilience functions as a foundational mechanism supporting adaptive professional functioning. Moreover, resilience has been shown to buffer against negative emotional states such as distress and burnout, while simultaneously promoting well-being and positive interpersonal relationships within school communities (Mullen *et al*., 2021).

Recent studies have further highlighted the emotional and regulatory dimensions of teacher resilience. Li (2023) identified a mediating role of teacher resilience in the relationship between emotional regulation and overall well-being, emphasizing the centrality of affective processes in sustaining teachers' psychological health. Similarly, Pagan-Garbin *et al*. (2024) found that personal accomplishment, alongside stress, age and gender, significantly predicted levels of teacher resilience. A growing body of research converges on the view that emotions play a pivotal role in shaping resilience and psychological well-being among teachers (Liu, 2024). In the context of Chinese EFL education, Liu and Chu (2024) demonstrated that professional competence, sociability and grit jointly contribute to teachers' adaptive

functioning, highlighting the importance of cultivating positive emotions in increasingly complex and challenging instructional environments.

2.4 Studies on EFL teacher emotions, work engagement, teacher resilience and research gap

There are studies about EFL teacher emotions and association with work engagement. According to Järvenoja *et al*. (2019), EFL teachers' work engagement was impacted by their emotional experience. Similarly, Minghui *et al*. (2018) also showed that teacher engagement would be influenced by social, emotional, physical and even financial burdens. Dong and Xu (2022) stated that most of the studies among EFL teachers on optimism, commitment and work engagement are correlational and one-shot.

Some researchers studied the impact of negative emotions on engagement based on positive psychology (Sweetman and Luthans, 2010) and conservation of resources (COR) theory (Chen *et al*., 2020). Extrapolating these propositions to the link between teachers' emotions and work engagement, it can be assumed that experience of higher levels of negative emotions at work would probably reduce their engagement (Ferreira *et al*., 2019).

Findings designated that Chinese EFL teacher resilience is associated with engagement (Xie, 2021), and about 76% of changes in Chinese EFL teachers' work engagement can be predicted by their resilience (Qu *et al*., 2025),

In summary, AI anxiety, a negative emotion, has not been studied in existing research as a potential factor predicting work engagement or teacher resilience. In addition, with the existence of recent AI anxiety, its association with teacher work engagement and teacher resilience needs more exploration.

2.5 Control–Value Theory as the theoretical framework

Control–Value Theory (CVT; Pekrun, 2006) provides a comprehensive framework for understanding teachers' emotional responses to emerging educational technologies and is therefore well suited to guide the present investigation of AI anxiety among Chinese EFL teachers. CVT posits that achievement emotions arise from two core cognitive appraisals: perceived control, referring to an individual's sense of capability in managing task demands, and subjective value, referring to the personal importance or relevance ascribed to the task. Anxiety is especially likely to emerge when individuals perceive low control over a task that carries high value or meaningful consequences.

Applied to the context of AI integration in English language teaching, CVT suggests that teachers may experience anxiety if they feel inadequately prepared to use AI tools, perceive AI as a threat to their professional competence or attach high value to instructional quality but doubt their ability to maintain it under new technological demands. Conversely, when teachers appraise themselves as capable and perceive AI as beneficial or professionally meaningful, anxiety should be reduced. CVT therefore provides a coherent basis for examining how AI-related emotions may interact with key professional resources such as work engagement and teacher resilience.

Work engagement and resilience are particularly relevant within the CVT framework because both reflect enduring personal resources that can influence control and value appraisals. Resilient teachers typically demonstrate adaptive coping, perseverance and effective problem-solving, which may elevate perceived control in the face of innovation or change. Similarly, engaged teachers tend to invest cognitive and emotional energy in their work, strengthening the value they attach to their teaching roles. Based on these theoretical assumptions, AI anxiety could theoretically act as an emotional mechanism linking resilience and engagement: teachers with higher resilience might experience lower AI anxiety due to greater perceived control, thereby maintaining high levels of engagement.

The present study draws on CVT to examine this theorized relationship and to test whether AI anxiety functions as an emotional correlate of work engagement and resilience in the context of

rapid technological change. While previous literature has consistently demonstrated a positive association between teacher resilience and work engagement, limited attention has been given to technology-related emotions as potential explanatory factors. By integrating AI anxiety into a CVT-informed model, this study seeks to determine whether emerging technology-induced emotions play a meaningful role in shaping teachers' professional functioning.

Research questions:

(1) What is the level of participants' AI anxiety? How do gender, blended teaching experience educational background, years of teaching affect AI anxiety?

(2) Do AI anxiety and work engagement reciprocally relate to each other?

(3) Do AI anxiety and teacher resilience relate to each other?

(4) Do work engagement predict teacher resilience among Chinese EFL teachers?

3. Method

This study aimed to reveal the relationships between EFL teachers' AI anxiety, work engagement and teacher resilience. It used a quantitative method.

3.1 Participants

The convenient sample and snowball sample were used in the study. The participants of the study are 206 EFL teachers from different levels of educational institutions and cities in China. A demographic form of 6 questions was used to obtain demographic information such as gender, age, educational background, length of teaching, experience of blended teaching and levels of their working institutions. As seen in Table 1, 85.92% of the participants ($n = 177$) are

Table 1. Demographic information of the participants

Variable	Frequency
Gender	Male = 14.08% Female = 85.92%
Academic Degree	Associate = 3.4% Bachelor = 37.86% Master = 52.91% PhD = 5.83%
Work Context	K-12 School = 43.69% Colleges and Universitied = 50.97% Other institutions = 5.34%
Years of Teaching	0–3 years = 13.59% 3–5 years = 8.74% 5–8 years = 5.34% 8–10 years = 5.34% 10–15 years = 16.02% 15–20 years = 21.84% 20–30 years = 22.82% Over 30 years = 6.31%
Age	18–25 years old = 9.71% 26–30 years old = 8.74% 31–40 years old = 30.1% 41–50 years old = 39.32% 51–60 years old = 12.14%
Experience of blended teaching or not	Yes 79.61% No 20.39%

female. Approximately 69.32% are between the ages of 31 and 50. A total of 50.97% of participants are colleges and university EFL teachers. Table 1 provided a more detailed overview of the demographic characteristics of the sample.

3.2 Instruments

3.2.1 EFL teacher AI anxiety scale. To evaluate the level of AI anxiety of Chinese EFL teachers, Chinese translation version of the 21-item Chinese EFL Teacher AI Anxiety Scale (Liu and Liu, 2025), were used. This scale is user friendly, more comprehensive as it covers various dimensions that influence teacher's AI anxiety and has shown high reliability and validity based on China context. The scale items were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scale has factorial structures involving technical proficiency, job displacement, technological support, student experience and research development. Question examples are: technical proficiency (e.g. "I find mastering AI technology to be very difficult."), technological support (e.g. "I feel that the AI technology training provided by my school is insufficient."), student experience (e.g. "I am concerned that AI cannot provide teaching experiences that involve deep interaction and personalized guidance with students) and research development (e.g. "I worry that AI technology will render my research methods outdated"). There is evidence in support of the reliability and validity of the Chinese EFL Teacher AI Anxiety Scale (Liu and Liu, 2025). In the current study, the reliability of the Chinese EFL Teacher AI Anxiety Scale estimated via Cronbach's alpha was 0.932.

3.2.2 Engaged Teachers Scale. To assess Chinese EFL teachers' work engagement, Chinese translation version of the 16-item, 4-factor Engaged Teachers Scale (Klassen *et al*., 2013), was used. This scale was created, validated and showed evidence of reliability. The scale items were rated on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The scale has 4 factorial structure involving Physical (e.g. I devote a lot of energy to teaching), Cognitive (e.g. While teaching, I get absorbed in my work), Emotional (e.g. I really put my heart into teaching) and Social (e.g. I connect well with my students). In the reliability of the Work Engagement Scale estimated via Cronbach's alpha was 0.968 in current study.

3.2.3 Chinese EFL teacher resilience scale. To assess Chinese EFL teachers' resilience, Chinese translation version of the 10-item Chinese EFL Teacher Resilience Scale (Liu and Chu, 2022), was used. This scale adapted from the 25 item CD-RISC (Connor and Davidson, 2003) and has shown high reliability and validity based on China educational setting. The scale items were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scale has tri-factorial structure involving tenacity, optimism and coping strategy. Question examples are tenacity (e.g. "In control of your English classroom"), optimism (e.g. "able to adapt to change") and coping strategy (e.g. Make unpopular or difficult decisions"). There is evidence in support of the reliability and validity of the Resilience Scale (Liu and Chu, 2022). In the current study, the reliability of the Resilience Scale estimated via Cronbach's alpha was 0.853.

3.3 Data collection and analysis

Data were collected from volunteer EFL teachers by stating the purpose of the study. It took approximately 5–10 min for participants to complete the scales. SPSS 29 program was used in the analysis of the data. Descriptive and inferential statistics (*T*-tests, ANOVA, regression) were employed.

4. Results

4.1 Descriptive statistics

Descriptive statistics show that the mean scores for these five items ranged from 2.37 to 3.68 on a 5-point Likert (1 = Strongly Disagree, 5 = Strongly Agree). The item "I feel anxious

about using AI technology in teaching" received the lowest mean score (M = 2.37, SD = 0.95), indicating relatively low emotional anxiety. Conversely, the highest concern was found in the item "I worry that students will become overly dependent on AI" (M = 3.68, SD = 1.01), suggesting a greater focus on the pedagogical implications of AI rather than personal apprehension.

To better understand the overall level of AI anxiety, a composite score was calculated by averaging the means of the five anxiety-related items (Figure 1). The resulting composite score was M = 2.96, indicating a low to moderate level of AI anxiety among the surveyed teachers. The findings suggest that while teachers are not broadly resistant to AI, there are nuanced concerns, particularly about the impact of AI on pedagogy and professional identity.

Table 2 shows that females had a slightly higher mean AI anxiety score (65.36) than males (63.17). Cohen's d was calculated using pooled standard deviation. A negative d (−0.16) indicates females scored higher than males on average. However, no statistically significant differences were found between gender groups on AI anxiety.

Table 3 shows that there was no statistically significant difference in AI anxiety scores between those with and without blended teaching experience, t (204) = 0.45, p = 0.651.

A one-way between-subjects ANOVA was conducted to compare AIA scores among participants with different levels of educational attainment. Table 4 shows that there was no statistically significant difference in AIA scores across education levels, F (3, 202) = 0.59, p = 0.620, indicating that participants' AI anxiety did not vary significantly by their educational background. Tukey's HSD post hoc test in Table 5 further revealed that no pairwise comparisons between education levels reached statistical significance ($p > 0.05$). All educational groups fell within the same homogeneous subset, indicating similar levels of AI anxiety across educational attainment.

Descriptive statistics were calculated for AI anxiety scores across eight categories of teaching experience. Table 6 shows that the means AI anxiety scores ranged from 59.28 (SD = 14.35) among teachers with 3–5 years of experience to 67.60 (SD = 13.95) among those with 20–30 years of experience. Overall, the average AIA score for the entire sample (N = 206) was 65.05 (SD = 13.34). While some fluctuations in mean scores are observable across groups (Figure 2), further inferential testing is needed to determine whether these differences are statistically significant.

Then, a one-way between-subjects ANOVA was conducted to compare AIA scores among teachers with different years of teaching experience. The results in Table 7 indicated that there was no statistically significant difference in AIA scores across the eight experience groups, F (7, 198) = 0.90, p = 0.506. Levene's test for equality of variances was non-significant, p = 0.618, suggesting the assumption of homogeneity of variances was met. The effect size was small (η^2 = 0.031), suggesting a negligible practical impact of teaching experience on AIA scores.

4.2 Correlation analysis

Table 8 shows that there were no significant correlations between AI anxiety and the other two variables. A moderate positive correlation was found between work engagement and teacher resilience (r = 0.52, $p < 0.001$).

4.3 Bayesian analysis

From Table 9, we can see that Bayesian analyses provided robust support for the absence of a meaningful association between AIA and work engagement, BF_{01} = 12.80 (strong evidence per Jeffreys' (1961) criteria; default Cauchy prior, r_{scale} = 0.333). This conclusion converged with frequentist linear regression, F (1, 204) = 0.13, p = 0.716, $R^2 < 0.001$, and remained stable across sensitivity analyses with alternative priors (r_{scale} = 0.1–0.5; all $BF_{01} > 10$).

Similarly, the null effect of AIA and teacher resilience was also revealed. Bayesian sensitivity analyses demonstrated that across prior scales (r_{scale} = 0.1–0.5), BF_{01} consistently exceeded 10 (M = 14.3, SD = 2.1), supporting the robustness of our conclusions. The

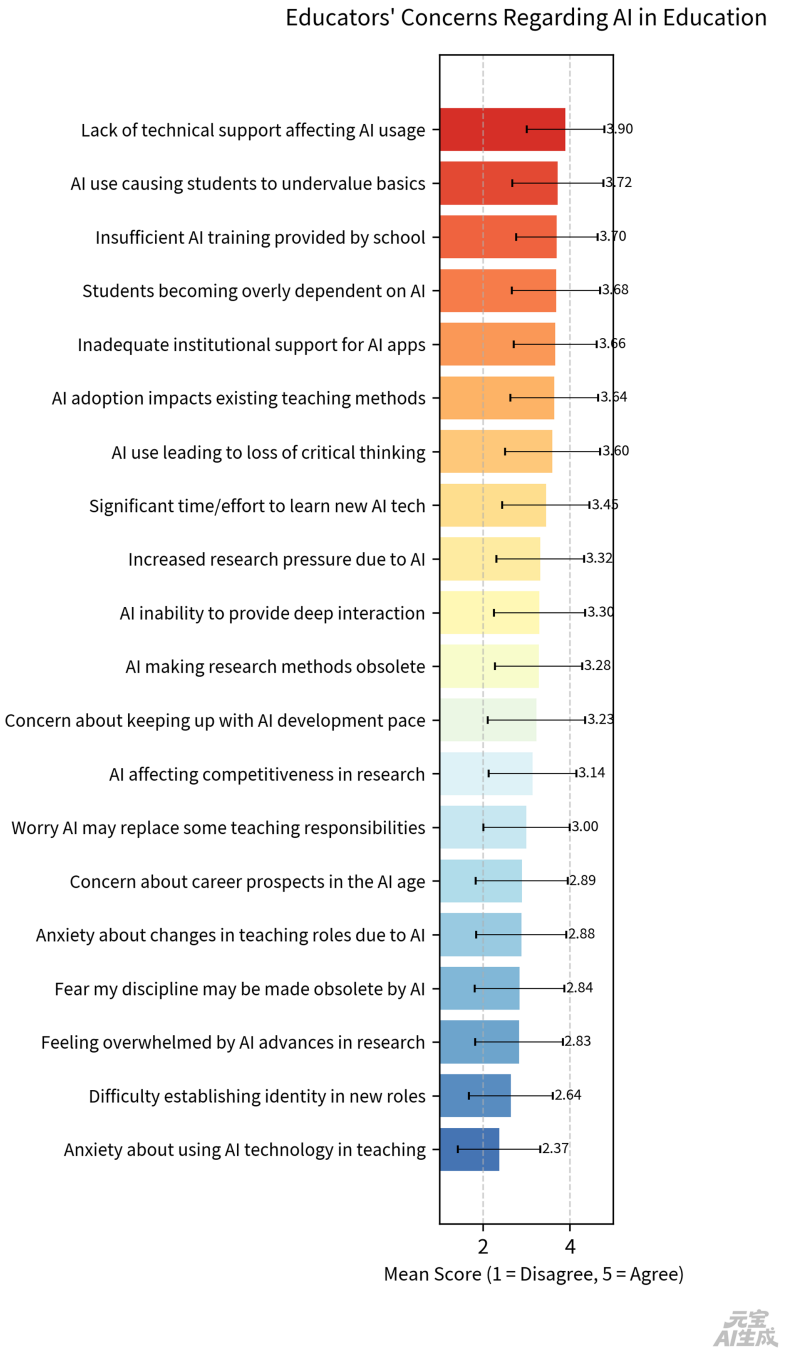

Figure 1. Mean scores of teachers' responses to the AI anxiety scale. The red dashed line represents the composite mean score of 2.96

Table 2. Descriptive statistics, independent sample *T*-test and effect sizes for AI anxiety scores by gender

	n	M	SD	*t* (204)	*p*	Mean diff	95% CI for mean	Diff Cohen's d
Male	29	63.17	10.82	−0.82	0.415	−2.18	[−7.46, 3.09]	−0.16
Female	177	65.36	13.71					

Table 3. Descriptive statistics, independent sample *T*-test and effect sizes for AI anxiety scores by blended teaching experience

Blended teaching experience	*n*	*n*	SD	*t* (204)	*p*	Mean diff	Diff Cohen's d	95% CI for mean
Yes	164	65.26	13.75	−0.45	0.651	1.05	0.08	[−3.51, 5.61]
No	42	64.21	11.72					

Table 4. One-way ANOVA for AI anxiety scores by educational level

Source	SS	df	MS	F	*p*
Between Groups	318.46	3	106.15	0.59	0.620
Within Groups	36161.06	202	179.02		
Total	36479.52	205			

Table 5. Means and Tukey HSD homogeneous subset result for AI anxiety scores by educational level

Educational level	*n*	Mean AI anxiety	Subset ($\alpha = 0.05$)
Doctoral	12	62.50	1
Bachelor's	78	63.97	1
Master's	109	65.89	17
Associate degree	7	68.29	1
Sig.			0.610

Bayesian analysis revealed strong evidence for the null effect of AI anxiety on teacher resilience ($BF_{01} = 14.3$, classified as "strong" according to Jeffrey, 1961, Table 10), which was consistent with the frequentist statistical result ($p = 0.755$).

We conducted statistical power analysis using GPower 3.1, which indicated that with the current sample size ($n = 205$), the power to detect a small effect ($f^2 = 0.02$) was 18%, suggesting the study was only adequately powered to detect medium-to-large effects. Power curves (Figure 3) demonstrate that while our study had limited sensitivity to detect very small effects ($f^2 < 0.02$), it achieved strong Bayesian evidence against effects exceeding Cohen's (1988) medium benchmark ($f^2 \geq 0.15$).

Table 6. Descriptive statistics for AI anxiety scores by years of teaching experience

Years of teaching experience	*n*	Mean	SD	SE	95% CI (lower)	95% CI (upper)	Min	Max
0–3 years	28	64.29	11.47	2.17	59.84	68.73	34.0	87.0
3–5 years	18	59.28	14.35	3.38	52.14	66.41	20.0	80.0
5–8 years	11	66.55	16.71	5.04	55.32	77.77	46.0	100.0
8–10 years	11	67.00	15.32	4.62	56.71	77.29	46.0	100.0
10–15 years	33	63.42	13.99	2.44	58.46	68.39	29.0	96.0
15–20 years	45	65.89	12.95	1.93	62.00	69.78	40.0	95.0
20–30 years	47	67.60	13.95	2.03	63.50	71.69	34.0	100.0
Over 30 years	13	63.77	6.85	1.90	59.63	67.91	53.0	75.0
Total	206	65.05	13.34	0.93	63.22	66.88	20.0	100.0

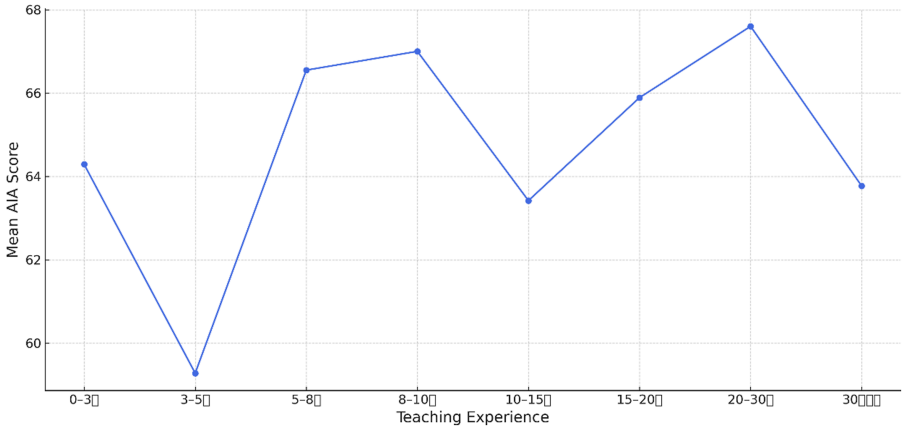

Figure 2. AIA mean scores by teaching experience

Table 7. One-way ANOVA for AI anxiety scores by years of teaching experience

Source	SS	df	MS	F	*p*
Between Groups	1127.33	7	161.05	0.90	0.506
Within Groups	35352.19	198	178.55		
Total	36479.52	205			

Table 8. Correlations among AI anxiety, work engagement and teacher resilience

	1	2	3
AI anxiety	–		
Work engagement	−0.03	–	
Teacher resilience	−0.02	0.52	–

Table 9. Bayesian-frequentist comparison

Model	BF_{01}	CI	F	*p*	η^2	Power ($f^2 = 0.15$)
AIA – Work Engagement	12.80	[10.2, 14.9]	0.13	0.716	0.0005	83%
AIA – Teacher Resilience	14.30	[12.1, 16.5]	0.10	0.755	0.0005	83%

Table 10. Bayesian evidence

BF_{10}	Evidence
>100	Extreme for H_1
30–100	Very strong
10–30	Strong
3–10	Moderate
1–3	Anecdotal
1	No evidence
<1	Support for H_0

Source(s): From: Jeffreys (1961)

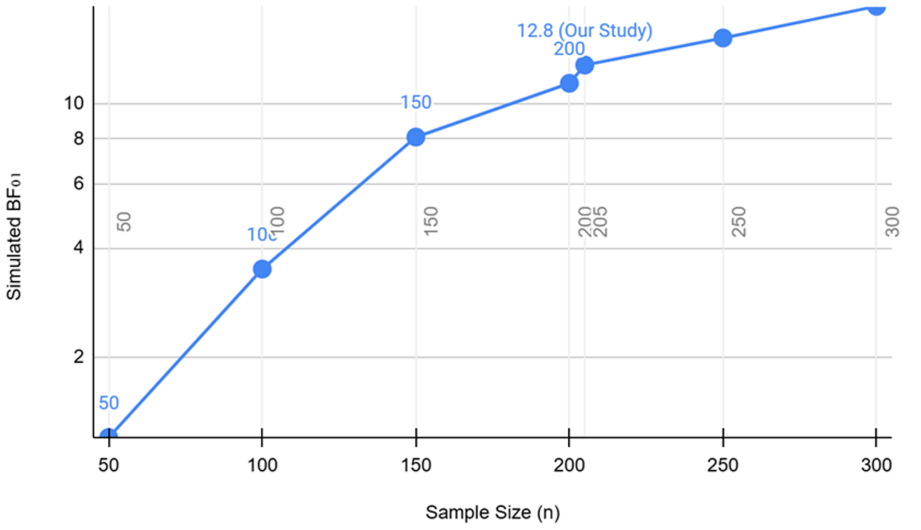

Figure 3. Bayesian power curve for AIA-work engagement. Sequential Bayesian evidence accumulation for the AIA-work engagement null hypothesis (BF_{01}). The achieved sample size ($n = 205$), where BF_{01} crossed the strong evidence threshold (BF > 10)

5. Discussion

5.1 Summary of findings

Chinese EFL teacher AI anxiety is at a low to moderate level. AI anxiety manifestation was remarkably consistent regardless of teachers' gender, blended teaching experience, educational background or years of professional experience. In addition, the present study

examined the relationships between AI anxiety, work engagement and teacher resilience, yielding key insights into how emerging technological concerns intersect with educators' professional well-being.

Contrary to initial expectations, AI anxiety was not significantly correlated with work engagement or teacher resilience, suggesting that apprehensions about artificial intelligence may not currently disrupt Chinese EFL teachers' job-related motivation or adaptive capacities. Meanwhile, the moderate positive correlation between work engagement and teacher resilience ($r = 0.52$, $p < 0.001$) aligns with prior literature, reinforcing the notion that engaged teachers tend to exhibit greater psychological resilience in challenging environments (Angelini *et al.*, 2024).

5.2 Possible reasons for null findings

The absence of statistically significant associations between AI anxiety and both work engagement and teacher resilience may be attributable to several interrelated theoretical and contextual factors. Rather than indicating the irrelevance of AI anxiety, these null findings likely reflect the current stage of AI integration, the presence of buffering resources and measurement-related considerations within the specific context of Chinese EFL education.

First, contextual buffering effects may attenuate the impact of AI anxiety. Teachers in the present sample appear to operate in institutional environments where AI functions primarily as a supplementary or assistive tool rather than as a disruptive force. In many Chinese public K–12 schools and higher education institutions, AI is commonly used for automated assessment, learning analytics or instructional support, rather than replacing core pedagogical roles. Importantly, teachers' job security in these settings is relatively stable, which may substantially reduce perceived threats to professional identity or employment continuity. Responses to the open-ended questions further indicated predominantly positive perceptions of AI-assisted teaching, suggesting that AI was framed as an efficiency-enhancing resource rather than a competitive substitute.

This finding challenges deterministic narratives that technological advancement inevitably induces occupational anxiety. Instead, it aligns with emerging evidence that teachers' emotional responses to AI are highly context-dependent. For example, Luo and Liang (2025) reported that music teachers perceived AI as an auxiliary pedagogical resource that enhanced instructional creativity without undermining professional autonomy. Similarly, Wu and Derakhshan (2025) demonstrated that job resources, such as institutional support, access to effective digital tools and structured professional development which exert a direct positive influence on teachers' willingness to adopt AI. From a Job Demands–Resources (JD-R) perspective, these contextual resources may neutralize AI-related demands before they translate into anxiety or disengagement.

Second, teacher resilience may function as a protective psychological mechanism. Teachers with higher levels of resilience are more capable of regulating negative emotions, maintaining perceived control and sustaining motivation in the face of uncertainty. In such cases, AI-related concerns may be cognitively acknowledged but fail to meaningfully influence day-to-day engagement or adaptive functioning. This interpretation is consistent with research indicating that resilience buffers the impact of technology-related stressors (Rohwer *et al.*, 2022) and supports psychological well-being during periods of digital transformation. Recent studies have also shown that AI-enabled communication and instructional technologies can enhance teachers' sense of efficiency and work–life balance, thereby indirectly promoting well-being (Zheng and Saigot, 2025).

Moreover, Wang *et al*. (2025) found that AI anxiety predicted negative attitudes toward AI but did not significantly undermine positive attitudes, suggesting that educators can simultaneously experience concern and optimism. This emotional ambivalence may explain why AI anxiety does not necessarily translate into reduced engagement or diminished resilience. From a CVT perspective, teachers may appraise AI as moderately threatening but

still perceive sufficient control and task value to sustain motivation, resulting in attenuated emotional consequences.

Third, measurement scope may have constrained the detection of nuanced effects. Although the AI anxiety scale employed demonstrated acceptable reliability, it may not have captured domain-specific anxieties most relevant to engagement and resilience, such as ethical concerns, pedagogical deskilling or long-term professional identity erosion. Prior research suggests that different dimensions of technology-related anxiety may exert differential effects on motivation and well-being. Broad measures may therefore obscure more specific pathways through which AI anxiety operates. Future studies could adopt multidimensional instruments that distinguish between short-term operational concerns and deeper existential or ethical apprehensions related to AI.

Finally, the strong association between work engagement and teacher resilience underscores the robustness of established motivational mechanisms. The moderate positive correlation observed in this study aligns with the JD-R model (Bakker and Demerouti, 2017), which posits that engaged individuals actively mobilize personal resources to cope with demands. For teachers, engagement may generate positive affect, professional meaning and a sense of accomplishment, all of which reinforce resilience over time. In this sense, engagement and resilience may form a mutually reinforcing cycle that remains relatively insulated from emerging stressors such as AI anxiety – at least during early stages of technological adoption.

Taken together, these findings suggest that AI anxiety may currently function as a *latent* or *contextually contingent* emotional factor rather than a direct determinant of teacher engagement or resilience. As AI becomes more deeply embedded in pedagogical decision-making and institutional evaluation systems, its emotional consequences may intensify. Longitudinal and mixed-methods research will therefore be essential to capture potential delayed or conditional effects and to identify the thresholds at which AI-related concerns begin to disrupt teachers' motivational and adaptive capacities.

5.3 Theoretical contribution

The findings of this study indicating low to moderate levels of AI anxiety and no significant associations between AI anxiety, work engagement and resilience, suggesting that, at present, AI may not constitute a sufficiently disruptive appraisal context to trigger the emotional mechanisms outlined by CVT among Chinese EFL teachers. Nonetheless, CVT remains a valuable lens for interpreting these results, as it highlights that emotional responses depend on both perceived control and value, which may currently be stable or only mildly challenged in this population. As AI becomes more deeply embedded in educational practice, these appraisal processes may shift, making CVT an important framework for future longitudinal and comparative research.

5.4 Limitations and future directions

While our preregistered analysis provided strong evidence for the null hypothesis, future studies might explore nonlinear relationships or moderator effects using larger, cross-cultural samples. Cross-sectional design precludes causal inferences, and longitudinal studies could track how AI anxiety evolves with increased classroom integration. Moderators unexplored variables like EFL teacher digital literacy or institutional leadership support might clarify boundary conditions for effects of AI anxiety. For future studies, sample specificity should also be concerned. Generalizability may be limited if participants had low AI exposure. Replication in tech-intensive settings (e.g. schools adopting AI tutors) is warranted. Future studies should also explore different types of AI anxiety (e.g. ethical concerns vs. fear of obsolescence). As the present study was designed as a cross-sectional quantitative investigation, we have now explicitly acknowledged this limitation and highlighted mixed-methods and qualitative approaches as important directions for future research.

5.5 Practical implications

The findings yield several implications for policy and practice in the professional development of Chinese EFL teachers. Given that AI anxiety among teachers was generally low to moderate and did not vary across demographic or professional characteristics, institutional interventions should avoid assuming that specific subgroups are disproportionately vulnerable. Instead, efforts may focus on maintaining this relatively stable level of confidence as AI technologies continue to evolve. Although AI anxiety was not significantly associated with work engagement or teacher resilience, the absence of negative effects at present does not preclude potential future impacts as AI becomes more deeply embedded in pedagogical practice. Thus, proactive training initiatives that cultivate teachers' familiarity with AI-enhanced instructional tools remain essential for preserving a sense of competence and autonomy.

Moreover, the strong positive association between work engagement and teacher resilience underscores the importance of sustained investment in programs that strengthen teachers' adaptive capacity. Institutional strategies, such as structured mentorship, peer collaboration opportunities and resilience-oriented professional development, may reinforce teachers' engagement without necessarily having to target AI anxiety directly. Such initiatives can support educators' long-term adaptability and well-being, ensuring they remain equipped to navigate ongoing technological transformations even when AI-related concerns are minimal.

6. Conclusion

Although AI anxiety did not emerge as a significant predictor of work engagement or teacher resilience in the present study, this null finding should not be interpreted as evidence of its inherent unimportance. Rather, the limited influence of AI anxiety may reflect the current stage of AI integration in Chinese EFL education, where exposure to AI-assisted pedagogies remains relatively moderate and institutional expectations are still evolving. As the adoption of educational AI becomes more widespread and pedagogically embedded, its emotional and motivational implications may likewise become more pronounced. Continued empirical monitoring will therefore be essential, particularly in relation to protective psychological resources such as resilience and engagement. By documenting baseline patterns and highlighting potential boundary conditions, this study offers a foundation for future longitudinal and comparative research aimed at ensuring that teachers' well-being is supported during periods of technological transition.

Authors' contributions

FL: conceptualization, supervision, data curation, methodology, writing-original draft, writing-reviewing and editing.

SW: conceptualization, methodology, writing-original draft, writing-reviewing and editing.

Ethical approval

The studies involving human participants were reviewed and approved by the Ethics Committee of Guilin University of Electronic Technology.

Consent for publication

All authors hereby consent to the publication of this manuscript in Artificial Intelligence in Education.

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Corresponding author
Fang Liu can be contacted at: fang.liu.1@ndus.edu