EFL teachers' digital literacy and its relation to self-efficacy and well-being in artificial intelligence-based context

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ABSTRACT: Integrating Artificial Intelligence (AI) in academic contexts has emerged as an innovative approach to improve language teaching. Digital literacy can act as a possible protection for educators when facing the challenges posed by AI-based experiences. This research explores the interaction between digital literacy, self-efficacy, and well-being among English as a Foreign Language (EFL) educators in an AI-based context. Based on Self-Determination Theory (SDT), the study investigates how digital literacy meets the fundamental psychological requirements of EFL educators for competence, autonomy, and relatedness, which in turn affects their well-being and self-efficacy. To reach this aim, 341 EFL teachers attended and answered the three scales but among them, 319 valid questionnaires were gathered. A Structural Equation Modeling (SEM) approach was used to analyze the causal relationships among the variables. The findings reveal a significant positive correlation between well-being, self-efficacy, and digital literacy. Indeed, digital literacy was a significant predictor of both variables and could predict 21.5% of the variance in teacher efficacy and 8.1% of the variance in well-being. The research highlights the critical role of digital literacy in enabling EFL educators and fostering a supportive, efficient, and satisfying AI-based teaching perspective.
Keywords: Artificial Intelligence, Digital Literacy, EFL teachers, Self-efficacy, Well-being.

La alfabetización digital de los profesores de inglés como lengua extranjera y su relación con la autoeficacia y el bienestar en un contexto basado en la inteligencia artificial

RESUMEN: La integración de la inteligencia artificial (IA) en contextos académicos ha surgido como un enfoque innovador para mejorar la enseñanza de idiomas. La alfabetización digital puede actuar como una posible protección para los educadores cuando enfrentan los desafíos que plantean las experiencias basadas en IA. Esta investigación explora la interacción entre la alfabetización digital, la autoeficacia y el bienestar entre los educadores de inglés como lengua extranjera (EFL) en entornos basados en IA. Basado en la teoría de la autodeterminación (SDT), el estudio investiga cómo la alfabetización digital cumple con los requisitos psicológicos fundamentales de los educadores de EFL para la competencia, la autonomía y la

relación, lo que a su vez afecta su bienestar y autoeficacia. Para alcanzar este objetivo, 341 profesores de EFL asistieron y respondieron las tres escalas, pero entre ellos se recopilaron 319 cuestionarios válidos. Se utilizó un enfoque de modelado de ecuaciones estructurales (SEM) para analizar las relaciones causales entre las variables. Los hallazgos revelan una correlación positiva significativa entre el bienestar, la autoeficacia y la alfabetización digital. De hecho, la alfabetización digital fue un predictor significativo de ambas variables y pudo predecir el 21,5 % de la varianza en la eficacia de los docentes y el 8,1 % de la varianza en el bienestar. La investigación destaca el papel fundamental de la alfabetización digital para capacitar a los educadores de inglés como lengua extranjera y fomentar una perspectiva de enseñanza basada en inteligencia artificial que brinde apoyo, sea eficiente y satisfactoria.
Palabras clave: Inteligencia artificial, alfabetización digital, profesores de inglés como lengua extranjera, autoeficacia, bienestar

1. Introduction

Recently, the incorporation of artificial intelligence (AI) and digital technologies in teaching has been at the center of considerable attention (Derakhshan et al., 2025; Liu & Wang, 2024; Xin & Derakhshan, 2025), with China leading this digital progression (Jun, 2020). AI-based instruments and platforms, including intelligent tutoring systems, automatic evaluation technologies, and AI-powered language learning apps, are becoming more common in English as a Foreign Language (EFL) teaching (Lu et al., 2024; Qin & Derakhshan, 2026; Zhi & Wang, 2024). These instruments provide chances to boost education efficiently, tailor learning experiences, and enhance learner results. The successful deployment of these technologies is indeed largely reliant on the digital literacy of educators, which is their capability to efficiently comprehend, utilize, and incorporate digital instruments (Li & Yu, 2022). Digital literacy, which includes the competencies necessary to access, assess, and generate information through digital technologies, is vital for educators to completely exploit the possibility of AI in teaching (Garzon & Garzon, 2023). For EFL educators in China who encounter specific difficulties in an AI-based context, a deficiency in digital literacy can obstruct their capacity to adjust to technological innovations (Xu, 2025; Zheng, 2025). Indeed, educators with restricted digital literacy may struggle to integrate these instruments into their educational methods, potentially resulting in frustration, diminished educational efficiency, and hesitance to embrace modern technologies (Qing & Jing, 2024).

Building on the interplay between digital literacy, self-efficacy is a significant factor, which refers to people's confidence in their capacity to succeed in particular activities. Regarding education, self-efficacy describes educators' belief in their capability to efficiently utilize AI-based instruments to accomplish educational objectives. Studies have indicated that educators with greater digital literacy often display higher self-efficacy because they have higher capability and assurance in utilizing technology to improve their educational strategies (Bandura, 2010; Cosby et al., 2023). Moreover to its effect on self-efficacy, digital literacy profoundly affects Chinese EFL educators' well-being, which includes psychological, emotional, and physical health, and is a crucial element in educators' capacity to do efficiently in their professional position (Wang et al., 2024). In an AI-based context, educators are frequently asked to handle complicated digital tools, adjust to swiftly evolving technological requirements, and fulfill great expectations for learner performance (Gunathilaka et al., 2022). For Chinese EFL educators, these requirements can generate considerable stress, especially

if they lack the digital literacy necessary to manage these challenges efficiently (Chiu et al., 2022). While existing studies have thoroughly examined the impact of digital literacy on educators' technological adaptation and self-efficacy, limited attention has been given to how digital literacy influences the well-being of educators in AI-based settings, particularly among Chinese EFL educators. Additionally, investigations into the interplay between digital literacy, self-efficacy, and well-being remain underexplored. Dealing with the research gap is vital for creating efficient strategies to assist educators in the digital era. By looking into the connections among these concepts in an AI-based context, this research seeks to add to the current literature and offer practical advice for teachers, policy-makers, and scholars. This study is significant because it addresses critical elements of digital literacy and their profound implications on educators' efficacy and well-being in AI-based settings. By identifying these interactions, the findings have the potential to inform targeted interventions and training programs that authorize teachers to adapt to technological advancements while preserving their mental health. Grasping these dynamics is essential for establishing supportive and efficient teaching settings that utilize the capacity of digital literacy to increase teachers' efficacy and well-being. Therefore, the following research questions were proposed:

1. Is there any significant association between Chinese EFL teachers' digital literacy, self-efficacy, and well-being in an AI-based context?
2. To what extent does Chinese EFL teachers' digital literacy predict their self-efficacy and well-being in an AI-based context?

Review Of Literature

2.1. Theoretical framework

Self-determination theory (SDT) focuses on satisfying three fundamental psychological requirements, namely autonomy, competence, and relatedness, which can influence educators' well-being and efficacy in an AI-based context (Ryan & Deci, 2020). Autonomy is defined as having control over one's acts and choices. For EFL educators, being digitally literate boosts autonomy by offering the confidence and proficiencies necessary to incorporate AI instruments into their educational practices. It allows educators to devise and execute their personalized strategies, fostering job satisfaction. When educators have autonomy, they are encouraged to innovate and experiment, leading to professional satisfaction. Educators who experience autonomy in their use of technology tend to feel greater well-being. Competence refers to a feeling of effectiveness and capability (Ryan & Deci, 2020). Digital literacy provides EFL educators with the instruments to incorporate AI successfully, enhancing their confidence and expertise with new instruments. Mastery of digital instruments enhances self-efficacy as educators develop involving materials and offer immediate feedback. This sense of proficiency alleviates stress and boosts job satisfaction, thereby improving well-being. Relatedness addresses the need to connect with others (Ryan & Deci, 2020). Digital literacy fosters relatedness by allowing educators to interact with learners, peers, and professional societies. AI instruments promote collaboration and communication, nurturing a feeling of community and connection. This sense of belonging develops a supportive atmosphere, im-

proving educators' well-being by enabling them to converse experiences, look for guidance, and establish relations.

2.2. Artificial intelligence

Zhang et al. (2023) believed that information and communication technology (ICT) are increasingly integral to numerous facets of human life. Within such technologies, AI emerges as a powerful instrument with the possibility to transform various societal sectors within the swiftly evolving technological view (Zhi & Wang, 2024). In addition, the application of AI in teaching is anticipated to boost customized learning experiences, ease efficient learning interactions, promote learners' creativeness, and ease the workload on educators (Díaz & Nussbaum, 2024). AI is a field within computer science focused on developing systems that can replicate processes like human cognition, such as learning, thinking, and self-correcting (Derakhshan, 2025). Current evidence shows that AI is being extensively and gradually adopted and used in teaching, especially by academic institutions, in different ways (Zheng, 2025). AI in teaching is described as an academic technology that can identify patterns in real-life or existing data and make automated teaching decisions created for academic goals to improve the teaching and learning experience (Díaz & Nussbaum, 2024). Literature indicates that AI can assist in addressing particular educational requirements, accommodating different learning methods, serving as a learning guide, improving the effectiveness of the educational process, and guiding learners in crafting career plans (Huang et al., 2021).

2.3. Digital literacy

Conventionally, literacy was characterized as the ability to read and write, yet it is important to recognize that defining digital literacy precisely is a complex challenge due to the evolving dimension of this concept. Specifically, digital literacy is affected by new technologies and societal shifts in online conversation (Taskin & Ok, 2022) In today's technology-based world, digital literacy is a fundamental aspect that involves both the willingness and the skills to utilize technologies, such as communication instruments to access information (Li & Yu, 2022). Additionally, it pertains to how individuals handle, assess, and evaluate knowledge, resulting in the creation of new knowledge. Acquiring this knowledge allows people to communicate with others and actively participate in society (Tinmaz et al., 2022). Digital literacy, which encompasses various literacies associated with the use of digital technologies, is essential for engaging in online learning settings, such as collaborating with teachers and peers. (Peng et al., 2024; Zhang, 2023). Similarly, digital literacy denotes a person's ability to access, create, and share necessary information, alongside the use of modern technologies for academic purposes. It also involves using technology appropriately (Wu et al., 2024). Within the educational setting, teachers must possess these skills, which are vital for fostering critical thinking and discerning the authenticity of information in e-learning (Xu & Guo, 2024). Digital literacy has a range of skills, including creativity, collaboration and communication abilities, critical thinking, problem-solving skills, decision-making abilities, understanding of technological constructs, and the capacity to utilize technology effectively to gain digital citizenship (Xu & Guo, 2024).

2.4. Teacher well-being

The term well-being relates to the positive occupational interactions of individuals, which includes five eudemonic dimensions, namely, the ability to build relationships at work, opportunities for development and improvement within the workplace, competence perception, being appreciated and recognized for one's help, and having a sense of engagement in one's tasks (Mercer, 2021). Based on the existing literature, well-being can be defined from two different perspectives, eudemonic and hedonic (Derakhshan et al., 2022; Fan & Wang, 2022; Wang & Derakhshan, 2024). The first viewpoint is exclusively linked to achieving pleasure and the pursuit of happiness in life as Mercer and Gregersen (2020) defined well-being as attaining satisfaction. Conversely, the other approaches to enhancing well-being focus on personal development and involve examining one's life experiences. This perspective paves the way for mental well-being and optimizes the capability to efficiently utilize the material in a way that infuses life with goals (Wang et al., 2024). The key methods that exemplify the well-being theory prefer a long-term outlook on goals and commitment to happiness, rather than seeking quick satisfaction and entertainment. When people frequently encounter positive emotions, they actively engage in various life dimensions, maintain interpersonal relationships, and make progress toward their objectives, resulting in them flourishing and experiencing a high well-being level (Gunathilaka et al., 2022). To effectively use AI in the AI-based context, teachers need to identify its relevance, engage with its aids, and encourage its use to improve their own well-being as it is suggested that educators with higher well-being are more likely to effectively use AI tools (Almaki et al., 2025).

2.5. Teacher self-efficacy

In the field of education, educator efficacy pertains to the beliefs that teachers hold concerning their capacity to bring about positive changes in their learners' academic achievements (Zhi & Derakhshan, 2024). Based on social cognitive theory, self-efficacy influences people's cognition, emotional conditions, and behavioral inclinations (Bandura, 2010; Zhi et al., 2024). Within this theoretical framework, it plays a significant role in shaping people's aims and activities and is affected by contextual environmental elements (Peng et al., 2024). Zhi et al. (2024) stated that teacher efficacy means their ability to efficiently plan, organize, and execute the essential tasks to achieve a particular academic goal and engagement. Research has shown that educators with a higher degree of efficacy exhibit improved skills in managing learners with challenging behaviors and show greater empathy, persistence, and acceptance of new teaching methods (Mok & Moore, 2019). To effectively use AI in an AI-based context, teachers need to have higher self-efficacy to enhance their engagement. The high degrees of self-efficacy guarantee a high willingness to integrate AI into teaching (Lim, 2023).

2.6. Current Empirical studies

Given the pivotal role teachers have in influencing educational practices, it is crucial to deal with the difficulties faced by Chinese EFL teachers in an AI-based context (Zheng,

2025). Undoubtedly, the successful utilization of AI relies on the digital literacy of teachers, which empowers them to exploit these instruments to develop more interactive, customized, and engaging learning settings. Therefore, based on Zheng's (2025) study, it is expected that teachers not only grasp the AI concept but also implement it effectively to enhance learning efficacy and engagement. Without sufficient digital literacy, these teachers may find it difficult to adjust to technological advancements, potentially affecting their success. For instance, educators have little knowledge and comprehension of AI and how it can be applied in the educational sphere (Chounta et al., 2022; Ng et al., 2023). Despite the importance of digital literacy, self-efficacy, and well-being, there is a lack of research examining the complex relationships among these factors in an AI-based context. Existing studies have predominantly focused on these three individual aspects without considering their interconnectedness. For instance, Kahveci (2021) investigated the link between digital literacy and educator self-efficacy, emphasizing foreign language teachers' self-efficacy. The results revealed an important positive correlation between digital literacy and educator self-efficacy. Gunathilaka et al. (2022) studied the interaction of digital literacy, psychological well-being, and the efficiency of remote education and learning during the pandemic. The findings suggest that digital literacy has a negative effect on educators' psychological well-being. In their study, Shonfeld et al. (2022) stated that educators with strong literacy proficiencies can affect the teaching procedure, thereby enhancing learner educators' self-efficacy and finally enhancing functions. With advanced literacy proficiencies, educators will possess the latest information. Garzon and Garzon (2023) analyzed how the technological profile, digital literacy, and self-efficacy of educators are related in a blended learning environment. Correlation analysis revealed a strong link between teachers' technological profiles and their digital literacy, which also showed a significant and strong correlation with self-efficacy. Lim (2023) investigated how educators' digital literacy and self-efficacy influence their understanding of AI teaching for younger learners, with findings confirming the connection among these variables. Ramazani and Talebi (2023) investigate the connection between preservice educators' knowledge literacy, digital literacy, and ICT self-efficacy in education. The findings indicate that preservice educators' perceived knowledge literacy has a direct and positive impact on their ICT self-efficacy. In a study, Esmaeil et al. (2025) explored the connection between digital literacy and transformational leadership in the context of educators' professional development, focusing on the mediating effect of self-efficacy. Their results indicated that digital literacy has a positive and significant direct effect on both professional development and self-efficacy, as does on transformational leadership. The purpose of the present research is to examine the connections between digital literacy, efficacy, and well-being among Chinese EFL educators in the AI-based context.

3. Method

3.1. Participants

A total of 341 EFL educators participated in this study, consisting of educators involved in teaching English through AI at different institutions across China. The subjects were aged 23 to 65 (M = 39.38, SD = 9.53), including 83 male and 236 female educators.

Their educational experience differed, 16 had Associate of Arts, 231 of them had Bachelor's degrees, 64 had Master's degrees, and 8 were achieving Ph.D, all in the field of English language education as reported in Table below. The educators demonstrated a wide range of education experience, 1 - 29 years. Before completing the survey, they were informed about the study's aims, with reassurances of their freedom and confidentiality.

Table 1. *Demographic Features of the Participants*

Feature	Part	Frequency	Percent
Gender	Male	83	26.0
	Female	236	74.0
Academic Degree	Associate of Arts	16	5.0
	Bachelor of Arts	231	72.4
	Master of Arts	64	20.1
	Ph.D.	8	2.5
Major	Applied Linguistics	71	22.3
	Linguistics	30	9.4
	English Language Literature	53	16.6
	English Language Translation	75	23.5
	Teaching English to Speakers of Other Languages (TESOL)	10	3.1
	Teaching English as a Foreign Language (TEFL)	29	9.1
	Teaching English as a Second Language (TESL)	17	5.3
	Other	34	10.7
Teaching Experience	1-5	80	25.1
	6-10	70	21.9
	11-15	67	21.0
	16-20	31	9.7
	21-25	22	6.9
	More	49	15.4
Total		319	100.0

3.2. Instruments

3.2.1. Digital Literacy scale

Amin et al. (2021) created the scale which contains 36 items measured on 5-point Likert points (ranging from 1 for strong disagreement to 5 for strongly agree). It addresses not only the fundamental digital functional proficiencies but also emphasizes the social, psychological, moral, and ethical dimensions. The scale's reliability was 0.861 in this study.

3.2.2. Teacher well-being scale

Collie et al. (2015) created a questionnaire that comprised 16 items, each item is assessed via a 7-point Likert scale, (ranging from negative to positive). It evaluates three distinct aspects of well-being, which include stress and challenges related to workload. The second aspect, termed "hierarchical well-being," investigates teachers' understanding of their work environment, which consists of the operational processes of the school, its cultural atmosphere, and the methods employed in learner instruction. The ultimate class examines the quality of the interactions between educators and students, as well as teachers' understanding of learners' behavior and motivational factors. In this analysis, the reliability of the scale was 0.725.

3.2.3. Teacher self-efficacy scale

The assessment of educator efficacy was carried out using a scale devised by Tschannen-Moran and Hoy (2001). This scale contains 26 items utilizing a 7-point Likert scale ranging from 1 to 7 (with 1 representing strong disagreement and 7 indicating strongly agree). The elements of this scale include mastery of experience, secondary experience, social persuasion, and psychological awareness. The scale reliability in this research was 0.841.

3.3. Procedure

Before starting data collection, subjects were informed about the academic objectives of the research, highlighting the voluntary type of their participation. Forms of consent along with the three inventories were shared by the WeChat platform to ease data gathering from different regions of China. Subjects were fully aware of their right to withdraw from the research at any time. Given their roles as teachers, two weeks were given for subjects to carefully review and answer the inventories. Ultimately, 341 authentic and full answers were obtained. Finally, from 341 collected answers, 16 cases with odd patterns (10 constant, 4 decreasing, and 2 increasing) were spotted and discarded. Moreover, the standard deviations of answers for each respondent were calculated and those with values below 0.5 (6 cases) were excluded as they were also considered as unengaged respondents. The final sample was left with 319 cases. The data were then reviewed by the author before submitting it to SPSS for more analysis.

3.4 Data Analysis

To respond to the research questions, the data collected from the inventories was analyzed using structural equation modeling (SEM). Additionally, the reliability of each inventory was comprehensively reported. The relationships among the variables were explored following the inherent covariance in the model. Moreover, Multiple Regression Analysis was conducted to assess the predictive roles of such variables.

4. RESULTS

A confirmatory factor analysis (CFA) model was created to make sure that the instruments are valid in the given context. All the instruments used in the study had items in their second order. Using SEM, the standardized and unstandardized loadings of the items were inspected to make sure of convergent validity. The results are reported in Table 2, below.

Table 2. *Unstandardized and Standardize Estimates of the CFA Model*

			Unstandardized				Standardized Estimate
			Estimate	S.E.	C.R.	P	
WB01	←	Workload	1.000				.362
WB04	←	Workload	1.765	.356	4.959	.000	.569
WB07	←	Workload	2.095	.410	5.109	.000	.637
WB10	←	Workload	1.450	.311	4.657	.000	.477
WB12	←	Workload	.705	.225	3.132	.002	.241
WB15	←	Workload	1.927	.384	5.021	.000	.594
WB02	←	Organization	1.000				.563
WB05	←	Organization	1.490	.155	9.595	.000	.779
EB08	←	Organization	1.078	.124	8.685	.000	.656
WB11	←	Organization	1.112	.126	8.793	.000	.668
WB13	←	Organization	1.065	.114	9.385	.000	.747
WB16	←	Organization	.963	.122	7.908	.000	.570
WB03	←	S.Interaction	1.000				.673
WB06	←	S.Interaction	.861	.091	9.439	.000	.658
WB09	←	S.Interaction	.989	.101	9.773	.000	.690
WB14	←	S.Interaction	1.039	.104	10.031	.000	.719
TE01	←	ME	1.000				.825
TE02	←	ME	.916	.071	12.849	.000	.669
TE03	←	ME	1.033	.064	16.245	.000	.799
TE04	←	ME	1.009	.062	16.218	.000	.798
TE05	←	ME	.966	.061	15.915	.000	.787
TE06	←	ME	.881	.062	14.164	.000	.722
TE07	←	VE	1.000				.705
TE08	←	VE	1.018	.095	10.671	.000	.653
TE09	←	VE	.996	.095	10.478	.000	.640
TE10	←	VE	1.295	.099	13.074	.000	.816
TE11	←	VE	1.172	.090	13.018	.000	.812
TE12	←	VE	.786	.117	6.719	.000	.405
TE13	←	SP	1.000				.654
TE14	←	SP	1.227	.111	11.090	.000	.729
TE15	←	SP	1.008	.120	8.377	.000	.526
TE16	←	SP	1.123	.128	8.742	.000	.551
TE17	←	SP	1.213	.114	10.623	.000	.691
TE18	←	SP	1.389	.117	11.826	.000	.791

			Unstandardized				Standardized Estimate
			Estimate	S.E.	C.R.	P	
TE19	←	SP	1.394	.139	10.056	.000	.648
TE20	←	SP	1.361	.135	10.102	.000	.651
TE21	←	PA	1.000				.696
TE22	←	PA	1.020	.082	12.395	.000	.739
TE23	←	PA	1.081	.077	14.047	.000	.845
TE24	←	PA	.939	.070	13.394	.000	.803
TE25	←	PA	1.019	.070	14.535	.000	.878
TE26	←	PA	1.047	.075	13.996	.000	.842
DL01	←	Communication	1.000				.461
DL02	←	Communication	.076	.156	.490	.624	.028
DL03	←	Communication	1.310	.193	6.773	.000	.516
DL04	←	Communication	1.890	.218	8.681	.000	.914
DL05	←	Communication	1.918	.220	8.715	.000	.939
DL06	←	Communication	1.296	.182	7.125	.000	.565
DL07	←	Communication	-.367	.177	-2.078	.038	-.123
DL08	←	Copyright	1.000				.411
DL09	←	Copyright	1.801	.314	5.727	.000	.859
DL10	←	Copyright	.877	.204	4.308	.000	.325
DL11	←	Copyright	.718	.186	3.868	.000	.280
DL12	←	CT	.293	.142	2.066	.039	.149
DL13	←	CT	1.000				.638
DL14	←	CT	-.124	.151	-.821	.412	-.059
DL15	←	Character	1.000				.511
DL16	←	Character	1.356	.179	7.583	.000	.703
DL17	←	Character	1.164	.152	7.662	.000	.727
DL18	←	Citizenship	1.000				.747
DL19	←	Citizenship	.940	.080	11.725	.000	.689
DL20	←	Citizenship	1.000	.085	11.802	.000	.693
DL21	←	Citizenship	1.032	.077	13.370	.000	.785
DL22	←	Curation	1.000				.813
DL23	←	Curation	.602	.079	7.639	.000	.481
DL24	←	Curation	.446	.082	5.422	.000	.339
DL25	←	Connected	1.000				.755
DL26	←	Connected	1.060	.080	13.203	.000	.810
DL27	←	Connected	.995	.076	13.069	.000	.796
DL28	←	Connected	.280	.064	4.359	.000	.265
DL29	←	Connected	.681	.071	9.648	.000	.580
DL30	←	Creativity	1.000				.629
DL31	←	Creativity	1.512	.148	10.219	.000	.924
DL32	←	Creativity	1.269	.119	10.638	.000	.730
DL33	←	Creativity	.288	.090	3.200	.001	.193
DL34	←	Collaboration	1.000				.600
DL35	←	Collaboration	1.273	.145	8.812	.000	.803
DL36	←	Collaboration	1.112	.124	8.946	.000	.739

The inspection of the results in Table 2 showed that there were two items (items 2 and 14 in the digital literacy questionnaire) with non-significant loadings. Moreover, three items (items 1, 10, and 12) from the questionnaire of well-being, one item (item 12) from the questionnaire of teacher efficacy, and 10 items from the questionnaire of digital literacy showed standardized loadings below 0.5. These items were excluded as they endangered the convergent validity of the instruments (Kline, 2016). Figure 1 delineates the final modified CFA model.

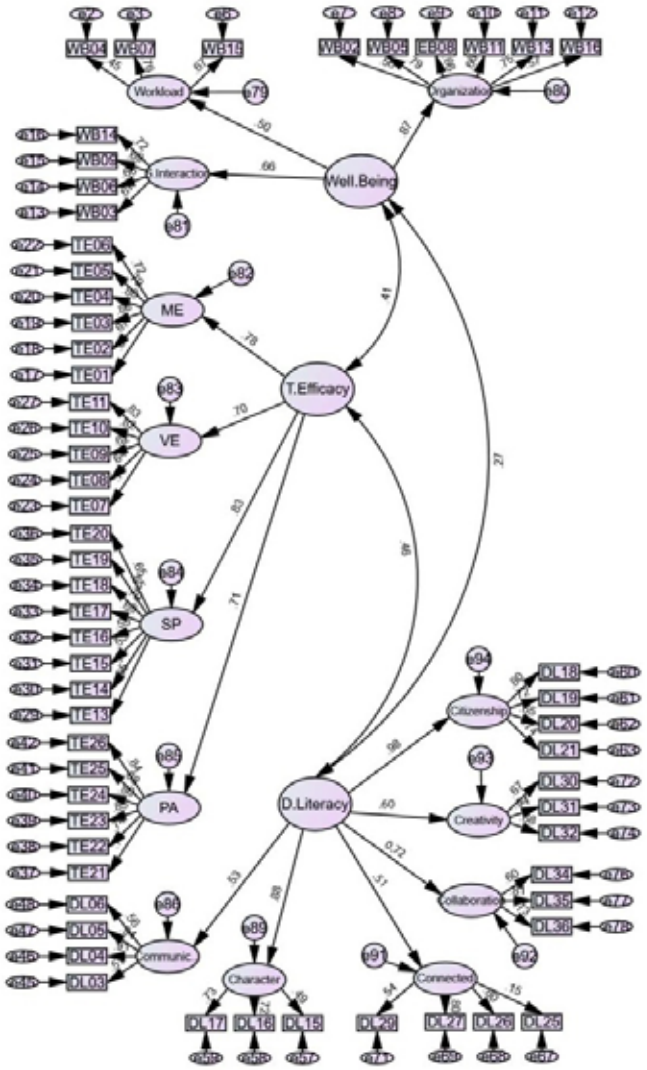

Figure 1. *The Final Modified CFA Model with Standardized Estimates*

Table 3. *Reliability and Validity of the Factors*

					Fornell - Larcker Criterion		
	CR	AVE	MSV	MaxR(H)	Well-being	Well-being	Digital literacy
Well-being	0.725	0.501	0.167	0.806	**0.708**	Self-efficacy	
Self-efficacy	0.841	0.571	0.210	0.852	0.409**	**0.756**	
Digital literacy	0.861	0.524	0.210	0.963	0.274**	0.458**	**0.724**

** Correlation is significant at p < .01

Next, the reliability and discriminant validity of the model were checked out. Table 3 summarizes the results. The inspection of the correlations documented that there are significant correlations (p< .01) between all pairs of factors. Strong relationships exist between well-being and efficacy (*r* = .41) as well as digital literacy and efficacy (*r* = .46), while the correlation between digital literacy and well-being (*r* = 27) was moderate. Finally, a measurement model was created to inspect the power of predictability digital literacy has over well-being and efficacy. The results are reported in Table 4 and depicted in Figure 2.

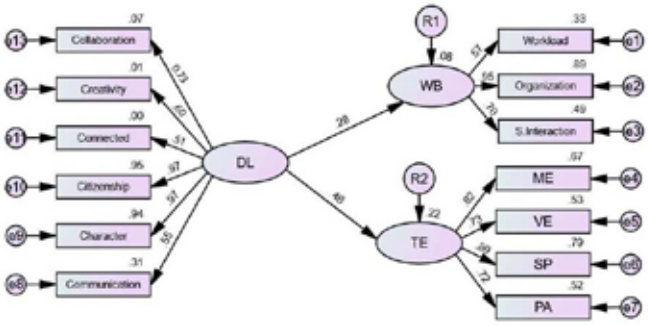

Figure 2. *The Final Measurement Model*

Table 4. *Results of Linear Regression Analysis with SEM*

			Weight	S.E.	C.R.	P	β	R^2
well-being	←	Digital literacy	.349	.085	4.133	.000	.284	.081
self-efficacy	←	Digital literacy	1.169	.175	6.665	.000	.464	.215

As reported in Table 4, digital literacy was a significant predictor of both variables and could predict 21.5% of the variance in teacher efficacy and 8.1% of the variance in well-being.

5. Discussion

The study indicates that digital literacy impacts EFL teachers' well-being. Educators with strong digital literacy are more likely to feel assured in their capacity to manage and use AI. This assurance can alleviate the tension and anxiety related to incorporating new instruments into their educational practices. Digital literacy can also enhance educators' work-

life equilibrium by facilitating the utilization of AI instruments to automate administrative duties like grading and tracking attendance. Decreasing the time dedicated to these activities allows educators to dedicate more time to education and personal tasks. This enhanced efficiency can foster an improved work-life equilibrium and, as a result, better well-being (Gunathilaka et al., 2022). Educators who are proficient in utilizing AI instruments can refine their instructional methods, engage learners more efficiently, and achieve enhanced educational results. This sense of achievement can substantially elevate their well-being. Educators with robust digital literacy proficiencies tend to be more resilient and compatible with transformations within the teaching perspective. The swift incorporation of AI into classes necessitates that educators consistently update their proficiencies and adjust to new technologies. Digital literacy lays the groundwork for educators to keep up with technological progress and successfully incorporate AI instruments into their educational methods. Being able to utilize AI instruments can boost educators' confidence in their capacity to manage the changing educational setting, thereby supporting their well-being.

The study indicates that digital literacy impacts EFL teachers' self-efficacy. Educators who possess higher digital literacy display a higher positive and assured self-image as teachers. They are more inclined to regard their AI comprehension as a resource to improve their instructional methods which is in line with Esmaeil et al. (2025). Indeed, they might see themselves as competent teachers, equipping learners for the difficulties and chances associated with the use of AI. Conversely, educators with limited knowledge of digital literacy might view AI as a possible danger that can substitute their role, resulting in diminished self-efficacy and reluctance to incorporate AI in their classes. The results of this research align with those of Kahveci (2021) and Ramazani and Talebi (2023) who identified a strong positive link between digital literacy and educators' self-efficacy. Their findings indicate that digital literacy positively influences ICT self-efficacy, allowing for more effective use of technology across various settings. Digitally literate educators are more likely to feel assured in their capability to efficiently utilize AI-based instruments, which bolsters their self-efficacy. Studies indicate that digital literacy enhances educators' self-efficacy by providing them with the necessary competence and knowledge to manage complicated AI systems and instruments (Zhang, 2023). This finding aligns with Lim (2023) and Shonfeld et al. (2022), who showed a direct relationship between digital literacy and educator self-efficacy. This likely indicates that the more digital literacy educators possess, the stronger their sense of self-efficacy becomes. Educators who possess stronger digital literacy are more inclined to pursue ongoing professional development (PD) to remain updated with the newest AI instruments and instructional techniques. This continuous learning journey can improve their educational efficacy by equipping them with the most up-to-date and impactful strategies for incorporating AI into their class. The findings align with research by Garzon and Garzon (2023), which revealed that specific PD initiatives centered on digital literacy considerably increased educators' confidence and efficacy in utilizing AI instruments. These results emphasize the necessity of offering continuous aid and training for educators to ensure they possess the essential proficiencies to manage the AI-based context.

The results can be justified in line with SDT. In essence, when EFL educators' psychological requirements for competence, autonomy, and relatedness are met by digital literacy, their self-efficacy and well-being tend to be enhanced. Educators who are adept at using digital

tools can make independent choices about applying effective teaching methods, feel part of a supportive community, and will potentially trust in their effective teaching abilities. This enhanced self-efficacy can yield improved teaching results. SDT offers a thorough framework for understanding how digital literacy can beneficially affect EFL educators' well-being by meeting their demands. By nurturing these demands, digital literacy can improve educators' job satisfaction, lessen stress, and contribute to their feeling of professional satisfaction.

6. Conclusion and Implications

In the context of EFL teaching, digital literacy can significantly impact teachers' well-being and efficacy, especially in AI-enhanced settings. Examining the connections among these variables allows us to present practical suggestions for teachers, policy-makers, and scholars to improve teachers' efficacy and well-being. This research is specifically relevant as China continues its significant investments in teaching and AI technology. EFL educators with strong digital literacy can select and personalize AI instruments that are consistent with their teaching methods and goals. This capacity to make autonomous choices about technology usage can enhance their well-being (Passey, 2021). When educators have digital literacy, they can efficiently utilize AI to offer customized learning experiences, provide immediate feedback, and efficiently handle class assignments. This enhanced skill can enhance their educational well-being and efficacy (Lim, 2023). Digital literacy enables educators to engage in internet-based professional learning forums, share tools, and cooperate with colleagues globally. This feeling of community and mutual learning can bolster educators' well-being by satisfying their demand for relatedness. As technology progresses, educators need to adapt to new instruments and methods to improve their instructional practices. Comprehending how EFL educators gain and develop their well-being and efficacy concerning their digital literacy can aid in designing specific professional development programs. These programs can concentrate on improving digital literacy proficiencies, enhancing educator efficacy, and improving well-being by dealing with the particular requirements and difficulties encountered by EFL educators in an AI-based context. For instance, PD programs for Chinese EFL educators ought to emphasize both the development of technical proficiencies as well as the enhancement of educators' confidence and the promotion of their psychological health. This approach will empower educators to effectively utilize AI-based instruments, gain greater confidence in their capabilities, and sustain a healthy work-life equilibrium. Creating detailed PD programs ought to encompass training on AI-based instruments and technologies and equipping educators to effectively boost their digital literacy. This, in turn, can enhance educators' self-efficacy and confidence, leading to improved educational results.

The research also has its limitations. First, it was done with 319 Chinese subjects. Future studies on the variables examined and their link with digital literacy, educator self-efficacy, and well-being could engage bigger samples in diverse geographic and cultural settings, potentially producing various findings. Second, being a cross-sectional, quantitative study, further research could utilize longitudinal, qualitative methods that might offer a more thorough understanding of the relationship among these variables. Such research may result in enriched findings regarding the effects of AI training, educators' majors, and other factors. Lastly, this research concentrated solely on whether subjects engaged in AI-based PD tasks.

Therefore, additional studies could be developed with more specific classifications regarding educators' participation in AI-based educator training to assess the efficacy of these programs.

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