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A Study on Digital Literacy of English Teachers in Private Universities in the Era of Generative Artificial Intelligence

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Abstract: The digital transformation has imposed new requirements on the professional development of foreign language teachers in higher education. Focusing on English teachers in private universities, this study employs questionnaires and interviews to investigate the status and influencing factors of their digital literacy. The findings reveal a notable pattern of "advanced awareness lagging behind practical competency." While teachers demonstrate strong digital awareness, higher-order abilities remain weak. Their digital knowledge is characterized by "strong operational skills but weak theoretical understanding," and technology use is largely confined to conventional tools, with limited integration of cutting-edge technologies. Furthermore, digital literacy development is dually constrained by pragmatic individual motivation and fragmented institutional support. This study provides empirical evidence for systematically cultivating digital literacy and constructing support mechanisms for foreign language teachers in private universities.

Keywords: digital literacy, private universities, english teachers, influencing factors

1. Introduction

The rapid advancement of generative AI is profoundly transforming foreign language teaching. AI tools enhance teaching efficiency and facilitate intelligent, adaptive, and blended learning models, reshaping teachers' roles from knowledge transmitters to learning facilitators and ethical gatekeepers of technology.

Foreign language education is uniquely intertwined with digital technology. Language is both the carrier and content of information, making digital means essential for instructional design and implementation. It is widely acknowledged that constructing authentic language learning scenarios today is difficult without technological integration. This demands that teachers combine linguistic, cultural, and practical skills while addressing personalized and interactive learning needs.

Digital literacy has thus become a core competency for foreign language teachers. However, research on digital literacy among English teachers in private universities remains limited. This study employs questionnaires and interviews to investigate its current state and influencing factors.

2. literature review

Digital literacy, as a comprehensive concept that continuously evolves alongside technological iterations, has seen its connotations deepen within academic discourse. Gilster (1997)[1] initially defined it as the ability to understand and use information resources presented via computer media, emphasizing the central role of critically evaluating digital information. Subsequent research highlighted the cognitive aspect of digital literacy, recognizing individual thinking

and awareness as integral components. For instance, Kinzer (2010)[2] stressed the capacity for critical identification, processing, and evaluation of information within individual digital practices. In recent years, building upon the traditional dimensions of "skill operation" and "cognitive understanding," digital literacy has incorporated a "social participation" dimension. Scholars have noted that digital literacy is essentially a competency rooted in specific socio-cultural practices. It manifests as the sum of an individual's awareness, attitudes, and abilities to use digital tools to identify, access, manage, integrate, evaluate, and analyze information within authentic contexts, thereby constructing new knowledge and engaging in effective collaboration. Its development also contributes to the positive construction of an individual's social literacy (Tang & Chaw, 2016)[3].

China has been placing increasing emphasis on digital literacy. In 2021, the Central Cyberspace Affairs Commission issued the *Action Plan for Enhancing Digital Literacy and Skills of the Whole People*, marking the first systematic strategic deployment of this concept at the national level. The document specifically highlighted the need to focus on improving teachers' awareness and ability to use digital technology to optimize education and teaching. This move signifies that, against the backdrop of deepening globalization and informatization, digital literacy has become a crucial issue concerning national development and educational innovation. To implement this plan, the Ministry of Education formally promulgated the standard of *Teacher Digital Literacy* in 2022, clearly defining the core connotations and a tiered indicator system for teacher digital literacy. This framework encompasses five first-level dimensions: digital awareness, digital technology knowledge and skills, digital application, digital social responsibility, and professional development. These are further subdivided into 13 second-level and 33 third-level dimensions, thus providing an authoritative and actionable basis for educational institutions at all levels to assess and develop teacher digital literacy.

Within the field of language education research, scholars have recently explored various aspects related to teacher digital literacy, including theoretical model construction, assessment, influencing factors, transformation into teaching practice, and perceptions and attitudes towards digital teaching. For example, Tour (2015) [4]investigated the relationship between university English teachers' digital literacy practices and their digital mindsets. The study found that their in-class and out-of-class digital literacy practices were closely linked to their digital mindsets, with the core lying in teachers' perception and interpretation of the pedagogical "affordances" provided by digital technology. Fang and Chen (2018)[5] surveyed the digital literacy of foreign language teachers in Chinese universities, finding that while teachers could independently use information facilities and resources, they were deficient in guiding students. The research by Jiang et al. (2021)[6] indicated that the diverse approaches foreign language teachers employed in digital multimodal writing instruction were attributable to significant variations in their digital literacy levels. Teachers' digital technology usage behaviors were influenced by multiple factors, including their perceptions of themselves, their students, and the teaching environment. Hu and Zhang (2023)[7] employed questionnaires, classroom observations, and interviews to study the beliefs and practices of digital literacy among university foreign language teachers. Their research revealed that the digital beliefs of Chinese foreign language teachers had not been effectively translated into digital teaching practices. Pan and Wang (2025)[8] conducted a comprehensive investigation involving 782 English teachers from 54 universities across 17 provinces in China. Using latent profile analysis, they identified four distinct AI literacy profiles: Poor AI Literacy (C1: 12.1%), Moderate AI Literacy (C2: 45.5%), Good AI Literacy (C3: 28.4%), and Excellent AI Literacy (C4: 14.1%). These findings suggest that the majority of Chinese EFL teachers (87.9%) perceived their AI literacy to be at a moderate or higher level, while only a small proportion (12.1%) regarded their AI literacy as relatively low.

In summary, existing literature shows that the connotation of digital literacy has evolved from basic skill operation to a composite competency integrating cognition, practice, and social participation, and has been incorporated into the strategic framework for teacher development in China. Although research in foreign language education has has begun to explore the relationship between teacher digital literacy and teaching practice, there remains a lack of

systematic investigation targeting the specific group of English teachers in private universities. In light of this, this study will utilize questionnaires and interviews to investigate the level and influencing factors of digital literacy among English teachers in private universities, aiming to provide a basis for enhancing the digital literacy of this group.

3. Research design

This study employs a combination of a questionnaire survey and teacher interviews to examine the digital literacy level of English teachers in private universities and its influencing factors. Specifically, it addresses the following two research questions:

(1)What is the current state of digital literacy among English teachers in private universities?

(2) What factors influence the current digital literacy of teachers in private universities?

3.1 Questionnaire Survey

Based on the *Teacher Digital Literacy* framework and foreign language teaching characteristics, a questionnaire was developed covering four dimensions: digital awareness, knowledge, competency, and ethics. It comprised three parts: (1) demographic information, (2) current digital literacy status, and (3) influencing factors, including internal and external factors, such as self-efficacy, motivation,training, etc. All main items used a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The main body of the questionnaire comprises 42 items.

The development of the questionnaire followed these steps: First, preliminary items were drafted. Subsequently, interviews with English teachers were conducted to form the initial draft of the questionnaire. Next, two peer experts were invited to review and provide suggestions for revision, leading to a modified version for pilot testing. Afterwards, five teachers participated in the pilot test. Based on their feedback and the pilot test results, the wording of the items was further adjusted to finalize the official questionnaire. The questionnaire was distributed online via an online survey platform (Wenjuanxing), targeting English teachers from several private universities in ** Province. A total of 125 questionnaires were collected. Applying the criteria of an average response time of no less than 5 minutes and excluding responses where all answers were identical, 12 invalid questionnaires were removed, resulting in 113 valid questionnaires. The valid response rate was 90.40%.

Table 4-1 Demographic Profile of the Survey Sample

Variable	Category	Number（N）	Percentage（%）
Gender	Male	18	15.93
	Female	95	84.07
Age	20-29 years	5	4.42
	30-39 years	54	47.79
	40-49 years	41	36.28
	50 years and above	13	11.51
Teaching Experience	0-5 years	6	5.31
	6-10 years	47	41.59
	11-20 years	56	49.56
	More than 20 years	4	3.54
Professional title	Unrated	7	6.19
	Intermediate	87	76.99
	Senior	19	16.82

Reliability and validity of the digital literacy scale were assessed. Cronbach's α was 0.935 for the overall scale and ranged from 0.930 to 0.967 across dimensions, all exceeding 0.70, indicating good reliability (Table 4-2).

The KMO value was 0.910, and Bartlett's test was significant ($p < 0.001$), confirming factor analysis suitability. Principal component analysis extracted four factors (eigenvalues >1), explaining 70.894% of variance. Factor loadings ranged from 0.737 to 0.920 with no significant cross-loadings. The four factors corresponded to digital teaching competency, awareness, knowledge, and ethics, aligning with the theoretical framework and demonstrating good structural validity.

Table 4-2 Reliability Analysis of the Questionnaire on the Current State of Digital Literacy among English Teachers in Private Universities

Dimension	Number of Items	Cronbach's α
Digital Awareness	6	0.934
Digital Knowledge	4	0.934
Digital Teaching Competency	19	0.967
Digital Ethics	4	0.930
Total Digital Literacy Scale	33	0.935

The influencing factors scale demonstrated good reliability (Cronbach's α= 0.875), with internal factors at 0.944 and external factors at 0.953, all exceeding 0.70.

For validity, KMO = 0.875 and Bartlett's test was significant ($p < 0.001$), confirming factor analysis suitability. Exploratory factor analysis extracted two factors (eigenvalues >1) explaining 84.078% of variance, indicating good structural validity. The factors were named "internal factors" and "external factors" based on item characteristics (see Table 4-3).

Table 4-3 Reliability Analysis of the Influencing Factors Scale for English Teachers' Digital Literacy in Private Universities

Dimension	Number of Items	Cronbach's α
Internal Factors	3	0.944
External Factors	6	0.953
Total Influencing Factors Scale	9	0.875

3.2 Teacher Interviews

Following the questionnaire survey, three English teachers were selected from private universities, varying in gender, age, professional title, and educational background, from the survey sample for individual interviews. The aim was to further explore the current state of teachers' digital practices and the factors influencing them. The interview content primarily focused on three aspects: first, to further investigate the actual situation and specific details of teachers' use of digital tools in teaching; second, to delve into the motivations and rationales behind teachers' digital practices and to probe into the influencing factors; and third, to gain a deeper understanding of the difficulties and challenges teachers encounter in digital practice, the training they have received, and their related suggestions. The interview data were used to supplement and contextualize the questionnaire findings.

4. Research Findings

4.1 Overall Situation of Digital Literacy

Table 4-4 presents the descriptive statistical results of the first-level dimensions of digital literacy among English teachers in private universities. Overall, the average scores of the respondents across all dimensions are higher than the midpoint of the scale (3), indicating that their digital literacy is generally at an above-average level.

In terms of the mean distribution, the Digital Awareness dimension scored the highest (M = 4.1121, SD = 0.92540), suggesting that most teachers fully recognize the importance of digital technology—especially against the backdrop of generative artificial intelligence—for English language teaching, and hold relatively positive attitudes and cognitions. This is followed by the Digital Knowledge dimension (M = 3.9204, SD = 0.91711), indicating that teachers have a certain understanding of the basic principles and usage of digital tools and related technologies, though there is still room for improvement.

In contrast, the scores for the Digital Competency dimension (M = 3.8265, SD = 0.91287) and the Digital Ethics dimension (M = 3.8208, SD = 1.11727) are relatively lower. Notably, the standard deviation of the Digital Ethics dimension is considerably large, reflecting noticeable disparities among teachers in their awareness of digital ethical norms and their practical implementation. This suggests that some teachers still need to strengthen their practical ability to apply digital technologies, as well as their understanding and enactment of data security, academic integrity, and technology ethics.

Overall, the digital literacy of English teachers in private universities exhibits a structural characteristic of "high level of awareness, yet relatively insufficient competency and ethical practice." This finding provides an empirical basis for subsequent targeted efforts to enhance teachers' digital literacy.

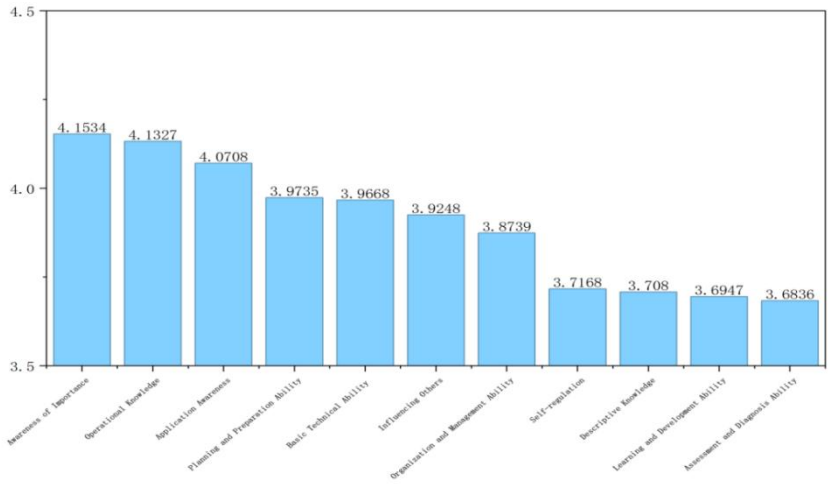
Table 4-4 Overall Situation of Digital Literacy Among English Teachers in Private Universities

Dimension	N	Minimum	Maximum	Mean	Std.Deviation
Digital Awareness	113	1.00	5.00	4.1121	0.92540
Digital Knowledge	113	1.60	5.00	3.9204	0.91711
Digital competency	113	1.56	5.00	3.8265	0.91287
Digital Ethics	113	1.00	5.00	3.8208	1.11727

4.2 Dimensional Analysis and Qualitative Interpretation of the Current State of Digital Literacy

To gain a concrete understanding of the current situation, further analysis of the sub-dimensions under the four dimensions was conducted in sequence based on the interview results (see Figure 4-1). The findings are as follows:

Figure 4-1 Bar Chart of Sub-dimension Means of Digital Literacy



4.2.1 Digital Awareness

Digital awareness primarily encompasses awareness of importance and application awareness, with mean scores of 4.1534 and 4.0708, respectively. As shown in Figure 4-1, these two items rank first and third among all sub-dimensions, indicating that English teachers demonstrate a highly prominent level of informational teaching awareness. They clearly recognize digital technology as a fundamental prerequisite for reshaping modern teaching, believe that the deep integration of technology into language instruction can effectively create authentic contexts and expand learning boundaries, and hold intrinsic recognition towards actively embracing technology to innovate teaching models.

This quantitative finding is further supported and elaborated by interview data. As Teacher T1 remarked: *"Nowadays, using digital tools in class is no longer a question of 'whether to use them,' but rather 'how to use them well.' Especially for today's students, who are accustomed to online interaction, if teaching methods remain limited to textbooks and PowerPoint, classroom appeal will be greatly diminished."*

This reflects that digital technology has shifted from being an 'option' to a 'necessity' in teaching—a transformation driven both by the external trend of technological advancement and by proactive responses to changes in students' learning habits.

At the level of application awareness, however, scores for items concerning attention to and attempts to use

emerging technologies such as *AI agents* and *virtual simulation* were relatively low. This suggests that while teachers generally possess the willingness to use conventional digital tools, the habit of actively exploring cutting-edge technologies and applying them to pedagogical innovation has not yet been widely established. Digital literacy has not been fully translated into practical digital application.

Overall, English teachers demonstrate a relatively strong level of informational teaching awareness, with widespread recognition of the value of technology and a willingness to engage in integrated practices. Nevertheless, within the dimension of awareness itself, the progression from "proficient use of existing tools" to "active exploration of frontier technologies" remains insufficient. This finding echoes the previously identified relative weakness in digital teaching competency, jointly revealing the specific bottleneck in the transformation process from awareness to competence.

4.2.2 Digital Knowledge

The digital knowledge dimension is divided into two sub-dimensions: descriptive knowledge (concepts and principles) and operational knowledge (procedures and methods). Data analysis reveals a significant gap between the two mean scores (descriptive knowledge: M = 3.708; operational knowledge: M=4.1327), ranking ninth and second, respectively, among all 11 sub-dimensions. This indicates that teachers' mastery of "how to operate" is considerably stronger than their theoretical understanding of "why it works."

Due to its strong theoretical nature and seemingly indirect connection to immediate teaching practice, descriptive knowledge often fails to become a focal point for teachers' attention and learning. As Teacher T2 stated in the interview: *"During digital technology training sessions, experts usually gloss over the conceptual principles and theoretical knowledge related to informational design. Instead, they focus more on demonstrating concrete operations with examples. Naturally, we also care more about 'how to apply this in the classroom,' and seldom dig deeper into those academic-oriented bodies of knowledge."*

This statement reveals that a practice-oriented training model, combined with teachers' practical demand for "learning for immediate application," has jointly shaped their knowledge structure characterized by "emphasis on operation, neglect of theory."

In contrast, teachers demonstrate a solid grasp of operational knowledge, reflecting their general confidence and clear understanding of how to effectively integrate digital tools into teaching design, implementation, and evaluation. However, the relative weakness in theoretical knowledge may also constrain their capacity for adaptive modification and deep integration when facing complex teaching scenarios or emerging technologies.

Therefore, the current structure of digital knowledge presents a distinct feature of being "strong in practice, weak in theory." While teachers' command of operational knowledge is highly satisfactory, their mastery of theoretical knowledge concerning digital instructional design, implementation, and evaluation remains comparatively insufficient.

4.2.3 Digital Teaching Competency

Digital teaching competency primarily refers to teachers' comprehensive ability to effectively utilize digital tools, platforms, and resources in English instruction and to achieve professional self-development within digital environments. As the practical core of the digital literacy system, this study deconstructs it into five key sub-dimensions, with mean scores ranked as follows: Planning and Preparation Ability (M = 3.9735), Basic Technical Ability (M = 3.9668), Organization and Management Ability (M = 3.8739), Learning and Development Ability (M = 3.6947), and Assessment and Diagnosis Ability (M = 3.6836).

Data indicate that teachers demonstrate relatively solid performance in pre-class resource integration and operation of common tools. They are capable of proactively using digital platforms to assign tasks, design activities, and conduct school-based adaptation of teaching resources, reflecting sound instructional design awareness and technological adaptability. All three interviewed teachers mentioned that they regularly assign tasks in advance on platforms such as *Xuexitong* and *U Campus*, and subsequently review and summarize completion during class. Rather than directly

adopting ready-made courseware or digital lesson plans provided by publishers, they reprocess and redesign these materials to better meet the specific needs of their students, thereby serving instructional goals more precisely. Teacher T3 shared: "*I often transform written writing tasks by adding digital elements—for example, asking students to produce short videos introducing the benefits of travel. This enhances students' ability to use language comprehensively for communication and expression in authentic, multidimensional digital contexts*."

However, interviews also revealed that some teachers' use of digital platforms remains primarily at the stage of task assignment and submission, without fully exploiting their potential for data analysis.

Nevertheless, the competency structure exhibits a clear pattern of "emphasis on pre-planning, neglect of dynamic adaptation; strength in operation, weakness in evaluation." At the classroom implementation level, while teachers are able to carry out interactive activities based on digital tools—such as collaborative online note-taking, co-editing documents, and mind mapping—with the entire process automatically recorded and visualized through digital platforms to achieve deep participation from all students, they still demonstrate insufficiency in handling dynamic situations such as unexpected technical failures or implementing differentiated task management. Systematic integration of digital practices has not yet become the norm.

Most notably, Assessment and Diagnosis Ability is the weakest among all sub-dimensions. Interview data reveal three specific manifestations: First, teachers are relatively cautious in using digital evaluation data collection tools. Teachers T1 and T2 did not fully utilize the testing modules provided by digital course platforms to assess student learning outcomes; none of the three interviewed teachers used online writing feedback platforms to analyze overall class performance and common issues. Second, there is a lack of visualization and interpretation of academic data. Although the digital course platforms teachers had begun using already included visualization features for metrics such as assignment completion rates, learning time, and test scores, teachers did not use this visualized information to provide feedback during instruction, nor did they encourage students to independently consult the platforms for self-monitoring. Third, teachers did not adequately leverage artificial intelligence technologies to deliver precise, personalized evaluative feedback. In providing feedback, the three teachers relied primarily on their personal experience to conduct relatively subjective analyses and evaluations of students' logical reasoning and language quality. Due to time constraints, only a few groups were able to share their work in class, while the remaining groups received no specific feedback; even the presenting groups received only general comments. It is evident that the insufficient use of intelligent assessment tools constrains the effectiveness of classroom feedback. Within the constraints of limited class time, how to harness the advantages of digital platforms to enable more precise personalized teaching has emerged as a key challenge in enhancing teachers' digital competency.

Furthermore, teachers demonstrate significant deficiencies in their capacity for continuous learning and self-directed professional development. Although they are aware of the learning pressure brought about by technological iteration, their professional development often lacks systematicity and sustainability due to constraints of time and energy, unclear learning pathways, and insufficient external support. As a result, the renewal of their digital literacy tends to lag behind technological advancements.

4.2.4 Digital Ethics

This dimension is divided into two sub-dimensions: Self-regulation and Influencing Others, with mean scores of 3.7168 and 3.9248, respectively. The former ranks eighth among all sub-dimensions, which is largely attributable to one particular item concerning citing sources when using online resources, which scored only 3.62. This data reflects that some teachers have not yet developed the habit of properly acknowledging sources when using open resources in teaching, indicating room for improvement in their awareness of intellectual property and academic norms.

The Influencing Others sub-dimension scored relatively higher. In interviews, all three teachers mentioned that they place great emphasis on cultivating students' digital literacy and encourage students to independently collect digital resources to complete tasks. Teacher T2 considered this approach well-aligned with students' characteristics—their

attention to digital tools and preference for online communication. Teacher T3, meanwhile, designs tasks with a certain level of challenge. In response to these challenges, some students attempted to use intelligent writing tools to complete their assignments. However, the automatically generated essays failed to meet their expectations in terms of logic and language quality, and the students ultimately chose to write independently. It is worth noting that although the students' attempts did not achieve the desired outcomes, Teacher T3 maintains an open attitude toward the use of intelligent tools and emphasizes their reasonable and appropriate application.

4.3 Analysis of Factors Influencing the Digital Literacy of English Teachers in Private Universities

In developing the questionnaire and interview protocols, this study drew on prior literature to hypothesize potential factors influencing teachers' digital literacy. These factors were categorized into two broad dimensions: internal factors and external factors.

Table 4-5 presents the descriptive statistics for each dimension. Overall, the mean score for the influencing factors scale was 3.7365, exceeding the theoretical median value of 3, indicating that the participating teachers generally perceived multiple factors as exerting a certain degree of influence on the development of their digital literacy.

Table 4-5 Descriptive Statistics of Influencing Factors on Digital Literacy of English Teachers in Private Universities

Dimension	N	Minimum	Maximum	Mean	Std. Deviation
Internal Factors	113	1.00	5.00	3.8702	1.16278
External Factors	113	1.00	5.00	3.6696	1.12290
Overall	113	1.44	5.00	3.7365	0.87730

At the dimensional level, the internal influence dimension scored higher than the external influence dimension. The mean score for internal influences was 3.8702 (SD=1.16278), suggesting that factors such as teachers' intrinsic motivation, self-efficacy, and personal attitudes play a relatively prominent role in enhancing their digital literacy. In contrast, the mean score for external influences was 3.6696 (SD=1.12290) , which, while still above the median, was comparatively lower. This indicates that institutional support, training resources, and the broader environment exert a relatively limited influence. The standard deviations for both dimensions (around 1.0) suggest considerable individual variation in teachers' perceptions of these influencing factors. Overall, the development of digital literacy among English teachers in private universities is simultaneously driven by internal dispositions and constrained by external conditions, with internal factors playing a more prominent role.

4.3.1 Internal Factors

(1) Self-efficacy

Self-efficacy refers to teachers' beliefs in their ability to successfully use digital technologies to accomplish teaching tasks. In this study, the mean score for the relevant items was 3.9711, indicating moderate self-efficacy. However, notable generational and contextual gaps exist: younger teachers experiment more readily, while some experienced teachers exhibit "operational confidence" but "failure anxiety" regarding deeper integration. This limits higher-order digital literacy development.Therefore, self-efficacy constitutes a critical internal factor influencing the development of English teachers' digital literacy.

(2) Intrinsic Motivation

With a mean of 4.1256, teachers' motivation strongly influences digital literacy. Yet their learning is highly pragmatic and just-in-time—focused on immediate classroom needs (e.g., using platforms to assign tasks) rather than sustained theoretical or cutting-edge exploration. As Teacher T2 noted: "*The knowledge from the training was excellent, and I was excited at the time. But if I don't apply it to my teaching immediately, I forget it quickly.*"This "learn for use" orientation facilitates tool adoption but results in fragmented knowledge, constraining pedagogical innovation.

(3) Behavioral Factors

Digital literacy develops through use and interaction. While technology use is frequent (M=3.8966), it is largely limited to preparatory, one-way tasks (e.g., lesson preparation). There is a marked deficiency in using technology for learning analysis, interactive design, or collaborative inquiry. Peer exchanges remain problem-driven and superficial, lacking sustained dialogue on deep technology-pedagogy integration, thus hindering the diffusion of digital literacy in teaching practice.

4.3.2 External Factors

(1) Digital Literacy Training System

The mean score for this item was 4.1635, indicating that teachers highly value digital literacy training, but interview data reveal widespread dissatisfaction with the existing training system, which is often characterized by generic content, monotonous delivery formats, and a lack of evaluation mechanisms. Training is often vendor-led, focusing on tool operation with limited connection to English teaching. As Teacher T3 observed: *"The training teaches you 'how to use the platform,' not 'how to teach English using the platfor*m'."

Furthermore, predominantly delivered via lectures or online courses, training lacks follow-up support, leaving teachers "excited during training but struggling to implement." This disconnect hampers sustained digital literacy development.

(2) Policy and Institutional Support

Most private universities lack systematic incentives for digital literacy or tolerance for experimentation. Routine evaluation prioritizes workload and test scores, with insufficient recognition of digital innovation. Teacher T1 noted : *"Developing a blended learning course takes hundreds of hours, yet it counts for the same workload as a traditional course. Naturally, motivation is low."* Additionally, fear of technical failures (e.g., platform crashes) leads to conservative practices. The absence of both incentives and failure tolerance undermines institutional momentum for digital innovation.

(3) University-Industry Collaboration Ecosystem

University-industry collaboration is a distinctive feature of private universities and offers a unique practical arena for developing teachers' digital literacy. However, collaboration remains limited to traditional forms like internships. Digital resources provided (e.g., simulation platforms) are often misaligned with English teaching contexts, requiring extensive adaptation. Moreover, there are few cases of joint research and development in digital teaching or co-construction of intelligent language learning environments. As a result, such collaborations have not effectively evolved into sustained, institutionalized support systems for teachers' digital literacy enhancement.Transforming enterprise technical advantages into sustainable resources for pedagogical innovation in English teaching remains a critical bottleneck.

In summary, digital literacy development among English teachers in private universities is simultaneously shaped by internal factors, including self-efficacy, intrinsic motivation, and behavioral patterns, and meanwhile conditioned by external factors, such as the training system, institutional policies, and the university-industry collaboration ecosystem. As Wu et al. (2025)[9] note, "behavioral practice constitutes the direct pathway for the formation of teachers' digital literacy, while external support serves as an essential safeguard for its enhancement." Currently, the combination of pragmatic internal motivation and systemic gaps in external support jointly contributes to the slow progression of teachers' digital literacy along the chain of "awareness—knowledge—competency—innovation."

5. Discussion

5.1 The Significant "Awareness-Competency" Gap: Structural Fault Lines in Digital Literacy Development

This study reveals that the digital literacy of English teachers in private universities exhibits a characteristic pattern of "advanced awareness lagging behind practical competency." Teachers scored highest on digital

awareness—particularly perceived importance—indicating that the group has generally developed positive technology identification. This finding aligns with Hu and Zhang's (2023)[7] study, which also found that foreign language teachers recognize the indispensable role of digital technology in modern foreign language education. However, digital teaching competency—the core of digital literacy—scored the lowest and demonstrated the greatest internal variation. This disparity reveals that strong willingness to use technology has not been effectively or evenly translated into robust teaching practice. Critically, within the competency sub-dimensions, the higher-order capacities involving innovative assessment, personalized diagnosis, and continuous learning (i.e., assessment and diagnosis ability, learning and development ability) were the weakest. This configuration of "easy to know, difficult to act" coupled with "high-order deficiency" constitutes the primary structural contradiction in current digital literacy development.

5.2 Dual Imbalances in "Practice-Theory" and "Conventional-Cutting Edge": Limitations in Knowledge Base and Application Orientation

The study identifies a dual imbalance in teachers' digital literacy concerning both their knowledge base and application orientation. In terms of knowledge structure, a pattern of "strong operational knowledge, weak descriptive knowledge" prevails. While teachers are adept at knowing "how to operate," they lack sufficient understanding of the educational principles and design logic underpinning the technologies. This gap constrains their capacity for flexible adaptation and deep integration in complex teaching scenarios. Regarding application orientation, teachers are "proficient with conventional tools but disengaged from cutting-edge exploration." Although they competently use mainstream platforms to execute established instructional workflows, their awareness and ability to actively engage with and attempt to integrate emerging technologies—such as AI and virtual simulation—into teaching are notably insufficient. This dual imbalance impedes the capacity of digital literacy to support fundamental innovation in instructional models.

5.3 Pragmatic Internal Drive and Fragmented External Support: Insufficient Systemic Support for Literacy Development

Analysis of influencing mechanisms indicates that the development of teachers' digital literacy is jointly constrained by both internal and external factors. Internally, teachers' learning motivation demonstrates a pronounced pragmatic and just-in-time orientation, lacking systematic and sustained investment in theoretical frameworks and cutting-edge technologies. Externally, institutional support systems are characterized by fragmentation and misalignment: training content is disconnected from disciplinary teaching realities; institutional policies lack effective incentive mechanisms and tolerance for experimentation; and university-industry collaboration has yet to provide deep support for digital teaching innovation. These findings are consistent with Lee and Chung's (2021)[10] research, which also identified deficiencies in teacher training, teacher collaboration, and the development of professional learning communities as persistent challenges in teacher digital literacy enhancement. This conjunction of "short-term internal motivation" and "fragmented external support" results in an insufficient and unsystematic supply of energy for teachers' digital literacy development, making it difficult to surmount the critical bottleneck impeding the transition from "tool application" to "pedagogical transformation."

6. implication and recommendations

6.1 Implications for Teacher Development: The Path from "Technology User" to "Wise Designer"

Individual teachers need to proactively upgrade their role perception. First, they must transcend tool-oriented thinking and strengthen their identity as "designers." Teachers should recognize that the essence of digital literacy lies not in how many tools one can operate proficiently, but in the capacity for critical selection, creative integration, and pedagogical design of technology based on instructional objectives and student needs. This requires teachers to consciously supplement descriptive knowledge while mastering operational knowledge, and to understand the learning science principles behind technologies, thereby enhancing their decision-making and adaptive capabilities in authentic,

complex teaching contexts.

Second, teachers should establish a personal practice cycle of "assessment-reflection-iteration." In response to the current weakness in assessment and diagnosis abilities, teachers should purposefully utilize the data analysis functions of digital platforms to conduct regular tracking and visual analysis of student learning processes. By reflecting on instructional effectiveness based on such data, they can form a closed loop of "design-implementation-assessment-optimization." This approach not only enhances precision teaching capacity but also generates process-oriented evidence that itself constitutes a valuable asset for professional development.

6.2 Implications for Institutional Support: Constructing a "Precisely Empowering, Systematically Incentivizing" Support Ecosystem

Institutional administrators must shift from fragmented support to systematic, precisely targeted empowerment systems.

First, implement "discipline-integrated, problem-oriented" precision training. Move beyond one-size-fits-all lectures toward blended formats combining workshops, lesson study, and professional learning communities. Content should address authentic English teaching challenges (e.g., AI for writing feedback, virtual simulation tasks), enhancing teachers' higher-order integration competencies through real problem-solving—an approach aligned with Lee and Chung's (2021) [10] community-based practical learning.

Second, foster a "teaching innovation-friendly" institutional environment. Adjust evaluation and incentive systems to recognize and reward teachers' digital teaching innovations, such as developing digital resources or smart teaching cases. Establish tolerance mechanisms for experimentation, reframing setbacks as professional learning rather than teaching accidents, thereby encouraging exploration of cutting-edge technologies.

Third, deepen "pedagogy-oriented" university-industry collaboration. Move beyond traditional internships and co-developed courses to establish "Digital Teaching Innovation Laboratories" or joint projects with industry partners. These initiatives can introduce cutting-edge platforms and authentic corpora, enabling co-development of virtual simulation and intelligent assessment scenarios tailored to English instruction. This transforms collaboration from resource input to deep, co-innovative partnership, providing sustained practical arenas and resource support for teachers' digital literacy development.

Conclusion

Situated within the context of digital transformation, this study focuses on English teachers in private universities as a specific population. Employing a mixed-methods approach integrating quantitative and qualitative methodologies, it systematically investigates the current state, structural characteristics, and influencing factors of their digital literacy. The findings indicate that while teachers' digital literacy is generally at a relatively good level, there exist significant fault lines along the transformation chain of "awareness—knowledge—competency". This manifests as a complex picture characterized by high identification, strong operational foundations, yet weak practical innovation and shallow theoretical support, a configuration dually constrained by the pragmatic orientation of individual intrinsic motivation and the fragmentation of institutional external support systems.

This study reveals the authentic patterns and specific bottlenecks in teacher competency development within the standardized framework, while providing empirical evidence for understanding the developmental logic of digital literacy under the background of application-oriented and characteristic-oriented education. The findings hold direct implications for how private universities can design training content, reconstruct institutional incentive environments, and activate university-industry collaboration resources to facilitate the systematic leap in teachers' digital literacy from "tool application" to "pedagogical innovation".

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References

[1] Gilster,P.1997.*Digital Literacy*[M].New York:Wiley Computer Publishing.

[2] Kinzer,C.K.Considering literacy and policy in the context of digital environments[J]. *Language Arts,*2010(1).

[3] Tang，C．M．&L．Y．Chaw．Digital literacy:A prerequisite for effective learning in a blended learning environment[J]. *Electronic Journal of E-Learning*，2016(1).

[4] Tour,E. 2015. Digital mindsets: Teachers' technology use in personal life and teaching[J]. *Language Learning&Technology,*(3):124-139.

[5] Fang, X. C., & Chen, J. L. (2018). The current situation and planning suggestions of foreign language education informatization in Chinese universities. *Foreign Language Education*, (2), 57-62.

[6] Jiang,L.,S.Yu &Y.Zhao.2021.Teacher engagement with digital multimodal composing in a Chinese tertiary EFL curriculum[J].*Language Teaching Research*,(4):613-632.

[7] Hu, J. H., & Zhang, T. F. (2023). A study on the beliefs and practices of digital literacy among Chinese university foreign language teachers. *Foreign Languages and Their Teaching*, (5), 73-85.

[8] Pan, Z., and Y. Wang. 2025. From Technology-challenged Teachers to Empowered Digitalized Citizens: Exploring the Profiles and Antecedents of Teacher AI Literacy in the Chinese EFL Context.*European Journal of* Education 60, no. 1: 1–16. https://doi.org/10.1111/ejed.70020.

[9] Wu, X. M., Huang, Y. H., & Wu, L. (2025). Factors influencing the digital literacy of teachers in higher vocational colleges and strategies for improvement. *China Higher Education Research*, (12), 101-108.

[10] Lee，C．&S．Chung．Navigating online language teaching in uncertain times:Challenges and strategies of EFL educators in creating a sustainable technology-mediated language learning environment［J］.*Sustainability*，2021(14).