

Research Article

EFL Teachers' Digital Identity Development: Reaching out to Teacher Engagement Based on Experience Levels

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ABSTRACT

This mixed-methods study examined digital identity development and engagement among 77 novice and experienced Iranian EFL teachers, with particular attention to experience-based differences and perceived barriers to pedagogical digital integration. Data were collected through an adapted Digital Identity Scale and semi-structured interviews. Quantitative analyses revealed that novice teachers significantly outperformed experienced teachers in overall digital identity as well as in digital pedagogical content knowledge, digital intercultural and lifelong learning, professional digital criticality, and digital professional agency, with moderate to large effect sizes. The findings suggest that digital identity is a dynamic, socially mediated construct influenced by generational exposure to technology and ongoing participation in digital environments. However, differences in reported pedagogical enactment were comparatively modest, suggesting that digital competence does not automatically translate into instructional implementation. Thematic analysis identified four interrelated categories of barriers—technical, institutional, pedagogical, and personal—whose salience varied by experience level. While experienced teachers emphasized resistance to change, confidence-related tensions, and identity vulnerability, novice teachers highlighted challenges in managing digitally enriched classrooms. Overall, digital identity emerged as a dynamic, socially situated construct shaped by agency, emotional readiness, and institutional affordances. The study underscores the need for differentiated and context-sensitive professional development models to sustain meaningful digital engagement in EFL settings.

Introduction

The integration of digital technologies into education has profoundly transformed the field of language instruction, most notably within the domain of English as a Foreign Language (EFL) (Kilag et al., 2023; Reinders et al., 2022). This transformation has led to traditional pedagogical approaches are being increasingly supplemented or replaced by innovative digital tools, thereby fostering more interactive and dynamic learning environments (Ng et al., 2021). EFL teachers serve as the primary agents of this shift, tasked with incorporating multimedia tools, online platforms, and communication technologies into classroom practice (Ning et al., 2024). Furthermore, the rapidly evolving media ecology shapes EFL teachers' digital identities, which in turn significantly influence their broader professional identities (Lee & Kim, 2014). Digital identity is a context-dependent construct shaped by variables, such as teachers' digital literacy, the frequency of engagement in digital environments, and the use of social networking services (Norton & Toohey, 2011). Such engagement encompasses both the intensity of technology use and the depth of pedagogical integration. However, despite the widespread availability of digital resources, there remains an inadequate understanding of the nature and depth of teachers' digital engagement (Aydin, 2020), which poses challenges for effective and sustainable implementation.

Existing studies have mainly concentrated on EFL teachers' adoption of technology, digital literacy, or attitudes toward creating digital teaching environments (Chen & Wang, 2020; Mei, 2019; Kohnke et al., 2024), rather than on the sustainability, quality, and multifaceted nature of their engagement across emotional, cognitive, social, behavioral, and

pedagogical dimensions (Al-Obaydi et al., 2025). In this context, engagement extends beyond mere technology implementation to encompass teachers' emotional commitment, instructional innovation, and enthusiasm for adapting to evolving digital ecosystems (Derakhshan & Fathi, 2023). Therefore, EFL teacher engagement in digital environments has emerged as a significant factor influencing pedagogical effectiveness, learners' motivation, and learning outcomes (Cao, 2023; Van Der Want et al., 2019). A lack of adequate empirical insight into the factors impeding purposeful teacher online engagement poses a risk to the practicality of digital language instruction, potentially restricting learner motivation, interaction, and education outcomes. Therefore, a deeper investigation into EFL teachers' formation of digital identity and engagement in digital environments is needed to inform pedagogical strategies, institutional support, and future teacher professional development. The present study attempts to bridge this gap by examining the perceived barriers to integrating teachers' digital knowledge into their teaching practice.

Literature Review

Gee (2000) characterizes identity as "acting and interacting as a certain kind of person" (p. 100), maintaining individuals shape identity through participation in particular social practices. Goode (2010) regards identity as a product of involvement in groups. Identity has also been conceptualized differently in educational contexts (Derakhshan et al., 2021) as well. In this regard, Pennington (2015) defines identity as a subjective model or impression of what being a teacher indicates. Teacher identity involves personal and professional aspects tied to time and context

reflecting an individual's incentive and commitment to the career (Rinne et al., 2023) and an evolving understanding of teachers' activities and interactions within their context (Hanna et al., 2022). This multidimensional construct is a coherent, socially acknowledged depiction of teachers' professional roles (Tsang & Jiang, 2018).

There is growing evidence that teacher identity development is closely connected to teaching practices and learner achievement (Li et al., 2023). In fact, teacher identity has been considered as a focal point in professional development (Marisa et al., 2024; Sun & Sun, 2025). More specifically, teacher professional identity is described as a positive perception of the job (Xu et al., 2023), including commitment and passion (Wang, 2025). By clarifying the relation between pedagogy and teacher identity, Bernstein (2000) presents pedagogic identity as the link between the teacher, the learner, and socially generated knowledge. The relational nature of pedagogic identity shows that teacher professional identity is formed through interactions with professional, cultural, and social environments (Akkerman & Meijer, 2011). Through these interactions, individuals develop an image of themselves as professional teachers, shaped by expectations from both themselves and others (Lasky, 2005). This understanding supports the basic assumption that identity is context-dependent, socially constructed, and dynamic over time (Rodgers & Scott, 2008). When identity is viewed as a unified construct, the focus shifts to teachers' perspectives, in which the teacher emerges as a key agent in fostering teacher identity (Zhang et al., 2024).

Teacher identity is an evolving and multifaceted construct that shapes how educators understand and enact their roles in technology-rich classrooms (Lai & Jin, 2021;

Popper-Giveon & Shayshon, 2017). Accordingly, teacher digital identity is an ongoing and dynamic process encompassing making sense and reinterpretation of the values, beliefs, and educational experiences in light of new forms of interaction in the contemporary digital society (Robson, 2018). Boyd and Ellison (2008) argued that digital identity is shaped through community processes such as network structure, online and offline social networks, and emotional management. Similarly, Goode (2010) suggested that the conceptual foundation of digital identity rests on four dimensions of belief systems: beliefs about technological capabilities, the significance of technology, the opportunities and barriers of participation, and motivation to learn about technology.

Drawing on social practice theory (Lave & Wenger, 1991), Vianna and Stetsenko (2011) explained the relationship between the individual and social dimensions of digital identity and proposed an approach that positions teachers' engagement with sociocultural practices as a foundation for both learning and identity construction. Engagement is commonly conceptualized as comprising cognitive, behavioral, and emotional dimensions (e.g., Shakki, 2023). Accordingly, teachers' emotional engagement in contextually situated sociocultural practices which are shaped by norms and values of their communities (e.g., online courses) is regarded as a crucial basis for digital identity development (Banegas et al., 2022). Similarly, Stetsenko (2017) argued that this relationship can be clarified by specifying the conditions under which identity and learning interact. This can be addressed through the transformative activist stance (TAS), a framework inspired by Vygotsky and Galperin. Within this framework, community

practices and individual contributions are emphasized as foundations for identity development and learning engagement. From this perspective, identity development involves seeking meaningful activities that make a difference and affirm one's uniqueness (Stetsenko, 2017).

Given the TAS perspective, teacher digital identity may be constructed through teachers' engagement in designing digital environments and online learning experiences (Rezai et al., 2024); this engagement provides the foundation for teachers to obtain the cultural tools that enable them to participate in and contribute to social practices necessary for professionals' distinctiveness (Engeness, 2020). From this perspective, teachers' engagement in learning about and designing digital environments can be considered as an active process of becoming digitally agentic professionals who can enhance learning with technology and support students as learners. Such assumptions are evident in other studies (e.g., Avidov-Ungar & Forkosh-Baruch, 2018; Li et al., 2024) which emphasize the need for teachers to be confident in their digital identity in order to generate meaningful learning practices that engage learners and support their development. However, online engagement demands that educators possess digital skills (Jusmawati et al., 2023). In other words, it is essential to prepare educators, to become digitally literate (Guo et al., 2023). Digital literacy, generally described as the ability to access, evaluate, and use digital tools effectively in different contexts (Bawden, 2008), plays a crucial role in helping EFL teachers engage in the complex digital environments (Ma, 2025).

Teachers' digital identity is usually examined through their engagement in training on pedagogical digital technologies,

participation in online projects, and digital assessment practices (Engeness, 2020; Koosel, 2013; Supriadi et al., 2022). In a study conducted by Trevisan (2024), the uneven quality of such training in initial teacher education and in-service settings was found to hinder the development of teachers' digital identity; accordingly, the design of specialized programs that engage teachers in digital environments is advocated to strengthen teacher resilience in an increasingly digitalized educational landscape. Moreover, some studies (e.g., Schneider, 2015; Xu et al., 2023; Zimmer et al., 2021) have explored teachers' digital identity from a learning perspective and extended technological understanding to teaching students how to use digital tools to enhance their confidence and literacy competence. A growing body of research has also explored the quality and quantity of digital engagement in the EFL field. While some investigations associate engagement with the amount of time spent on or the frequency of online activities (Rashid, 2016), recent studies suggest that deeper and strategic engagement, such as designing instructional content and employing AI tools, predicts achievement more reliably (Lai & Chen, 2022; Nugraha et al., 2025; Shou et al., 2024).

Despite these developments, a significant gap persists in the empirical integration of the challenges associated with teachers' digital engagement and identity development within EFL contexts. Existing literature frequently examines these variables in isolation, often overlooking the interactive influences that shape identity development in digital environments (Abdelhalim et al., 2025; Mozafari et al., 2023). Consequently, a holistic model incorporating both quantitative and qualitative dimensions is necessary to accurately capture the nuanced realities of

EFL teachers' digital engagement within educational systems such as Iran's. The dimensions of engagement in the present study are rooted in the engagement framework initially proposed by Norris (2001) and subsequently expanded by Lee and Kim (2014). This framework posits that engagement comprises three overlapping dimensions: cognitive, behavioral, and emotional. The research questions are as follows:

1. Is there any significant difference between the digital identity formation of novice and experienced Iranian EFL teachers in digital environments?
2. Is there any significant difference between the engagement of novice and experienced Iranian EFL teachers in digital environments?
3. What are the perceived barriers that novice and experienced Iranian EFL teachers face when integrating their digital knowledge into their teaching practices?

Method

The study employed a mixed-methods design to compare novice and experienced Iranian EFL teachers in relation to digital identity formation, digital engagement, and perceived barriers to integrating digital knowledge into instructional practice. Data were gathered online using an adapted Digital

Identity Scale and a semi-structured interview; the latter conducted through Telegram voice messages in Persian. Quantitative data were analyzed using normality testing, independent-samples t-tests, and chi-square tests, whereas qualitative data were examined thematically following Braun and Clarke's framework.

Participants

A total of 77 volunteer EFL teachers from public and private high schools in Iranian cities of Tehran and Karaj were recruited using convenience sampling. Participants were selected based on their proficiency in digital tools and engagement in new media environments. The sample comprised 13 males and 62 females with ages ranging from 21 to 52 years ($M=32.4$, $SD=7.19$). Teachers were divided into novice ($n=43$) and experienced ($n=34$) groups based on their years of teaching experience. Referring to the literature, 0-5 years of teaching was considered novice, and more than 5 years as experienced. Overall, the participants' teaching experience ranged from 3 months to 24 years ($M=10.5$, $SD=5.26$). They held degrees in English literature ($n=18$), applied linguistics ($n=49$), and translation ($n=10$), specifically 56 B.A., 16 M.A., and 5 Ph.D. holders. Participant demographics are summarized in Table 1.

Table 1
Participants' Demographic Information

	Gender		Age		Academic Degree			Teaching experience	
	Males	Females	M	SD	Undergraduate	Postgraduate	Ph.D.	M	SD
Novice	2	41	31.84	8.68	42	9	0	7.59	3.88
Experienced	11	23	36.12	6.25	14	7	5	13.04	6.91

Instruments

The primary instrument used in this study was adapted from Lee and Kim's (2014) Digital Identity Scale, which was originally developed and validated for EFL learners (Appendix). It comprised three sections: 1) participants' background information, 2) participants' range of online activities in which they engage (engagement in digital environment), 2) participants' attitudes towards multiliteracy, using technology in teaching English, and the value of new media (digital identity formation). The engagement part consisted of items categorized into three thematic domains representing the multifaceted nature of digital engagement:

1. Behavioral Engagement (Items 1–17):

Captures observable digital activities, such as resource searching, online instruction, and professional collaboration.

2. Cognitive Engagement (Items 4, 5, 7, 13, 15):

Reflects the investment of effort into professional learning, material creation, and information retrieval.

3. Emotional Engagement (Items 18–20):

Measures the internal states of motivation, confidence, and professional outlook regarding digital integration.

The digital identity formation part of the scale comprises 25 items rated on a 5-point Likert scale (1 = *Strongly Disagree* to 5 = *Strongly Agree*), organized into four domains:

1. Digital Professional Agency (DPA):

(Items 1, 2, 7, 10, 13)

2. Digital Pedagogical Content Knowledge (DPCK):

(Items 9, 11, 12, 18, 20, 21)

3. Professional Digital Criticality (PDC):

(Items 3, 4, 5, 6, 14, 15, 16)

4. Digital Intercultural & Lifelong Learning (DILL):

(Items 8, 17, 19, 22, 23, 24, 25)

To ensure that the modified items in the scale accurately reflected the construct of

teacher digital identity formation and engagement in digital environments, and to align the instrument with the professional context of EFL teachers, several modifications were made to the item phrasing by subjecting it to an expert review process. A panel of three specialists in CALL (Computer-Assisted Language Learning) and three professors in applied linguistics reviewed the items for clarity, relevance, and representativeness. Since the nature of the digital engagement instrument was descriptive, content validity was the primary focus. The experts evaluated the inventory for domain relevance and contextual appropriateness. Through their feedback, minor adjustments were made to the wording of some items to ensure they accurately represent current EFL professional practices. The panel reached an average content validity index (S-CVI/Ave) of 0.91, confirming that the items adequately cover the dimensions of digital engagement. The scale construct validity is supported by its logical alignment with established theories of engagement. By segregating the items into Behavioral, Cognitive, and Emotional domains, the inventory creates a mapping that allows for the comparison of engagement levels between different cohorts (e.g., Novice vs. Experienced teachers). As demonstrated in the results section, the instrument successfully captures statistically significant differences in these domains, confirming its sensitivity in distinguishing professional digital engagement profiles.

Since the engagement items are descriptive and frequency-based rather than summative scales, internal consistency metrics (Cronbach's alpha) are not applicable. Instead, we ensured temporal stability through a test-retest procedure. A subsample of 30 teachers completed the inventory twice over a

two-week interval. The test-retest reliability was calculated using Cohen's Kappa (κ /kappa) for categorical choices, yielding an average $\kappa=.84$, which indicates a strong level of agreement and stability in teachers' self-reported engagement patterns.

The items in the digital identity formation part of the scale were also reviewed by the same experts and as a result, some adjustments were made to the wording of some items. Given these modifications and the change in target population, a comprehensive validation was conducted. Construct validity was established through exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) using 30 participants. An EFA was also conducted to verify the factor structure. Sampling adequacy was confirmed via the Kaiser-Meyer-Olkin (KMO) measure (.92) and Bartlett's test of sphericity ($p<.001$). A four-factor solution was retained based on eigenvalues > 1 , accounting for 62.5% of the

total variance. All 25 items exhibited factor loadings $\geq .40$ on their respective domains, with no significant cross-loadings.

To confirm the structural validity of the four-factor model, a CFA was conducted using maximum likelihood estimation. The model demonstrated a good fit to the empirical data: $\chi^2/df=1.85$, CFI=.96, TLI=.95, and RMSEA= (90% CI [.03,.07]). All standardized factor loadings for the items were statistically significant ($p<.001$) and exceeded the threshold of .50, supporting the convergent validity of the measurement model.

To ensure the reliability of the four-factor model, internal consistency was assessed using Cronbach's alpha. As presented in Table 2, the subscales demonstrated satisfactory to excellent reliability, ranging from .82 to .91, with the total scale showing high consistency ($\alpha = .93$).

Table 2

Reliability and Factorial Distribution of the Digital Identity Formation Scale

Domain	No. of Items	Cronbach's α
1. Digital Professional Agency (DPA)	5	.82
2. Digital Pedagogical Content Knowledge (DPCK)	6	.88
3. Professional Digital Criticality (PDC)	7	.85
4. Digital Intercultural & Lifelong Learning (DILL)	7	.91
Total Scale	25	.93

To explore the barriers that experienced and novice teachers perceive when integrating their digital knowledge into teaching practices, a semi-structured interview was developed based on the objectives of the study and the relevant literature. The initial interview protocol included the following two open-ended questions:

1. From your perspective, what are the primary institutional or environmental challenges (such as infrastructure,

curriculum constraints, or administrative support) that hinder your ability to effectively implement digital tools in your English language classrooms?

2. Could you describe any personal challenges or hesitations you feel when trying to integrate your digital knowledge into actual teaching practices?

The initial draft of the interview questions was reviewed by three professors of applied linguistics, who were asked to provide their

feedback. Based on their comments, two pilot interviews were conducted with two teachers, one novice and one experienced, who were not part of the main study sample. The interview guide was subsequently revised in light of the professors' feedback and the results of the pilot interviews. The final version of the interview retained only the second question.

Data Collection Procedures

Data were collected online via social media platforms using a semi-structured interview and a three-part questionnaire. Initially, the purpose of the study was shared in teachers' community groups on social media, and participants were informed that their participation was voluntary, and they would remain anonymous by using pseudonyms in transcription and reporting, and they could withdraw at any stage. Of the 104 teachers who completed the questionnaires, 77 teachers from both experienced and novice groups consented to participate in the interviews, which were conducted in participants' first language (Persian) to ensure participants' comfort and depth of expression. Participants were asked to describe, in as much detail as possible, the challenges they have experienced when engaging with digital environments for teaching and professional development. They recorded their voice messages and sent them individually to the researcher via a private Telegram account. This mode of data collection was selected to provide a familiar, low-pressure medium that supports natural speech and emotional nuance, while also offering privacy and flexibility, which may facilitate deeper reflection and trustworthiness in self-expression. Each voice message lasted between one and three and a half minutes,

and all recordings were downloaded and stored securely.

All interviews were transcribed verbatim in Persian and subsequently translated into English for analysis and reporting purposes. To enhance translation accuracy and preserve semantic equivalence, the translations were reviewed by a second bilingual researcher, and discrepancies were resolved through discussion. This procedure ensured the credibility and trustworthiness of the qualitative data.

Data Analysis

In order to answer the first research question, the normality of the distribution of the digital identity scale was examined using the Kolmogorov-Smirnov (KS) test. The K-S statistics for overall teacher digital identity and its 4 domains are reported in Table 2. All K-S p -values exceeded .05, suggesting no significant departure from normality. Additionally, to examine the differences between novice and experienced EFL teachers in their overall digital identity and its four domains, four independent samples t -tests were conducted. To determine whether the between-group difference in digital engagement was statistically significant, response frequencies were tabulated and chi-square tests were performed.

In the qualitative phase, 77 voice messages (one per participants) were downloaded and stored securely. Transcripts were produced verbatim and analyzed using Braun and Clarke's (2006) six-step thematic analysis framework. This process involved recursive reading of the transcripts alongside the original recordings. Initial inductive coding was employed to identify meaningful segments related to perceived barriers. Codes were subsequently organized into themes capturing

shared patterns. To ensure dependability, two researchers independently coded a subset of the data, compared their interpretations, and

refined the coding scheme through iterative discussion until consensus was reached.

Table 2

The Normal Distribution and Reliability of the Answers to the Digital Identity Scale Items

	Overall digital identity	Digital Professional Agency (DPA)	Digital Pedagogical Content Knowledge (DPCK)	Professional Digital Criticality (PDC)	Digital Intercultural & Lifelong Learning (DILL)
KS Sig.	0.19	0.11	0.22	0.27	0.13

Results

Results for the First Research Question

To compare novice and experienced EFL teachers' digital identity formation based on their responses to the Digital Identity Scale, five sets of independent samples t-tests were conducted, as all pre-assumptions were met. As shown in Table 3, novice teachers scored significantly higher than their experienced counterparts in the overall digital identity; $t(75) = 4.01$, $p = 0.00$, as well as its four domains: Digital Pedagogical Content Knowledge (DPCK); $t(75) = 4.60$, $p = 0.00$, Digital Intercultural & Lifelong Learning (DILL), $t(75) = 3.06$, $p = 0.00$; Professional Digital Criticality (PDC), $t(75) = 3.43$, $p = 0.01$; and Digital Professional Agency (DPA), $t(75) = 3.97$, $p = 0.01$. Cohen's d effect sizes indicated that the largest difference between the groups was observed for PDC ($d = 0.88$), followed by overall digital identity ($d = 0.75$), DPCK ($d = 0.64$), and DILL ($d = 0.42$). The smallest effect size was obtained for DPA ($d = 0.35$).

Consequently, novice EFL teachers demonstrated a stronger perception of their overall digital identity than experienced teachers. Across the four subscales, the most pronounced difference occurred in Professional Digital Criticality (PDC) ($m = 4.43$), indicating that novice teachers reported

greater engagement in critically selecting and evaluating online professional resources and participating in digitally mediated professional learning, compared with their experienced peers ($m = 2.55$). A substantial difference was also observed in the groups' Digital Pedagogical Content Knowledge (DPCK), with novice teachers ($m = 4.60$) reporting more frequent use of digital tools and media to design instructional materials, personalize learning, support collaboration, and manage online assessment, than experienced teachers ($m = 3.50$). Regarding Digital Intercultural & Lifelong Learning (DILL), novice teachers ($m = 3.06$) expressed significantly higher agreement with ongoing online professional development and collaboration with other educators through digital platforms than experienced EFL teachers ($m = 2.08$). Finally, the smallest, yet still statistically significant, difference emerged for Digital Professional Agency (DPA). This indicates that novice teachers ($m = 3.97$) were only marginally more competent than experienced teachers ($m = 3.12$) in maintaining a professional digital presence, networking with other practitioners, and sharing professional practices in online spaces

Table 3*Novice and Experienced EFL Teachers' Responses to the Digital Identity Scale Items*

		Novice teachers		Experienced teachers		<i>t</i>	<i>df</i>	Sig. (2-tailed)	<i>d</i>
		M	SD	M	SD				
Overall digital identity		4.01	0.89	2.81	0.76	-3.59	75	0.00	0.75
Digital Content (DPCK)	Pedagogical Knowledge	4.60	0.42	3.50	0.33	-4.16	75	0.00	0.64
Digital Lifelong Learning (DILL)	Intercultural & Digital	3.06	0.53	2.08	0.49	-2.55	75	0.00	0.42
Professional Criticality (PDC)	Digital	4.43	0.48	2.55	0.53	-2.98	75	0.01	0.88
Digital Agency (DPA)	Professional	3.97	0.50	3.12	0.41	-2.33	75	0.01	0.35

Results for the Second Research Question

Regarding engagement in digital environments, the results of the frequency analyses and Chi-Square tests indicated that the two groups differed significantly in conducting online classes which was one of the options they reported doing most frequently when they were online (novice teachers: 59%; experienced teachers: 35%; $X^2 = 4.41$, $df = 1$ $p < .05$), exchanging ideas with colleagues in teacher groups, which was among the options they reported they would like to do using their computer or smartphone (novice teachers: 62%; experienced teachers: 29%; $X^2 = 4.79$, $df = 1$ $p < .01$), and downloading software or applications (novice teachers: 69%; experienced teachers: 44%; $X^2 = 7.95$, $df = 1$ $p < .05$) all of which were classified under the

cognitive engagement domain. The groups also differed significantly across all items of emotional engagement, including “I am highly motivated” (novice teachers: 30%; experienced teachers: 21%; $X^2 = 7.49$, $df = 1$ $p < .05$), “I feel confident” (novice teachers: 54%; experienced teachers: 9%; $X^2 = 16.08$, $df = 1$ $p < .01$), and “I look forward to learning from my colleagues on social networking sites” (novice teachers: 16%; experienced teachers: 70%; $X^2 = 19.51$, $df = 1$ $p < .05$). Moreover, the groups differed in the number of online classes (novice teachers: 26%; experienced teachers: 3%; $X^2 = 7.63$, $df = 1$ $p < .01$) and in the number of SNS accounts (novice teachers: 31%; experienced teachers: 3%; $X^2 = 9.08$, $df = 1$ $p < .05$) which were treated as indicators of the behavioral domain.

Table 4*Results of Chi-Square tests*

		Variable	Group		Value (X²)	Sig.
			Novice	Experienced		
1	Choose three options that you do most frequently when you go online.	Checking emails	12 (28%)	9 (26%)	.041	ns, p>.05
2		Checking SNS updates or messages (e.g., Facebook, Instagram)	16 (38%)	14 (41%)	.075	ns, p>.05

	Variable	Group		Value (X ²)	Sig.
		Novice	Experienced		
3		Maintaining relationships and socializing	10 (24%)	9 (26%)	.071 ns, p>.05
4		Training and updating digital competence	18 (43%)	21 (62%)	2.68 ns, p>.05
5		Searching for educational digital resources and content adapted to the school facilities.	19 (45%)	18 (53%)	.442 ns, p>.05
6		Exchanging and sharing information	5 (12%)	4 (12%)	.01 ns, p>.05
7		Searching for news or retrieving academic information	17 (41%)	13 (38%)	.039 ns, p>.05
8		e-Class/having online classes	25 (59%)	12 (35%)	4.41 Sig. p<.05
9		Others	4 (10%)	2 (5%)	.34 ns, p>.05
10	Choose every option that you would like to do using a computer (or smartphone)	Downloading and editing images and video clips	23 (55%)	13 (38%)	2.05 ns, p>.05
11		Exchanging ideas with my colleagues in the teachers' groups	26 (62%)	10 (29%)	7.95 Sig. p<.01
12		Writing and editing text messages	21 (50%)	10 (29%)	3.29 ns, p>.05
13		Creating teaching and testing materials	29 (69%)	27 (79%)	1.04 ns, p>.05
14		Blogging	5 (12%)	3 (9%)	.189 ns, p>.05
15		Searching for academic news or information	24 (57%)	14 (41%)	.065 ns, p>.05
16		Taking e-classes/online lectures files	21 (50%)	16 (47%)	1.91 ns, p>.05
17		Downloading software or applications	29 (69%)	15 (44%)	4.79 Sig. p<.05
18	Feelings you experience when you are online or using digital tools	I am highly motivated	18 (30%)	7 (21%)	7.49 Sig. p<.05
19		I feel confident	23 (54%)	3 (9%)	16.08 Sig. p<.01
20		I look forward to learning from my colleagues on social networking sites	2 (16%)	24 (70%)	19.51 Sig. p<.05
22	The number of online classes that you have had so far is approximately	0	11 (26%)	1 (3%)	7.63 Sig. p<.01
23		1-3	10 (24%)	18 (53%)	6.85 Sig. p<.01
24		4-10	5 (12%)	5 (15%)	.129 ns, p>.05
25		More than 10	16 (38%)	10 (29%)	.417 ns, p>.05

	Variable		Group		Value (X ²)	Sig.
			Novice	Experienced		
26	The number of your SNS accounts (examples of SNS include Facebook TM , Cyworld TM , Kakaotalk TM , Line TM , Band TM , Twitter TM , Metoday TM , online communities)	0	13 (31%)	1 (3%)	9.08	Sig. p<.05
27		1-3	25 (59%)	22 (65%)	.214	ns, p>.05
28		4-10	4 (10%)	8 (23%)	2.77	ns, p>.05
29		More than 10	0 (0%)	3 (9%)	1.56	ns, p>.05

Results for the Third Research Question

In the qualitative part of the study, a thematic analysis of the interview transcripts identifies recurring themes that were grouped into four overarching categories: technical, institutional/contextual, pedagogical, and personal barriers. Themes emerging across both teacher groups are presented below, supported by illustrative interview excerpts and brief interpretive commentary.

Category 1: Technical Barriers

The main theme within this category was “*technical and infrastructure problems*.” This issue was cited primarily by experienced EFL teachers, accounting for 30% of all the challenges reported. Among novice teachers, it was likewise the most prominent challenge in integrating digital knowledge into their teaching practices (32%). Participants reported poor internet connectivity, outdated computers, and a lack of digital tools for students and teachers. They also noted software- or platform- related issues that made it difficult to use these tools effectively.

- Example: “*Some schools don’t have the necessary devices or stable internet connection, which limits what I can do digitally in my classes.*”
- Example: “*The localized platforms and applications permitted to be used in*

schools have many limitations, and some are not user-friendly.”

Category 2: Institutional/Contextual Barriers

The theme that emerged in this category was “*Inadequate professional training and support*” reported by both novice (28%) and experienced (24%) teachers as the second most frequently mentioned barrier. Participants indicated that this limitation was associated with the ineffective application of their digital knowledge in professional practice. Novice teachers noted that their professional development activities often focus on theory rather practical digital pedagogy, whereas experienced teachers identified school policies and limited resources as major barriers.

- Example: “*Most public schools have limited funding to provide digital literacy workshops or online courses that help us develop our digital knowledge.*”
- Example: “*The school doesn’t provide manuals or guidelines that help me use technological devices effectively.*”

Category 3: Personal Barriers

This category comprised four main themes: a) *gaps in digital competence*, b) *lack of confidence and anxiety*, c) *resistance to change*, and d) *heavy workload and time constraints*. All four themes were identified in the experienced teachers’ interview

transcripts; however, novice teachers mentioned only the last theme. Overall, some experienced participants reported that they felt their digital knowledge and skills were unsatisfactory or inferior to their students' and they favored traditional methods due to familiarity and previous successful experiences. Some also reported anxiety in their online classes, particularly when technology failed. Both groups indicated that preparing digital materials takes up a substantial portion of their limited time.

- Example: *"I can use digital tools, but I am uncertain how to integrate them effectively into my classroom practice."*
- Example: *"I lack confidence and feel anxious about using digital tools during instruction because my students demonstrate advance digital competence and I may make mistakes."*
- Example: *"My workplace is not supportive of innovative digital pedagogies at present, and continues to favor traditional instructional approaches."*
- Example: *"I don't have enough time to develop digital materials and integrate social media and new applications into my lesson planning while managing my routine teaching duties."*

Category 4: Pedagogical Barriers

Two main themes emerged from this category: a) *classroom management problems*, and b) *assessment-related difficulties*. Classroom management problems were reported only by novice teachers and accounted for 21% of all their responses. These teachers reported that managing online classes, particularly with younger learners, was difficult and that integrating technology into instruction sometimes distracts students. Both novice (6%) and experienced (10%) teachers emphasized the challenges of online assessment, particularly in assessing speaking and writing, as well as providing appropriate and timely feedback. Overall, assessment-related issues appeared to constitute the most significant pedagogical challenge reported by the participants.

- Example: *"Online tests don't always produce reliable outcomes, and I personally don't trust their results. Moreover, I have difficulty designing and administering online assessments, especially when evaluating my students' writing skills. Providing feedback is also a significant challenge."*
- Example: *"I can't manage my students effectively in online classes; most of them are asleep, especially during the morning classes."*

Table 5*The Frequency of the Categories and Themes for Novice and Experienced EFL Teachers*

Novice EFL Teachers			Experienced EFL Teachers		
Categories	Themes	f(%)	Categories	Themes	f(%)
1. Technical barriers	<i>Technical and infrastructure problems</i>	32%	1. Technical barriers	<i>Technical and infrastructure problems</i>	30%
2. Institutional/contextual barriers	<i>Inadequate professional training and support</i>	28%	2. Institutional/contextual barriers	<i>Inadequate professional training and support</i>	24%
3. Personal barriers	<i>Heavy workload and time constraints.</i>	13%	3. Personal barriers	a) <i>Gaps of digital competence</i> b) <i>Lack of confidence and anxiety,</i> c) <i>Resistance to change</i> d) <i>Heavy workload and time constraints.</i>	8% 10% 7% 11%
4. Pedagogical barriers	a) <i>Classroom management problems</i> b) <i>Difficulty in assessment</i>	21% 6%	4. Pedagogical barriers	<i>Difficulty in assessment</i>	10%

Discussion

This study attempted to explore Iranian EFL teachers' digital identity formation and engagement in online environments by considering their teaching experience and the perceived challenges they encounter in integrating digital knowledge into teaching practice. The findings collectively revealed a clear experiential divide, not only in levels of digital identity development and engagement, but also in the nature of the barriers teachers faced when translating digital knowledge into instructional practices. Quantitatively, novice teachers demonstrated significantly higher levels of digital identity development across all measured domains, including digital

pedagogical content knowledge (DPCK), digital intercultural and lifelong learning (DILL), professional digital criticality (PDC), and digital professional agency (DPA). These findings are consistent with previous studies suggesting that early-career teachers are more likely to view digital technologies and related skills as integral part of their professional identities (Avidov-Ungar & Forkosh-Baruch, 2018; Marisa et al., 2024; Trevisan, 2024). From an identity perspective, these findings support Gee's (2000) view of identity as enacted by practice: beginner teachers' frequent involvement in digital environments seems to reinforce their view of themselves as professionals with high digital competency.

The findings are further consistent with Rodgers and Scott's (2008) and Akkerman and Meijer's (2011) conceptualizations of identity as socially constructed, relational, and continually negotiated. From this perspective, novice teachers may be more willingly positioned within digital environments that demand ongoing adaptation, experimentation, and constant reconstruction of professional identity.

The higher scores of novice teachers, particularly on DPCK and PDC, may reveal their more recent exposure to technology-integrated teacher education and their greater familiarity with digital forms of instruction. This interpretation is in line with Avidov-Ungar and Forkosh-Baruch (2018) and Li et al. (2024), who argue that beginner teachers often show greater confidence in incorporating digital tools into their teaching practices. By contrast, while experienced teachers may have considerable pedagogical expertise, they may still perceive digital environments as disruptive to their professional routines. Such tension aligns with Lasky's (2005) claim that identity is shaped by external expectations and institutional demands, and with Robson's (2018) conceptualization of digital identity as an ongoing reinterpretation of one's professional identity.

The largest effect size observed for PDC suggests that the difference between novice and experienced teachers is most evident at the level of enacted professional competence, rather than discrete technical skills. This finding is significant because, as Bernstein (2000) maintains, pedagogical identity is shaped through the dynamic relationship among teacher, learner, and knowledge. Within digital contexts, novice teachers may be better positioned to integrate these factors through online interaction and multimodal

resources, whereas experienced teachers may initially find such alignment less instinctive. Similarly, Goode's (2010) emphasis on group involvement and emotional positioning helps explain why digital identity formation may be stronger among novice teachers who are still actively consolidating their professional membership within modern teaching communities.

These findings also echo the broader view that digital identity is closely intertwined with digital literacy and engagement. Studies conducted by Engeness (2020), Rezai et al. (2024), and Li et al. (2024) show that identity construction in digital environments depends on sustained participation in technology-oriented practices. Therefore, the present findings imply that teacher identity development in the digital era should not be reduced to the learning of technical skills alone. Rather, professional development for experienced teachers should provide opportunities for reflection, experimentation, and identity negotiation so that digital practices can be meaningfully incorporated into their existing pedagogical identities. In this sense, the present study extends prior literature by showing that the difference between novice and experienced teachers is not only functional but also deeply rooted in identity.

Differences in engagement further clarify the complexity of these findings. Novice teachers showed significantly higher levels of cognitive, emotional, and behavioral engagement in digital environments, particularly in collegial collaboration, online teaching, and software use. These patterns accord with recent research, highlighting that the depth and diversity of engagement—rather than mere frequency of participation—are central to professional development (Lai & Chen, 2022; Nugraha et al., 2025).

In particular, the higher levels of confidence and motivation observed among novice teachers as components of emotional engagement suggest that digital environments may serve as spaces of community building and professional confirmation for early-career EFL teachers (Robson, 2018).

However, a notable difference emerged in emotional engagement associated with learning from colleagues through social media, with experienced teachers reporting a greater willingness toward collegial learning in digital environments than novice teachers. This finding challenges conventional pictures of experienced teachers as detached from online professional communities and is consistent with Tsang and Jiang's (2018) emphasis on the social aspect of identity development. It further suggests that although experienced teachers may encounter technical or confidence-related difficulties, they continue to value professional interactions and collective knowledge-construction.

These qualitative insights serve to contextualize and reinforce the quantitative findings. Participants across both groups identified technical and infrastructural shortcomings as the most prevalent barriers, verifying long-lasting concerns regarding inequitable access and institutional readiness for digitally mediated instruction (Aydin, 2020; Kilag et al., 2023). The fact these obstacles were encountered by teachers regardless of their experience levels indicates that digital identity formation is constrained not merely by individual digital proficiency, but by broader systemic factors. Furthermore, institutional barriers, most notably inadequate professional training and support, serve to worsen the complexities of digital engagement. While novice teachers expressed dissatisfaction with overly theory-based

training programs, experienced teachers emphasized a deficiency in institutional leadership and policy coherence. This divergence reflects distinct professional requirements of each group and aligns with Trevisan's (2024) argument that a discrepancy between pedagogical theory and classroom reality can significantly damage educators' digital confidence and identity.

Personal barriers exhibited the strongest contrast across the teaching experience levels. Experienced teachers highlighted deficiencies in digital competence, a lack of self-confidence, and resistance to change, reflecting previous research linking professional vulnerability with identity tension (Lasky, 2005; Hanna et al., 2022).

These barriers suggest that for some experienced teachers, digital engagement is not merely a technical challenge but a threat to their professional identity, particularly when students' digital proficiency surpasses their own. Within the transformative activist framework (Stetsenko, 2017), this implies limited opportunities for experienced educators to reposition themselves as genuine contributors to rapidly evolving digital practices. Conversely, pedagogical barriers further underscored divergence between the cohorts. Novice teachers' challenges in managing online classes reflect their limited experience-based pedagogical repertoire, whereas the concerns shared by both groups regarding online assessment show persistent pedagogical difficulties in technology-mediated EFL instruction. These results align with Mozafari et al. (2023) and Kohnke et al. (2024), who emphasize that assessment and feedback provision, are among the most demanding aspects of online teaching.

Overall, these findings indicate that digital identity formation and engagement in digital

environments are not linear outcomes of experience or technology exposure. Instead, they are deeply rooted in the interplay of emotional readiness, individual agency, pedagogical expertise, and institutional support. This interactional perspective aligns with social practice theory (Lave & Wenger, 1991) reinforcing the conceptualization of digital identity development among EFL teachers as a situational, social, and dynamic process.

Conclusion

This study examined Iranian EFL teachers' digital identity development and engagement in online environments by considering teaching experience and the perceived barriers that constrain meaningful digital integration. Using a mixed-methods design, the study sought to provide a comprehensive view of how professional experience relates to digital literacy, engagement, and identity development. The findings clearly show that novice EFL teachers have stronger digital identities and demonstrate higher levels of cognitive, behavioral, and emotional engagement in digital environments than their experienced counterparts. This suggests that digital identity development is closely related to generational experience and early socialization in technology-rich settings. Meanwhile, the relatively small differences in instructional application indicate that digital confidence does not necessarily translate into instructional effectiveness, highlighting the important roles of experience and contextual factors. The lower digital identity scores of experienced teachers should not be attributed solely to resistance or a lack of digital literacy. Rather, the qualitative findings show that emotional factors, institutional constraints, and a lack of professional support have a

substantial impact on the formation of teachers' engagement. These barriers point to structural shortcomings and underscore the need to create supportive conditions that value teachers' capabilities and facilitate digital transformation.

Theoretically, these findings strengthen sociocultural and transformative perspectives on teacher identity by showing that digital identity is not a fixed trait but a continuous process shaped by agency, participation, and recognition within pedagogical communities. Practically, the findings indicate the need for differentiated digital identity development models that address the distinct needs of novice and experienced teachers, promote collaborative learning, and reduce the emotional risks associated with digital experimentation. However, several limitations should be acknowledged for future research. Because of the limited interview time, participants' suggestions for removing barriers to integrating their digital knowledge into teaching practice remained unexplored. Moreover, the longitudinal effects of in-service workshops on improving teachers' engagement in digital environments require further investigation.

Conflict of Interest (Author Declaration)

The authors declare no conflict of interest.

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Appendix

EFL Teachers' Digital Identify Scale

Question items	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
1. I use professional social networks (e.g., LinkedIn, professional Facebook groups) to cultivate a network of fellow EFL practitioners.					
2. I maintain a digital presence that reflects my professional identity as an educator.					
3. I leverage digital platforms to stay current with global trends in English Language Teaching (ELT).					
4. I consider the digital spaces I inhabit as vital extensions of my professional learning environment.					
5. I critically evaluate online pedagogical resources and teaching materials before integrating them into my lessons.					
6. I consult peer-reviewed forums or professional communities when making decisions about teaching strategies or methodologies.					
7. My primary purpose for online activity is to exchange pedagogical resources or ideas with other teachers.					
8. I utilize digital tools to conduct action research or seek solutions for specific classroom challenges.					
9. I use digital media (video, audio, infographics) to create engaging learning materials for my students.					
10. I manage an online professional portfolio, blog, or community to document my teaching journey and share expertise.					
11. I experiment with digital games or gamified applications to enhance student motivation and engagement.					
12. I use digital platforms to facilitate collaborative student projects and inquiry-based learning.					
13. I participate in online discourse regarding educational policies and their impact on language teaching.					
14. I actively incorporate modern digital discourse (e.g., specific online English registers/vernaculars) into my teaching to bridge the gap with students.					
15. I believe that multimodal content (images/videos) is more effective than text-only input for explaining complex linguistic concepts.					
16. I prioritize the use of digital, multimodal resources when designing instructional materials.					
17. I prefer searching online pedagogical databases or asking expert communities over relying solely on traditional printed textbooks.					
18. I believe that digital platforms allow for more personalized and differentiated English instruction than traditional classroom settings.					
19. I use online corpora and digital concordance tools to resolve questions about English usage and grammar.					
20. I integrate authentic online media (e.g., YouTube, Podcasts, TED Talks) into my curriculum to enhance students' listening and intercultural competence.					

Question items	Strongly disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
21. I feel proficient and comfortable managing digital reading materials and online assessment tools in my teaching.					
22. I collaborate with teachers from other cultural contexts through digital platforms to foster intercultural communicative competence in my classroom.					
23. I use English-based professional websites to attend virtual conferences or access international teaching certificates.					
24. I frequently engage in professional development (PD) via webinars and online teacher training programs.					
25. I am more comfortable facilitating online English interactions for my students than navigating digital pedagogical administrative tasks.					