

Research Article

Identity Development and English Language Achievement in Technology-Integrated Classrooms in Iran: A Mixed-Methods Study

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Abstract


Technology integration in the classroom extends beyond the teaching methods employed by language teachers and the educational experiences of language learners. It also shapes how these individuals construct and reconstruct their identities. Accordingly, the present concurrent cross-sectional mixed-methods study investigated the relationship between identity development and the English language achievement of high school English language learners. It also explored the process of identity development and confusion in technology-integrated English language classrooms. The current study, using convenience sampling, surveyed 450 Iranian high school students in four counties of Jiroft, Iran, during the 2023–2024 academic year. The identity development questionnaire and school English language achievement tests were used to collect quantitative data. A semi-structured interview was used to collect qualitative data on identity development and confusion in technology-integrated classrooms. The quantitative analysis showed a positive relationship between identity development and English language achievement among participants. The commitment-making process was identified as the strongest predictor of English language proficiency, and this relationship remained consistent across the age and gender of learners. The findings derived from the qualitative data indicated that learners' attendance in technology-integrated English language classrooms accelerated the process of identity development, particularly in the domains of self-discovery, self-admiration, and self-actualization. However, for some students, technology contributed to identity confusion, including feelings of self-doubt, self-disapproval, and self-dissatisfaction. Overall, the findings suggest that identity development is a complex process shaped by learners' experiences within their socio-educational environments. Classroom is a rich context affecting learners' identity, leading to identity development or identity confusion, and the integration of technology in the English language classroom context can accelerate the identity construction process.

Keywords: adolescent identity, commitment making, identity confusion, identity development, Iranian EFL learners, qualitative reflections

1. Introduction

The English language has become a worldwide communication medium, strongly affected by the internet and information communication technology. Globalization has caused a dramatic change in the number of English language users around the world (Clyne & Sharifian, 2014). Following

Received: 03/07/2025; **Revised:** 31/10/2025; **Accepted:** 23/11/2025; **Published:** 21/12/2025

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this trend, there has been a fast increase in the number of English speakers and learners in Iran, and a great portion of Iranians view English as an important skill, playing a critical role in the country's economic, political, and educational sectors. This shift has increased the demand for English language teaching in Iranian schools, institutes, and universities (Zarrabi, 2018).

In a world characterized by globalization and digitalization, the form and scope of communication and interaction among individuals have experienced a deep change, mostly affected by smartphones and digital platforms among language users (Buonocore et al., 2024). This shift is not just a simple trend but a movement in how young people connect and express themselves regarding their personal and social interactions. The consequences of digital engagement are far-reaching, as these platforms create dynamic contexts for the development of individuals' identities. Digital platforms not only accelerate communication but also affect the process of identity formation. In technology-integrated environments, participants are not passive consumers of the content; they are active participants who can generate their dynamic self (Vincze & Joyce, 2018). Despite some scholarly explorations, there remains a notable lack of studies that specifically investigate the learners' identity development in technology-integrated foreign language learning contexts.

The integration of technology in English language classrooms has become a basic part of language instruction in educational systems around the world (Palacios Hidalgo et al., 2020), as illustrated by the emergence of computer-assisted language learning (Gillespie, 2020), mobile-assisted language learning (Elaish et al., 2019), and technology-enhanced language learning (Shadiev & Yang, 2020). The implementation of different technological tools in the classroom context has been explored (Lim & Aryadoust, 2021; Zhang & Zou, 2022), with research showing positive attitudes and effects on using technology in the process of language learning. The integration of technological tools into classroom environments leads to positive results in receptive skills of language, including vocabulary, grammar, listening, and reading (Zhang & Zou, 2022), and productive skills of language such as speaking and writing (Shadiev & Yang, 2020).

Despite decades of calls for stronger integration of technology in language education, the concept of emergency remote teaching during the recent COVID pandemic accentuated the difficulties and challenges faced by educators (Wong & Moorhouse, 2021). Despite teachers' reluctance to integrate technologies in their classes, the implications of digitalization extend beyond personal experiences, influencing educational norms and shaping the direction of identity development. It means that individuals in the process of

identity development consider significant others, groups or social categories, material objects, and places (Vignoles, 2017).

Understanding the nature of identity development in technology-integrated contexts is vital for researchers, teachers, learners, and other relevant stakeholders, as it can inform pedagogical practices and help them create more dynamic learning climates that acknowledge the diverse identities of language learners in digital environments. Accordingly, the present study used a mixed-methods approach, integrating quantitative and qualitative methodologies to investigate the relationship between identity development and language achievement in technology-integrated English language classrooms. It further investigated how learners experience identity development and confusion within these environments. The current study was designed to find answers to the following questions:

RQ1: Is there any relationship between learners' identity development and language achievement in technology-integrated English language classrooms?

RQ2: Which component of identity development better predicts the achievement of learners in technology-integrated English language classrooms?

RQ3: What is the effect of age on the relationship between identity development and language achievement in technology-integrated English language classrooms?

RQ4: What is the effect of gender on the relationship between identity development and language achievement in technology-integrated English language classrooms?

RQ5: What are learners' reflections on the development and confusion of their identities in technology-integrated English language classrooms?

2. Literature Review

The study's theoretical framework is based on Marcia's (1966) concept of identity development. The identity development processing framework introduced by Marcia (1966) represents one of the first models that operationalized Erikson's (1950) concepts regarding identity development. Marcia (1966) added two fundamental processes central to the process of identity development: exploration, which refers to an active consideration of different options, and commitment, which refers to making purposeful decisions based on one's choices. Consequently, Marcia (1966) presented four identity statuses: achievement, characterized by commitment following exploration; foreclosure, defined as commitment without prior exploration;

moratorium, which involves exploration without commitment; and diffusion, where neither commitment nor exploration occurs.

Luyckx et al. (2008) expanded the definition of identity development, referring to two forms of commitment (i.e., commitment making and identification with commitment) and three types of exploration (i.e., exploration in breadth, exploration in depth, and ruminative exploration). They stated that individuals start their identity development journey by engaging in exploration in breadth, assessing different options before arriving at decisions through commitment making. Regarding this, individuals may reevaluate their commitments based on their personal beliefs and values, engaging in exploration in depth, which leads to the integration of these choices into their self-concept through identification with commitment. Accordingly, it is significant to know that exploration does not always facilitate the process of identity formation. Continuous exploration of options and repetitive engagement with the same identity questions, referred to as ruminative exploration, can lead to feelings of anxiety, stress, and indecision, finally blocking the process of identity development and leading to identity confusion.

Concerning the incorporation of technology within educational settings, it has transitioned from being an alternative to becoming an essential component of contemporary schools (Richards, 2017). Both the English language and technology function as tools for societies to participate in a global community and advance socially, economically, and politically (Warschauer, 2002). Technologies do not simply serve as intermediaries that deliver content; they also cultivate a social atmosphere and become integrated into personal lives. In the current era, individuals form their identities in relation to and through technology and media content. Technology offers entertainment, education, and information. Our lives are molded and understood within the digital landscape (Žikić, 2022). The integration of digital technologies in language classrooms is generally encouraged, but there is a lack of empirical research on how digital technologies are used (Bećirović et al., 2021; Zhang & Zou, 2020). Yang and Shadiev (2019) reported a lack of a theoretical base in the field of digital language learning, asking for more effective knowledge transfer between research and application. Moreover, some theoretical approaches to L2 learning are difficult to transform into practical implications for language learning. The characteristics of the technologies alone are inadequate to yield beneficial outcomes in language learning (Sung et al., 2015). The way technology is utilized is equally important (Burston, 2015).

The way technology is utilized within educational settings can significantly influence learners' identities. Vincze and Joyce (2018) conducted

a comparison between the face-to-face interactions of Swedish-speaking Finns in one informant's second language (Finnish) and their online interactions conducted in English. Their findings indicate that "online contact enhanced language confidence, which in turn contributed to language identity" (p. 96), and that "the process of linguistic identification is not only one of acculturation, but also one of global citizenship and multilingualism" (p. 97). Androutsopoulos (2015) demonstrated that the communication patterns of multilingual individuals on Facebook diverge from their offline language use and linguistic choices. Multilingual youth frequently take this into consideration and modify their utilization of diverse linguistic resources through audience design, particularly in contexts where the recipients on social media are perceived as an imagined audience (Androutsopoulos, 2015). Other scholars have found that digital technologies show potential in facilitating connections and fostering a sense of belonging among people (Chen, 2017).

3. Method

3.1. Design

In the present survey, a mixed-methods approach was used to gather data, applying quantitative and qualitative methodologies to enhance the research findings (Creswell & Creswell, 2023). Quantitative data was collected using a questionnaire designed to measure different dimensions of identity development. In addition to the quantitative approach, a semi-structured interview was used for the qualitative descriptions of the study. The qualitative phase of the study provided an opportunity for participants to share their insights and reflections regarding their identity development and identity confusion as English language learners in technology-integrated classrooms. The semi-structured interview helped the researcher with a holistic view of identity development among school language learners, thereby enriching the quantitative data. In the current study, the predictor variable was English language learners' identity development, and the criterion variable was the language achievement of English language learners.

3.2. Participants

At the first phase of the study, 480 English language students were invited to participate in the current study. But 20 respondents did not answer the questionnaire, resulting in a final sample of 460 English language students. Before conducting the study, the researcher administered the Longman Placement Test to guarantee that all participants were at a homogenous level of English language proficiency. Accordingly, students who scored as pre-intermediate learners were chosen as participants of the current study based on

the outcomes of this placement test. The reason for choosing pre-intermediate level students was that 95 percent of the students scored 36-60. The study utilized a convenience sampling technique, selecting participants who were most easily accessible to the researcher. This approach helped the researcher with meaningful data.

The participants were high school students in grade 10-12 from Jiroft's four counties: Narjuiie, Esfandoghe, Anbarabad, and Karimabad, during the academic year 2023–2024. Participants were chosen from these schools since students in these regions, because of financial challenges, had no technology exposure inside the classroom before this experience, and their identities were not affected by technology before this exposure. The researcher, who is also a teacher in these schools, managed this study after a four-month period during which the participants were exposed to technology within the English language classrooms. This 4-month experience was designed to provide the students with digital tools that are often taken for granted in more technologically advanced settings. The teacher focused on the integration of some limited technological tools, such as PowerPoints, digital projects, e-games, and online chats, in English language classrooms. Accordingly, participating students could answer the questionnaire questions.

In the current study, 182 participants (40.4%) were female, and 268 participants (59.6%) were male. 220 students (48.9%) were in grade 10, 180 students (40%) were in grade 11, and 50 students (11.1%) were in grade 12. This diverse representation across grades was intentional, as the researcher aimed to ensure comprehensive data collection by including all learners in the study. Having a close and friendly interaction with the participating students facilitated a deeper understanding of the context and shaped a sense of trust between the researcher and the participating students. Participants were informed that their participation was voluntary, and were given information about the study's procedure. All names were deleted, and pseudonyms were used to respect participants' privacy.

3.3. Instrument

3.3.1. English Language Achievement Test

This test was comprised of four parts, assessing participants' listening comprehension, vocabulary, grammar, and reading comprehension. The content of all parts was based on the school English book and the parts taught inside the classroom. The listening comprehension part consisted of 18 comprehension questions. These questions were based on dialogues between different speakers based on the content of the schoolbook. After listening to the dialogue, the students were asked to answer the related questions. The

questions were designed to test different types of listening skills, ranging from understanding concrete ideas to implied meanings. The listening comprehension part lasted 15 minutes.

The vocabulary part comprised 16 questions, including receptive and productive skills. In some questions, students were asked to recognize the correct word, and in other questions, they were requested to produce the correct word. They were given 12 minutes to answer vocabulary-related questions.

The grammar part consisted of 12 questions that assessed different grammatical structures. Some questions asked the students to complete some phrases with an appropriate grammatical structure. Some other questions tested students' knowledge of grammar rules and asked them to use the rules in the required sentences. Students were given 10 minutes to answer grammar questions.

The reading comprehension part comprised 23 questions, which were based on four different texts. Students were asked to read the texts and answer the related questions. The reading comprehension questions tested students' understanding of the main ideas, inferences, and vocabulary in the related context. Students were given 20 minutes to answer this section's questions. The final scores were changed to 20 to increase clarity. To check the reliability of the test, Cronbach's alpha was used to measure the internal consistency of the test. Cronbach's alpha estimated for the whole test was .88, indicating a strong internal consistency. The internal consistency of the listening comprehension part was .86, vocabulary part was .82, grammar part was .91, and reading comprehension part was .94. All parts showed good internal consistency reliability. To check the content validity, three experienced English language teachers reviewed the test questions based on the course and book objectives. The teachers checked the questions and rated the relevance of each question item. The calculated Scale-Level Content Validity Index (S-CVI) was .94, and all test items had an Item-Level Content Validity Index (I-CVI) of 1.00, strong evidence showing that the test represented the classroom content (Shi et al., 2012).

3.3.2. Identity Development Questionnaire

The Persian translation of the identity development questionnaire was used in this study. To confirm a valid translation of the questionnaire, it was translated into Persian following a back-translation procedure (Brislin, 1970). At first, the original English language version of the questionnaire was translated into Persian by the dissertation team members (the researcher, supervisor, and advisor). Then, a bilingual professional translator, blinded to

the original English version, did a back-translation of the Persian draft into English. The back-translated version was then compared with the original questionnaire by the dissertation team to check the potential differences in linguistic and conceptual unity. The process of back-translation confirmed the linguistic and conceptual validity of the translated questionnaire.

The Identity Development Questionnaire, designed by Luyckx et al. (2008) is a self-report questionnaire comprising 25 items. This questionnaire measures five dimensions of identity development, with each dimension represented by five items, which are rated on a 5-point Likert scale. Illustrative items for each dimension of identity development include: I have determined the path I wish to pursue in life (Commitment Making – CM), I contemplate the direction I aspire to take in my life (Exploration in Breadth – EB), I continue to search for the path I desire in my life (Ruminative Exploration – RE), Future plans provide me with a sense of stability (Identification with Commitments – IC), and I reflect on the future plans I have established (Exploration in Depth – ED). The participants were asked to complete the questionnaire in 30 minutes. Participating students rated each statement on a scale of 1-5 (1 = *strongly disagree* to 5 = *strongly agree*).

A pilot study was conducted with a sample of 20 students from the target population. This pilot study was done to assess the practicality and comprehensibility of the items. Participants reported no difficulties in understanding the questions or the response format. This feedback confirmed that all items were clear and easily understandable, further reinforcing the face validity of the instrument.

The translated questionnaire was reviewed by a panel of three experts (two in English Language Teaching and one in Research Studies). They evaluated the items for face and content validity. The experts confirmed that the items were clear, relevant, and comprehensive, providing evidence for strong face and content validity. To check the reliability of the questionnaire, Cronbach's alpha was used to measure the internal consistency of the questionnaire. Cronbach's alpha estimated for the whole questionnaire was .87, indicating a strong internal consistency. The internal consistency of the commitment was .88, exploration in breadth was .85, ruminative exploration was .93, identification with commitments was .85, and exploration in depth was .87. All parts showed good internal consistency.

3.3.3. Semi-Structured Interview

A semi-structured interview protocol was formulated in conjunction with the quantitative data, aligning with the research objectives. The aim of engaging participants in face-to-face interviews was to extract deeper insights

into learners' experiences of identity development within English language classrooms. These interviews were conducted in a face-to-face manner and followed a semi-structured format, with the interview protocol prepared in advance. Persian was used as the medium for both the interview questions and responses, with each interview spanning approximately fifteen minutes. Participants' names were anonymized and replaced with coded identifiers.

To display dependability and consistency of the interview process, a pilot study was used before the main interview process. The pilot study was done to clarify the interview process and guarantee the questions were rich, clear, and relevant. Some minor adjustments were made to the wording and sequence of questions based on this pilot study, increasing the reliability of the interview process. Moreover, an intra-coder reliability check was used to increase consistency in coding processing. The transcripts were re-coded two weeks after the initial coding by the same coder (the researcher). A high degree of consistency was observed between the two rounds of coding, showing a strong intra-coder consistency.

To enhance the credibility and accuracy of interviews, the researcher employed member checking. Member checking was used to increase the credibility of the research's qualitative findings. Participating students were provided with a briefing of the initial themes and given the chance to confirm, modify, or disprove the interpretations. Their feedback was applied to the final analysis, ensuring the results accurately reflected their insights.

3.5. Procedure

The current mixed-methods survey aimed to investigate the relationship between identity development and English language achievement among school English language learners. It also explored the participating students' reflections regarding the process of identity development and confusion in technology-integrated classrooms during the academic schedule 2023-2024. Before starting the research, the researcher had some meetings with the participating schools to introduce the study procedure and objectives. After these meetings, the researcher received the school's approval to conduct the study. The data collection process involved administering the identity development questionnaire and English language achievement in person to almost 480 students. Some of these students did not answer the questionnaire completely; accordingly, 450 students comprised the final sample of this study.

The data collection process lasted two months, during which the researcher organized two sessions for each participating class: one session for the placement test and the administration of the questionnaire, and one session

for the administration of the English language achievement test. This structured approach helped the researcher with a comprehensive collection of data while minimizing disruption to the students' regular academic activities. Establishing direct communication with most students was instrumental in cultivating a sense of trust between the researcher and the participants. The researcher took the time to inform the participants about the study's design, emphasizing the voluntary nature of their participation. This transparency was essential in fostering an environment where students felt comfortable sharing their thoughts and experiences.

To guarantee the confidentiality of the participants' information, all personal identifiers were omitted from the original data, and pseudonyms were used to protect the identities of the participating students. For qualitative purposes, 45 students, representing 10% of the whole sample, were invited to participate in semi-structured interviews. This sample size for the qualitative phase of the study aligns with Patton's (2015) purposive sampling, choosing the participants based on their potential to provide information-rich insights.

The interviews were transcribed and processed into textual form. The researcher carried out a three-stage coding process (namely, open, axial, and selective) to conduct the data analysis. The open coding phase involved thoroughly examining, comparing, conceptualizing, and categorizing the data. The raw data were scrutinized for similarities and differences, leading to the identification of preliminary conceptual categories. During the open coding stage of data analysis for the present study, preliminary categories were determined by identifying commonalities in the participants' responses. Subsequently, in the axial coding phase, the data were consolidated by establishing links between categories and subcategories. The selection of subcategories aimed to address questions about the timing, manner, and consequent outcomes; thus, improving the explanatory depth of the overarching category.

Ultimately, the process of selective coding entailed the careful selection of the fundamental categories and their organization around a central explanatory concept. The primary inquiries during the interviews were as follows: How would you characterize your personality within English language classrooms that incorporate technology? What aspects do you prioritize the most in these technology-enhanced learning environments? Additionally, what notable occurrences have taken place in your technology-integrated English language classrooms, and what makes them significant? To extract additional information, appropriate probes were employed based on the responses provided by the interviewees.

3.6. Data Analysis

The current study is a mixed-method correlational survey based on descriptive and inferential statistical analysis. To analyze the data, descriptive and inferential statistics were used. Excel 2016 and SPSS 21 software were used, respectively. Descriptive statistics and a description of research variables were presented using frequency tables, bar charts, and line charts. To answer the research questions, Spearman correlation, multiple linear regression, hierarchical linear regression, and the Friedman test were used in the inferential statistics section. Analysis of the qualitative data was supported via semi-structured interviews. By reading each participant's transcript, the conceptual themes were identified, and these conceptual categories were used to create a matrix of major themes.

4. Results

4.1. Results for the First Research Question

At first, the normality of the distribution of the research variables was assessed. The method employed for this assessment was the Kolmogorov-Smirnov test. The significance level exceeded 0.05 for all variables. Accordingly, Pearson correlation was conducted to answer the first research question (i.e., Is there a significant relationship between English language learners' identity development and their English language achievement in technology-integrated classrooms?) (Table 1).

Table 1

Pearson Correlation between Identity Development and English Language Achievement

Variables	Spearman Correlation	<i>p</i>	R ²
Identity Development	0.53	0.000	0.29
Commitment Making	0.49	0.000	0.25
Identification with Commitment	0.42	0.000	0.18
Exploration in Breadth	0.44	0.000	0.20
Exploration in Depth	0.44	0.000	0.20
Ruminative Exploration	0.32	0.000	0.11

Based on the results presented in Table 1, regarding the *p* values that are lower than 0.01 ($p = 0.01$), it can be said with more than 99% confidence that there is a meaningful relationship between identity development (commitment making, identification with commitment, exploration in breadth, exploration in depth, and ruminative exploration) and English language achievement.

4.2. Results for the Second Research Question

To answer the second research question (i.e., Which component of identity development better predicts the English language achievement of English language learners in technology-integrated classrooms?), the multiple linear regression method was used (Table 2).

Table 2

Simultaneous Regression of Identity Development Dimensions and English Language Achievement

Model	B	Std. Error	Beta	t	Sig.	95% CI	
						Lower	Upper
(Constant)	73.74	1.91	—	38.44	.000	69.97	77.51
Commitment Making	.95	.21	.47	4.42	.000	.53	1.38
Identification with Commitment	-.38	.20	-.19	-1.82	.069	-.79	.03
Exploration in Breadth	.15	.18	.08	.82	.410	-.21	.52
Exploration in Depth	.32	.17	.17	1.88	.060	-.01	.67
Ruminative Exploration	-.03	.09	-.02	-.30	.758	-.22	.16

Considering the results in Table 2, among five variables, which were entered this model, commitment making ($\beta = 0.47$, p of $t < 0.01$) could predict English language achievement meaningfully; however, identification with commitment (p of $t > 0.05$), exploration in breadth (p of $t > 0.05$), exploration in depth (p of $t > 0.05$), and ruminative exploration (p of $t > 0.05$) couldn't. Regarding the adjusted R Square (Adjusted $R^2 = 0.25$), it can be said that commitment making predicts 25% of English language proficiency variance. Therefore, it can be concluded that the most effective component of identity development in predicting English language achievement was commitment making.

4.3. Results for the Third Research Question

To answer the third research question (i.e., What is the effect of age on the relationship between identity development and language achievement in technology-integrated English language classrooms), a hierarchical regression was run.

Table 3

Results of Hierarchical Regression of the Relationship Between Identity Development Dimensions and English Language Achievement Across Age

Model	Predictor	B	SE B	β	t	Sig.	95% CI LL	95% CI UL
1	Constant	73.72	1.92	—	38.35	.000	69.94	77.40
	Commitment Making	.95	.21	.47	4.38	.000	.52	1.38

Model	Predictor	B	SE B	β	t	Sig.	95% CI LL	95% CI UL
2	Identification with Commitment	-.37	.21	-.19	-1.74	.08	-.78	.04
	Exploration in Breadth	.15	.19	.07	.80	.42	-.22	.52
	Exploration in Depth	.32	.17	.17	1.87	.06	-.01	.67
	Ruminative Exploration	-.03	.10	-.02	-.30	.76	-.22	.16
	Constant	76.14	2.43	—	31.33	.000	71.36	80.90
	Commitment Making	.99	.21	.49	4.55	.000	.56	1.42
	Identification with Commitment	-.46	.22	-.24	-2.11	.03	-.89	-.03
	Exploration in Breadth	.20	.19	.10	1.04	.29	-.17	.57
	Exploration in Depth	.36	.17	.19	2.06	.04	.01	.70
	Ruminative Exploration	-.07	.10	-.04	-.69	.49	-.27	.13
	Age	-.94	.57	-.07	-1.62	.10	-2.07	.19

Note. B = unstandardized coefficient; SE = standard error; β = standardized coefficient; CI = confidence interval. Significance values are two-tailed. Dashes indicate not applicable.

As shown in Table 3, ($\Delta R^2=0.25$) ΔR , ($F=30.78$) F , and its P -value (P -value of $F<0.01$) in phase one, and also ($\Delta R^2=0.25$) ΔR , ($F=26.19$) F , and its P -value (P -value of $F>0.05$) in phase two, the entrance of age variable didn't have any meaningful increase in R^2 . Accordingly, age didn't play any moderating role in the relationship between identity development and English language achievement.

4.4. Results for the Fourth Research Question

To answer the fourth research question (i.e., What is the effect of gender on the relationship between identity development and language achievement in technology-integrated English language classrooms?), a hierarchical regression was run.

Table 4

Results of Hierarchical Regression of the Relationship Between Identity Development Dimensions and English Language Achievement Across Gender

Model	Predictor	B	SE B	β	t	Sig.	95% CI LL	95% CI UL
1	Constant	73.74	1.91	—	38.44	.000	69.97	77.51
	Commitment Making	.95	.21	.47	4.42	.000	.53	1.38
	Identification with Commitment	.38	.20	.19	1.82	.06	-.79	.03
	Exploration in Breadth	.15	.18	.08	.82	.41	-.21	.52
	Exploration in Depth	.32	.17	.17	1.88	.06	-.01	.67
	Ruminative Exploration	.03	.09	.02	.30	.75	-.22	.16

Model	Predictor	B	SE B	β	t	Sig.	95% CI LL	95% CI UL
2	Constant	74.42	1.98	—	37.45	.000	70.51	78.32
	Commitment Making	.96	.21	.48	4.46	.000	.54	1.39
	Identification with Commitment	.36	.20	.18	1.72	.08	-.77	.05
	Exploration in Breadth	.14	.18	.07	.75	.45	-.23	.51
	Exploration in Depth	.33	.17	.17	1.90	.05	-.01	.67
	Ruminative Exploration	.02	.10	.01	.22	.82	-.21	.17
	Gender	.80	.61	.05	1.29	.19	-2.01	.41

Note. B = unstandardized coefficient; SE = standard error; β = standardized coefficient; CI = confidence interval. Significance values are two-tailed. Gender coded as a dummy variable.

As displayed in Table 4, ($\Delta R^2=0.249$) ΔR , ($F=30.846$) F , and its P -value (P -value of $F<0.01$) in phase one, and also ($\Delta R^2=0.251$) ΔR , ($F=26.024$) F , and its P -value (P -value of $F>0.05$) in phase two, the entrance of gender didn't have any meaningful increase in R^2 . Gender didn't play any moderating role in the relationship between identity development and English language achievement.

4.5. Results for the Fifth Research Question

To answer the fifth research question (i.e., What are learners' reflections on the development and confusion of their identities in technology-integrated English language classrooms?), the qualitative data analysis is supported by citations derived from the participants involved in the present study to increase the credibility and depth of the findings. An extensive thematic examination of qualitative data unveiled two categories of the development and confusion of identity. Identity development involves the stages of self-discovery, self-admiration, and self-actualization, and identity confusion includes phases of self-doubt, self-disapproval, and self-dissatisfaction. This section presents these categories in greater detail within the subsequent sections that follow.

4.5.1. Identity Development

The identity development theme shows how the participants used the technological and social climate of the English language classroom to build a more positive identity.

4.5.1.1. Self-discovery

The data from interviews shows that technology helped students have a better understanding of themselves by providing them with different viewpoints and creating a platform for free expression of self.

Excerpt 1: “Being a school student in this classroom and using technology in different parts of the classroom has improved my feelings and understanding of myself. This course has helped me think deeply about my aims and abilities. Through online discussions, assignments, and group projects, I have been encouraged to express openly what is important to me and the reasons behind it.”

Excerpt 2: “Technology has provided me with the chance to see different views and use different resources. The experience of participating in online discussions and chats has helped me get familiar with different perspectives and encouraged me to share my experiences and listen to theirs. This sort of exposure has helped me discover myself (weaknesses & strengths).”

4.5.1.2. Self-admiration

The participating interviewees reported that technology provided them with some opportunities for self-assessment that led to more self-admiration.

Excerpt 1: “Technology has changed how I see and admire myself, especially in valuing my strengths and weaknesses. Using and participating in different digital sources in the classroom, I had the chance to evaluate and reflect on myself. For example, online tests gave me great insights into my strengths and areas where I need to work on.”

Excerpt 2: “Technology has helped me see and evaluate my skills more closely, showing me what I do well and where I need some improvements. This awareness has played an important role in my English language achievements, enabling me to admire my strengths. Instead of considering my gaps as negative points, I see them as important understandings of who I am.”

4.5.1.3. Self-actualization

Self-actualization shows the highest level of identity development among participants, where the participating students felt a sense of meaning and purpose.

Excerpt 1: “I have gained new skills and expanded my knowledge of different subjects through online exposure. Connecting with other learners through online chats inside the classroom has created a collaborative learning environment, giving me valuable insights that support my growth.”

Excerpt 2: “I can now set high goals and chase them with confidence. The tools I have help me monitor my progress, evaluate my performance, and make smart choices that drive me toward success. It gives me a feeling of fulfillment and purpose.”

4.5.2. Identity Confusion

Identity confusion is connected to the experiences of students for whom the technology-integrated classroom stimulated negative feelings of doubt, disapproval, and dissatisfaction, shaped through wrong comparisons.

4.5.2.1. Self-doubt

The analyzed data connects self-doubt to a feeling of uncertainty as a consequence of a wrong comparison of oneself with others' achievements, which brings some levels of anxiety and shame.

Excerpt 1: "Technology has made me aware of others and their skills and achievements. In this English classroom, I am doubtful about myself, what I say, and what I write. I compare myself with others' productions, and this comparison has created a feeling of uncertainty in me."

Excerpt 2: "In English classrooms, I have a strong fear of rejection, leading to a sense of doubt and uncertainty. The fear of conforming to high expectations dictated through technology makes me worried that if I show my real self, others will not accept me. So, I find myself doubtful to start connections and relations, and it strengthens my sense of loneliness."

4.5.2.2. Self-disapproval

In this classroom context, identity confusion stemmed not from the classroom content, but from the medium itself (technology).

Excerpt 1: "When the teacher asks us to use technology during her teaching in English language classrooms, I have a bad feeling of inadequacy. If I used a digital game or online task, I feel that my knowledge is not enough, and I disapprove of myself and my English language abilities."

Excerpt 2: "As I watched others successfully working with technology, I had a sense of disapproval of myself. I think that my problems were representative of my technological limitations during the formative years."

4.5.2.3. Self-dissatisfaction

This theme shows how exposure to online spaces leads to a persistent sense of inadequacy.

Excerpt 1: "Technology is frightening, and when I am using technology in English language classrooms, I feel dissatisfied, filled with high levels of shame when I think I'm not good enough."

Excerpt 2: “The more I use technology, the more I see my gaps and weaknesses, which only increases my feelings of self-dissatisfaction. The feeling of being behind in knowledge and social connections due to the endless flow of information in the digital world leads to bad feelings about my skills and values.”

5. Discussion

As mentioned before, this study investigated the relationship between identity development and language achievement in technology-integrated English language classrooms. Moreover, it explored the process of identity development and confusion in technology-integrated classrooms. Quantitative data was obtained through the administration of the identity development questionnaire and English language achievement test. Additionally, qualitative data was collected using a semi-structured interview.

Regarding the first and second research questions, the findings indicated a positive relationship between the development of identity and the language achievement of language learners in technology-integrated English language classrooms. A positive relationship was also observed between components of identity development—namely, commitment making, identification with commitment, exploration in breadth, exploration in depth, and ruminative exploration—and language proficiency in technology-integrated English language classrooms. Commitment making was the most significant factor in the process of identity development, predicting learners’ English language achievement.

The act of making commitments has been framed within Marcia’s (1966) theoretical model, particularly concerning the degree to which individuals have arrived at decisions related to identity-development issues. The results of the present study indicate that technology offers learners a comprehensive environment conducive to decision-making processes. Luyckx et al. (2008) suggested that the degree of confidence individuals have in their decisions, their capacity to relate to these decisions, and the level of internalization of these choices (referred to as identification with commitment) are vital components of identity development (Ryan & Deci, 2000). Moreover, the results of this study suggest technology as the selection of some plans, providing the learners with identity options. Hejazi et al. (2009) have corroborated similar findings that clearly indicate a positive relationship between the identity development of English language learners and their subsequent success in technology-enhanced environments. These studies show the important role that technology plays in shaping educational experiences, particularly language and cultural ones. Technology in educational settings

provides learners with rich opportunities for collaborative engagement, which is a fundamental aspect of the learning process.

Using technology in the classroom, students can interact, share ideas, and work together on classroom issues, fostering a sense of community and belonging, all of which relates to the development of students' identity. As learners collaborate with their classmates and other learners through online platforms, they are not only improving their language skills but also constructing and reconstructing their identities in such technologically supported environments. Relationships with others are connected to the formation and development of a person's identity. Researchers in the field of identity development have emphasized the important role of context in constructing/reconstructing developmental pathways. The formation of identity is intricately linked to the dynamics of the context. Longitudinal studies indicate that individuals' connections with their classmates and context are predictive of enhanced commitment to and exploration of their identities (Albarelo et al., 2018). Research shows that when individuals feel safe and comfortable with their peers and context, it facilitates the exploration of their identities (Branje et al., 2021). Furthermore, identity development and the development of relations are positively interconnected. Strong relations foster identity development, and deployment of identities fosters relations (Branje et al., 2021).

Research has indicated that connections with peers in classroom are positively correlated with educational achievements. A sense of belonging to a group has been found to have a positive relationship with interpersonal commitment and in-depth exploration (Crocetti et al., 2023). This notion is reported by Moreno and Uhls (2019), highlighting the importance of digital platforms in influencing the identity formation and social competencies of younger generations. Their study emphasizes that digital environments are not only recreational spaces but also they are integral to the social fabric of modern youth culture. Through which school students can experience different interactions, engagements, and feedback, which contribute to a better understanding of who they are.

Regarding the third and fourth research questions, it was found that the relationship between the identity development of English language learners and their English language achievement is not influenced by age or gender mediators. Although the present study shows no role played by age and gender in this relationship, other studies indicate that the age of individuals participating in a technology-integrated environment needs careful consideration. Therefore, online behavior during early adolescence may stimulate both positive and negative explorations, as well as commitments,

which are intricately connected to the evolving identity status characteristic of this developmental stage, specifically the search for a moratorium in identity formation. Moreover, different studies have reported the significant influence and multifaceted role that gender plays in the intricate processes involved in the development and formation of individual identity, as evidenced by the comprehensive research conducted by Rogers et al. (2015).

Regarding the fifth research question, the qualitative data analyses revealed that participation in technology-integrated classrooms helped English language learners pass the stages of self-discovery, self-admiration, and self-actualization, which are directed to the process of identity development. In technology-integrated English language classrooms, school students engage with technological tools that boost their learning experiences and provide them with opportunities to express themselves freely. As learners participate in digital worlds, they see and understand themselves, leading to a greater understanding of their identities. This digital exploration involved experimenting with different roles and perspectives, which contributed to a deeper sense of self, resulting in identity development. The data from interviews shows that technology helped students have a better understanding of themselves by providing them with different viewpoints and creating a platform for free expression of self. Participating students reported that technology provided them with some opportunities for self-assessment that led to more self-admiration. Self-actualization shows the highest level of identity development among participants, where participating students felt a sense of meaning and purpose.

But the integration of technology in the English language classroom led to identity confusion for some participating students. Identity confusion is connected to the experiences of students for whom the technology-integrated classroom stimulated negative feelings of doubt, disapproval, and dissatisfaction, shaped through wrong comparisons. Identity confusion is connected to the experiences of students for whom the technology-integrated classroom stimulated negative feelings of doubt, disapproval, and dissatisfaction, shaped through wrong comparisons. The analyzed data connects self-doubt to a feeling of uncertainty as a consequence of a wrong comparison of oneself with others' achievements, which brings some levels of anxiety and shame. In this classroom context, identity confusion stemmed not from the classroom content, but from the medium itself (technology).

While previous generations engaged in identity formation through real-life experiences, present generations construct their identities in digital worlds. Within digital worlds, individuals find themselves trapped in an expansive

digital universe that transcends time and space (Gherbi & Mahmoudi, 2025). Accordingly, identity formation has moved beyond the family sphere, where it was once guided and monitored. This interest in digital communities has coincided with rising rates of depression, doubt, disapproval, and dissatisfaction, particularly among adolescents and youth (Othman, 2019). The identity crisis in the era of digital citizenship presents significant challenges for individuals in defining themselves within a highly connected digital world. The shift from real to digital identity has contributed to the superficiality of social interactions, increasing feelings of isolation (Gherbi & Mahmoudi, 2025).

6. Conclusions

Identity development is a dynamic process constructed through relationships in different contexts. Interactions inside the classroom context make identity-defining moments through which learners can understand their personal and social position in existing communities of practice. In the current world of digitalization, classrooms that integrate technology into their educational climate play an important role in stimulating these constructive opportunities, providing new paths for interaction and communication to boost the identity development process. Identity is a fluid dynamic process that involves an individual's discovery of self and others over time. This self-discovery means that how English language students see and accept themselves is connected to how they believe others see and accept them, especially those whose opinions are appreciated. Interactions inside the classroom create a safe and comfortable space for students to have different social and cultural experiences, providing the students with a deep understanding of who they are and who they want to be.

Technology has changed the way students interact with themselves and the world around them, offering them a wide range of opportunities to engage in new language experiences that were previously impossible inside the classroom. Technological developments have brought a novel range of experiences inside the classroom, from virtual reality simulating real-world events to online platforms connecting students from different parts of the world. When students find themselves in new digital worlds, they are not only experiencing different language instances but are also constructing/reconstructing their identities. For adolescent language learners, who are spending an important part of their identity development, interactions inside digital spaces play an important role in shaping their identities within the classroom climate. Digital worlds increase students' interactions inside the classroom, motivating them to initiate and regulate their learning, all of which increases a strong sense of identity. Technology leads to a holistic educational

culture inside the classroom, where students' identities are affected by all possible existing factors (Branje et al., 2012; de Goede et al., 2009).

The story is not always an interesting one. Technology is a double-edged sword, which can lead to both identity development and identity confusion. The identity crisis in the context of digital education emerges as a complex process that reflects the challenges students face in finding and placing themselves within a digitally connected world. Identity, whether cultural or digital, reveals multiple layers of the self, rooted in belonging and social membership. Technology has accelerated communication opportunities, and it has also complicated the process of identity construction by clouding the boundaries between cultural, social, and digital identities; consequently, shaping both internal and external clashes. Progressive changes of the digital age have weakened traditional foundations of identity, leading to the emergence of hybrid identity adding the concept of digital identity to the identity-related items. The shift to digital identities contributes to the superficiality of social interactions, leaving individuals feeling isolated. Besides, the lack of educational programs that address digital citizenship is a major barrier to the effective integration of digital identities. This reality necessitates a comprehensive response from policy makers and educators to raise awareness of digital identity and citizenship through education and public engagement, ensuring a balance between diverse identities and fostering a positive sense of belonging in this fluid digital world. In brief, digital identity presents a new challenge that compels teachers to rethink how students define themselves and interact within the digital sphere. It calls for the reinforcement of educational policies in the age of technology.

The results of the current study have some important theoretical implications that expand the understanding of the relationship between identity development and English language achievement in technology-integrated classrooms. Luyckx et al. (2008)'s dual-cycle model was basically developed in psychosocial contexts, but the present study validated its applicability in the English language context. The positive relationship between all components of identity and English language achievement demonstrates that identity development is not a secondary but a primary component of language learning. The findings suggest that the factors inherent in identity development can be connected to language skills achieved in technology-integrated classrooms.

The present study can increase the existing research in the field of identity development, but the findings must be interpreted considering the study's limitations. First, the researcher used a self-report questionnaire for measuring the participants' attitudes towards identity development, and their

answers might not have completely and honestly reflected how they behave regarding the process of identity development. Therefore, triangulation can boost the validity and reliability of the findings. Teachers' attitudes, in addition to classroom observations, could help the researcher get a deeper understanding of the process. Second, since the list of all English language learners in the present context was not available to the researcher, he used a convenience sampling method, not a random sampling. Third, school English language learners were asked to answer the interview questions with reference to the moments or events in which their identities were affected by using a technological tool in the English language classroom. It might have been difficult for some of them to remember such moments or events of identity development or confusion, and how they felt at those experiences. Fourth, the participants in the present study were limited to some schools in some villages of Jiroft, Iran. Therefore, generalizing the findings of this study to English language learners of different academic or educational contexts should be done with caution.

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