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Investigating the Digital Literacy Levels of Iraqi EFL University Students: Challenges, Opportunities and the Status Quo

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ABSTRACT

The digital literacy of English-as-a-Foreign-Language (EFL) learners plays a significant role in their progress as EFL learners especially in Computer-Assisted Language Learning (CALL) contexts. Yet, scant recent attention has been paid to the digital literacy skills of EFL learners in underprivileged, developing countries. Thus, this mixed-methods study set to investigate Iraqi EFL university students' digital literacy skills and the role of gender in this regard. Accordingly, a total of 250 senior EFL students (125 males and 125 females) were selected from five public Iraqi universities via convenience sampling method and completed the questionnaire of the study. Of these participants, a random sample of 25 students was also selected for interview sessions. The results of the study revealed that Iraqi EFL university students had generally low-to-moderate levels of digital literacy in CALL courses and gender played no meaningful role in the EFL students' digital literacy levels. Whereas they had an average level of competence in using English websites and computer-based dictionaries, they had low levels of digital literacy in using Microsoft Office Words and PowerPoint, using emails, and using English podcasts. Besides they used digital devices for both recreational and educational purposes on average. In interviews, they stated that the main challenge they faced in using digital technology was lack of sufficient digital skills mainly due to ineffective relevant training.

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دراسة مستويات المعرفة الرقمية لدى طلاب جامعة اللغة الإنجليزية كلغة أجنبية في العراق: التحديات والفرص والوضع الراهن

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المُستخلص

للمعرفة الرقمية لمتعلمي اللغة الإنجليزية كلغة أجنبية أثر مهم في تقدمهم كمتعلمي اللغة الإنجليزية كلغة أجنبية وخاصة في سياقات تعلم اللغة بمساعدة الكمبيوتر. ومع ذلك، لم يتم إيلاء سوى قدر ضئيل من الاهتمام مؤخرًا لمهارات القراءة والكتابة الرقمية لمتعلمي اللغة الإنجليزية كلغة أجنبية في البلدان النامية المحرومة.

وبالتالي، تهدف هذه الدراسة ذات الأساليب المختلطة إلى التحقق من مهارات القراءة والكتابة الرقمية لدى طلاب جامعة اللغة الإنجليزية كلغة أجنبية في العراق ودور النوع الاجتماعي في هذا الصدد. وبناءً على ذلك، تم اختيار ما مجموعه 300 طالب من كبار طلاب اللغة الإنجليزية كلغة أجنبية (150 ذكرًا و150 أنثى) من خمس جامعات عراقية حكومية عبر طريقة أخذ العينات الملائمة واستكملوا استبانة الدراسة.

ومن بين هؤلاء المشاركين، تم أيضًا اختيار عينة عشوائية مكونة من 25 طالبًا لإجراء جلسات المقابلة. كشفت نتائج الدراسة أن طلاب الجامعات العراقية للغة الإنجليزية كلغة أجنبية لديهم بشكل عام مستويات منخفضة إلى متوسطة من المعرفة الرقمية في دورات CALL ولم يلعب الجنس أي دور مهم في مستويات المعرفة الرقمية لطلاب اللغة الإنجليزية كلغة أجنبية.

في حين كان لديهم مستوى متوسط من الكفاءة في استخدام مواقع اللغة الإنجليزية والقواميس المعتمدة على الكمبيوتر، كان لديهم مستويات منخفضة من المعرفة الرقمية في استخدام وتطبيقات الاوفيس والعروض التقديمية، واستخدام رسائل البريد الإلكتروني، واستخدام البث الصوتي باللغة الإنجليزية.

إلى جانب أنهم استخدموا الأجهزة الرقمية للأغراض الترفيهية والتعليمية في المتوسط. وفي المقابلات، ذكروا أن التحدي الرئيس الذي واجهوه في استخدام التكنولوجيا الرقمية هو الافتقار إلى المهارات الرقمية الكافية؛ ويرجع ذلك أساسًا إلى عدم فعالية التدريب ذي الصلة. بشكل عام، تظهر هذه النتائج أن طلاب جامعات اللغة الإنجليزية كلغة أجنبية يفتقرون إلى مستويات كافية من المعرفة الرقمية للعمل بفعالية في تعليم CALL والذي يجب أن يؤخذ بالحسبان من قبل مطوري مناهج اللغة الإنجليزية كلغة أجنبية ومصممي المناهج لتحسين الوضع..

الكلمات المفتاحية: تعلم اللغة الرقمي، المعرفة الرقمية، طلاب جامعة اللغة الإنجليزية كلغة أجنبية

I. INTRODUCTION

In today's digitally interconnected world, digital literacy has become a significant component of education. For second or foreign language learners, grasping adequate digital literacy is not just an extra benefit but an essential requirement that helps language learners navigate the digital world confidently while empowering their target language learning (Hockly, 2015). Generally defined as the ability to effectively and responsibly utilize digital technologies, tools, and platforms (Tinmaz et al., 2022), digital literacy is of particular significance in English as a foreign language (EFL) context in which teachers and learners depend on an array of Internet-based resources and technologies, such as online applications and social media platforms, to facilitate the language learning process (Pegrum, 2014).

The inclusion of digital literacy in EFL pedagogy and classroom practice reflects a paradigm shift in how language learning is regarded and approached. Traditionally, learning a new language relied mostly on printed textbooks, in-person classroom interactions, and limited audiovisual materials. Yet, the introduction of computer-assisted language learning (CALL) in the field of second or foreign language acquisition has totally shapeshifted the language learning domain and provided language learners with easy access to various types of language input from all parts of the world, real-time interactions with native speakers, and interactive online and offline devices which turn language learning into an interactive process (Mudra, 2020). Therefore, utilizing different types of digital tools by teachers and learners and mastering relevant digital literacy to use such technology effectively is of paramount significance in EFL contexts (Rinekso et al., 2021; Rayeji & Tabandneh, 2023).

For EFL learners, digital literacy skills are beyond simple rudimentary digital skills that are expected to be known for everyday social interactions. It includes learners' capability to evaluate online critically and Internet-based content and utilize digital devices and advanced technology to develop their language learning process (Akayoglu et al., 2020). As an example, when EFL learners participate in online forums or video calls, not only are they practicing their communicative language skills, but they are also fostering their intercultural competence while interacting with different digital milieus (Reinders & White, 2016). Furthermore, digital literacy helps EFL learners be more responsible for their language learning as it can provide them with the necessary digital tools and equipment to access personalized language resources like podcasts, videos, and online content based on their interests, proficiency levels, and proficiency levels (Hockly, 2015; Colton, 2020).

Nevertheless, digital literacy can pose inimitable challenges in EFL contexts because many EFL learners, especially in developing countries, may have problems accessing the required technology or lack the necessary skills to use such technology effectively (Cote & Milliner, 2018). Such a digital divide can deteriorate existing inequalities which makes it vital for EFL curriculum developers and syllabus designers to address these barriers and warrant equal access to digital devices and resources (Meurant, 2009; Dashtestani & Hojatpanah, 2022). This highlights the significance of measuring EFL learners' digital literacy levels and investigating the degree to which their digital literacy levels are in line with the CALL-based facilities they are equipped with and their language learning needs (Alfia et al., 2020). Research in this regard in developing countries shows that EFL learners in such regions lack sufficient digital literacy levels required to make use of CALL efficiently (e.g., Alfia et al., 2020; Nguyen & Habok, 2020; Dashtestani & Hojatpanah, 2022; Purmayanti, 2022). One such context that is on the verge of developing a digitally oriented educational system with increasing CALL-based educational programs and courses in

tertiary education is Iraq (Ziaei & Alsaedi, 2024). Accordingly, investigating Iraqi EFL university students' digital literacy levels in this technologically developing country can shed light on their current digital literacy skills and pave the way for improving such skills in EFL teaching and learning contexts.

II. LITERATURE REVIEW

In the twenty-first century, digital literacy—which is broadly defined as the capacity to access, assess, and use digital technology efficiently—has grown to be a crucial part of language instruction (Eshet, 2012). Digital literacy offers language learners new opportunities for communication, language learning, and cross-cultural engagement. In EFL situations, digital literacy is essential because it supports language development and makes it easier for students to interact with real-world language resources. The use of digital tools and platforms has changed traditional classroom settings into more participative and dynamic spaces, claim Warschauer and Matuchniak (2010). Students can practice their English in authentic settings using digital technologies such as social media, learning management systems, and language-learning applications. This helps them retain and use the language more effectively.

The necessity of digital literacy in second or foreign language instruction has also been brought to light by the growing use of English as the universal language. Proficiency in English and digital abilities have become crucial for academic, professional, and social success as global communication takes place more and more through digital platforms (Selwyn, 2012). Digitally literate language learners can build intercultural abilities and engage in global networks more successfully, both of which are essential in the linked world of today (Gee, 2015).

Challenges in Developing Digital Literacy for Language Learners

Despite its advantages, teaching digital literacy to EFL students is fraught with difficulties. The digital gap, which describes disparities in access to technology and the internet, is one significant obstacle. Many EFL learners live in low-income and rural areas of developing nations, where gaps in technological availability are especially noticeable (Hohlfeld et al., 2017). Inequities in learning outcomes and limited possibilities for language practice are caused by limited access to digital resources. Teachers' digital competency presents additional difficulties. According to research by Son et al. (2017), many teachers lack the skills and confidence needed to use digital tools effectively, even though they acknowledge the benefits of incorporating them into EFL or ESL training. Teachers are frequently ill-prepared to handle the demands of a classroom with increased technology because professional development programs that concentrate on improving teachers' digital literacy are insufficient. One of the findings of the study of Al-Ibadi (2022) is that Iraqi students believe that teachers lack the electronic skills and the e-learning process is insufficient.

Critically assessing internet sources presents another difficulty. Students may find it difficult to evaluate the accuracy and applicability of digital resources, which may result in the use of subpar or deceptive content (Leu et al., 2013). This problem is especially important in second language environments, when learners' capacity to critically navigate online content may be further hampered by language limitations. Online searches to stay up to date on essential digital learning resources may be challenging for EFL learners who are already having trouble achieving sufficient competency in the target language (Kendrick et al., 2022). Furthermore, the adoption of digital literacy practices may be impacted by environmental and cultural factors. For example, because digital tools may differ from traditional teaching methods in their cultural contexts, some language learners might not be comfortable with collaborative learning or autonomous learning approaches. The successful implementation of digital literacy programs in language education may be hampered by such cultural incompatibilities (Li & Yu, 2022).

Teaching Practices for Enhancing Digital Literacy

According to general research, incorporating digital literacy into language teaching necessitates a well-rounded strategy that incorporates language growth, technological proficiency, and critical thinking. Project-based learning is one successful tactic, in which students collaborate to accomplish tasks involving real-world language use using digital tools. O'Byrne and Pytash (2015), for instance, point out that EFL students can develop digital competences and practice writing by creating digital portfolios or blogs. Another strategy that is frequently suggested for improving digital literacy is blended learning. Students can interact with digital tools while getting direction from their teachers in blended learning environments, which integrate in-person instruction with online learning activities (Graham, 2013). By offering possibilities for self-directed learning and real-time feedback, blended learning enhances the digital literacy and language competency of EFL learners, according to a 2015 study by Sun and Yang.

When it comes to incorporating digital literacy into EFL instruction, teacher preparation programs are essential. Initiatives for professional development that concentrate on increasing teachers' proficiency with technological pedagogical content have proven very successful (Mishra & Koehler, 2006). These courses educate educators how to match digital resources to language learning goals and design engaging lessons for their pupils. Last but not least, developing critical digital literacy is crucial in EFL settings. Critical digital literacy, according to Buckingham (2015), entails evaluating and challenging the sources and content of digital information. Critical thinking skills can be developed while practicing English through exercises like analyzing news stories, spotting media biases, and talking about online privacy

concerns. Thus, digital literacy is a vital part of EFL instruction in the new millennium. It gives students the opportunity to interact with real materials, grow as individuals, and take part in international networks. To guarantee fair access to digital literacy opportunities, however, issues including the digital gap, teachers' digital competency, and cultural considerations need to be addressed (Cote & Milliner, 2016).

Recent Findings on Digital Literacy in ESL/EFL Contexts

Several recent studies have investigated digital literacy of English learners in various EFL and ESL contexts. For instance, Gilbert (2017) examined high school students' perceptions on their digital literacy in ESL reading in the United States. The researcher focused on reading strategies and reading-based digital literacy of the learners while reading ESL digital texts in the Internet, social platforms, and PDFs. The learners' journals, diaries, group discussions, and interviews to collect the data. The findings suggested that ESL learners were moderately literate about the use of different types of digital computer-based tools to read but they needed training and education of more sophisticated digital skills taught in conjunction with the development of traditional literacy skills in the English.

In another study in the ESL context, Mantiri et al. (2019) studied the benefits of sufficient CALL based digital literacy for both language learners and teachers. First, they emphasized that more education and training should be carried out so that ESL and EFL teachers are digitally literate enough to make use of advanced technology for ESL learning. Moreover, computerized infrastructure and Internet-based equipment should be readily available so that such education becomes practical in ESL contexts. Pazilah et al. (2024) also studied the digital literacy of Malaysian ESL learners from the perspectives of pre-service teachers. The ESL pre-service teachers reported that it is pivotal for them to know and be able to implement 21st-century skills in their classrooms. They also mentioned that they should be able to have digital literacy and have awareness towards learners' digital literacy levels and try to train learners in this regard.

As for the EFL context, focusing on both EFL teachers' and learners' perceptions about the benefits and challenges of digital literacy, Mudra (2020) used semi-structured interviews to investigate EFL issues regarding digital literacy. He reported that improving learners' writing, reading, listening, and speaking skills, getting used to authentic materials, increasing the frequency of digital technology use, improving teacher-learner connection are among the most important benefits of digital literacy of EFL learners. But young learners had problems understanding digital materials and digital literacy tools are usually expensive. Moreover, teachers themselves lack enough digital literacy to teach them to their learners which requires further education and training for EFL teachers. Likewise, Silvhiany et al. (2021) introduced the concept of critical digital literacy for EFL learners and asserted that EFL learners need to be digitally

literate enough to distinguish valid information from misinformation from online sources and make use of such credible information for language learning purposes.

In one study in the Iranian EFL context, Dashtestani and Hojatpanah (2022) stated that adequate digital literacy has become a significant challenge for EFL educational authorities and course designers. Thus, they focused on high school students' and their teachers' perceptions regarding challenges they face in terms of CALL digital literacy. They found that these two groups of stakeholders are significantly different in terms of their perceptions regarding digital literacy. Moreover, Iranian EFL learners had moderate-to-low levels of digital literacy which is not sufficient for effective CALL instruction. The teachers also did not have consensus on the issues related to high school students' digital literacy. Moreover, teachers and authorities stated that the Ministry has no clear plans for promoting students' digital literacy levels. Similarly, Nguyen and Habók (2022) reported that Vietnamese EFL students generally possess low-to-medium levels of levels of knowledge regarding digital literacy, and despite generally positive attitudes towards technology in language learning, they do not use technologies extensively when learning English. One interesting finding of their study was that gender made a difference in digital literacy and males were found to have better digital knowledge and skills than their female peers. Although female learners were more aware of the digital integration benefits of learning than their male peers, males tended to use technologies more extensively than females. All in all, all these findings on the one hand and significant role of adequate digital literacy for successful CALL-based EFL instruction, particularly in underdeveloped and developing contexts (Palacios-Hidalgo & Huertas-Abril, 2025) underscores the importance of gauging EFL learners' digital literacy in different EFL contexts and providing improvement strategies based on these levels. Therefore, the current mixed-methods study set out to investigate Iraqi EFL university students' digital literacy levels and gender role in this regard. The following research questions were thus posited:

RQ1: What are Iraqi EFL university students' perceptions on their digital literacy levels?

RQ2: Is there a significant difference between male and female Iraqi EFL university students' digital literacy levels?

III. METHOD

III. 1. Participants

The participants of the study consisted of 250 Iraqi EFL university undergraduate students. These students were all selected via the convenience sampling method from English departments at the College of Education in five public universities in Iraq. A total of 50 students were selected from each of these

universities equaling 250 participants in total: 125 male students (M = 21.45, SD = 1.13) and 125 female students (M = 20.89, SD = .95). Regarding the interview participants, 25 students were selected randomly from these participants to sit interview sessions. These universities implement CALL-based programs, including blended EFL teaching courses, have the same syllabus, and have almost the same experience with CALL-based programs since the breakout of the COVID-19 pandemic. These 250 students completed the questionnaire of the study. All the participants were selected from those students who were senior bachelor's students (final year of university) due to their long period of blended learning that extends to four years of study.

III. 2. Instrument

III. 2. 1. Digital Literacy Questionnaire

To investigate the EFL students' perceptions on their digital literacy and measure their digital literacy levels quantitively, the digital literacy questionnaire developed and validated by Dashtestani and Hojatpanah (2022) was adopted and administered. The questionnaire has four sections with 41 items: perspectives on level of digital literacy (15 items), purpose of using technology (4 items), devices used for CALL (7 items), and software/applications used for CALL (15 items). All items are on a 5-point Likert scale from 1 (*no level of competence/not using at all*) to 5 (*high level of competence/frequently using*) (see Appendix 1). The Cronbach's alpha (α) was measured for the internal consistency reliability of the questionnaire in this study, and the results showed an acceptable value (α = .847, > .7). Accordingly, to measure EFL learners' digital literacy scores for statistical analyses and comparisons, based on the response-scale of the questionnaire, learners' scores were calculated ranging from 41 (lowest level of digital literacy) to 205 (highest level of digital literacy).

III. 2. 2. Interview Protocol Development

The main purpose of conducting interviews was to provide triangulated qualitative data to augment the quantitative data of the questionnaires. To achieve this aim, an interview protocol was developed. The interview was semi-structured. Based on a review of the relevant literature including the digital literacy questionnaire used in the study by Dashtestani and Hojatpanah (2022), a total of eight questions were devised. To establish the content validity and suitability of the questions, evaluation checklists were submitted to a group of three experts of CALL and their opinions and comments were received and considered. The questions were also piloted with similar groups of EFL students to identify the strengths and weaknesses of the questions. The students' interview questions focused on topics such as digital

literacy levels, limitations and challenges, suggestions for digital literacy improvement, and purposes of using technology.

III. 3. Ethical Issues

Regarding the ethical considerations of this study, an informed consent form was submitted to students before the data collection procedure. The consent form was developed based on the guidelines of the ethical committees of the five universities. The form provided the participant with the required information about the study. Furthermore, the anonymity and confidentiality of the collected data were completely ensured.

III. 4. Data Collection Procedure

The data were collected by administering the questionnaires to the 250 Iraqi EFL university students in the quantitative phases and interviewing 25 students in the qualitative phase. The senior EFL university students from the five Iraqi universities were selected via convenience sampling method to complete the hard-copy version of the digital literacy questionnaire. The questionnaire was distributed manually to the students in their classrooms under the supervision of the first researcher (i.e., the teacher). The reason for this supervision was to ensure that students could understand the items completely and did not copy each other's answers. The interview sessions were held in a comfortable room at the university, and students' responses were transcribed verbatim. Finally, the data were collected, organized, and coded for the analysis procedures.

III. 5. Data Analysis

First, to assess the validity and internal consistency reliability of the adapted questionnaire, Exploratory Factor Analysis (EFA) and Cronbach's Alpha (α) internal consistency reliability were run respectively. Next, descriptive statistical analysis was used to analyze the data of the questionnaire to summaries the overall responses of the learners to the questionnaire items. The means and standard deviations of each item of the questionnaire were calculated and presented for reporting participants' levels of digital literacy and attitudes towards blended learning. For measuring significant differences between male and female participants regarding digital literacy levels, after making sure that the data met the assumptions of conducting parametric tests, independent-sample *t*-test was used.

As for the interview data, an inductive reflexive thematic analysis was employed as the method of data analysis and interpretation to analyze the content and extract themes and relevant sub-themes (Braun & Clarke, 2022). As a robust method of qualitative data analysis, inductive reflexive thematic analysis is a type of content analysis defined as a critical reflection on the researcher's part on research practice and

process while coding and extracting themes where the analysis is located within the content as coding and theme development are driven by the data content, rather than being shaped by external theories as in deductive reflexive thematic analysis. This model of thematic analysis has six consecutive phases: 1) familiarizing yourself with the dataset, 2) coding, 3) generating initial themes, 4) developing and reviewing themes, 5) refining, defining, and renaming themes, and 6) writing up. Regarding the reliability of the extracted themes, 50% of the qualitative data was coded by a second coder (a colleague of the researcher), and the results of intercoder reliability analyses (Cohen's Kappa *k*) revealed substantial collaborative agreements between the two coders ($k_s > .7$).

IV. RESULTS

IV. 1. Students' Perceptions on their Digital Literacy Levels: Questionnaire Data

The students' responses to the questionnaire items in the four sections of the questionnaire were analyzed via descriptive statistics of the items (i.e., *Means* and *Standard Deviations*). The first section of the questionnaire targeted on the learners' self-perceived level of digital literacy.

Table 4.1 designates the results of EFL learners' self-perceived levels of digital literacy in terms of the mean and standard deviation. Based on the 5-point Liker scale range of responses, the mean range 1-2.5 demonstrates no level or a low level of competence, the mean range of 2.6-3.5 shows an average level of competence, and the mean range of 3.6-5 shows a moderately high to high level of competence. As shown in Table 1, EFL learners had an average level of competence in using English websites, social network sites, computer-based, online, and mobile-based dictionaries, using search engines, using English videos, and using English learning applications.

Table 1

Digital Literacy: Section 1

Items		*M**	*SD.*
I am competent in……. .			
Q1	Playing computer games.	2.04	1.09
Q2	Playing online games.	2.46	1.25
Q3	Using English websites.	3.22	0.98
Q4	Using social network sites.	3.53	1.06
Q5	Using Microsoft Office Word.	2.18	1.03
Q6	Using Microsoft PowerPoint.	2.06	1.05
Q7	Using computer-based dictionaries.	2.68	1.67
Q8	Using online dictionaries.	2.98	1.09
Q9	Using mobile-based dictionaries.	3.00	1.14

Q10	Using Wikipedia.	2.51	1.12
Q11	Using search engines.	3.34	1.14
Q12	Using English videos.	3.22	2.13
Q13	Sending and receiving emails.	2.54	1.02
Q14	Using English learning applications.	3.09	0.96
Q15	Using English podcasts.	2.52	1.19

**Mean of responses based on a 5-point Likert scale ranging from 1 (not competent at all) to 5 (highly competent)*

However, they had low levels of digital literacy in terms of other digital technologies such as playing computer and online games, using Microsoft Office Word and PowerPoint, using emails, using English podcasts.

The second section of the questionnaire inquired the purpose of using digital devices by the learners. Table 2 demonstrates the results.

Table 2

Digital literacy: Section 2

Items		*M**	*SD.*
I use digital devices for ……. .			
Q1	Educational purposes	2.59	1.03
Q2	English learning purposes	2.78	0.89
Q3	Having fun	3.32	1.09
Q4	Non-educational purposes	3.24	1.09

** Responses based on a 5-point Likert scale ranging from 1 (not using at all) to 5 (frequently using)*

As can be seen in Table 2, the learners used digital devices mostly for fun and non-educational purposes. Overall, the learners had an average level of use for such devices in total.

The third section of the questionnaire addressed frequency of the use of different digital devices by the learners. Table 4.3 shows the results. As observed in Table 3, the only device which was highly frequently used by the EFL learners was smart phones whereas all other devices, including basic phones, computers, laptops, tablets, game consoles, and MP3 players were rarely used.

Table 3

Digital literacy questionnaire: Section 3

Items		*M**	*SD.*
I use …….. .			
Q1	Smart phones	4.33	0.98
Q2	Basic phones	2.14	1.17
Q3	Desktop computers	2.22	1.11
Q4	Tablets	2.10	1.33

Q5	Game consoles	1.92	1.30
Q6	Laptops	2.36	1.26
Q7	MP3 player	2.49	1.33

** Responses based on a 5-point Likert scale ranging from 1 (not using at all) to 5 (frequently using)*

Finally, the fourth section of the questionnaire inquired about the frequency of using software and applications by the learners. Table 4 depicts the results. As can be observed in Table 4.4, most software and applications were either moderately or rarely used by the EFL learners. The learners rarely used English podcasts, Microsoft PowerPoint, Microsoft Office Word, computer and online games, computer-based dictionaries, Wikipedia, emails, and English podcasts. They also moderately used English websites, online dictionaries, mobile-used dictionaries, English videos, and English-learning software and applications. They only frequently used English search engines and social network websites.

Table 4

Digital literacy: Section 4

Items		*M**	*SD.*
I do …….			
Q1	Play computer games.	2.22	1.18
Q2	Play online games.	2.39	1.27
Q3	Use English websites.	3.24	1.04
Q4	Use social network sites.	3.66	1.09
Q5	Use Microsoft Office Word.	2.34	1.07
Q6	Use Microsoft PowerPoint.	2.17	1.07
Q7	Use computer-based dictionaries.	2.44	1.16
Q8	Use online dictionaries.	3.12	1.08
Q9	Use mobile-based dictionaries.	3.06	1.12
Q10	Use Wikipedia.	2.80	1.20
Q11	Use search engines.	3.64	1.03
Q12	Use English videos.	3.14	0.93
Q13	Send and receiving emails.	2.60	1.09
Q14	Use English learning applications.	3.23	0.91
Q15	Use English podcasts.	2.54	1.24

** Responses based on a 5-point Likert scale ranging from 1 (not doing at all) to 5 (frequently doing)*

IV. 2. Students' Perceptions on their Digital Literacy Levels: Interview Data

The thematic analysis of the students' responses to interview questions yielded four major themes regarding their perceptions on their digital literacy levels: digital literacy level, purpose of using technology, strategies and skills for improvement, and challenges and limitations. Each of these themes included some subthemes which emerged from the thematic analysis as discussed below.

The first theme was the 'digital literacy level' of EFL learners. Here, the learners named the following subthemes as the main components of: low level for educational technology, moderate level for non-educational/recreational technology, inadequate level for recent updated technology. Table 5 depicts the theme and its relevant subthemes.

Table 5

Digital Literacy Level and Relevant Subthemes

Theme	*Subthemes*
Digital literacy level	1. Inadequate level for advanced educational technology
	2. Low level for routine educational technology
	3. Moderate level for non-educational technology

The EFL university students almost unanimously stated in their interviews that they lack adequate knowledge and skills in using cutting-edge educational technology, such as AI devices and applications, and hence feel they are behind the schedule for using such technology for educational purposes compared to university students in advanced countries. Likewise, they expressed that their digital literacy of ordinary and routine educational devices and technology is also low which renders CALL-based programs such as blended EFL courses mostly ineffective. They believed that if they are supposed to make the most of CALL courses they need to be educated and trained for learning how to use relevant advanced educational technology to keep up with the pace of digital literacy progress withing global standards. Two comments by the students introduce these issues:

> *Familiarization with updated educational technology and knowing how to use it in online and blended courses is a must for EFL students these days. Unfortunately, the majority of students lack sufficient knowledge.* (Student 3)

> *AI is spreading rapidly in all educational realms and has provided a lot of advantages for students. Most of university students are not competent enough to use AI for educational purposes.* (Student 15)

The learners also stated that they are moderately literate in digital technology used for noneducational and recreational purposes. They maintained that they use smartphones and computers for personal and recreational purposes which shows that their use of such devices is mostly for noneducational purposes. One EFL student expressed the following comment in this regard:

I mostly use regular digital devices such as smartphones and laptops for personal and noneducational purposes such as social relationships and gaming. I rarely use these devices for EFL purposes. (Student 18)

The second theme was the 'purpose of using technology'. Two subthemes emerged from the learners' responses: infrequent use for educational purposes and frequent use for noneducational purposes. Table 6 shows the theme and its relevant subthemes.

Table 6

Purpose of Using Technology and Relevant Subthemes

Theme	*Subthemes*
Purpose of using technology	1. Infrequent use for educational purposes
	2. Frequent use for noneducational purposes

The students stated that they mainly use digital devices such as smartphones, laptops, and tablets for noneducational and fun purposes. They stated that they use these devices for social-media interactions, gaming, and other functions. On the other hand, they mostly expressed that such digital devices are not frequently used for EFL learning purposes and any CALL-related functions. In this regard, two students commented:

The only digital device I use is my smartphone. I use it mostly for being connected to the Internet and sending messages on social media applications like Telegram and Instagram. (Student 24)

I use my dictionary application for English learning purposes. Apart from that, I often use my laptop and smartphone for noneducational purposes such as chatting and sending videos and photos to my friends. (Student 9)

The third theme was 'strategies and skills for improvement' mentioned by Iraqi EFL learners. The learners underscored the importance of increasing general knowledge of computerized technology, and receiving more CALL training, and incorporating CALL into the syllabus by EFL programs. Table 7 demonstrates the theme and its relevant subthemes.

Table 7

Strategies and Skills for Improvement and Relevant Subthemes

Theme	*Subthemes*
	1. Increasing general knowledge of technology

Strategies and skills for improvement	2. More CALL training 3. Incorporating CALL into EFL syllabus

The first point highlighted by the students was that university students should set to increase their general knowledge of updated technology and Internet based educational software and application beyond boundaries of university context. They maintained that if EFL students are generally and sufficiently literate in digital technology, they can easily learn to use technology and digital devices for EFL purposes. One student's comment elaborates this issue:

> *Students who are already proficient enough in using advanced computerized technology and Internet-based applications can learn how to use relevant application for EFL learning much faster. So, I think students should update their digital knowledge before entering the university.* (Student 11)

The other important issue stated by EFL students was the importance and significance of providing university learners with sufficient CALL training to prepare them for online and blended EFL courses. They believed that CALL workshops and CALL-related credits in the beginning semesters can prepare learners for different types of CALL courses and programs and equip them with necessary digital literacy skills they need to function properly in CALL-based EFL courses. Two students emphasized this point by commenting:

> *Universities can hold some technology-based learning workshops so that students would update themselves and make the best use of EFL courses using CALL in different ways.* (Student 13)

> *In my opinion, all university students including different majors should pass some preliminary computer and technology familiarization courses as general credits in the first university semester. These courses can prepare them for computer-based learning.* (Student 25)

The final point highlighted for improvement was the incorporation of digital literacy courses into the official syllabus of university programs to help student brush up their digital literacy and become familiar with CALL. By so doing, teachers can easily incorporate educational technology as they become assured that learners know the ropes. One student's comment made this point clear:

> *University curriculum planners and syllabus designers need to include different types of CALL programs and courses, including workshops, credits, seminars etc., in their syllabuses so that*

students are made to familiarize themselves with relevant necessary technology and increase their digital literacy levels. (Student 17)

The final theme was 'challenges and limitations' in the way of digital literacy of university EFL students. Here, the EFL student underlined instructors' insufficient digital literacy, students' insufficient digital literacy, and lack of adequate digital facilities as the main subthemes. Table 8 demonstrates the theme and its relevant subthemes.

Table 8

Challenges and Limitations and Relevant Subthemes

Challenges and limitations	*Subthemes*
	1. Instructors' insufficient digital literacy
	2. Students' insufficient digital literacy
	3. Lack of adequate digital facilities

One of the main challenges in the way of university EFL students' digital literacy, according to the students' opinions, was the lack of sufficient digital literacy of university instructors. The students mentioned that many EFL instructors in in-person or blended EFL courses lack adequate knowledge of technology and how to use it appropriately in CALL settings. This issue is reflected in two students' comments:

In many blended EFL courses, we can see that the teacher is not able to use technology and applications effectively. Some teachers ask the students to help them deal with technical problems in blended classes which shows their inadequate digital literacy. (Student 22)

It is necessary for teachers to be familiarized with relevant computerized technology they have to use in blended EFL courses. If they do not possess such knowledge, the quality of such classes deteriorates enormously. (Student 1)

The other issue was students' inadequate digital literacy. They said that most of them did not possess sufficient digital knowledge and CALL skills which made them unable to fully make use of online or blended EFL courses. One student mentioned:

Not just me but also the majority of my classmates are not digitally literate enough to use CALL technology and application efficiently. University students need training and preparation in this regard. (Student 18)

Finally, the interviewees also stated that lack of advanced or sufficient digital facilities is also another issue which affects the quality of CALL programs and blended EFL courses. They asserted that to hold effective CALL courses, universities need to provide efficient updated digital devices for their students. One student commented:

> *If university directors want to run effective blended EFL courses or any CALL programs, they must have necessary digital and computerized infrastructure so that such courses run smoothly*. (Student 14)

IV. 3. Gender-based Differences in Students' Digital Literacy Levels

The second research question asked whether there was a significant difference between male and female Iraqi university students' levels of digital literacy. To answer this research question, the learners' digital literacy scores derived from digital literacy questionnaire were measured and compared based on the gender (i.e., male vs. female). Independent-sample *t*-test was used to compare the two groups after checking the assumptions of conducting parametric statistics tests. Table 9 shows the results of descriptive statistics. As shown, the two groups of male and female EFL learners had close mean of scores in terms of digital literacy scores.

Table 9

Descriptive Statistics for Digital Literacy Scores

Groups	*N*	*Min.*	*Max.*	*Mean*	*SD.*
Male leaners	125	77	169	117.072	20.133
Female learners	125	51	162	114.512	18.646

Next, to test the normality of the distribution of digital literacy scores, Kolmogorov-Smirnov and Shapiro-Wilk tests were used. As demonstrated in Table 10, none of the *P*-values for both genders were significant proving that the data were all distributed normally parametric statistical tests of significance.

Table 10

Tests for normality of Distribution of Digital Literacy Scores

	Kolmogorov-Smirnov			Shapiro-Wilk		
Groups	Statistic	df	Sig.	Statistic	df	Sig.
Male learners	.091	125	.085	.977	125	.075
Female learners	.124	125	.096	.967	124	.104

To check the homogeneity of variance as another prerequisite for carrying out parametric tests, Levene's statistic test

was used. This test checks the assumption that the error variance of the dependent variable is equal across groups. As shown in Table 11, the results of Levene's test were not significant for the two groups' speaking scores, hence no significant differences were observed between the variances of speaking scores.

Table 11

Levene's Test of Equality of Error Variances for Digital Literacy Scores

Groups	*df*	*F*	*Sig.*
Male learners	125	24.976	.315
Female learners	125	19.721	.124

Finally, independent-samples t-test was used to check whether there is a significant difference between the two groups in terms of digital literacy scores. Table 12 shows the results.

Table 12

Results of Independent-samples T-test for Gender-based Difference

		F	*Sig.*	*t*	*df*	*Sig. (2-tailed)*	*Mean Difference*	*SE Difference*	*Lower*	*Upper*
Scores	Equal variances	3.627	.058	1.043	248	.298	2.560	2.454	-2.274	7.394

As observed in Table 12, the two groups were not significantly different in terms of digital literacy levels ($t(248) = 1.043$, $P = .298 \geq .05$) which proves that the two groups were homogenous in terms of their digital literacy scores. This statistical result reveals that although there were some minor differences between the mean digital literacy scores of male and female Iraqi EFL learners, such a difference was statistically insignificant meaning that both groups enjoyed the same level of digital literacy.

V. DISCUSSION

This study sought to investigate the perceptions of Iraqi EFL university students regarding their digital literacy levels and the role of gender in this regard. The first research question examined the EFL learners' perceptions about their digital literacy levels quantitatively and qualitatively. The digital literacy questionnaire of the study investigated the issue in terms of four components: digital literacy levels, purpose of using digital devices, frequency of the use of digital devices, and frequency of using software

and applications. The results showed that Iraqi EFL university students had low-to-average levels of digital literacy. Their competence in using English websites, social network sites, computer-based, online, and mobile-based dictionaries, search engines, English videos, and English learning applications were generally at the average level. However, they had low levels of digital literacy in terms of other digital technologies such as playing computer and online games, using Microsoft Office Word, using emails, and using English podcasts. In the interviews, the learners also claimed that they have low levels of digital literacy, especially in relation to relevant essential CALL technology. This finding in general reveals low levels of digital literacy skill levels among Iraqi EFL university students despite its significance for effective CALL education (Eryansyah et al., 2019; Pazilah et al., 2024). This finding is in agreement with previous research findings especially in developing countries. For example, emphasizing the significance of digital literacy skills among EFL learners, Alavi et al. (2016) reported low levels of digital literacy levels among Iranian EFL learners. Some other studies have also reported low or inadequate digital literacy levels of students and suggested the need to train students to promote their digital literacy for functioning properly in educational contexts (e.g., Bataineh & Baniabdelrahman, 2006; Ozdamar-Keskin et al., 2015; Cote & Milliner, 2017; Eryansyah et a., 2019;). Emphasizing the importance of adequate digital literacy among EFL learners, Eryansyah et al. (2019) reported very low levels of digital literacy among Sumatran EFL learners.

Such low levels of digital literacy were also reflected in Iraqi EFL learners' responses in the interviews in this study. The learners raised relevant concerns about their low digital levels and strategies to compensate for such drawbacks. They mentioned that their low levels of digital literacy in blended EFL courses necessitate the importance of providing them with effective digital literacy and CALL workshops and training programs. In this respect, Ozdamar-Keskin et al. (2015) reported very basic levels of digital literacy among Turkish EFL learners and called for more digital literacy training programs. Similarly, more recently, Dashtestani and Hojatpanah (2022) also observed that Iranian EFL high school students had low to moderate levels of digital literacy and CALL competence despite what they claimed in interviews. They also emphasized the importance of holding CALL training programs for EFL students to familiarize them with updated educational technology because the lack of sufficient digital literacy was one of the most significant limitations. So, against this backdrop, in interviews, the learners suggested that effective CALL training workshops and courses are needed to brush up their literacy levels. This demand is also reiterated recently in other studies, such as Pazilah et al.'s (2024) and Soifah et al.'s (2021) studies, highlighting the need for holding digital literacy training programs for EFL learners. All in all, these findings prove the low levels of digital literacy in developing countries, such as Iraq and Iran, in different educational EFL

programs and underline the need for incorporating CALL-based training and digital literacy improvement programs into the EFL syllabuses in various educational levels.

The quantitative results of the study based on questionnaire responses also showed that Iraqi EFL university students moderately used digital devices for both educational and recreational purposes. The same concept was also reiterated in the learners' interview responses as they stated that they mostly used digital tools and computerized technology, such as smartphones and laptops, for personal and recreational purposes. The use of computerized technology by EFL learners for non-educational and recreational functions is also reported frequently by some studies (Dashtestani, 2016; Dashtestani & Hojatpanah, 2022). For instance, Dashtestani and Hojatpanah (2022) found that Iranian EFL students mostly used technology for recreational activities rather than for CALL purposes. This finding together with low levels of digital literacy skills in general implies that more awareness-raising activities and CALL-training measures should be considered to educate and prepare Iraqi EFL students for gaining the most from blended EFL courses. Such activities can motivate learners to learn about computerized technology and use their knowledge in blended EFL courses (He & Wray, 2017).

The other finding of the study reflected in both questionnaire and interview responses was that Iraqi EFL students only used smartphones frequently, and their use of desktop computers and laptops as well as gaming consoles was infrequent. This finding is in line with that of the study by Dashtestani and Hojatpanah (2022) in which they reported that Iranian EFL learners mostly used smartphones compared to other types of digital devices. These findings are not very surprising because students mostly use social networks and applications on their smartphones which mostly have noneducational functions. Likewise, Cote and Milliner (2017) also found that Japanese EFL students commonly used social network sites and online messaging applications and did not use a wide range of computer applications and tools. Similarly, Eryansyah et al. (2019) also reported that Sumatran EFL students mostly rely on using smartphones for educational purposes and they are not willing to use other types of software and applications because they lack the proper knowledge to do so.

As for Iraqi EFL students' frequency of use of software and applications, most software and applications were used either moderately or rarely. The learners mentioned that they rarely used English podcasts, Microsoft PowerPoint, Microsoft Office Word, computer and online games, and computer-based dictionaries. They also moderately used English websites, online dictionaries, mobile-used dictionaries, Wikipedia, English videos, and emails. They only frequently used English search engines and social network websites. This finding also agrees with what Dashtestani and Hojatpanah (2022) reported, stating that Iranian EFL learners did not use a wide range of digital applications. EFL students were found to use

social media more frequently than the other applications. Similarly, Cote and Milliner (2017) also showed that Japanese EFL students commonly used social network sites and did not use a wide range of computer applications and tools. Therefore, it seems that Iraqi EFL learners together with learners in other developing contexts mostly use English websites and English videos for educational purposes. Overall, such a lack of sufficient digital literacy levels as well as overreliance on more traditional types of technologies and devices, such as computers and websites, highlight the significance of educating the EFL learners in terms of CALL and how to make use of blended courses efficiently (Reddy et al., 2020).

The second research question investigated the role of gender in digital literacy levels and results revealed no significant difference between male and female EFL university students. Generally, mixed findings have been reported in this regard in different sociocultural contexts. For instance, in a large-scale study including 6695 Indonesian individuals, Long et al. (2023) observed that men were generally more digitally literate than women, especially in older generations. This finding implies that in younger and new generations, the gender divide in terms of digital literacy is narrower. The same finding is also reported by Maxwell and Maxwell (2014) in the Nigerian university context. However, Campos and Scherer (2023) reported that girls are slightly more digitally literate than boys in educational contexts, but digital literacy is generally influenced by individuals' attitudes toward technology. In the field of EFL, scant research has compared the two genders in terms of digital literacy but some findings suggest that there is no meaningful difference. For example, Bataineh and Baniabdelrahman (2006) observed that male and female Jordanian EFL learners are both equally digitally illiterate. They stated that the reason for the lack of difference between the two genders might be that the new generations of students are all equally exposed to advanced technology and computerized devices from early childhood and hence no particular difference can be observed in this regard among EFL learners. This argument can be also supported by the findings of Long et al. (2023) in general sociocultural contexts where younger individuals were reported to be more equal in terms of digital literacy than the older generations. Therefore, it seems that gender had no meaningful role in the digital literacy of new generations of learners in the new millennium (Hammoda & Foli, 2024).

VI CONCLUSION

The overall findings of the study regarding Iraqi EFL university students' perceptions of their digital literacy levels revealed that they had low-to-moderate levels of digital literacy skills. The EFL learners had an average level of competence in using English websites, social network sites, computer-based and mobile-based dictionaries, using search engines, using English videos, and using English learning

applications. Yet, they had low levels of digital literacy in terms of other digital technologies such as playing computer and online games, using Microsoft Office Word, using emails, and using English podcasts. These issues were also reflected in interviews as the students mentioned that they lack adequate digital literacy skills mainly due to insufficient relevant CALL training and familiarity. Such a low level of digital literacy shows that Iraqi EFL learners are still far behind the ideal level of digital literacy to make the most of CALL education including online and blended EFL courses. Questionnaire and interview findings also revealed that Iraqi EFL learners' purpose of using digital devices was mostly personal and recreational rather than CALL-oriented. They also reported using online dictionaries, social websites, and English learning applications moderately. Moreover, such insufficient levels of digital literacy were found to be equally spread among male and female students in this study, revealing that gender plays no part in this regard and both genders lack adequate digital literacy skills for attending CALL courses efficiently. This finding underscores the need for developing and implementing CALL-based training programs and workshops so that students can brush up their digital literacy skills and make use of such updated skills efficiently in their online and blended EFF courses. This highlights the role of educational decision-makers, curriculum planners, and syllabus designers as well as university instructors in setting plans for improving digital literacy skills and creating a culture of educational use of technology for university EFL students.

Similar to any empirical study, the study dealt with its own limitations. The first one was the participants of the study who were selected from bachelor's EFL students. Thus, the findings of the study can be generalized to undergraduate and postgraduate students with caution. Further research can include other educational levels to provide a wider picture of digital literacy among Iraqi EFL learners. Another limitation was that the data was only collected via a questionnaire. Further studies can triangulate the findings by collecting data through observations and interviews as well as questionnaires to delve deeper into EFL learners' digital literacy skills both perceptually and practically in CALL educational contexts.

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Appendix

A sample of participants' answers to interview questions:

1. What do you think about your level of digital literacy? Is it adequate for learning English effectively? Can you explain?

- I think my digital literacy is adequate as I am familiar with online tools and possess necessary communication skills. I can improve my digital literacy and learn much better via practice and training.

- I think my digital literacy level is not sufficient for effective learning. We haven't had any special training and education on how to use technology for learning English and how to participate effectively in blended EFL courses.

2. Name some strategies to promote your digital literacy? Explain each of them!

- Students should engage in continuous learning and self-improvement. They should try to update their technology and computer knowledge so they learn better in blended EFL courses.

- EFL learners should develop problem-solving skills for computer and technology to troubleshoot common issues with devices and applications. This helps them reduce dependence on teachers and foster independence.

3. What digital competencies and skills are important for language learning?

- Basic computer skills are a must. University students should be able to work with computers, smartphones, and tablets. They should work well with educational applications and software.

- Specifically, EFL students should know how to use language learning applications and be familiar with the online platform of the university. They should also know how to troubleshoot relevant online issues.

4. Do you believe that it is the responsibility of the university to help you foster your digital literacy or it is your responsibility?

- Yes. In my opinion, it is the responsibility of the university to provide necessary digital training courses and workshops so that blended courses are held more effectively.

- I think both university and students themselves are responsible. On the one hand, universities should hold educational courses and workshops on digital tools and applications. On the other hand, students should boost their technology knowledge as much as they can.

5. Is fostering digital literacy for learning English important to you? Why is it important?

- In today's technological world where Internet and online contents are easily available, it is necessary to foster digital literacy to learn English more effectively using different available multimedia and online sources.

- Sufficient digital literacy can help you utilize a wide variety of instructional sources such as online and web-based dictionaries, web sites, applications, and social media which can are useful in learning English.

6. What is your main purpose for using technology? What kind of digital devices and applications do you use for your purpose?

- I most use digital tools and devices for entertainment and personal use rather than for learning English. I use my smartphone for connecting with my friends on the Internet or viewing audio-visual contents.

- I use my laptop for different purposes including learning English. I use dictionaries on my smartphones and listen to audio podcasts for improving my English.

7. What are the possible limitations and challenges of promoting your digital literacy? Explain please.

- I think the main challenge is facilities that university student have access to inside and outside the university. Promoting and improving digital literacy requires knowledge and practice which without the availability of updated facilities becomes difficult.

- Lack of sufficient training and preparation for using digital tools for learning English in online classes is a serious challenge. Both teachers and students should be trained to make the most of such mediums of instruction.