The pros and cons of incorporating emerging technologies into L2 classrooms: A qualitative dual perspective from Chinese EFL teachers and students

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ABSTRACT: The use of emerging technologies (ETs) has recently gained increasing attention in second and foreign language (L2) education. However, little is known about how both teachers and students perceive their advantages and disadvantages. To address this gap, the present study explored Chinese EFL teachers' and students' perceptions of the benefits and challenges of incorporating ETs into L2 education. A total of 22 teachers and 31 students participated in online semi-structured interviews. Thematic analysis revealed several shared benefits, including personalized learning, access to rich and diverse materials, immediate feedback, emotional engagement, and flexibility in time and space. Teachers additionally emphasized enhanced teaching efficacy and improved instructional planning, while students highlighted novelty, enjoyment, and the use of multimedia-rich tools. On the other hand, teachers pointed to drawbacks such as risks to interpersonal communication, the need for training and infrastructure, unequal access, and ethical concerns. Students identified further challenges, including the need for technical support, the neglect of individual learning styles, and information overload. These findings offer practical insights for EFL teachers, students, and policymakers aiming to integrate ETs more effectively into L2 classrooms.
Keywords: Emerging technologies (ETs), EFL teachers, EFL students, educational technology

Los pros y los contras de la integración de las tecnologías emergentes en las aulas de ILE (Inglés como Lengua Extranjera) nivel L2: una perspectiva cualitativa dual desde la óptica de profesores y estudiantes chinos de ILE

RESUMEN: El uso de tecnologías emergentes (TE) ha suscitado un interés creciente en la educación de segundas lenguas (L2) y lenguas extranjeras. No obstante, se conoce poco acerca de cómo tanto profesores como estudiantes perciben sus ventajas y desventajas. Para abordar esta laguna, el presente estudio exploró las percepciones de profesores y estudiantes chinos de Inglés como Lengua Extranjera (ILE) con respecto a los beneficios y desafíos que implica la incorporación de las TE en la educación de L2. Un total de 22 profesores y 31 estudiantes participaron en entrevistas semiestructuradas en línea. El análisis temático reveló varios beneficios compartidos, entre ellos: el aprendizaje personalizado, el acceso a materiales ricos y

diversos, la retroalimentación inmediata, la implicación emocional y la flexibilidad en tiempo y espacio. Los profesores, además, enfatizaron una mayor eficacia docente y una mejor planificación de la instrucción, mientras que los estudiantes destacaron la novedad, el disfrute y el uso de herramientas enriquecidas con elementos multimedia. Por otro lado, los profesores señalaron inconvenientes tales como los riesgos para la comunicación interpersonal, la necesidad de capacitación e infraestructura, el acceso desigual y las preocupaciones éticas. Los estudiantes identificaron desafíos adicionales, incluyendo la necesidad de soporte técnico, el descuido de los estilos de aprendizaje individuales y la sobrecarga de información. Estos hallazgos ofrecen perspectivas prácticas para educadores de ILE, estudiantes y legisladores, con el objetivo de integrar las TE de manera más efectiva en las aulas de L2.
Palabras clave: Tecnologías emergentes (TE), profesores de ILE (Inglés como Lengua Extranjera), estudiantes de ILE tecnología educativa

1. Introduction

Different types of technologies have been incorporated into educational domains to foster teaching and learning outcomes (Qi & Derakhshan, 2025; Sosa et al., 2017; Zhi & Wang, 2024). Technology, which is intended to foster, support, and contribute to learning, plays a pivotal role in language learning (Derakhshan & Zhang, 2024; Kern, 2006). Research into the role of new technologies in language education has been thriving and has revealed many potential benefits, such as providing immediate feedback (Li et al., 2021), augmenting language input and sustaining collaborative learning tasks (Lin et al., 2020), offering authentic samples of language and authentic interactions (Colpaert & Stockwell, 2022). In response to the ever-growing popularity of new technologies, emerging technologies (ETs) have penetrated educational domains in order to enhance the quality of teaching and learning and prepare learners for a digitalized world. ETs are defined as "resources, artifacts, tools, concepts, and innovations associated with digital, that have a disruptive potential to transform or generate changes in the processes where they are used, regardless of whether these are new or old technologies" (Sosa et al., 2017, p. 129). Given this, in terms of education, ETs are believed to bring about changes in different educational domains. These ETs can entail Augmented Reality, Virtual Reality, Artificial Intelligence (AI), the Internet of Things (IoT), gamification, Massive Open Online Courses (MOOCs), and 3D printing technology (Fuentes-Penna et al., 2025; Khazaei & Derakhshan, 2024). In the context of Chinese L2 education, these technologies are considered emerging due to their limited but growing adoption and their potential to reshape instructional practices. It is also claimed that ETs can be adapted in accordance with the context and learner characteristics (Karacan & Akoğlu, 2021), which enables learners to incorporate technology in their learning based on their educational needs and preferences.

It is crucial to point out that ETs are constantly updating and changing based on contextual factors (Wu et al., 2012), which make them appropriate tools for educational settings that are undergoing rapid growth. In this regard, ETs are inventive since they engender transformation in educational processes compared with conventional modes of teaching (Fuentes-Penna et al., 2025). Furthermore, these technologies can be employed by teachers and learners regardless of time and place constraints (Parmaxi, 2023). Regarding instructors, ETs contribute to teachers' daily instruction, the provision of personalized learning, and the administration process of education (Fuentes-Penna et al., 2025). More importantly, it is asserted that ETs offer new teaching methodologies, which assist both teachers and

learners in acquiring novel technological skills required in this contemporary era (Sosa et al., 2017). Additionally, the evolving nature of ETs requires teachers and learners to engage in life-long learning in order to keep up with new dimensions of technology integration in education (Sosa et al., 2017). Nevertheless, the adoption of ETs may be hampered due to certain concerns regarding the privacy of data, teachers' insufficient knowledge and skills, and difficulties in the digital preparation of learners (Fuentes-Penna et al., 2025). Moreover, incorporating ETs into educational environments may be unsuccessful due to their complexity in use and application (Gardner et al., 2016).

Notwithstanding the pervasiveness of ETs in educational domains, their application in second/foreign language (L2) education has not received the attention it deserves. This gap is significant because L2 education, like general education, is becoming more and more technology-mediated. Yet, the benefits and drawbacks of using ETs in L2 education have not been explored, to date. Moreover, a careful scrutiny of the literature revealed that no studies have explored EFL teachers' and learners' perspectives on the integration of ETs in EFL contexts. In other words, previous studies have taken a single perspective approach, while this investigation adopts a dual perspective involving both teachers and learners. Therefore, to fill these lacunas, this study aims to explore Chinese EFL teachers' and learners' perspectives on the advantages and disadvantages of employing ETs in L2 education. The contribution of this study is its dual focus on both teachers and learners to understand how ETs can be beneficial or disadvantageous in EFL settings. The findings of this study will contribute valuable insights into how EFL teachers and learners perceive ETs, their influences (both positive and negative) on teaching and learning, and their core characteristics.

2. Literature Review

2.1. Technology and L2 Education

Technology-assisted education has been a vibrant strand of research in recent years due to its substantial influence on teachers and learners (Buddha et al., 2024; Chen et al., 2025; Shadiev & Yang, 2020). Additionally, technology integration has garnered noticeable attention in educational milieus, and many instructors have been encouraged to embed technology in their instruction (Aghaei et al., 2022). Concurrent with this surge of interest in technology in general education, prior studies have accentuated the significant role of technology in language education (e.g., Blake, 2011; Otto, 2017), and a concomitant line of inquiry has examined diverse aspects of technology integration in language education (e.g., Ataeifar et al., 2019). Otto (2017) maintains that technology is regarded as a source of content and tasks for instructors, which boosts authentic language use to address the challenges involved in language learning. Compared with conventional classes, technology-driven language classes highlight the significance of language production through drawing on multiple online resources that augment learners' abilities to interact in real-life circumstances (Buddha et al., 2024). It is argued that technology exerts substantial influence on learners' academic performance, attitudes, and interest (Buddha et al., 2024). Furthermore, it is postulated that technology-enhanced language education augments learners' engagement and motivation during language learning (Shadiev & Yang, 2020).

In line with traditional technologies, ETs are offering new approaches to foster teaching and learning in educational domains (Makridakis, 2017). ETs not only digitize the learning context but also aim to reshape how knowledge can be learned, shared, and utilized (Collins & Halverson, 2018). Among diverse ETs, AI is considered the most transformative emerging technology in educational domains (Fuentes-Penna et al., 2025). Recent AI technologies such as ChatGPT, Claude, Siri, and Copilot provide personalized learning experiences and intelligent tutoring support (Wang et al., 2025). This development aligns with broader expectations regarding AI's role in education discussed by Holmes et al. (2019). AI integration in language learning has been attested by previous studies, which highlight the positive changes that AI has brought to language learning and teaching practices (Song & Song, 2023). In addition, Virtual Reality and Augmented Reality technologies engender engaging learning settings, which facilitate the exploration of virtual worlds, interactions with 3D models, and involvement in real-life simulations (Merchant et al., 2014). Parmaxi (2020) points out that Virtual Reality enhances language learning by providing access to situations unavailable in conventional classes.

Moreover, as another ET, gamification is changing how students learn educational content. Teachers aim to enhance learners' motivation, enjoyment, and engagement through game-based instruction when assigning learning tasks (Fuentes-Penna et al., 2025). Another emerging technology pertains to the inclusion of MOOCs, which provide learners with online courses from all around the world regardless of geographical limitations (Yuan & Powell, 2013). It is established that MOOCs enhance language learning skills such as speaking (Hashemifardnia et al., 2021), reading (Ahmed et al., 2022), and grammar knowledge (Du & Qian, 2022). In addition, another ET is 3D printing, which has helped students create designs that contribute to their understanding of complex concepts (Ford & Minshall, 2019). This emerging technology hones students' creativity, problem-solving skills, and capacity for innovation (Trust & Maloy, 2017). Similarly, IoT facilitates the use of smart classes, which alter educational conditions for achieving optimal learning outcomes (Fuentes-Penna et al., 2025). IoT technologies create more comfortable learning environments through adaptive teaching and increase learners' engagement (Hsu & Lin, 2018). As discussed, there are different educational technologies that innovatively inform L2 teaching and learning. However, their utilization may have both pros and cons depending on the context.

2.2. The Advantages and Disadvantages of Technology-Mediated L2 Education

The inclusion of technologies in language education has brought about both benefits and drawbacks for instructors and learners in L2 environments (Derakhshan & Ghiasvand, 2024; Huo, 2019). Research suggests that the incorporation of technology offers improvements in different dimensions, namely instruction, assessment, and research practices (Li et al., 2021). As for instructional purposes, technology can offer immediate feedback in order to cater to learners' individual differences (Al-Obaydi et al., 2023; Li et al., 2021). Likewise, technology can increase access to input, cultivate collaborative learning, and augment the use of interactional activities (Lin et al., 2020). Additionally, technology provides learners with authentic language input and facilitates authentic interactions among learners and native speakers (Colpaert & Stockwell, 2022). By utilizing technology, teachers have the capability to

design diverse learning tasks more efficiently and in accordance with learners' needs (Shadiev & Yang, 2020). It is worth mentioning that using technology accelerates learning through the provision of input without time or place constraints (Hsu & Lin, 2022). Furthermore, embedding technology enhances learners' language outcomes, retention of language, and metacognitive capabilities (Buddha et al., 2024). Regarding assessment, technology, through its learner-centered approaches, fosters learners' attitudes and confidence during assessment practices (Milliner & Barr, 2020). As for the research dimension, the incorporation of technology boosts rigor in conducting research studies by producing reliable sources of data collection and exerting more control over research projects (Chapelle, 2007).

Regarding ETs, some studies have examined the benefits of integrating them into educational domains. For instance, Parmaxi and Zaphiris (2017) emphasized the effectiveness of 3D virtual worlds in language teaching and learning through the provision of multimodal learning contexts to tackle the complexities of language education. It is posited that these technologies can boost listening performance (Lan et al., 2018), vocabulary (Vázquez et al., 2018) and grammar (Kruk, 2015) learning. Moreover, Shih (2015) remarks that ETs have the potential to teach culture through the creation of simulations. Additionally, Augmented Reality technologies are believed to increase language learners' motivation (Mumtaz et al., 2017), facilitate language retention (Karacan & Akoğlu, 2021), increase interaction (Parmaxi & Demetriou, 2020), enhance learners' academic achievement (Akçayır & Akçayır, 2017), provide multimedia content to learners (Karacan & Akoğlu, 2021), and expand learners' vocabulary repertoire (Hwang et al., 2016). Furthermore, it should be noted that employing ETs such as IoT may accelerate teaching processes by offering learners diverse internet sources and providing online teacher-student interaction (Almufarreh & Arshad, 2023). More recently, AI-powered chatbots, such as ChatGPT, have been recognized as effective tools for enhancing EFL students' academic writing skills, thinking skills, learning motivation, and academic engagement by providing interactive and personalized learning support (Chen et al., 2025; Derakhshan & Taghizadeh, 2025; Song & Song, 2023; Wang & Xue, 2024; Zare et al., 2025).

On the other hand, technology integration brings about a number of setbacks for teachers and learners in educational settings. One challenge is that in order to implement technology, teachers need to possess technological literacy, which may demand high costs and time (Felix, 2002). In a similar vein, learners may not have adequate technological literacy, which is required for effectively utilizing technology in their learning (Buddha et al., 2024). Furthermore, deficiencies in technological infrastructure can hinder the application of technology in educational domains. Specifically, poor internet connection and network accessibility may cause challenges in completing online tasks (Ataeifar et al., 2019). Moreover, the integration of technology may incur additional costs for educational institutions with limited budgets (Huo, 2019). More importantly, hinging heavily on technological affordances may put learners' creativity at risk (Huo, 2019). Relatedly, it is recognized that technology inclusion has the propensity to trigger negative emotions, distress, and cognitive load (Shadiev & Yang, 2020). Likewise, Kurt and Bensen (2017) explicated that students might experience frustration when completing online tasks due to their complexity. Moreover, learners may feel confused and nervous when drawing on technological advancements due to their lack of familiarity with new technologies (Bailey, 2019).

ETs have the potential to trigger negative emotions in EFL learners, including anxiety (Kruk, 2021a; Melchor-Couto, 2017) and boredom (Kruk, 2021b), and may also diminish interpersonal communication among students and their teachers (Almufarreh & Arshad, 2023; Kruk, 2019). Furthermore, the complexity of using ETs may create challenges for students who are not trained to use them (Almufarreh & Arshad, 2023). In this regard, teachers may also find it difficult to utilize these technological tools and platforms (Karacan & Akoğlu, 2021). Relatedly, the inclusion of ETs makes class management difficult for teachers since students may have so much fun that it reduces teachers' control over the classroom environment (Karacan & Akoğlu, 2021). It should also be noted that drawing on ETs such as AI may require theoreticians to reexamine current conceptualizations of education to ensure alignment with exponential technological changes (Almufarreh & Arshad, 2023). Another challenge pertains to the role of infrastructure, internet connections, and facilities in implementing ETs in educational settings (Karacan & Akoğlu, 2021).

Notwithstanding the prolific literature on the potential and drawbacks of technology incorporation, the advantages and disadvantages of integrating ETs in language education remain an uncharted area of research. Few studies have delved into how ETs can either contribute to or hinder language education. Furthermore, the dual perspectives of EFL teachers and learners on the incorporation of ETs in L2 education have not been explored to date. Inspired by these gaps in knowledge, this study sets out to answer the following research question:

RQ: What are the perceptions of Chinese EFL teachers and students about the pros and cons of incorporating emerging technologies into L2 classrooms?

3. Method

3.1. Participants and Context

Two groups of participants took part in the present study based on a convenience sampling technique. The first group included a total of 22 Chinese EFL teachers (10 males, 12 females). All of them specialized in English language teaching and held BA (5), MA (9), or Ph.D. (8) degrees. Their age ranged from 31 to 44 years old. Regarding teaching experience, 5 teachers had 6-10 years of experience, 8 teachers had 16-20 years, and 9 teachers had 21-25 years. As for the second group, a sample of 31 Chinese EFL students (14 males, 17 females) participated in the study. They were studying English privately in non-governmental language institutes in different cities in China. Their first language was Chinese, and they claimed to have upper-intermediate (11) and advanced language proficiency levels (20). Academically, they had either BA (12) or MA (19) degrees in English-related fields. Their age ranged from 23 to 30 years old. All participants reported being familiar with ETs to varying degrees. This technological familiarity and willingness to cooperate were the recruitment criteria for the research participants.

3.2. Instrument

An online semi-structured interview was used to examine EFL teachers' and students' perceptions of the advantages and disadvantages of incorporating ETs in L2 education from a dual perspective. Two interview questions were asked: one addressing the perceived benefits and the other focusing on the potential drawbacks of such technologies. The interviews were conducted in English, as all participants were competent English users. A Chinese version of the questions was available upon request. The interviews were held online using Skype during participants' free time, each session lasting approximately 10 minutes and being audio-recorded for subsequent analysis.

3.3. Data Collection

Data collection for this study began with the initial development of four open-ended questions in line with the research question and goals of the study. They were then given to two experts to review their content and language as part of a content validity check. After three days, the experts returned the questions and unanimously recommended the removal of two redundant items. After revising the questions, an interview protocol including the questions and the process of interviews was created to ensure consistency during the interviews with both groups. The EFL community of China was invited virtually and in-person to cooperate in the study using an invitation message in which the goal and process of the research were clearly explained. The participants were asked to inform the researcher of their decision to partake in the research within two weeks. On October 21, 2024, a total of 22 teachers and 31 students from different parts of China agreed to participate in the online interview. They were assured that their privacy and confidentiality would remain strictly protected throughout and after the study. The time of each interview was set with the participants. It took 45 days to glean the whole dataset from both groups. The interviews were interactive and friendly. The respondents could ask for explanations and clarifications. Efforts were made to encourage them to speak as freely and fully as possible. The degree of researcher interference was limited to probing questions. After gathering all the interviews, the participants were given a compressed file containing popular textbooks and handbooks related to English language education and research as a token of appreciation for their participation. The interviews were placed in order for transcription and analysis, as explicated in the following section.

3.4. Data Analysis

The recorded audio files of the interviews from EFL teachers and students were separately sorted based on participants' numbers and then transcribed word by word. Three MA students assisted with the transcription process. The transcriptions were re-checked for spelling errors. After that, Braun and Clarke's (2006) framework was used to run thematic analysis on the dataset. In particular, in the first step, the interview transcripts were read multiple times to gain a general understanding of the respondents' perspectives regarding ETs. This initial step helped the researcher become familiar with the data. Important parts

of the transcripts were highlighted, underlined, and tagged for use in coding procedures. The second step involved reviewing the data again to produce initial codes regarding the pros and cons of ETs for L2 education. In the teachers' dataset, ten preliminary codes were produced. In contrast, students' data led to the generation of seven codes. The third step involved grouping and refining initial codes in order to form larger themes. For instance, codes such as developing materials and boosting classroom content were combined to create the "ETs provide rich instructional materials" theme. In the fourth step, the extracted themes were reviewed for their reliability and validity. A second coder was invited to re-examine the generated themes after one week. Subsequently, labels were attached to the extracted themes. They were also defined and specified in accordance with the objectives. Finally, a detailed report of the findings was prepared based on the dual perspective of EFL teachers and students.

Another effort in analyzing the data was ensuring adherence to criteria of trustworthiness common in qualitative research. Member checking was done to establish credibility. The participants were asked to review the themes and findings. The next criterion was confirmability, for which an external expert researcher was asked to re-examine the entire data analysis process. Furthermore, transferability was guaranteed by providing a thick description of all stages of the methodology to support future replication studies. The coding procedure and theme generation were clearly explained and supported with real excerpts from interviewees as a sign of transparency in data analysis. The researcher's positionality in this study was that of an outsider to ensure the data remained natural and unbiased. Personal experiences and opinions were entirely excluded from data collection and analysis. Therefore, in reporting the outcomes of the study, personal interpretations were limited.

4. Findings

4.1. The Advantages of Emerging Technologies for L2 Education

To unveil the advantages of ETs from the perspective of EFL teachers and students, responses to the interview question on perceived benefits were analyzed. The views of both groups (i.e., teachers and students) were dually considered in extracting the advantages. Regarding EFL teachers' perspectives, the results of interview analysis revealed that ETs had the potential to benefit L2 education in four areas (see Figure 1), as noted in four separate themes below.

- ETs Foster Personalized L2 Learning Experiences
- ETs Provide Rich Instructional Materials
- ETs Engage and Immerse Students in Classroom Activities
- ETs Facilitate Teaching and Teaching Efficacy

Figure 1. *The advantages of ETs from teachers' perspectives*

The first advantage of ETs, from the view of EFL teachers, was their capacity to provide a learning process that is personalized and learner-specific. In this regard, it was argued that

"*ETs foster personalization in learning. They do it by analyzing students' learning behavior data and formulate corresponding solutions according to different students' needs*" (T2). Another teacher stated that ETs are "*useful for making learning person-specific because they are based on prompts*" (T6). Another advantage of using ETs was related to teaching and learning materials. As noted by a teacher, "*with their vast data base, ETs provide students with unlimited language learning materials, from news sites to social media to specialized language learning apps, which can effectively complement traditional textbooks*" (T11). Moreover, the use of ETs for "*providing engaging classroom practices and games is really beneficial for L2 learning at lower levels*" (T4). In another interview, one of the teachers argued that "*ETs add diversity and authenticity to instructional materials in a quick way*" (T9). Given their new and attractive environment and nature, many ETs can "*engage students in the classroom procedures*" (T15). In case of Virtual Reality, it was also maintained that "*students are deeply immersed in their L2 learning activities because they see practices and experiences that are not present in actual classes*" (T19). As an example, one of the respondents declared "*hypothetical situations can be used in Virtual Reality technologies to teach conditional sentences and tap into learners' imagination*" (T22). The last advantage of ETs had to do with teaching. It was stated that "*ETs like AI and Augmented Reality can foster instruction and teaching efficacy in the long run if they are applied carefully*" (T3). Due to their capacity to provide course-long plans and paths, "*ETs can help teachers present the content effectively and this promotes their efficacy in terms of learner success*" (T7).

With regard to the advantages of ETs for L2 education, from the view of EFL students, the results of the interviews indicated that such technologies are advantageous in five domains (see Figure 2). The first common advantage among EFL students concerned 'learning motivation and enjoyment' in light of ETs. As noted by S10, "*ETs, especially AI bots increase our interest in learning English along with an internal motivation to enjoy and succeed in academic tasks*". Similarly, it was claimed that "*with their engaging atmosphere, ETs are able to enhance learning motivation and sense of joy in L2 education. The classes are no longer rigid and boring*" (S20). Another student stated that joy and fun are added to L2 classes "*with rapid growth of using Virtual and Augmented Reality technologies by up-to-date teachers*" (S13). The next advantage, similar to that of teachers, pertains to the 'personalization' and 'innovation' of L2 education by ETs. According to S7, "*ETs can provide personalized paths for learning English based on their algorithms*". They can add novelty and innovation to L2 education "*by offering diverse classroom tasks and practices based on short prompts that we give them"* (S4). L2 classes powered by ETs "*are no longer limited to paper and pencil. They are now complicated and advanced"* (S16).

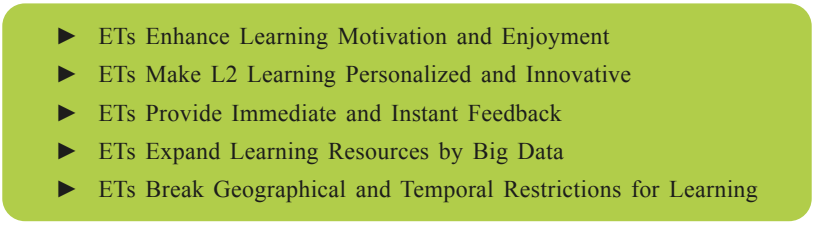

Figure 2. *The advantages of ETs from students' perspectives*

The third advantage of ETs was 'providing immediate and instant feedback', which is essential for L2 learning. In terms of L2 writing skills, it was asserted that "*AI bots can quickly examine our essays and show our areas of strength and weakness immediately*" (S2). Another student referred to the interactive capacities of ETs by saying that "*students can instantly pose questions and get their answers from ETs like AI and this multiplies the speed of learning and progressing in English learning*" (S17). Resources and materials provided by ETs are the next commonly referred to benefit among students. Specifically, it was contended that "*ETs offers a vast amount of language learning resources, including authentic materials like podcasts, videos, and e-books from native speakers*" (S20). Another student highlighted multimedia by declaring that "*ETs rest on unlimited algorithms and data bases, so they can provide multimedia materials that are very practical. With animations and videos, ETs can make boring grammar and words interesting and easy to remember*" (S28). The last theme concerned the removal of space and time restrictions through ETs. It was argued that "*ETs remove space and time limitations of traditional L2 education"* (S30). As noted by a student, "*in light of ETs, geographical and temporal restrictions can be broken and this promotes equality in education*" (S13). As an example, one of the interviewees argued that "*we can see imaginative worlds with Virtual Reality technologies and ask questions from AI tools whenever and wherever we wish*" (S11). Restrictions to learning English "*are now gone away by innovative technologies in this digital era"* (S24).

4.2. The Disadvantages of Emerging Technologies for L2 Education

Regarding the disadvantages of incorporating ETs in L2 education, the second interview question was analyzed in both datasets of teachers and learners. EFL teachers argued that ETs are disadvantageous in four aspects (see Figure 3). The first challenge pertained to the possibility of 'jeopardizing interpersonal communication skills' by making students and teachers over-reliant on technology. As mentioned by T3, "*over-reliance on ETs can result in students lacking basic language communication skills. If students are always interacting with virtual partners through a screen, they may have interpersonal communication troubles*". Additionally, it was claimed that "*the outputs of AI bots may not be as natural as human beings. Hence, limiting learning to such tools can endanger communicative skills in real-life situations*" (T7). The second disadvantage concerned training and equipment for incorporating ETs in L2 education. As declared by T15, "*ETs are challenging because they need the purchase of hardware, software licenses, training of teachers, etc. This can be a burden for schools or districts with limited resources"*. Another teacher referred to the same logistic problem by saying that "*ETs require both facility and training to reach optimal outcomes in L2 classes*" (T17).

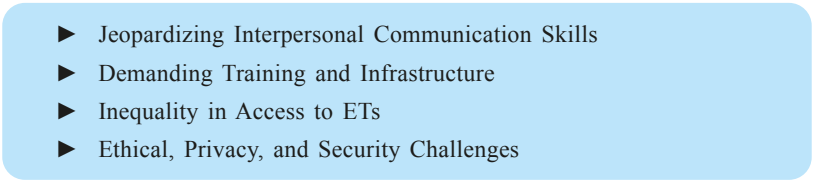

Figure 3. *The disadvantages of ETs from teachers' perspectives*

The next drawback of ETs, as noted by EFL teachers, is 'inequality in access to such technologies'. This would make L2 education biased. As declared by T20, "*Not all students have equal access to ETs and the latest technological devices with high-speed Internet connections. This difference can result in some students being at a learning disadvantage, exacerbating educational inequality*". Contextual differences in access to ETs have also been claimed to "*make learning biased for the developed and the rich rather than middle class society*" (T6). Finally, the teachers argued that the use of ETs in L2 education poses "ethical, privacy, and security challenges" for L2 educators and the community. As evidence of this concern, T19 stated "*ETs bring challenges such as distractions, digital divides, and reliability and security concerns in L2 educators*". Another respondent declared "*using and depending on innovative technologies carry ethical and security problems, too. Academic dishonesty and cyberbullying increase with technologies*" (T11).

On the other hand, EFL students perceived ETs to be disadvantageous because they 'need technical support and training', 'overlook individual differences and styles', and 'create information overload' on the part of users (see Figure 4). Concerning the first theme, like EFL teachers, students mentioned that "*ETs are new and complex and they need technical support, tools, and explicit training*" (S12). Another student posited "*these innovative technologies require instruction and guideline for students and teachers"* (S14). Regarding the second disadvantage, the students believed that "*ETs lack emotion and understanding of individual differences and styles among L2 students. This is problematic*" (S18). Finally, the participants declared that "*ETs bombard L2 educators with heavy loads of information making them exhausted and burned out*" (S4).

- Requiring technical support and training
- Overlooking individual differences and styles
- Creating information overload

Figure 4. *The disadvantages of ETs from students' perspectives*

5. Discussion

This study aimed to examine EFL teachers' and students' perceptions of the advantages and disadvantages of ETs in L2 education. The findings revealed that incorporating ETs is advantageous since it provides personalized learning, rich and diverse materials, immediate feedback, emotional engagement in the classroom, enhanced teaching efficacy, and freedom from geographical and temporal constraints in learning. The advantages proposed by EFL teachers and students in the interviews are in line with previous studies on the influence of ETs on learning, feedback, engagement, and geographical flexibility (e.g., Colpaert & Stockwell, 2022; Fuentes-Penna et al., 2025; Li et al., 2021; Shadiev & Yang, 2020; Yuan & Powell, 2013). This comparison is meaningful because it provides further empirical basis for the utility of ETs in L2 education. In this study, it was also found that ETs have the capacity to 'enhance teaching efficacy', which might be due to their rich databases and algorithms.

ETs could foster personalized learning probably because many of these technologies are individually directed. Their basic single-user essence can explain this theme as well. The provision of rich instructional materials is also attributable to the power of ETs in producing diverse tasks and materials with only one prompt. Their vast repertoire of educational corpora also contributes to this capacity. Their instant prompt-response procedures further explain the contribution to feedback provision in the classroom. ETs, such as AI chatbots, use instant messaging functions that offer immediate feedback. The participants highlighted the impact of ETs on learners' emotions, interest, motivation, enjoyment, and engagement perhaps because such tools are currently new and attractive to many L2 teachers. The engaging atmosphere of ETs may also account for this finding. The emotional nature of L2 learning even in light of ETs also explains this finding. The teachers underscored the capacity of ETs to enhance teaching efficacy, probably because the main goal of technology integration is to be effective in the classroom. Pedagogical vision and reasoning may justify this finding. Regarding the last advantage, it can be claimed that ETs are free from time and space constraints, and the participants' overall digital literacy and technological knowledge help explain the theme. The teachers' pre-service training and the students' university instruction can be the reasons for reporting this advantage.

The study also evinced that, from teachers' perspectives, ETs are disadvantageous because they jeopardize interpersonal communication skills, require training and infrastructure, entail unequal technology access, and raise ethical challenges. These findings comply with Almufarreh and Arshad (2023), who found ETs problematic for interpersonal communication skills in learners. Similarly, Ataeifar et al. (2019) found such technologies risky because they need training, support, and technological infrastructure. They also contended that ETs may not be accessible to everyone in academia, which creates inequality. This alignment with prior research is important because the findings of the current study and those reported in the literature call for attention to the challenges of using ETs rather than taking a simplistic and purely positive view of adopting them. The participants' communicative competence, interpersonal skills/concerns, and logistic knowledge of ETs integration justify these disadvantages. Their technological literacy seems to be high. A reason for highlighting unequal access might be the teachers' understanding of and care about social aspects of L2 education (e.g., fairness, justice).

The last challenge of ETs was ethical, privacy, and security risks, which agrees with Fuentes-Penna et al. (2025), who reported that using ETs can create ethical, privacy, and security risks for L2 teachers. The fragile and hazardous nature of technological tools, as a whole, may explain this finding. Many technologies including ETs are easily misused; hence ethics and security are crucial. This theme shows the participants' high awareness of technology adoption and its ethical risks. Besides training and facility requirements, EFL students perceived ETs to be disadvantageous for overlooking individual differences and styles and creating information overload. The findings are inconsistent with previous investigations (e.g., Li et al., 2021; Shadiev & Yang, 2020) that found ETs in tune with learner differences. The context of the study may be the reason for this divergent outcome. The type of ETs that the students used in China may be another justification. Concerning the last theme, the participants' low cognitive capacity to use ETs may explain the finding, a claim in line with Shadiev and Yang (2020). The multifunction nature of many ETs can also be a reason for such overload.

6. Conclusions

The findings of this study demonstrated that incorporating ETs in L2 education has several advantages and disadvantages. It is therefore concluded that the efficacy of such technologies may depend on how EFL teachers and students use them. Their digital literacy may play a mediating role in accepting and incorporating ETs. Another conclusion is that ETs function like a double-edged sword and both pros and cons are natural and expected in their utilization. The study expands theories related to educational technology and technology-assisted language learning. Practically, it informs EFL teachers and students of the benefits and challenges of using ETs in L2 education. They can identify areas of help and challenge in light of the findings. Therefore, they can use strategies and practices to maximize advantages and minimize disadvantages. EFL teachers can use the findings to develop and provide training programs on ETs for novice EFL teachers, where pros and cons are clearly explicated with regulatory techniques. Policymakers may also use the study as a guide in revisiting curricula and plans related to technology-based L2 education.

However, this study has several limitations that warrant cautious interpretation of the findings. First, the use of two small, non-random samples limits the generalizability and representativeness of the results. In addition, personal and demographic factors that may influence perceptions of ETs were not considered. Future research is encouraged to employ more robust sampling strategies, such as maximum variation sampling, to capture a broader range of perspectives. Second, the reliance on a fully qualitative design may restrict the depth and breadth of the findings; thus, adopting mixed-methods approaches in future studies could enhance the credibility and triangulation of results. Lastly, rather than treating ETs as a broad category, subsequent research may benefit from focusing on specific technologies, such as AI-powered chatbots, Virtual Reality, or Augmented Reality, to yield more targeted and actionable insights

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