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Technology Integration in English Language Learning During the COVID-19 Pandemic: A Review

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Abstract. In response to the closure of academic institutions during the COVID-19 pandemic, the integration of technology was adopted and expanded more than ever. With existing studies being more generalized in scope, this systematic review aimed to establish the effects of technology integration, particularly in English language learning, and identify the recommendations offered in recent studies. An analysis of 44 peer-reviewed, open-access journals led to the identification of the effects and recommendations of technology integration. Following thematic analysis, the review indicates that technology integration produces positive effects, such as improved language skills, enhanced learning experiences, better socialization, and increased efficiency, outweighing its few negative aspects. With these, while technology use is encouraged in learning, caution is necessary to avoid misuse. It is then recommended that instructional methods be designed to maximize these positive effects and address the negative ones. Teacher training also needs to be reinforced and updated with the emerging technology. Generally, this study affirms the value of technology as an effective tool for enhancing language learning when used strategically.

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INTRODUCTION

In recent years, technology has long been recognized as a transformative tool in enhancing education. This is particularly evident in the integration of various multimedia tools into language education. Zhang and Zou (2022a) reviewed 41 publications from 2009 to 2020 and identified five main multimedia tools, specifically computers, mobile devices, printed materials, audio players, and PowerPoint slides, as primary resources for supporting vocabulary, listening, reading, and grammar. In their subsequent review, the authors (2022b) analyzed 57 publications from 10 journals up to 2019 and highlighted mobile devices, multimedia, speech-to-text, text-to-speech technologies, and digital game-based learning as the top five technologies used in language teaching.

To this day, technology is an essential part of education (Haleem et al., 2022b). Virtual learning environments, online courses, and educational software make learning accessible to anyone with an internet connection. The quick development of modern technology has increasingly impacted how humans live, work, and think (Wang and Kabilan, 2024), and during the COVID-19 pandemic, the importance of technology in education became even more pronounced.

The COVID-19 pandemic brought major disruptions in all areas of life around the world, and it certainly did not leave education unaffected. The education sector faced many challenges as schools and universities closed (UN, 2020). Consequently, this led to a global lockdown, including schools (Emelogu et al., 2022), and because of this, the adoption and expanded use of online teaching and learning technologies in education remarkably accelerated. More and more professionals teaching at different levels of education experienced teaching in different modes of delivery (Ates Ozdemir et al., 2024). Eventually, schools opted for the emergency distance learning format, taking advantage of digital platforms, technological tools, and resources to sustain education. Technology Enhanced Language Learning (TELL), as defined by Hasumi and Chiu (2023), covers a wide range of approaches, including online learning, distance education, virtual classrooms, learning management systems, and tools like the Internet and Web 2.0. It also includes methods like massive open online courses (MOOCs), synchronous and asynchronous learning, e-learning, and flipped, blended, or hybrid learning. Essentially, any use of digital technology for formal or informal learning, whether inside or outside the classroom, is part of TELL (Marijuan & Sanz, 2017), and these were all accentuated by the COVID-19 pandemic.

However, this sudden transition also echoed the identified challenges in technology integration in education. Pelila et al. (2022), in their review, specified several barriers to effective technology integration, including limited access to facilities, insufficient time, lack of resources, and the unavailability of experts to address basic technological issues during classes. Additionally, other studies have reported that teachers' non-readiness with online teaching formats and the difficulty in student-teacher interaction introduced greater challenges and concerns (Baker et al., 2021; Muhammad & Nagaletchimee, 2023; Sahu, 2020). As a result, it is also not surprising that many studies relayed the increased levels of stress, anxiety, and exhaustion among teachers during this period (Al Lily et al., 2020; Li et al., 2020; Zhou & Yao, 2020; Karakose et al., 2021).

On the other hand, the potential of technology to transform English language education even in the most challenging circumstances became even more established. In some studies, the positive aspects of compulsory distance education were identified. For instance, Telli and Altun (2021) found that, within a year of the COVID-19 pandemic, online education transitioned from being an emergency solution to a viable solution, as proven by their systematic review of COVID-19 articles. Similarly, Yamamoto and Altun (2020) suggested that the pandemic and the shift to online education could serve as a foundation for future education systems and potentially become a standard alternative.

As for English language instructors, integrating technologies with language instruction gave way to improving the quality of language instruction, and it has made it possible to teach and learn a language in distance education (Subasi et al., 2022). They added that mobile learning and computer-based technologies are effective strategies. Moreover, technology can offer a secure platform for sharing student information, decreased cost, and increased transparency (Sakhipov and Yermaganbetova (2022). Manzoor et al. (2024) added that technology makes a language classroom more effective and motivating for the students. They found that with technology, there are opportunities to take online tests and quizzes and enhance collaboration and independent learning.

In English language classrooms, several technologies have been proven to be useful for practice. Munir et al. (2021) and Muhammad and Nagaletchimee (2023) discovered that WhatsApp turned out to be a fun and effective educational media for sharing information, group discussions, and materials sharing. Other technologies explored included platforms like Microsoft Teams, Facebook, Zoom, YouTube and learning management systems such as Google Suite, Blackboard, Moodle, and Google Classroom.

Despite the widespread integration of technology in English language education during the COVID-19 pandemic, a significant research gap remains in understanding its specific impact on language learning. While existing studies have explored the general benefits, challenges, and technical aspects of technology integration, most have primarily focused on teachers' perspectives. This leaves the learners' experiences underrepresented in the research particularly on how technology integration affects the development of English macro skills, enhances learning experiences and personal skills, and contributes to overall learning efficiency..

This study aims to address that gap by conducting a systematic review of the literature by focusing on learners' perspectives to provide a detailed understanding of technology integration in their English language learning. Understanding the relevant successes of the different technologies adopted can provide knowledge on the effectiveness and sustainability of technology integration, both during and beyond crisis situations. To be able to achieve this aim, the following research questions were addressed:

1. What are the topics addressed in existing literature on technology integration in English language learning?
2. What are the effects of technology integration in English language learning?
3. What recommendations do existing studies provide for the effective integration of technology in English language learning and for guiding future research?

METHOD

This study used the systematic literature review method which involves identifying, evaluating, and interpreting all available research related to a specific research question or topic. To be able to meet the aims of this study, the search of multiple databases to locate related studies was the first step. The search process was based on the eligibility criteria (Table 1) established before the process of identifying, locating, and retrieving the research articles started. The eligibility criteria in Table 1 were applied to ensure that relevant studies were included, and no study was excluded without thorough evaluation.

Table 1. The inclusion and exclusion criteria for screening

Parameters	Inclusion Criteria	Exclusion Criteria
Type of Research	Primary research published in peer-reviewed journals	Book reviews, opinion pieces, literary reviews, policy documents
Results of the study	Research articles or scientific papers that dealt with the effects of technology integration in English language learning during the COVID-19 pandemic	Research articles that did not have the effects of technology integration in English language learning during the COVID-19 pandemic
Language	Research articles that used English as a medium of writing	Research articles that did not use English as a medium of writing
Data Base	ERIC, Taylor and Francis, ScienceDirect	Databases not accessible to the researcher
Time frame	Research articles published from 2019 to 2024	Research articles beyond the time frame set

In the search process, 'technology integration in the English language' was used as the keyword to locate relevant journals from three databases: The Educational Resources Information Center (ERIC), Taylor&Francis and ScienceDirect. In particular, ERIC was the main source of screened articles as according to Santhanasamy (2021), EIRC is a comprehensive, searchable, and full-text database of education research and information. This also makes it a great source of academic papers related to the English language.

The Preferred Reporting Items for Systematic Literature Reviews and Meta-Analyses (PRISMA) 2009 Flow Diagram (Moher et al., 2009), found in Figure 1, was used to illustrate the articles that were searched and screened based on the identified criteria. The figure further shows that the initial search from all three databases yielded a total of 316,200 articles: 99,543 from ERIC, 61,495 from ScienceDirect, and 155,162 from Taylor&Francis. Utilizing the automation tools to screen the peer-reviewed and full-text articles, publication date from 2019-2024, publication types, publication languages, and descriptors such as English language and ESL and COVID, the search ended up with a total of 706. This number was further screened manually by titles and then by abstract through the Systematic Review Accelerator (SR-Accelerator), which is easily available online. With SR-Accelerator, abstracts were read and categorized, resulting to a final number of 44 articles.

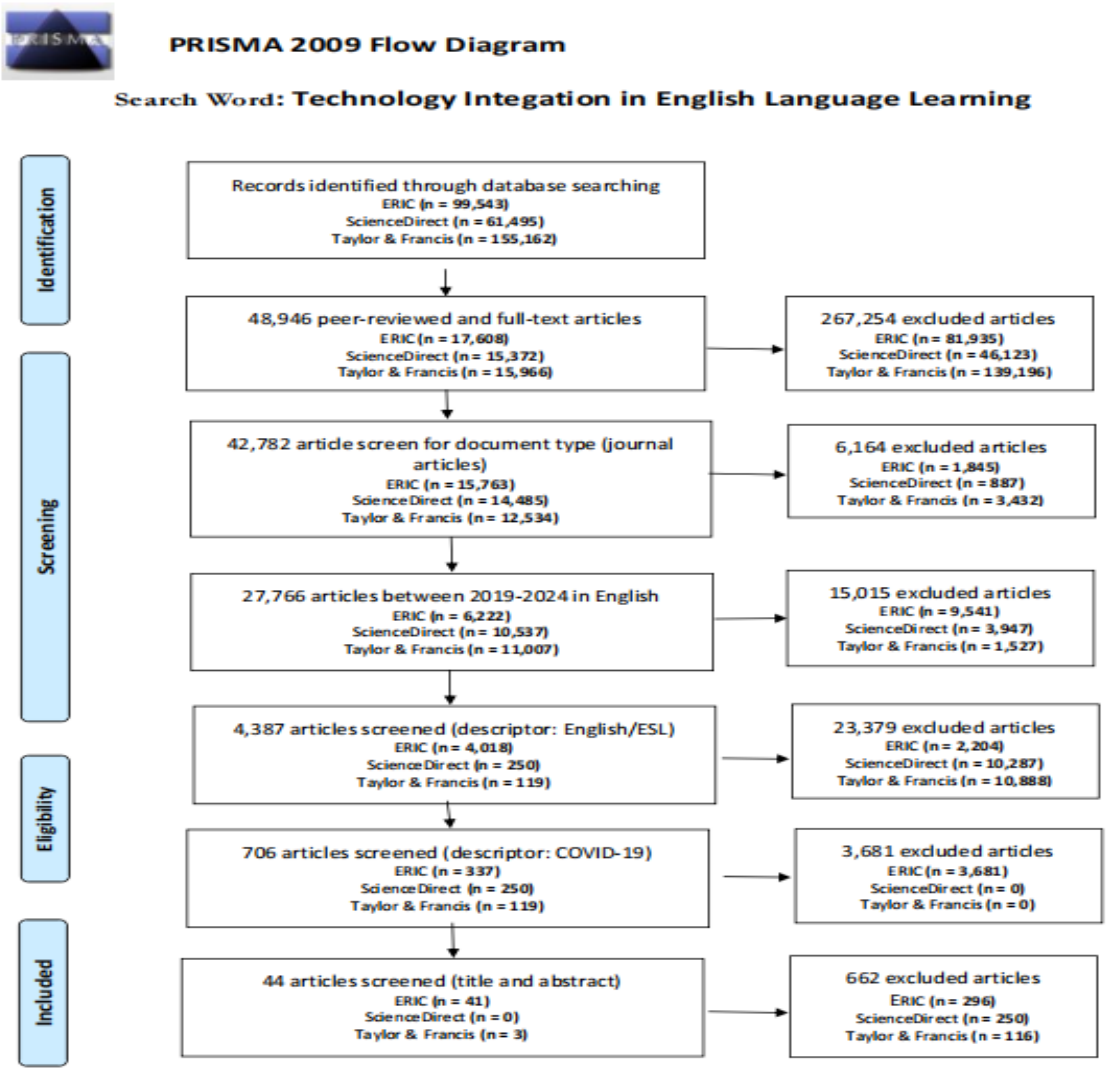

Figure 1. PRISMA 2009 Flow Diagram

Furthermore, a repertory grid was used to map the responses to the research questions. This allowed for the smoother structuring and comparison of all relevant data. The data were then organized and interpreted using Clarke and Braun's (2013) approach to thematic analysis (TA), which involved the following: familiarizing with the data, generating initial codes, identifying

potential themes, reviewing the themes, (defining and naming the themes, and producing the report.

RESULT AND DISCUSSION

1. Topics addressed in existing literature on technology integration in English language learning

Based on the review of 44 literature on technology integration in English learning, the following topics were addressed: effectiveness and impact of specific digital tools and platforms, student perception, attitudes, and preferences; effectiveness of online learning for language skill development; benefits and challenges of integrating technology, current status and trends of technology use and the linguistic features and practices in technology-enhanced learning.

This chapter contains the results of research findings and a discussion of the findings obtained. The discussions are presented systematically from general to specific.

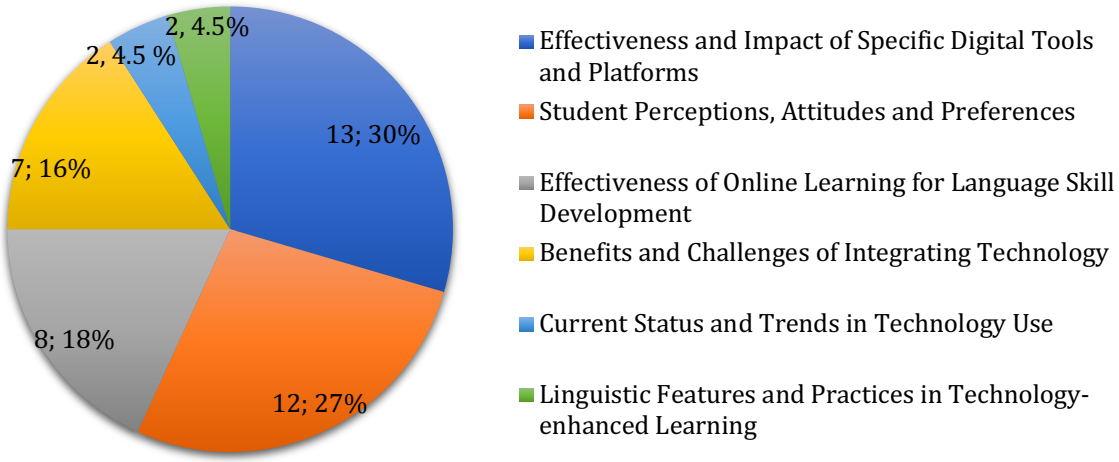

Figure 2. Topics Addressed in Existing Literature

Figure 2 reveals that the most researched area of focus on language learning is the effectiveness and impact of specific digital tools and platforms, which was discussed in 30% of the articles (Aldaghri & Oraif, 2022; Cabrera-Solano, 2022; Chiablaem, 2021; Dhivya et al., 2023; Each & Suppasetseree, 2021; Elbashir & Hamza, 2022; Li et al., 2021; Seker & Karagül, 2022; Shimray, 2023; Soleimani & Aghazadeh, 2024; Tarihoran et al., 2022; Wahyuni et al., 2022; Yaguara et al., 2021).

Another common focus studied by 27% is on student perceptions, attitudes, and preferences on technology-enhance learning (Al Shammari, 2021b; Amrullah et al., 2022; Chugai & Pawar, 2021; Dolmaci, 2021; Guo et al., 2020; Huh et al., 2022; Moghadam & Shamsi, 2021; Pouriran, 2023; Shofiyuddin et al., 2022; Silalahi et al., 2022; Sompakdee et al., 2021; Syahrin & Salih, 2020), followed by the effectiveness of online learning for language skill development which constitutes 18% of the articles (Ahmad, 2021; Alasmari, 2021; Albogami, 2022; Maru et al., 2020; Oflaz et al., 2022; Pratiwi & Ubaedillah, 2021; Sariani et al., 2021; Thirakunkovit & Boonyaprakob, 2022). Other significant areas include the benefits and challenges of integrating technology as studied by 16% (Al Shammari, 2021a; Alzamil, 2021; Rintaningrum, 2023; Sakulprasertsri, 2022; Sim et al., 2021; Sulistyawati & Kuswandono, 2022; Zaghar, 2022), current status and trends in technology use (Bayar & Karaduman, 2021; Bin Dahmash, 2021) and the last 4.5% looked into

linguistic features and practices in technology-enhanced learning (Alqahtani, 2022; Huong & Phúc, 2023).

This review identified the most explored and least explored areas of research in relation to English language learning during the COVID-19 pandemic when technology served as both a need and an opportunity. The most explored research is on the effectiveness and impact of specific digital tools and platforms for language learning. This emphasizes the exploration of technology to continue and enhance the learning processes during the pandemic. Various technological tools and platforms were explored to their capacity to facilitate learning. These included English Language Speech Assistant (ELSA), Facebook, WALL, MALL, G suite, Genially, Online Speaking Tasks (OST), Mobile-blended Cooperative Learning (MBCL), Moodle, Blackboard and Google Classroom. This means that with the range of available technology, learning can easily take place, with or without a pandemic. There are indeed many tools at the disposal of English language teachers and learners.

Another focus is on the exploration of student perceptions, attitudes, and preferences. In these studies, preferences and positive and negative experiences towards the online learning mode were established. This stresses the importance of understanding learners' experiences with technology-supported language learning to further positive attitudes and better the learning progress. Educational institutions are therefore encouraged to accommodate or consider these findings for a more inclusive classroom.

The effectiveness of online learning for language skill development from the perspective of English language learners was also studied. The reviewed literature enumerated how online learning approaches enhanced specific language skills. With these studies, it was established whether learning meets the needs and goals of language learning. Research in this area generally demonstrated that online learning can be effective in improving specific language skills. However, studies also highlighted areas for improvement.

While other studies also investigated online learning for specific language skills, others established the broader benefits and challenges of integrating technology into language learning, focusing on other learning experiences. These studies confirm two natures of technology: while it offers learning opportunities, it also introduces new challenges that may require careful consideration in the adaptation of such in the language learning process. Therefore, not one technology is perfect for everyone. It may or may not work for learning, probably depending on different factors.

Other topics that may still need to be explored include the status and trends in technology use and the linguistic features and practices in technology-enhanced learning. These studies, while least studied in this review, point out the progressive nature of language education, from the emergence of new practices to the integration of new technology for language learning.

2. Effects of Technology Integration on English Language Learning

In recent years, the integration of technology in language learning has brought about significant changes, particularly enhancing various aspects of the learning process. This study focuses specifically on English language learning and looks into areas affected by technology: language skills specifically writing, speaking, listening, reading, grammar, and vocabulary acquisition; learning experiences specifically on confidence, motivation, autonomy, and accessibility; socialization and interpersonal development specifically interaction, teamwork skills, collaboration and engagement; and the overall efficiency of the learning process.

The articles reviewed reveal both the positive and negative effects of technology integration in English learning, particularly in relation to language skills, learning experiences, social and interpersonal development, and efficiency. These are presented in Table 2.

Table 2. The Effects of Technology Integration on English Learning

Effects	Frequency	Percentage (%)
Language Skills		
Improved writing skills	9	23.69
Improved speaking skills	5	13.17
Improved listening skills	4	10.53
Improved reading skills	3	7.89
Improved vocabulary skills	8	21.05
Improved grammar skills	3	7.89
Insufficient development of language skills	3	7.89
Grammar errors	1	2.63
Spelling issues	1	2.63
Low scores in vocabulary	1	2.63
Total	**38**	**100**
Learning Experiences		
Boosting confidence	4	22.22
Enhancing motivation	4	22.22
Promoting autonomy and independent learning	4	22.22
More flexibility	4	22.22
Better accessibility of material	1	5.56
Fostering passive learning habits and poor time management	1	5.56
Total	**18**	**100**
Socialization and Interpersonal Development		
Better interaction and engagement	4	28.57
Enhanced teamwork skills	3	21.43
Greater family involvement	1	7.14
Limited interaction	2	14.29
Resistance to collaborate	2	14.29
Stressed to communicate	1	7.14
Isolating and stressful	1	7.14
Total	**14**	**100**
Efficiency		
Time-saving and cost-effective	3	100
Total	**3**	**100**

a. Language Skills

Many studies found that the integration of technology in English learning results in improved writing skills, as evident in learners' improved organization of ideas, longer outputs, better writing strategies, and confidence in writing tasks (Chugai & Pawar, 2021; Dolmaci, 2021; Huong & Phúc, 2023; Oflaz et al., 2022; Pouriran, 2023; Rintaningrum, 2023; Seker & Karagül, 2022; Tarihoran et al., 2022; Thirakunkovit & Boonyaprakob, 2022). The same area was identified by Wang and Kabilan (2024) in their bibliometric analysis stating that writing is one of the most researched skills integrating with various technological tools.

Chugai and Pawar (2021) investigated the experiences of 500 Ukrainian and Indian students, while Dolmaci (2021) focused on 78 university students during the pandemic. Both found that during their online classes, most students somehow developed writing skills. This improvement can be attributed to the study of Huong & Phúc (2023), who concluded that students often used several online English writing aids while learning and practicing writing English. Moreover, as noted by Tarihoran et al. (2022), using a computer made writing and editing easier,

and this allowed students to write better-structured sentences. Apparently, students believe that technological tools help motivate and improve their writing skills, usually resulting in longer and better writing outputs.

In contrast, Syahrin & Salih (2020) and Sakulprasertsri (2022), in their studies on learning experiences as well, concluded that there was insufficient experience with speaking and writing as more focus was on listening and reading. This may have influenced the learners' reluctance to participate in speaking and writing activities in English. This may also be because the 2020 study was conducted in an ESL context with a limited number of respondents. Moreover, persistent grammatical, punctuation, and spelling issues continued to be challenges for EFL learners (Sariani et al., 2021). However, because this case study analyzed only four samples from a single student, these findings may not be generalized. In speaking, there was also enhanced confidence, fluency, and pronunciation in online or technology-supported settings (Alzamil, 2021; Chugai & Pawar, 2021; Rintaningrum, 2023; Sakulprasertsri, 2022; Yaguara et al., 2021). Respondents expressed positive attitudes to using technology to deliver their speaking tasks. In the studies by Alzamil (2021) and Sakulprasertsri (2022), it was established that the learners felt more confident in delivering their speaking tasks and improved better. To further concretize these attitudes, action research conducted by Yaguara et al. in 2021 with EFL learners verified that the integration of technology and the CLIL methodology indeed contributed to improved speaking skills. However, Pouriran (2023) argued that in a similar EFL context, the conventional face-to-face mode remained more effective in improving speaking skills. The contrast may be explained by the additional variable in Yaguara et al. (2021), which is the Content and Language Integrated Learning (CLIL), and not just the ICT tools. This implies that while technology improves speaking skills, traditional methods still hold certain advantages for oral skills development.

Research also proved that listening skills are better (Chugai & Pawar, 2021; Each & Suppasetseree, 2021; Sakulprasertsri, 2022; Sim et al., 2021). In his online survey, Sim et al., 2021 highlighted university students' positive perceptions of online learning's role in enhancing listening skills, while the experiment by Each and Suppasetseree (2021) provided empirical evidence of the benefits of integrating technology, particularly Mobile-blended Cooperative Learning (MBCL), for listening comprehension. This implies that online learning and specific technology-based methodologies can effectively support the development of listening skills in language learners.

In reading, there is improved reading comprehension and reading engagement (Alasmari, 2021; Dolmaci, 2021; Rintaningrum, 2023). This is probably because more focus is given to receptive skills, such as listening and reading (Syahrin & Salih, 2020). Alasmari (2021) specifically experimented on Internet Reciprocal Teaching (IRT) through Blackboard and found that this integration boosted the reading comprehension skills of tertiary students, as evidenced by the experimental group displaying advanced comprehension. The control group, taught through conventional reading, was outperformed. Dolmaci (2021) also identified in his survey that university students agreed on the positive effects on the development of reading skills.

Moreover, there were significant gains in vocabulary (Chiablaem, 2021; Chugai & Pawar, 2021; Pratiwi & Ubaedillah, 2021; Rintaningrum, 2023; Sariani et al., 2021; Sim et al., 2021; Tarihoran et al., 2022; Yaguara et al., 2021). Pratiwi and Ubaedillah (2021) investigated the implementation of digital English classes in teaching vocabulary and the improvement in test scores proved that technology was effective in improving vocabulary achievement. This was coupled with the positive perceptions of learning through digital platforms. Yaguara et al. (2021) stated that integrating ICT had a similar finding in the improvement in vocabulary because, apparently, there was a more constant exposure to the target language. This suggests that

incorporating technology into language instruction is a beneficial strategy for vocabulary development. Improved grammar performances are evident in other studies (Chiablaem, 2021; Chugai & Pawar, 2021; Wahyuni et al., 2022).

However, there are also some negative effects of technology integration on language skills development. There is insufficient development of speaking and writing skills (Syahrin & Salih, 2020), and with that, student perceptions suggest that face-to-face learning is better for enhancing speaking and listening skills (Chugai & Pawar, 2021; Huh et al., 2022) and reading and writing skills (Ahmad, 2021). In addition, persistent grammatical errors, spelling issues, and difficulties with word formation continue to be challenges for learners (Alqahtani, 2022; Li et al., 2021; Sariani et al., 2021). In certain cases, students even saw a decline in their vocabulary test scores, particularly in specific programs that integrated technology (Li et al., 2021), and there were challenges in word formation with online tools (Alqahtani, 2022). These findings suggest that while technology can enhance language learning in many areas, few challenges remain that may hinder its full potential in developing certain language skills. This implies the need for continued evaluation and adaptation in the use of technology for language education.

b. Learning Experiences

This section explains how technology integration affects confidence, motivation, autonomy, flexibility, and accessibility of materials. Some highlighted the effects of technology integration on the confidence and motivation of learners. Research indicates that technology can boost their confidence (Albogami, 2022; Dhivya et al., 2023; Sakulprasertsri, 2022; Tarihoran et al., 2022) and enhance their motivation to learn the English language (Albogami, 2022; Dhivya et al., 2023; Seker & Karagül, 2022; Yaguara et al., 2021). Tools such as discussion platforms or group chats support collaboration and could even develop a community among learners without the authority of a teacher.

However, Sim et al. (2021) cautioned that online learning environments can sometimes lead to a lack of motivation, boredom, and feelings of loneliness. These are especially prevalent when students are learning on their own, which can happen in asynchronous or modular classes. Without face-to-face contact, learners may struggle to stay motivated to engage with the learning material, leading to disengagement. While technology can enhance confidence and motivation, it can also lead to boredom and a sense of isolation when learners are left to their learning.

Online lessons are also perceived by students as monotonous with insufficient engagement, especially in synchronous classes (Dolmaci, 2021; Oflaz et al., 2022). Technology-enhanced learning can sometimes feel rigid, especially when teachers follow a lecture-style delivery without much student participation. The absence of non-verbal cues can also make it difficult for both students and teachers to build relationships.

In addition to improving confidence and motivation, technology integration promotes autonomy and independent learning (Albogami, 2022; Alzamil, 2021; Sulistyawati & Kuswandono, 2022; Zaghar, 2022). With the increasing availability of online learning platforms, educational apps, and digital resources, students are no longer dependent solely on classroom instruction. They can independently explore content that will fit their learning styles. This implies that technology use has positive impacts not only in enhancing their language skills but also their entire learning experiences.

Flexibility in learning is another advantage as it allows students to manage their studies more effectively (Alzamil, 2021; Bin Dahmash, 2021; Sim et al., 2021; Wahyuni et al., 2022). With flexibility, learners can manage both their academic and personal responsibilities. Also, they can revisit recorded lectures at their own pace. Autonomy and independent learning also let learners

take charge of their educational progress, particularly in online settings where access to learning materials is facilitated by technology (Bin Dahmash, 2021; Sulistyawati & Kuswandono, 2022; Wahyuni et al., 2022). Thus, it supports the idea that various tools help learners in their English language learning.

Despite the many benefits, there are drawbacks, as technology-facilitated learning can sometimes encourage passive learning habits and poor time management skills (Zaghar, 2022) and can be seen as less effective when compared to face-to-face lessons (Ahmad, 2021; Alzamil, 2021; Chugai & Pawar, 2021). When students rely heavily on technology and without the classroom structure, learners can procrastinate. Hence, the benefits of technology integration can diminish if not properly managed. Therefore, balancing technology use with structured guidance is crucial to maximize its educational benefits.

c. Social and Interpersonal Development

This section details how technology integration affects collaboration, teamwork, and interaction. The findings from various studies bring contrasting effects of technology integration in English learning to social and interpersonal development. Other authors (Aldaghri & Oraif, 2022; Amrullah et al., 2022; Moghadam & Shamsi, 2021; Thirakunkovit & Boonyaprakob, 2022) found that technology integration led to better interaction and engagement among learners while enhancing teamwork skills (Chiablaem, 2021; Sim et al., 2021; Thirakunkovit & Boonyaprakob, 2022). Greater family involvement in the learning process was also noted by Sim et al. (2021), indicating that technology can strengthen family engagement in education.

In addition to these benefits of integrating technology into learning English, there are some challenges that need to be addressed. Some studies (Alasmari, 2021; Chugai & Pawar, 2021; Sakulprasertsri, 2022) reported limited interaction in online settings. This means that technology may not always facilitate meaningful communication. Resistance to collaborate (Thirakunkovit & Boonyaprakob, 2022; Wahyuni et al., 2022) and stress related to communication (Sim et al., 2021) were observed, with some learners finding it challenging to work together or communicate effectively through digital platforms. This evidence supports the idea that technology integration indeed helps with socialization and interpersonal development.

d. Efficiency

Finally, the integration of technology in English learning also proved to be both time-saving and cost-effective (Aldaghri & Oraif, 2022; Dolmaci, 2021; Sompakdee et al., 2021). This means more efficiency while reducing the need for physical materials and classroom time. With distance education, travel time was terminated, and learning could transpire at their convenient time. This accommodates different learning paces or schedules, such as when the learner is totally ready or pauses when mentally drained. Digital sources may also be easily accessible, such as online dictionaries, learning apps, or educational videos to back up reading materials. With the reduced cost, learners can also allocate their funds to other learning resources.

3. Recommendations for the effective integration of technology in English language learning and for guiding future research

a. For the Effective Integration of Technology in English Language

Different recommendations on the effective integration of technology in the English language from the 44 articles were reviewed. Figure 3 illustrates the recommendations identified in the journal articles reviewed. The identified recommendations mainly target teachers across five areas: designing instruction and teaching methods, enhancing student engagement and

autonomy, utilizing technology tools and support systems to improve learning, general education improvement, and teacher training and professional development.

The largest portion or 27% recommended designing instruction and teaching methods (Al Shammari, 2021b; Alasmari, 2021; Alzamil, 2021; Dolmaci, 2021; Each & Suppasetseree, 2021;

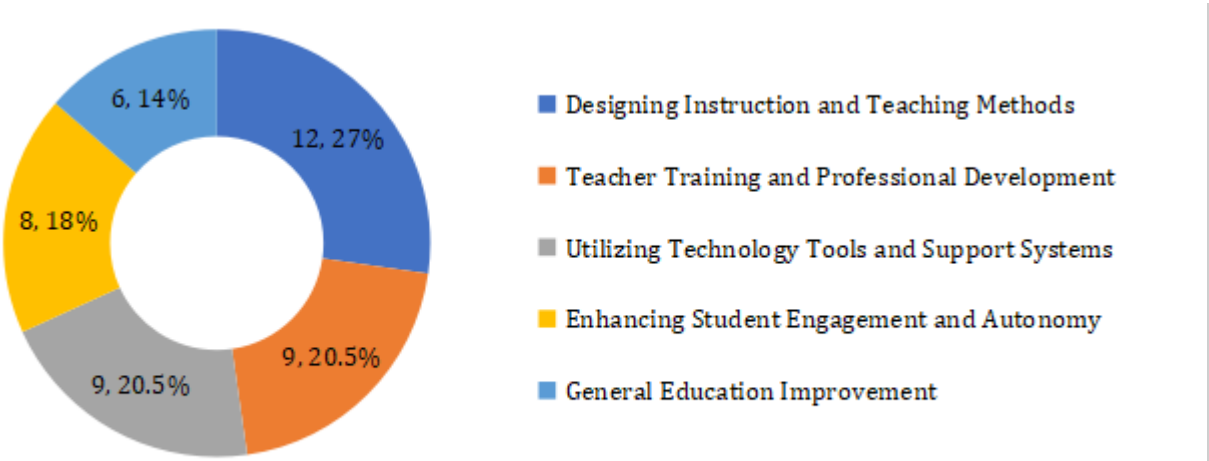

Figure 3. Recommendations for effective integration of technology

Elbashir & Hamza, 2022; Huong & Phúc, 2023; Huh et al., 2022; Li et al., 2021; Oflaz et al., 2022; Sakulprasertsri, 2022; Sulistyawati & Kuswandono, 2022). This indicates a strong emphasis on revising and improving teaching strategies to be more student-centered, to be effective in addressing the specified learning needs, and to keep up with the rapid developments in technology. These include incorporating both online and in-person elements, blending technology in English instructions successfully, and working on the identified effects of technology integration.

This is closely followed by 20.5 % or nine (9) recommendations for the need for ongoing capacity-building among teachers (Ahmad, 2021; Amrullah et al., 2022; Guo et al., 2020; Pouriran, 2023; Seker & Karagül, 2022; Silalahi et al., 2022; Sim et al., 2021; Yaguara et al., 2021; Zaghar, 2022). This includes workshops, training programs, seminars, or certifications focused on digital literacy and instructional technology. This prepares teachers to use technology effectively in their teaching practices. Also, this not only keeps them informed about the latest tools and trends but also enhances their teaching efficiency.

Another 20.5% expressed the need to utilize technology tools and support systems to improve learning (Bayar & Karaduman, 2021; Cabrera-Solano, 2022; Chiablaem, 2021; Dhivya et al., 2023; Moghadam & Shamsi, 2021; Shofiyuddin et al., 2022; Soleimani & Aghazadeh, 2024; Tarihoran et al., 2022; Wahyuni et al., 2022). By strategically integrating technology tools and support systems, more flexible and personalized learning environments can be created to address the identified negative effects of technology integration in language learning. These tools include adopting Education 4.0, Web 2.0, social networks, cellphone applications, videos, GAFE, and Genially games to leverage the flexibility of these technologies. Ultimately, the strategic use of technology introduces educational settings where learners can benefit from maintaining the scale between technological advancement and language learning.

Eighteen percent (18%) of the existing research also recommended enhancing student engagement and autonomy that emphasized promoting technology as a tool for enhancing student engagement and autonomy in English learning (Aldaghri & Oraif, 2022; Albogami, 2022; Maru et al., 2020; Pratiwi & Ubaedillah, 2021; Rintaningrum, 2023; Sariani et al., 2021; Syahrin &

Salih, 2020; Thirakunkovit & Boonyaprakob, 2022). These recommendations promote the use of multimedia resources and interactive platforms to provide students with more control over their learning. Included here are for teachers to adopt a facilitative role and integrate collaborative approaches or interactive platforms to not only improve learner engagement but also allow learners to be more self-directed in times of distance education.

Moreover, the remaining 14% recommended general education improvements, particularly in being aware of current challenges, accepting the integration of digital learning, understanding student motivations, and preparing for unexpected shifts in teaching methods (Al Shammari, 2021a; Alqahtani, 2022; Bin Dahmash, 2021; Chugai & Pawar, 2021; Shimray, 2023; Sompakdee et al., 2021) to relay broader efforts to strengthen learning outcomes.

Overall, the total of 44 recommendations points to an extensive interest in improving digital learning environments, supporting students' self-directed learning, and equipping teachers with the necessary skills for technology integration.

4. Recommendations for Research

The distribution of recommendations for research, Figure 4, gives direction and possible gaps in technology integration in language learning. Among the 44 articles reviewed, nearly a third or 13 articles (Al Shammari, 2021b; Amrullah et al., 2022; Bayar & Karaduman, 2021; Bin Dahmash, 2021; Dolmaci, 2021; Guo et al., 2020; Huh et al., 2022; Rintaningrum, 2023; Sariani et al., 2021; Shofiyuddin et al., 2022; Soleimani & Aghazadeh, 2024; Thirakunkovit & Boonyaprakob, 2022; Wahyuni et al., 2022) refrained from suggesting any further research, which could reflect either a sense of completion in addressing their objectives or probably a missed opportunity to relay the recommendation in this area.

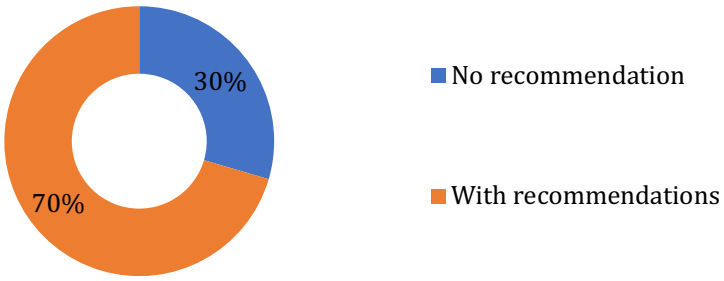

Figure 4. Recommendations for research

The larger portion (70%), however, extended and identified areas for further exploration. This suggests that technology integration in English learning remains an active and researchable topic, probably driven by the continuous advancements in technology. This advancement naturally entails new opportunities and challenges to explore academically.

The remaining 31 articles, summarized in Table 3, offered general recommendations, categorized as follows: 30% (Alasmari, 2021; Albogami, 2022; Al Shammari, 2021a; Chugai & Pawar, 2021; Each & Suppasetseree, 2021; Elbashir & Hamza, 2022; Huong & Phúc, 2023; Maru et al., 2020; Sakulprasertsri, 2022; Shimray, 2023; Sulistyawati & Kuswandono, 2022; Syahrin & Salih, 2020) suggested changes to the research variables, 12 (Ahmad, 2021; Alzamil, 2021; Chiablaem, 2021; Li et al., 2021; Moghadam & Shamsi, 2021; Oflaz et al., 2022; Pouriran, 2023;

Seker & Karagül, 2022; Sim et al., 2021; Sompakdee et al., 2021; Tarihoran et al., 2022; Yaguara et al., 2021) recommended modifications to the participants and context, and 6 (Aldaghri & Oraif, 2022; Alqahtani, 2022; Cabrera-Solano, 2022; Dhivya et al., 2023; Pratiwi & Ubaedillah, 2021; Zaghar, 2022) proposed alterations to the research design.

Table 3. Recommendations for Future Research

Recommendations	Frequency	Percentage (%)
No Recommendation for Further Research	13	30
With Research Recommendations		
Change in Research Variables	13	30
Change in Participants and Context	12	27
Change in Research Design	6	13
Total	**31**	**100**
Grand Total	**44**	**100**

The most frequently suggested area by 30% of the studies was changes to research variables. This extends a need for deeper exploration of different dimensions of technology integration, particularly on different tools and platforms, teaching and learning approaches and strategies, targeting specific language skills, and using different devices. This emphasis reflects the progressive understanding of the factors that may influence English language learning through technology.

Recommendations on expanding studies with changes in participants and context, as recommended by 27%, point to examining how different learner demographics, educational settings or backgrounds, a larger sample, or a different learning modality may impact findings. This recommendation also reveals the importance of contextual diversity in ensuring that research findings are applicable and relevant across different learning contexts.

Finally, recommendations to alter research designs suggest that these studies recognize the limitations in existing studies and seek to encourage more thorough approaches. These included using longitudinal studies, comparative studies, different statistical analytical methods, and supplementing quantitative data with qualitative data. This could provide more comprehensive and reliable findings.

Generally, this pattern of recommendations creates a research background with opportunities for addressing gaps in variables, contexts, and designs. It also emphasizes the need to continue academic research to better understand technology integration in English language learning.

CONCLUSION

This review identified that the most researched topic was on the effectiveness and impact of specific tools and platforms and that future research may focus on the current trends and practices of technology integration post-pandemic.

While positive and negative effects were identified in this review, the positive results significantly outweigh the negative ones. The emphasis on the positive findings affirms the importance of technology in modern education. Thus, when used with caution, technology is a valuable and effective strategy, especially in enhancing language skills. Despite these benefits, there remains a gap in long-term studies that evaluate how sustained technology integration impacts language learning over time. Additionally, researchers may investigate the role of evolving technologies, such as AI-powered language tools and virtual reality, in language learning.

Recommendations were primarily directed at teachers to effectively integrate technology into language learning. These included designing instructional strategies and teaching methods that better address learners' needs while enhancing the positive impact of technology. Also, most of the articles that suggested further research reveal that technology integration in English education is still an active and productive topic for research, considering other aspects of new technology and its potential contribution to language learning.

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