

The Use of Digital Technology in ELL Research: Current Trends, Agendas and Future Directions

By

Amporn Sa-ngiamwibool

Phranakhon Si Ayutthaya Rajabhat University, Thailand

Email: amporn.kai@yahoo.com

Abstract

This systematic review gives a full summary of the evidence about how digital technology is used in English language learning (ELL) research right now. It looked at how this body of literature helped English Language Learners (ELL) with the help of digital technologies. I found 35 systematic reviews of the evidence, and 29 of them had some specific, relevant findings. Mobile-assisted language learning (MALL) was discussed in the majority of reviews (16.13%). The findings identified these nine trends: mobile learning, digital technologies for new skills, constructivism, online ELL classes, the use of ICT to facilitate informal learning, the decline of old technology, transformation into interactive multimedia learning environments, digital tools for communication networks, and social media writing. The results also revealed these three agendas: enhancing language skills, developing language learning, and assessing language learning. Finally, self-directed learning (online learning, open resources, and personal learning networks), constructivism, MALL, and the communication network (video conferencing, self-publishing, Twitter, and YouTube) will be the future directions for digitally enabled ELL, while research will shift to new assessments for new tools (self-assessment, e-portfolios, and viewpoints on the use of digital technology in ELL). This review contributes to our understanding of how digital technology is used in ELL research.

Keywords: English language learning (ELL), digitally enabled technology, mobile-assisted language learning (MALL)

1. Introduction

As digital technology keeps getting better and is used more and more in education, especially English language learning (ELL), students have more chances than ever to practice and improve their English outside of the traditional classroom. Students can do this in both formal and informal online learning situations by using a variety of online learning tools and resources. Even though interest in digital technology is growing, less research has been done on whether or not digital learning can help ELLs, especially research that looks for best practices. This subject calls for additional study.

Digital technology now has a bigger role to play in making online education more international. As the epidemic spreads, it will be important to plan for the future. This includes planning, making, and integrating technology into the ELL teaching framework to get ready for the day when digital technology will replace traditional learning platforms in all fields. In a previous study (Chooprayoon and Sa-Ngiamwibool, November 2020), I studied how YouTube enhanced cognitive learning in sustainable management. The results showed that after watching the movies, the people who took part knew more about the problem. Also, they had good things to say about the dynamics of a meaningful and socially engaging argument, as well as the way they explained what they knew about the topic.

Even though the study was based on real-world data, it couldn't show how digital technology helped ELL in general. The goal of this study was to look at how evidence-based research can be used to answer questions about how to best use a variety of digital tools in ELL without doing more research that only looks at a few digital tools. This was done so that students could learn a lot more without having to do more research on a small number of digital technologies. To achieve the objectives, a systematic review of the literature (SLR) was chosen. This research methodology can provide a comprehensive and easy review of a broad range of digital technologies. In addition, it offers a complete description of the digital technologies now utilized in ELL. In addition, the SLR helps identify research gaps in our existing knowledge and comprehension of the examined subjects. It raises concerns regarding how research studies may be employed to improve future work.

Thus, this study examined the issues, with the following research questions (RQs): 1) What are the research trends in digital technology-enabled formal and informal ELL from 2012 to 2022? 2) What are the major agendas of the digitally enabled ELL? 3) What future direction of the digital technology-enabled formal and informal ELL should be?

The contents of this study are divided into five parts. Part 1 introduces the rationale for the study. Part 2 illustrates the research approach. Part 3 describes the characteristics of the articles under study. Part 4 presents the results of the study. Part 5 concludes the results of the study and provides the implications of the study.

2. Research Method

SLR was chosen as the method for this study because it allows for a clear, repeatable, and objective search of the included articles. This was done to reduce bias and make the analytical selection process clear and objective. Careful decisions were made about which papers would be accepted or rejected based on clear and objective criteria. This proposal from Tranfield et al. (2003) can ensure reproducibility. This review consists of the following seven phases: (1) planning, (2) establishing criteria, (3) defining the database, (4) selecting articles, (5) executing the review, (6) developing a framework for RQs, and (7) data analysis. Below are the phase-specific details.

2.1. Planning the Review

This analysis included 29 research publications published between 2012 and November 2022. Utilizing the keywords "ELT research trends and the use of digital technology," which is the topic of this study, a search was done on Science Direct to identify the significant papers cited in this article.

Establishing the Criteria

The following were the inclusion and exclusion criteria:

2.2.1 Inclusion

The researcher did an online search using keywords and looked at research papers that were only published in English between 2012 and November 2022. In this review, full research publications were counted as data if they made the research designs clear. Full research publications from conferences on the subject of this review were therefore included. The contributions of dissertations and theses on the topic of this review were also incorporated to enrich data analysis and generate extensive and rigorous study results. Articles available from the authors' institution were also included.

Exclusion

The symposium essays were excluded due to their brevity. As books, workshops, and annual conferences do not qualify as research projects, they were eliminated as well.

2.3 Defining the Database

The databases were determined in accordance with the criteria. Science Direct and Google Scholar were used to retrieve the papers. They are additionally accessible via additional sources. Journal of English for Academic Purposes, Journal of Second Language Writing, Heliyon, Teaching and Teacher Education, System, Journal of English for Academic Purposes, English for Specific Purposes, Procedia Computer Science, Language Sciences, Computers & Education, Teaching and Teacher Education, and Procedia-Social and Behavioral Sciences were included in this review.

2.4 Choosing the Articles

Using Mendeley Desktop Software, a literature search was conducted. The selection was determined by keywords entered into the computer databases of several publishers. It was determined which articles from more than fifty databases contained the keywords. To boost the results' trustworthiness, a variety of sources were chosen. Application of inclusion and exclusion criteria Figure 1 illustrates a summary of the selection.

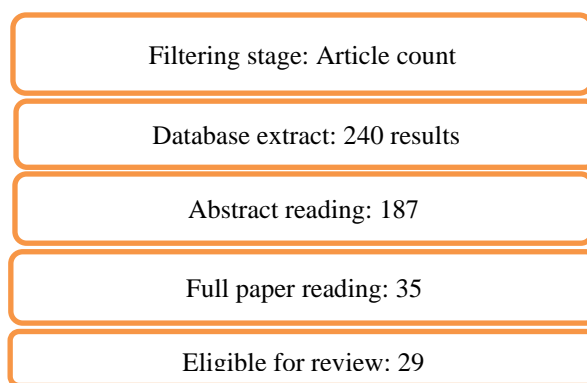


Figure 1 *Article filtering process*

Figure 1 displays the article selection procedure for this review. The initial stage of filtering is the article count using the search phrases "ELT research trends and digital technology utilization." Then, during the data extraction phase, 240 papers were extracted from the databases, including the following publication titles (and article counts): Procedia CIRP (49 articles), Procedia Social and Behavioral Sciences (29 articles), Procedia Computer Science (7 articles), Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, and Associated Equipment (6 articles), IFAC-Articles OnLine (6 articles), Journal of English for Academic Purposes (5 articles), International Journal of Heat and Mass Transfer (4 articles), Construction and Building Materials (4 articles), Computer Networks (4 articles), Procedia Manufacturing (4 articles), IFAC Proceedings Volumes (4 articles), Transportation Research Part E: Logistics and Transportation Review (3 articles), Journal of Cleaner Production (3 articles), Teaching and Teacher Education (3), Energy and Buildings (2 articles), Sensors and Actuators B: Chemical (2 articles), Bioresource Technology (2 articles), Composites Science and Technology (2 articles), Data & Knowledge Engineering (2 articles), Progress in Particle and Nuclear Physics (2 articles), System (2 articles), Journal of Pragmatics (2 articles), English for Specific Purposes (2 articles), Computers & Education (2 articles), Journal of Second Language Writing (2 articles) Subject areas: Engineering (108 articles), Social Sciences (64 articles), Arts and Humanities (43 articles), Computer Science (33 articles),

Decision Sciences (19 articles), Materials Science (15 articles), Energy (14 articles), Physics and Astronomy (14 articles), Business, Management and Accounting (11 articles), and Environmental Science (10 articles). Then, in the stage of abstract reading, 187 abstracts were reviewed. The abstracts were arranged as follows: 2022 (45 articles), 2021 (21 articles), 2020 (25 articles), 2019 (13 articles), 2018 (22 articles), 2017 (7 articles), 2016 (11 articles), 2015 (15 articles), 2014 (25 articles) and 2013 (3 articles). Thirty-five papers were pertinent to this review's objectives. Afterward, 35 complete papers were examined. Following the reviews, 29 articles qualified for this review.

2.5 Conducting the Review

In this review, a backward search was only done when it was needed to understand the article's context. It was not part of the study.

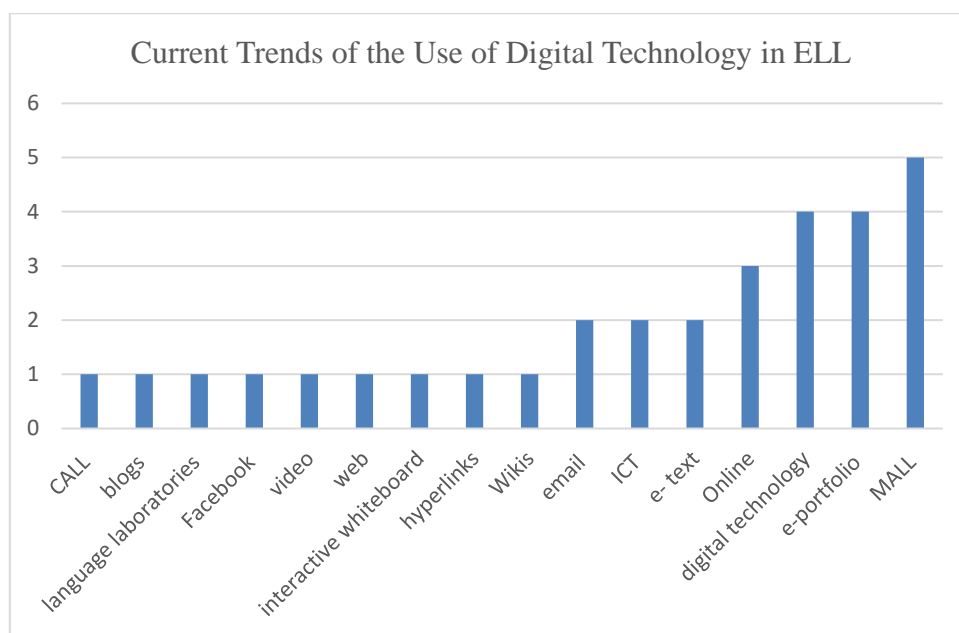


Figure 2 Current trends of the use of digital technology in ELL

Figure 2 shows how the number and percentage of digital types and formats show how digital technology is used in ELL today. The types and formats fall into the following five categories, ranked from least to most: first, CALL, blogs, language labs, Facebook, video, web, interactive whiteboard, hyperlinks, and wikis (3%); second, e-text, email, and ICT (6%); third, online (10%); fourth, digital technology, and e-portfolio (13%); and lastly, MALL (16%), respectively. This shows that, among the five categories, MALL, digital technology, e-portfolios, and the internet are the three most popular digital forms and formats in ELL.

This review contains the following articles: online EFL classrooms (Sak, 2022), online games (Ashraf et al., 2014a), online distance learning (Çamlıbel-Acar & Eveyik-Aydın, 2022), digital technology (Zhang & Chen, 2022; Matsuoka, 2014), digital storytelling (Razmi et al., 2014), digital games (Twenty three Shahriarpour, 2014), CALL technology (Samadi et al., 2014), mobile learning or m-learning (Öz, 2014a), mobile-assisted language learning (MALL) (Bozdoğan, 2015; Azar & Nasiri, 2014), mobile applications (Klimova, 2021), mobile games (Chen & Hsu, 2020), e-portfolio (Yastibas & Yastibas, 2015; Yastibas & Cepik, 2015; Yastibas & Cepik, 2015), email portfolio (Khoosf & Khosravani, 2014), email writing (Parviz & Gorjian, 2014), ICT for ELT (Ahmed et al., 2014), ICT-facilitated informal education (Naghdipour, 2022), blogs (Kamberi, 2015), language laboratories (Lokmacioğlu et al., 2015), Facebook (Ponnudurai & Jacob, 2014), e-text/e-lifestyle (Twenty four Ashraf et al., 2014b;

Amerian & Amerian, 2014); video-mediated (Yousefi, 2014), web-based learning (Öz, 2014b), interactive whiteboard (Amiri & Sharifi, 2014), hyperlinks (Soleimani & Esmaeili, 2014), and Wikis as social software (Ahmadi & Marandi, 2014).

2.6 Creating a Framework for RQs

This review produced operational definitions that link ELT research trends and digital technology usage. The term "trend" refers to a general direction or pattern of change or development. The term "agenda" refers to a topic of study. Future direction refers to the general growth or development of future research agendas and research projects.

2.7 Data Analysis

A summary of the aforementioned review procedure could be shown in Figure 2.

The components of data analysis are data extraction, content analysis, and data synthesis. A spreadsheet was developed to facilitate data analysis. The spreadsheet contained the following information: data identification (e.g., databases, titles of journals and articles, year of publication, institution of the first author, and sector in which the study was conducted); contents of the study (e.g., research objectives, research questions, methodological approach, and results of the study and major findings); research trends, agendas, and future research directions.

Below is a summary of the aforementioned review procedure.

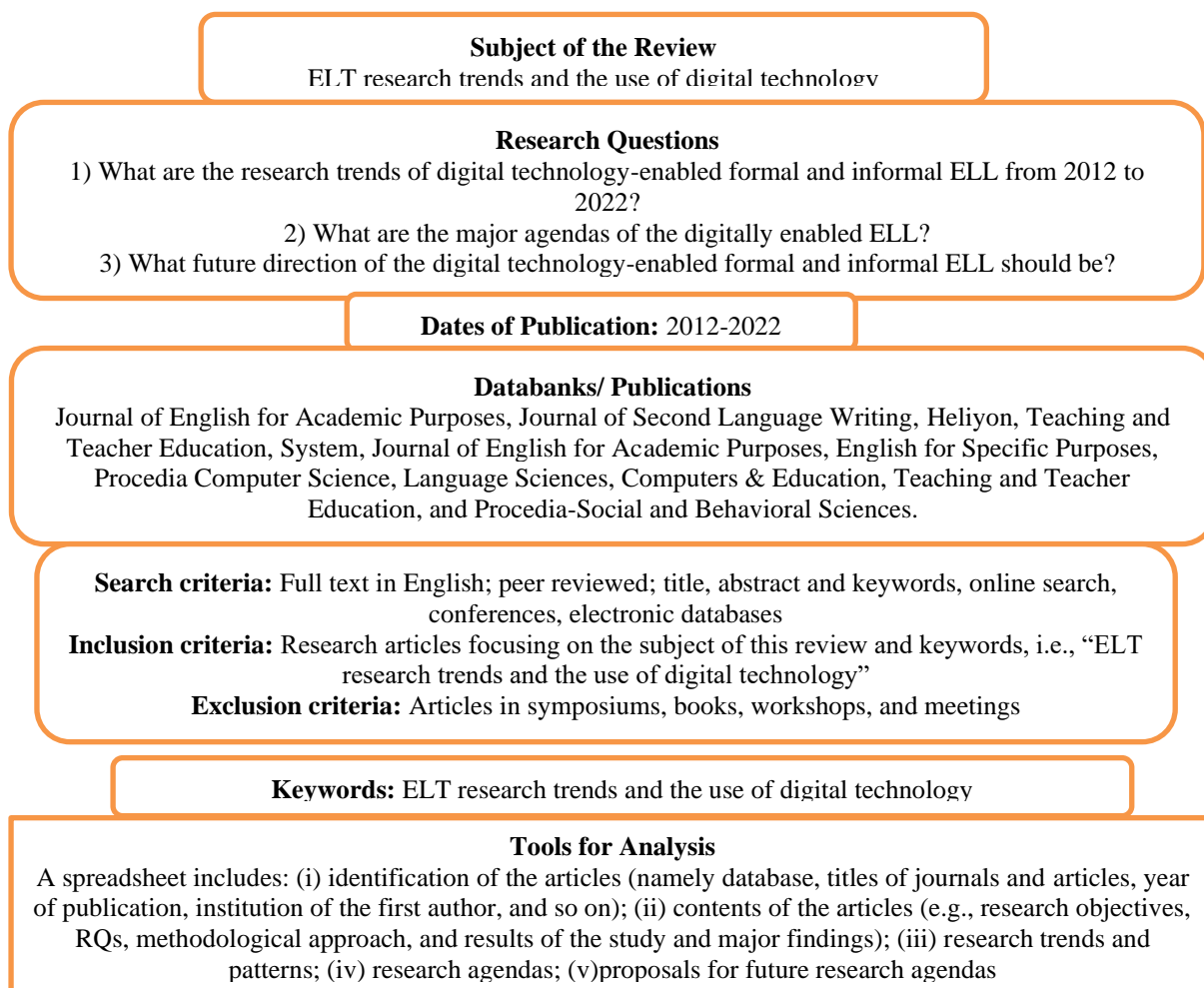


Figure 3 SLR protocol summary

Figure 3 illustrates an overview of the SLR methodology. The summary contains the subject, research questions, publication dates, databanks, search criteria, inclusion criteria, exclusion criteria, keywords, and analysis methods for the review.

The review's findings were then presented in the next section.

3. Characteristics of Articles under Study

When it comes to digital forms and formats in ELL, all articles that have been looked at can be seen as shown in Figure 2.

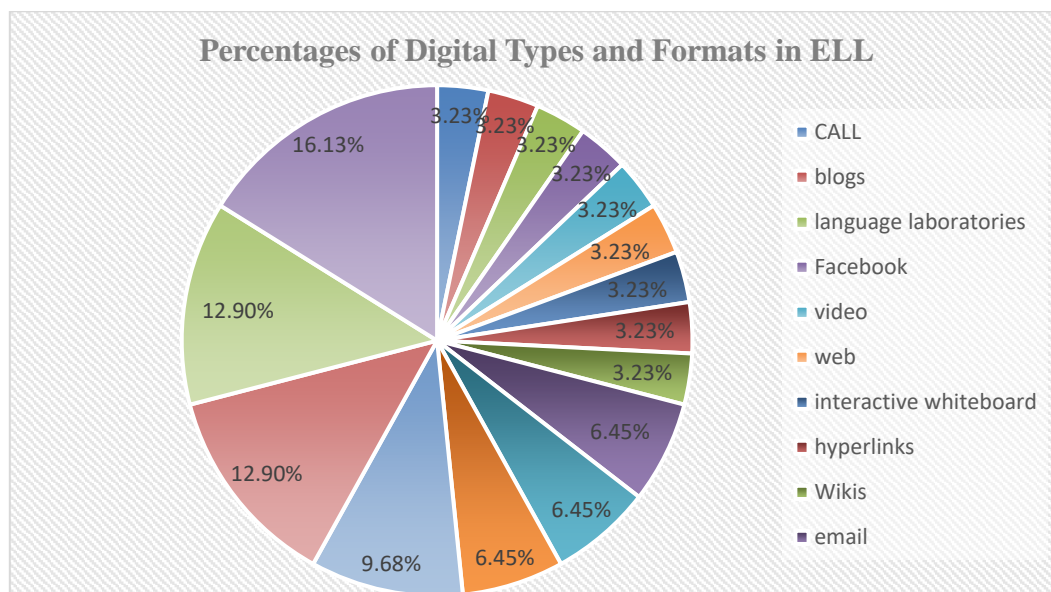


Figure 4 Digital types and formats in ELL of current digital technology usage trends in ELL

Figure 4 shows how digital technology is being used in ELL right now in terms of the percentage and number of digital types and formats. The types and formats are divided into five groups and are arranged in the following order: first, mobile-assisted language learning (MALL) (16.13%); second, digital technology (12.90%) and e-portfolio (12.90%); third, online (9.68%); fourth, e-text (6.45%), email (6.45%), and ICT (6.45%); and lastly, CALL (3.23%), blogs (3.23%), language laboratories (3.23%), Facebook (3.23%), video (3.23%), web-based learning (3.23%), an interactive whiteboard (3.23%), hyperlinks (3.23%), and wikis (3.23%) respectively.

4. Results of the Study

4.1 Current Trends in the Use of Digital Technology in ELL

In response to RQ 1 (What are the research trends of digital technology-enabled formal and informal ELL from 2012 to 2022?), below are the results of the study.

As digital technology gets better, teachers all over the world are looking for new and effective ways to use it in their classrooms. Language teachers, like other teachers, are trying to take advantage of this growth by coming up with new ways to help students learn languages. The following five key themes could be highlighted based on the research studies in this review: All of the technological improvements in education have resulted in significant modifications to English teaching and learning methodologies. Every year, new trends emerge

to provide learners with something new. The results of the review in this study reveal the following nine trends, which can be presented as shown in Figure 5.



Figure 5 *Current trends in the use of digital technology in ELL*

Figure 5 presents the current trends in the use of digital technology in ELL. There are nine trends, including: mobile-assisted language learning (MALL), digital technologies for new skills, constructivism, online ELL classes, the use of ICT to facilitate informal learning, the decline of old technology, the transformation into interactive multimedia learning environments, digital tools for communication networks, and social media writing. Below are the details of each trend.

First, mobile learning, or m-learning, has recently emerged as a new form of learning model that enables learners to access learning materials utilizing mobile technology and the internet anywhere and at any time. Mobile-assisted language learning (MALL) is becoming increasingly popular. Smartphones, 3G mobile phones, notebooks, netbooks, tablets, digital cameras, MP3 players, personal digital assistants (PDAs), and other mobile gadgets are increasingly popular among students. This development also suggests a growing interest in mobile technology's potential role in formally aiding students both in and out of the classroom. Many studies, including those on m-learning (Öz, 2014a), MALL (Bozdoan, 2015; Azar & Nasiri, 2014), mobile applications (Klimova, 2021), and mobile games (Chen & Hsu, 2020), show that students have positive attitudes and perceptions of m-learning and are increasingly utilizing many features for their language learning development.

Second, there is a growing trend to integrate digital technology into ELL for skill learning. Digital technology can successfully foster the learning process (Zhang & Chen, 2022; Matsuoka, 2014). It can also assist students in improving their multimodal communication skills by supporting a learner-centered environment. As a result, learners will have numerous opportunities to communicate and use language in meaningful and practical ways. Digital storytelling, according to Razmi et al. (2014), allows the students to adapt narratives into multimedia works that enhance their reading, writing, listening, and speaking skills. Students were able to create compelling and inventive personal narratives of the stories by utilizing the digital images, photography, video, animation, sound, music, text, and narrative voice utilized to depict the stories. Playing digital games, according to Shahriarpour (2014), enhances students' excitement for learning, shifting the focus from rote memorization to meaningful learning. The utilization of digital games is one of the things that engages and inspires learners.

Third, the digital tools integrated in ELT are increasingly centered on constructivism. E-portfolios, for instance, place a significant emphasis on learning by doing, and evaluating this process necessitates a variety of evaluation methodologies that account for elements such as students' knowledge and individual characteristics when assessing their performance. E-portfolios are a valuable tool for encouraging the use of the target language outside of the

classroom. Students improve their self-evaluation, self-reflection, and linguistic skills. They can also take academic risks by actively participating and accepting responsibility for their learning, which will help them enhance their social skills. Students have the chance to use the target language in real-world contexts if they are able to make connections between what they learn in the classroom and how they could use it in the real world. Students are able to present their work, which stimulates and enhances their confidence. By doing so, e-portfolios enable educators to monitor the growth of their students, identify their strengths and weaknesses, and provide each student with tailored feedback on those constraints. Therefore, it can be stated that teachers see the use of e-portfolios in ELL classes favorably. Various research (e.g., Yastibas & Yastibas, 2015; Yastibas & Cepik, 2015; Khoosf & Khosravani, 2014) advises that educators develop new student-centered evaluation methodologies in order to evaluate ELT students. One of these ways is to use e-portfolios as a type of assessment in class to improve students' diverse learning preferences.

Fourth, the most visible movement around the globe right now is the creation of online ELL courses. Online learning at a distance helps people develop a wide range of skills, such as language skills and higher-order thinking skills. Amlbel-Acar and Eveyik-Aydn (2022) revealed that online distance learning has a number of benefits, such as instant access to lesson recordings, easy and practical personal skill development, research-based assignments, stress-free learning, improved technological skills, time, energy, and money savings, safety and comfort, and collaboration. Learners' motivation and performance improved during the online learning process. Sak (2022) discovered that L2 instructors' desire to teach online fluctuates not just within single lessons but also from lesson to lesson, with the oscillations arising from a complex array of learner-related, course-related, and personal factors. The sense of professional identity, the (non)display of agency, and self-efficacy beliefs were found to be important in mediating motivational shifts. Similarly, Ashraf et al. (2014) discovered that online games can be beneficial for vocabulary acquisition, establish an interactive and motivating environment in which learners can simply and instinctively share their information, and raise motivation and performance during the learning process.

Fifth, there is a tendency for ICT-enabled informal learning to emerge as a critical tool for ELT. As a result of the increased usage of information and communication technology, English-as-a-foreign-language (EFL) students now have access to and opportunities to interact with a wide range of online informal learning tools and resources (ICT). In Naghdipour's study (2022), for example, students employed a number of digital tools to assist them in completing classroom-based writing projects and communicating well in online casual forums. Additionally, translation and proofreading software were the most frequently and successfully utilized tools in both instances, indicating that EFL students are concerned with the linguistic components of their writing. While they used synchronous platforms for informal writing tasks, they depended on asynchronous resources for professional writing assistance. Ahmed et al. (2014) discovered the benefits of blogs and podcasts in ELT among a variety of digital technologies. To facilitate ICT-enabled learning, e-texts and e-lifestyles (Ashraf et al., 2014; Amerian & Amerian, 2014) have been deployed. Thematically, the most significant electronic text expressions and traces are e-commerce and e-reservations, online communication, and the use of electronic resources and databases in research concerns. E-lifestyle influences a major portion of what ELT course book authors believe English language learners should understand in the cybernetic age (Amerian & Amerian, 2014).

Sixth, the way things are going now shows that old technology may not be as important as it used to be. This is because many schools and colleges are turning their classrooms into multimedia rooms. Despite their ineffectiveness, certain traditional technologies are still used

to improve ELL. Students in Lokmacolu et al. (2015)'s study, for example, are amenable to using language laboratories because this digital environment is engaging and beneficial to their English skills. Students, on the other hand, prefer distinct lab hours to using classrooms as multimedia platforms. Samadi et al. (2014) explored how CALL technology influences the speaking skills of female students.

Seventh, in an effort to turn classrooms into multimedia classrooms, modern tools were used for a variety of purposes. Kamberi (2015) said that blogging helps students improve their language skills and gives them some protection by letting them post in a comfortable and quiet environment.

Eight, digital tools that enhance conferencing and communication networks are becoming widely accepted. Studies point to the usage of video-mediated platforms such as Skype to improve learning because screen sharing, file transfers, instant conversation, and other online activities are all feasible with Skype. Skype users can hold conference conversations with three or more individuals, as well as video and voice chats with other Skype users. Yousefi (2014) has shown that Skype may also be used in English classrooms. Online Skype English courses are available, are the best approach for people with busy schedules to learn English, and are taught by qualified, experienced teachers. Soleimani and Esmaeili (2014) noted that, similar to Skype, the use of hyperlinks allows learners to alter language in order to facilitate learning.

Ninth and lastly, online writing through social media replaces traditional writing in ELL. Ponnudurai and Jacob (2014) discovered a link between Facebook writing and lower anxiety levels. Given the present predominance of e-learning, educators should embrace the use of social networks in the classroom and be open to new technological innovations. Similarly, Amiri and Sharifi (2014) discovered that an interactive whiteboard is useful for writing. Finally, Ahmadi and Marandi (2014) discovered wikis as social software to help encourage learning and support a networked environment where the necessary interactions within these communities focus on knowledge sharing. Particularly through tools like wikis within the membership, which may range from experts to novices, virtual communities of practice using CALL tools like wikis encompass the concept of social interaction.

4.2 The Agendas of the Digital Technology-Enabled ELL

In response to RQ 2 (What are the major agendas of the digital technology-enabled ELL research?), the agendas could be conceptualized as shown in Figure 6.

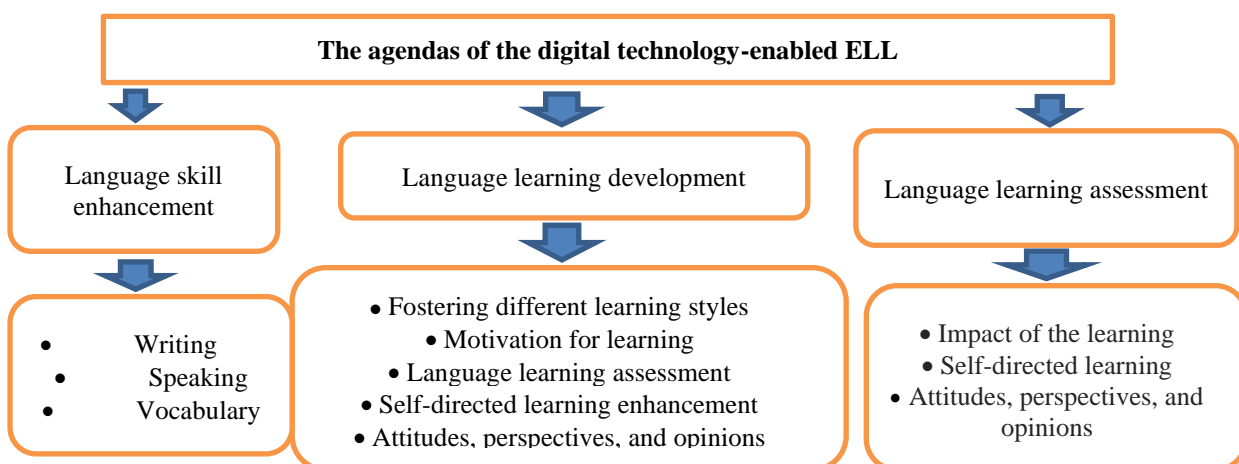


Figure 6 The agendas of the digitally enabled ELL and research

Figure 6 depicts the agendas for digitally enabled ELL. The agendas are divided into three categories: language skill enhancement, language learning development, and language learning assessment. Language skill enhancement aims to develop writing, speaking, and vocabulary. Language learning development involves these agendas: fostering different learning styles; motivation for learning; language learning assessment; self-directed learning enhancement; and attitudes, perspectives, and opinions. Language learning assessment deals with assessments of the impact of the learning, assessments of self-directed learning, and assessments of attitudes, perspectives, and opinions. Each agenda is detailed below.

4.2.1 Language Skill Enhancement

The agendas on writing skills deal with ICT-facilitated informal education for EFL writing (Naghdipour, 2022), how Iranian students of different genders use linguistic elements in email writing (Parviz & Gorjian, 2014), and how using an interactive whiteboard affects EFL students' writing about adverbs (Amiri & Sharifi, 2014). Concerning speaking skills, the studies use digital storytelling to encourage oral output (like telling the story out loud) in EFL classes (Razmi et al., 2014) and study how CALL technology affects the speaking skills of Iranian high school girls (Samadi et al., 2014). In terms of vocabulary learning, studies have looked at how playing digital games affects intermediate Iranian EFL students' motivation to learn English vocabularies (Shahriarpour, 2014), as well as explicit instruction of vocabulary and thematic words from context with hyperlinks (Soleimani and Esmaeili, 2014).

4.2.2 Language Learning Development

Agendas regarding growth in language learning entail two important components that may play a major role in ELL: encouraging different learning styles and motivating students to study. E-portfolios and email portfolios are examples of digital technologies that can effectively promote diverse learning styles, according to Yastibas & Yastibas (2015), Yastibas & Cepik (2015), and Khoosf & Khosravani (2014). This strategy enables students to take charge of their education from start to finish. It also promotes self-directed learning. Setting goals and building learning environments around them are part of this activity. Despite recent attention to the dynamic character of second or foreign language (L2) teacher motivation, prior research has mostly focused on variations in motivational trajectories. Chen and Hsu (2020) proposed that self-regulated mobile game-based English learning will boost students' motivation to learn in a virtual reality (VR) setting. Self-efficacy, genuine worth, and test anxiety all have a substantial impact on both in-game involvement and the gaming experience. Immersion, flow, and presence promote self-efficacy, whereas absorption and infusion improve self-control. Self-control and self-efficacy have an impact on one another. According to this study, the interactive nature of VR applications and the difficulties of game design boost students' capacity to reach the flow state and increase their enthusiasm to learn. Other studies focused on language teachers' motivational dynamism in m-learning (Öz, 2014a), mobile-assisted language learning (MALL) (Bozdoan, 2015; Azar & Nasiri, 2014), mobile applications (Klimova, 2021), online EFL classrooms (Sak, 2022), and learning to develop autonomous motivation and novice educators' perspectives (Glas et al., 2019).

4.2.3 Language Learning Assessment

Agendas on language learning assessment engage these three aspects. **First, assessment of the impact of the learning** deals with the impact of online games (Ashraf et al., 2014), the use of e-portfolio-based evaluation to foster students' self-directed learning in English language instruction (Yastibas & Yastibas, 2015), evaluating collaborative writing in the digital age (Zhang & Chen, 2022), evaluating the impact of mobile applications on the vocabulary acquisition of EFL university learners (Klimova, 2021), comparing traditional and video-mediated English learning (Yousefi, 2014), and Japanese English learners' digital

employment and analysis (Matsuoka, 2014). **Second, assessment of self-directed learning enhancement is directed** toward self-directed English learning via mobile games in a virtual reality setting (Chen & Hsu, 2020) and introducing an email portfolio as a means of developing EFL learners' autonomy (Khoosf & Khosravani, 2014). Lastly, **assessment of attitudes, perspectives, and opinions** focuses on learners' opinions on how well mobile aided language learning (MALL) improves L2 listening comprehension (Azar & Nasiri, 2014), teachers' perspectives toward the usage of e-portfolios in English language teaching and learning speaking classes (Yastibas & Cepik, 2015), the opinions of English teachers on web-based testing in a course on pedagogical content knowledge (Öz, 2014b), teachers' perspectives on the usage of e-portfolios in speaking classrooms for the teaching and learning of English (Yastibas & Cepik, 2015), and the necessity of continuing to use distance learning among future EFL teachers and teacher educators during the current pandemic (Çamlıbel-Acar & Eveyik-Aydın, 2022).

4.3 Future Directions for Digitally Enabled ELL and Research

Future directions for ELL and research could be presented as shown in Figure 7.

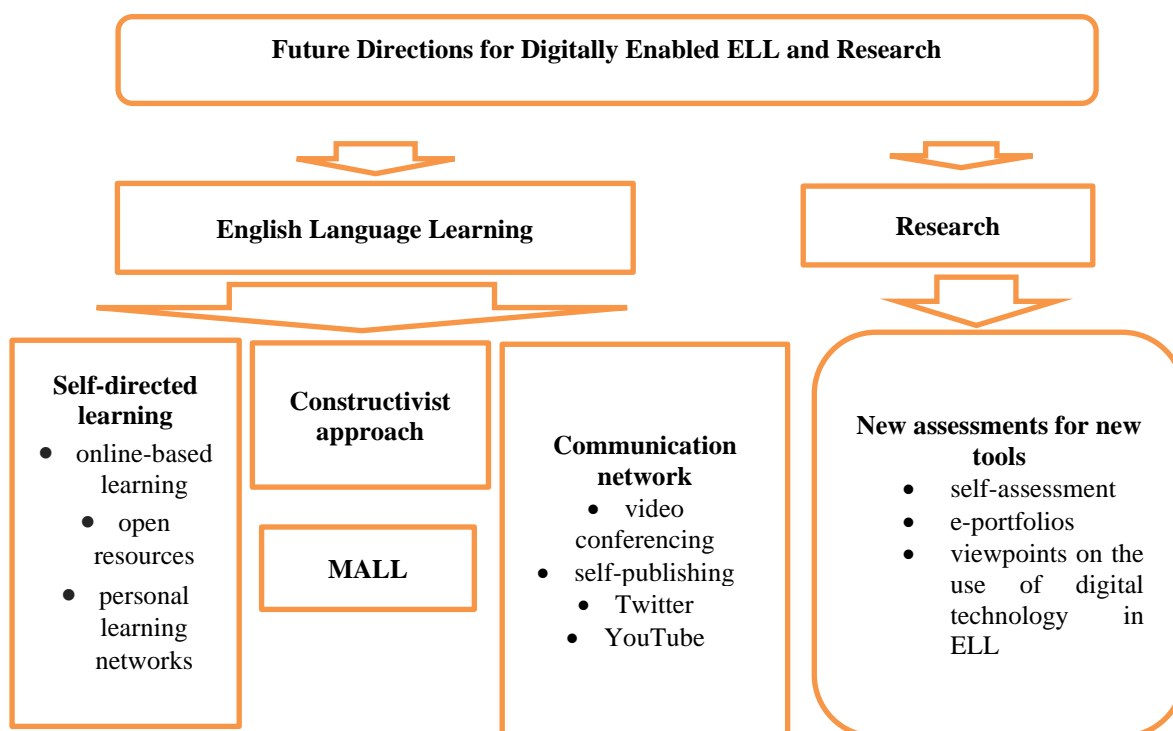


Figure 7 Future directions for digitally enabled ELL and research

Figure 7 depicts the future directions for digitally enabled ELL and research. The future of ELL will be directed toward **self-directed learning**, a constructivist approach, MALL, and the communication network. New assessments for new tools. The future research will highlight new assessments for new tools.

In the future, on both the theoretical and practical sides, practitioners are likely to highlight the following directions:

4.3.1 Future Directions of Digitally Enabled Formal and Informal ELL Fostering self-directed learning

With self-directed learning, students may comprehend how technology and learning are related. It is clear that technology significantly affects the development and promotion of self-

directed learning. Thanks to technology, students can engage in social contact, subject-specific research, and global involvement without any limitations. Students now have more freedom to organize their own resources, adopt their own learning styles, and study alone or in groups thanks to the modernization of classrooms made possible by cutting-edge technologies. There are numerous other ways that technology aids in self-directed learning and independent study among students. Open resources, personal learning networks, and online learning are a few examples of specific tools and strategies useful for self-directed learning.

a) Online-based learning

Students who take classes online have access to a variety of online resources in their areas of interest. Also, they are free to study whenever and however they want. The effectiveness of student learning is increased through online learning. Together with providing authentic and adaptable learning settings, online materials can promote deliberate and cooperative learning. We have access to a wide range of tools, such as blogs and wikis, because of the affordances of technology, computers, and the Internet millennium. Wikis can be used to improve and augment the learning environment in the classroom, much like other social media platforms and online settings that promote deep learning through student interpretation and application of knowledge.

b) Open resources

These resources help students learn any subject on their own and do away with the need for a constant teacher because they are cost-free, high-quality teaching tools.

c) Personal learning networks

Personal learning networks serve as the cornerstone of engaged, self-directed learning. These can be made using a variety of social networks, including Facebook, Twitter, and blogs. They encourage teamwork, which supports independent learning.

To support self-directed learning more effectively, a constructivist approach should be promoted.

4.3.1.2 Promoting the constructivist approach

The student-centered constructivist approach encourages classroom activities that focus on the students and says that education is "learning by doing." It is the basis for modern ideas and methods in education, like the project-based learning approach and the problem-solving approach. Learning by doing is the main goal, but there are many ways to evaluate this process that take into account how well students understand, how well they perform individually, and who they are as people.

One effective way for teachers to promote the constructivist approach is to use MALL in their lessons.

4.3.1.3 Integrating MALL into ELL

As digital technology gets better, teachers all over the world are looking for new and effective ways to use technology in their lessons. Language teachers, like other educators, are attempting to take advantage of this development by putting strategies in place to enhance the four skills, vocabulary, and language learning growth as outlined in the research agendas for developing formal and informal ELL and digital learning environments, with the aim of modernizing instruction to appeal to the digital generation and making it easier and more efficient for students. Future ELL pedagogy and research that uses educational technology in the classroom should focus on the following areas to help students learn and improve their

language skills in a creative and effective way: MALL is the most widely used type and format of all due to educators' preferences for more individualized and portable technology than other digital types and formats, especially CALL, the pioneer type and format. Due to the fact that there are more subscribers than people on earth, this trend is still present. In 2021, there were around 8.6 billion active mobile device subscriptions globally, according to the World Economic Forum (2022). The future of formal and informal ELL that is digitally enabled will be shaped by cell phone use, which is the top priority in ELL.

4.3.3.4 Expanding the communication network

ELL aims to improve communication through social interaction. The communication network is therefore essential for digitally enabled ELL. The following resources are beneficial for ELL.

Videoconferencing

Free videoconferencing tools, like Skype, turn schools into hubs of global connection. Students can engage in global conversation to discuss interests and gain knowledge from experts or teachers.

Self-publishing

Self-publishing allows students to reach an audience beyond their teacher. Students can share their ideas and collaborate with real audiences outside of their universities. This is facilitated by blogging and social networking sites.

Twitter

Twitter lets students make microblogs that they can use to talk with people who like the same things they do. They can follow them, reply to their tweets, and use the search term in their own tweets to allow others to access the stuff they share.

YouTube

YouTube provides a visual component to aid in education. These platforms are utilized by instructors in schools and colleges and universities to distribute free content. They allow students and teachers to design their own educational experiences.

New tools need new assessments. Future directions should search for appropriate assessments for the new tools. Researchers will therefore direct their efforts toward the new assessments.

4.3.2 Research for new assessments for new tools

Although educators, instructors, and teachers are aware of how to use digital technology in the classroom and the impact of the technology on learning, they are unable to fully utilize the different learning preferences of their students because they are more accustomed to traditional methods of assessment. Multiple-choice exams and other conventional assessment techniques have long been used in schools to evaluate student achievement. Conventional methods of assessing learners' ability levels are inadequate, fruitless, and ineffective since they primarily rely on the behaviorist approach and do not accurately reflect students' actual performance. Below are some assessments that will play a crucial role for ELL researchers.

4.3.2.1 Research on self-assessment

Virtual environments accessible online bring benefits. In this context, students discuss their aims, accomplishments, and observations. This allows them to evaluate their educational objectives. Instead of relying on teachers to grade them, students should evaluate themselves

by making their own learning plans and assessments, sharing their work with others to get feedback on how to improve it, taking practice exams on a website that helps students prepare for exams, making videos and asking for feedback on them, etc.

Other forms of self-assessment, including e-portfolios, can benefit from the use of technological tools. Self-directed learning tools like e-portfolios will become increasingly important in the field of ELL in the years to come. There is a lack of flexibility in e-portfolio evaluations. As a result, e-portfolio studies will become increasingly important in the ELL field.

4.3.2.2 Research on e-portfolio assessment

For the future of ELL development, it is clear that more research needs to be done on e-portfolios. Because of this, new evaluations of e-portfolios must be based on evidence. Digital portfolios have the potential to completely change how tasks and grades are done in the classroom. To begin with, it improves instruction. In an electronic portfolio, students can demonstrate their abilities and accomplishments. An electronic portfolio is a great way for a student to show off their skills, experiences, and academic work. This can help them grow and get ready for the real world. With the use of digital portfolios, coordination and communication are fostered. Nowadays, there is more communication between students and instructors. Connecting with peers, getting them involved, and working together are all facilitated by the use of electronic portfolios. The students' ability to work together and the quality of their e-portfolios were both improved by the comments they received from their peers. Teachers who are used to giving tests with rubrics might find it hard to switch to electronic portfolios, like multiple-choice exams. Topics like students' critical thinking, analysis, and perspective shifts, as well as their ability to take charge of their own education and develop a heightened awareness of crucial learning elements, strategies, and attitudes, are becoming increasingly important in e-portfolio assessments. All of these uses of e-portfolios for ELL growth call for more research. Newly created methods that make use of digital technology, such as e-portfolios, present a number of difficulties for both educators and students. The study of ways to address the challenges presented by these ground-breaking pedagogical uses of technology.

4.3.2.3 Research for viewpoints on the use of digital technology in ELL

More research could be done to find out how students feel about the problems of integration and which teaching methods work best. This research could focus on how students feel about the use of digital technology in ELL classrooms for specific goals, such as e-portfolios, mobile learning, games, blogs, assessment, etc., and how they feel about self-directed learning and hybrid learning (e.g., creative storytelling, digital games, e-portfolio, etc.). Their perceptions will help develop both ELL and ELL research.

5. Conclusion

In this review, the digital types and formats comprise these five groups: first, mobile-assisted language learning (MALL) (16.13%); second, digital technology (12.90%) and e-portfolio (12.90%); third, online (9.68%); fourth, e-text (6.45%), email (6.45%), and ICT (6.45%); and lastly, CALL (3.23%), blogs (3.23%), language laboratories (3.23%), Facebook (3.23%), video (3.23%), web-based learning (3.23%), an interactive whiteboard (3.23%), hyperlinks (3.23%), and wikis (3.23%) respectively.

In response to the first research question, "What are the research trends of digital technology-enabled formal and informal ELL?", the results of the review indicate these nine trends. First, a new way of learning called "mobile learning" (or "m-learning") has become

popular. It lets students access course materials through their mobile devices and the internet whenever and wherever they want. The second is the increased interest in using digital technologies to teach ELLs new skills. Third, constructivism is becoming more of a focus with the digital tools used in ELT. As a fourth point, the development of online ELL classes is currently the most talked about phenomenon all over the world. Fifth, there is a growing trend toward the use of ICT to facilitate informal learning, which has become an important resource for English language teaching (ELT). Sixth, the way things are going now suggests that old technology may not be as important as it used to be. Seventh, many modern tools were used to try to make traditional lecture halls into interactive, multimedia learning environments. In number eight, digital tools that improve meeting and communication networks are gaining popularity. The ninth and last point is that old-school writing in ELL has been replaced by writing on social media sites.

In response to the second research question, “What are the major agendas of the digital technology-enabled ELL?”, the results of the review indicate these three agendas: improving language skills, developing language learning, and measuring language learning. Writing, speaking, and vocabulary development are the goals of language skill advancement. The promotion of various learning styles, motivation for learning, assessment of language learning, improvement of self-directed learning, and attitudes, perspectives, and opinions are among the goals that go into language learning growth. The assessment of language acquisition includes evaluations of the educational impact, evaluations of self-directed learning, and evaluations of attitudes, views, and opinions.

In response to the third research question, "What should be the future direction of the digitally enabled formal and informal ELL?", the results of the review indicate the results in two areas: ELL and research. In the future, practitioners are expected to emphasize these three directions for ELL from both a theoretical and practical standpoint. Through online learning, free materials, and personal learning networks, self-directed learning will first be encouraged. Second, there will be a stronger emphasis on the constructivist approach. Finally, ELL will include MALL more and more. Fourth, the communication network will be further expanded through the use of videoconferencing, self-publishing, Twitter, and YouTube. Additionally, future research will replace traditional evaluations that are incompatible with new teaching tools with research into new assessments for new tools that represent students' actual performance. Self-assessment, which enables students to analyze their educational goals and evaluate their e-portfolios, is one of the new evaluations. Future studies will focus on how students perceive the challenges of integrating digital technology into ELL and how it is used in ELL. Their perception will aid in the advancement of ELL and ELL research.

For the implications of this study, the results of this systematic review undoubtedly added to our understanding of how digital technology is used in ELL research. This review's primary contribution is to draw conclusions from previously published research articles on the subject of current ELL trends, agendas, and future directions. The discoveries advance ELL research.

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