

**The Impact of Integrating Digital Technologies on
Language Teaching and Learning**

Richard B. Goldsmith

School of Education, Liberty University

Author Note

Richard B. Goldsmith

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Correspondence concerning this article should be addressed to Richard B. Goldsmith.

Email: rgoldsmith4@liberty.edu

Abstract

In the United States, English Language Learners (ELLs) constitute over 10% of K-12 enrollment, facing academic challenges with lower graduation rates compared to non-ELL peers. This disparity raises concerns about their prospects in postsecondary education and employment. The COVID-19 pandemic accelerated the integration of digital technologies in education, particularly in language learning where mobile apps and devices facilitate collaboration and resource access. The diversity and sophistication of these technologies offer opportunities to enhance language skills both in and out of the classroom. Academic research on Computer-Assisted Language Learning (CALL) and Mobile-Assisted Language Learning (MALL) focuses on their effectiveness in improving language acquisition. Academic studies extensively explore multimedia, MALL, socially mediated, and gamified language learning, showcasing their potential to enhance language curriculum delivery and learner engagement. However, reviews often lack comprehensive insights into their broader impact. This paper aims to investigate the effects of integrating digital technologies on language education and explore their intersection with constructivist learning theory to reshape teaching methodologies and foster student collaboration. It underscores the function of digital technologies as cooperative partners in education, mediating interactions between students, educators, and learning resources, thereby reassuring the audience about the human-centric approach to technology integration.

Keywords: English Language Learners (ELLs), Computer-Assisted Language Learning (CALL), Mobile-Assisted Language Learning (MALL), Social Constructivism, Zone of Proximal Development (ZPD), peer-assisted learning, self-regulated learning, socially mediated learning

The Impact of Integrating Digital Technologies on Language Teaching and Learning

In the United States, English Language Learners (ELLs) are among the student populations growing most rapidly, comprising over 10% of enrollment in grades K-12 in the fall of 2020 (National Center for Education Statistics [NCES], 2023). However, ELLs face significant academic challenges, with their performance lagging behind that of their non-ELL peers. For instance, during the academic year of 2015–2016, the on-time graduation rate for ELLs was a mere 67%, significantly lower than the 85% rate achieved by non-ELL students (U.S. Department of Education, 2018). This discrepancy in graduation rates is a cause for concern, given the well-established link between lower earnings and higher unemployment for individuals without a high school diploma (Zaff et al., 2020). These statistics highlight the difficulties many English Learners (ELLs) face in meeting the criteria for academic success, thereby jeopardizing their prospects in postsecondary education and the workforce (Rodriguez et al., 2020).

The recent COVID-19 pandemic forced both educators and students into circumstances where technology became indispensable for educational experiences. Consequently, even the most skeptical critics now recognize the potential of technology to enhance teaching and learning (Stockwell, 2022). Thankfully, digital technologies have already been seamlessly incorporated into language education, becoming an integral part of the daily practices of both teachers and learners (Hubbard, 2022). Educators utilize mobile apps to facilitate student learning by offering collaborative tools that promote creativity, learner independence, and convenient access to resources (Zhang et al., 2021). The use of mobile devices, like tablets and smartphones, is rapidly increasing in schools, particularly because of the shift to remote, online instruction during the global pandemic (O'Dowd, 2021).

The diversity, abundance, and sophistication of digital technologies in language learning are considerable (Chen et al., 2020). The central objective for language teachers is to identify the most effective ways to incorporate these technologies into language education to maximize student engagement and academic success (Hubbard, 2022). Computer-assisted language learning (CALL) and mobile-assisted language learning (MALL) have revolutionized language testing, teaching, and learning by providing new methods of enhancing speaking, writing, reading, and listening skills in and out of class (Ziegler & González-Lloret, 2022). With the rapid development of digital devices and technologies, MALL tools have expanded the possibilities for CALL, making the curriculum more accessible to students with diverse needs by providing learning opportunities for effective language education (Burston & Arispe, 2022).

There are numerous reports of academic research investigating the impact of integrating digital technologies on second and foreign language learning, yet these reviews are often limited in scope. CALL researchers frequently focus on specific digital technologies like mobile apps and digital games. However, they often fall short of offering a holistic understanding of how these tools contribute to language teaching and learning overall (Hwang & Fu, 2018; Xu et al., 2019). Moreover, numerous reviews on CALL concentrate on scrutinizing the research methodologies employed in prior studies (e.g., Shadieff & Yang, 2020). As an example, they condensed the CALL field by scrutinizing journals and publication years, methods of data collection, target languages, and experimental methodologies. This approach restricted the study from thoroughly examining the different kinds of technology used to improve language learning and how they were put into practice.

The focus of this paper is on themes that emerged from a robust literature review surrounding the topic of incorporating digital technologies intended to facilitate effective second language learning and assess educators' utilization of these technologies to enhance learning outcomes. Furthermore, an additional section of this paper will examine the intersection of the constructivist learning theory and digital technologies to reshape teaching methodologies, teach language curriculum, and enhance student collaboration (Schunk, 2020). The research question that guided this literature review is: What impact does integrating digital technologies have on language teaching and learning? By addressing this question, this researcher aims to offer a comprehensive understanding of the role of digital technologies in language education.

Definition of Key Terms

1. *English Language Learners (ELLs)*: A term employed to characterize students who are currently developing their skills in the English language (U.S. Department of Education, NCES, 2022; Zaff et al., 2020).
2. *Computer-Assisted Language Learning (CALL)*: Refers to the use of computers and technology in teaching and learning languages (Ziegler & González-Lloret, 2022; Chen et al., 2020).
3. *Mobile-Assisted Language Learning (MALL)*: Describes the utilization of mobile devices, such as tablets or smartphones, to facilitate language learning (Burston & Arispe, 2022; Zhang & Zou, 2020).
4. *Social Constructivism*: Initially proposed by Lev Vygotsky, it asserts that learning occurs within a social framework, where knowledge is constructed through interactions with others and within the cultural and social environment (Schunk, 2020; van Compernelle et al., 2022).

5. *Zone of Proximal Development (ZPD)*: ZPD represents the disparity between what a learner can accomplish independently and what they can achieve with guidance from others (Schunk, 2020; van Compernelle et al., 2022).
6. *Peer-Assisted Learning*: Learning entails instructional techniques where peers play an active role in the learning process (Schunk, 2020; van Compernelle et al., 2022).
7. *Self-Regulated Learning*: Learning that encompasses being actively engaged behaviorally, cognitively, metacognitively, and motivationally in one's learning, goal attainment, and performance (Schunk, 2020; van Compernelle et al., 2022).
8. *Socially Mediated Learning*: Refers to the process through which individuals acquire knowledge, skills, and behaviors by observing, imitating, and interacting with others within a social context (Schunk, 2020; van Compernelle et al., 2022).

Related Literature

Investigating the impact of integrating digital technologies into language teaching and learning reveals that technology is not just a tool but a collaborative partner within the educational journey. It plays a crucial role as a mediator, facilitating interactions between students and educators, students and peers, and students and learning resources (Hubbard, 2022). Additionally, it is noteworthy that two key themes emerged from a comprehensive review of academic studies on incorporating CALL technologies into language education. First, researchers extensively investigated the technologies of multimedia, MALL, socially mediated language learning, and gamified language learning (Shadiev & Yang, 2020). Second, contemporary academic research on effective language education incorporates these technologies to deliver language curriculum, foster language skill development, and encourage collaborative learning among students (Zhang & Zou, 2020).

Fusing Multimedia with Language Pedagogy for Dynamic Learning

Multimedia-enhanced language learning integrates videos, audio, and images to deliver language knowledge, such as grammar or vocabulary concepts, and to facilitate learning activities like exercises and educational games. In one unique study, researchers examined the technological involvement of English learners beyond classroom settings (Lai et al., 2022). Researchers observed significant correlations between students' access to multimedia resources, their simultaneous focus on meaning and form, and their depth of vocabulary processing, all of which were linked to vocabulary scores. Also, the Lai et al. (2022) data revealed a significant positive correlation between vocabulary scores and access to technological resources integrating both audiovisual and textual modalities. Jeon (2022) compiled an extensive list of multimedia opportunities presented by chatbots in an English language education classroom. Researchers assessed language learners' psychological aspects, specifically their motivation to learn English through chatbots. This study uncovered pedagogical, technological, and social benefits facilitated to learners by the multimedia capabilities of chatbots (Jeon, 2022).

Animations, audio, and video clips embedded within e-portfolios were identified as advantageous for enriching language learning and enhancing writing abilities while also fostering students' enthusiasm to create, display, and exchange multimedia content (Lam, 2020). Further, the Lam (2020) study also examined how multimedia technologies for e-portfolio creation were integrated with other types of technology to enhance student evaluation. For instance, various social media platforms were integrated with student e-portfolios to facilitate formative and summative assessments (Lam, 2020). The online component of these multimedia technologies provides exposure to online texts, which can strengthen second language (L2) vocabulary and reading development among learners. Cong-lem and Lee's (2020) research study

suggests that exposure to second language (L2) online text not only predicted participants' vocabulary size but also facilitated their reading comprehension progress over two years.

Enhancing Language Pedagogy Through Mobile-Assisted Learning

Mobile learning involves the use of wearable devices like Virtual Reality (VR) and Augmented Reality (AR) glasses, as well as portable gadgets such as tablets, smartphones, and digital pens (Kartal et al., 2020; Ziegler & González-Lloret, 2022). The research revealed that mobile applications were the primary method employed for mobile learning (Dizon, 2020). For instance, Katal et al. (2020) investigated the effectiveness of microblogging with Twitter and Youglish apps in teaching and retaining commonly mispronounced words. Twitter was utilized for explicit instruction, emphasizing stressed syllables, providing authentic speech links, and highlighting pronunciation aspects. Youglish facilitated extensive listening and input enhancement, with tweets directing learners to pronunciation examples (Kartal et al., 2020). Results showed that both platforms effectively enhanced learners' pronunciation by providing explicit and implicit error correction, aligning with learner preferences, and facilitating language collaboration through learner-shared content and daily pronunciation tweets (Kartal et al., 2020).

The advantages of mobile technologies include enriching the learning content with game-based interactions and hands-on activities, all within a highly accessible learning modality that can be engaging for learners. Integrating mobile-assisted language learning (MALL) with other technologies in blended learning approaches can be self-paced, collaborative, and team-oriented (Dizon, 2020; Zhang et al., 2021). A study by Dizon (2020) examined automatic speech recognition (ASR) technologies and intelligent personal assistants (IPAs) as a method to overcome anxiety, time constraints, or avoidance when students collaborate. This research explored how L2 English students use the IPA Alexa in class, evaluating its effects on their

listening comprehension and speaking skills. The results revealed that the experimental group demonstrated significantly greater improvements in L2 speaking proficiency (Dizon, 2020).

Fostering Language Learning and Pedagogy Through Social Engagement

Socially mediated language learning is based on the learning theories of Albert Bandura and Lev Vygotsky. It refers to the process through which individuals acquire knowledge, skills, and behaviors by observing, imitating, and interacting with others within a social context (Schunk, 2020). According to Vygotsky's theory, all learning is dependent on tools such as language, symbols, and signs to aid comprehension, which are acquired through social interactions with others (Schunk, 2020; van Compernelle et al., 2022).

Language researchers van den Bos and Tan (2019) incorporated peer-assisted learning by examining how anonymity in online peer review affects the types of feedback provided and the revisions made by students in second-language writing. This study illustrated Vygotsky's Zone of Proximal Development (ZPD), where individuals can tackle tasks with assistance from peers possessing greater expertise (Schunk, 2020). The data showed that anonymous assessors provided notably more feedback on advanced aspects, like idea elaboration and the organization of essays, in contrast to assessors who were not anonymous (van den Bos & Tan, 2019). Additionally, students in the anonymous condition showed significantly higher levels of engagement with directive, higher-order feedback compared to those in the non-anonymous condition (van den Bos & Tan, 2019). The instruction for higher-order feedback played a crucial role in improving students' writing performance in the anonymous setting, leading to higher final grades compared to those in the non-anonymous setting.

Technology-Enhanced Collaborative Writing (TECW) involves multiple students working together to create a single text in their second language (L2). Zhang and colleagues

(2022) conducted a meta-analysis covering research conducted between 2010 and 2021, with a specific focus on TECW. Their analysis revealed that technology significantly facilitated TECW by expediting information sharing, establishing collaborative spaces such as chat rooms, documenting writing and collaboration activities, and maintaining organized records of the TECW process (Zhang et al., 2022). Researchers noted that students utilized their new knowledge, practiced skills, shared resources, exchanged ideas, and engaged in self- and peer-reflection during TECW sessions. Consequently, students are likely to produce higher-quality collaborative writing, improve their writing abilities, and enhance their emotional well-being (Zhang et al., 2022).

A study by Toscu and Erten (2020) expanded on this notion of socially mediated language learning by examining how much intercultural communicative competence (ICC) among English language learners improved through communication with both non-native and native English speakers via asynchronous communication tools (telecollaboration). Researchers confirmed that participating in online communication with individuals who speak English from various cultural backgrounds promoted adaptability among learners, fostered openness to exploring diverse cultures, and reduced prejudices (Toscu & Erten, 2020). Telecollaboration empowers language learners to conquer their apprehension of speaking English, nurturing fluency and confidence in interacting with speakers of the language. Data showcased by Toscu and Erten (2020) demonstrated the considerable positive influence of telecollaboration on participants' ICC compared to traditional classroom instruction.

Incorporating Gaming Elements into Language Learning and Pedagogy

Game-based learning in language education integrates rules, challenges, rewards, goals, and storylines into instructional delivery and activities (Ziegler & González-Lloret, 2022). A

comprehensive analysis of 398 CALL studies by Shadiev and Yang (2020) identified digital games as the most commonly used technology in language education, applied predominantly to improve listening, speaking, vocabulary, and pronunciation skills. Bueno-Alastuey and Nemeth (2020) compared the impact of student-produced podcasts and Quizlet flashcards on vocabulary retention in adults aged 18–61. Their research utilized pre-tests, immediate post-tests, and questionnaires to evaluate technology integration in adult language education. The findings indicated that both methods enhanced receptive vocabulary, although their efficacy in using learned vocabulary was limited. Participants favored Quizlet due to its perceived effectiveness, driven largely by motivation, while expressing concerns about podcast creation and sharing due to potential errors and time constraints (Bueno-Alastuey & Nemeth, 2020).

Learning Theory Association

Vygotsky's constructivist learning theory illustrates how interpersonal, cultural-historical, and individual factors influence human development (Schunk 2020). He suggested that environmental interactions, like apprenticeships and collaborations, promote cognitive growth as learners adjust experiences to their existing knowledge. The theory, as outlined in Schunk (2020), emphasizes the strong connection between learning and the context, where concepts develop through real-world connections. A key idea is the Zone of Proximal Development (ZPD), which highlights the importance of collaborative interactions between learners and knowledgeable others in advancing cognitive development (Schunk, 2020). In practice, educational strategies should prioritize sociocultural influences, promoting self-regulated learning and instructional scaffolding to aid learners within their ZPD. For instance, peer collaboration methods, in line with Vygotsky's emphasis on social mediation, encourage active

participation and cooperation among students, influencing how knowledge is constructed and internalized (Schunk 2020).

Transitioning from Vygotsky's constructivist learning theory to computer-assisted language learning (CALL), the literature reveals digital technologies as collaborative partners in education, fostering interactions among learners, educators, and resources. Embracing Vygotsky's Zone of Proximal Development (ZPD), recent studies highlight peer-assisted learning and collaborative writing through digital tools. These findings demonstrate learners' ability to tackle tasks beyond their current abilities with peer support, echoing Vygotsky's principles. Additionally, multimedia-enhanced MALL provides active engagement with language content within the ZPD (Lai et al., 2022; Dizon, 2020). Integration of digital platforms like social media and online texts enriches language learning and fosters collaborative interaction, in line with Vygotsky's social learning perspective (Lam, 2020; Cong-lem & Lee, 2020). Thus, the literature underscores the vital role of sociocultural interactions mediated by digital tools in cognitive development and language acquisition, echoing Vygotsky's constructivist learning theory.

Gaps in Research

Recent years have seen a notable focus on multimedia language learning. Scholars like Lai et al. (2022) highlighted its positive impact on vocabulary scores through the integration of digital media forms such as videos, audio, and images. Similarly, Jeon (2022) emphasized the benefits of chatbots in boosting motivation and language acquisition. Lam (2020) also underscored how multimedia technologies, when seamlessly integrated with social media platforms in e-portfolios, could enhance language learning and writing skills. Lai et al. (2022), Lam (2020), and Jeon (2022) stressed the importance of future studies encompassing a diverse range of language learners, considering differences in proficiency levels, ages, and cultural

backgrounds. This focus on diversity should enrich theoretical frameworks and recognize the unique contributions of each learner, closing significant gaps in understanding.

In the field of MALL, Kartal et al. (2020) studied how microblogging via platforms like Twitter and Youglish impacted the pronunciation skills of English learners, especially in environments prone to mispronunciations. They suggested that future research should expand beyond these platforms to explore other social networking sites like Facebook and Instagram, as well as mobile messaging tools like WhatsApp, offering promising avenues for investigation. Additionally, Dizon (2020) proposed that upcoming studies on automatic speech recognition (ASR) technologies and intelligent personal assistants (IPAs) should involve large, randomly selected student cohorts. Both Kartal et al. (2020) and Dizon (2020) highlighted the importance of future MALL research in utilizing mobile apps and digital technologies to improve language teaching and learning.

Research on socially mediated language learning attracted attention, with studies by van den Bos and Tan (2019), Zhang et al. (2022), and Toscu and Erten (2020) serving as examples. Nevertheless, these studies were hindered by their short durations and the use of small, homogeneous sample sizes, which complicates the ability to apply the findings to a broader population of English language learners (ELLs). For instance, van den Bos and Tan (2019) mainly involved second-year university students from the Netherlands, mostly male, studying Commerce and Marketing. Similarly, Toscu and Erten (2020) focused on 15 participants from a Turkish university collaborating with 16 foreign peers. These narrow participant pools hindered the applicability of results to other student groups. Additionally, both Toscu and Erten (2020) and van den Bos and Tan (2019) suggested that future studies should explore efficacy with larger sample sizes. Furthermore, Zhang and colleagues (2022) proposed that future research should

investigate technology-enhanced collaborative writing (TECW) with expanded sample sizes and longer study durations.

Digital game-based learning ranked among the top five crucial types of computer-assisted language learning (CALL). Its impact was overwhelmingly positive, particularly in enhancing vocabulary acquisition and the overall learning experience (Shadiev and Yang, 2020; Bueno-Alastuey and Nemeth, 2020). Earlier studies frequently approached game-based learning and Augmented Reality (AR) learning as distinct entities. Therefore, forthcoming studies should incorporate games and AR into other strategies to fully exploit their potential in language education (Shadiev and Yang, 2020). Bueno-Alastuey and Nemeth (2020) suggested that upcoming studies should incorporate delayed post-assessments and the introduction of new vocabulary. This approach has the potential to offer valuable insights into the long-term effects of both methods on vocabulary retention.

Biblical Worldview

The Bible clearly communicates the importance of the written and spoken word. Suppose English learners live in the United States. In that case, students must be literate in English to understand God's written word in English since they live in a society where English is the dominant language. God often communicates His most precious words in writing, as Moses experienced as he conversed with God on Mount Sinai. As stated in the book of Exodus, "Moses turned, and went down from the mount, and the two tables of the testimony were in his hand: the tables were written on both their sides; on the one side and on the other were they written. And the tables were the work of God, and the writing was the writing of God, graven upon the tables." (*King James Bible*, 1769/n.d., Exodus 32:15-16). As English learners learn the Bible, they will see that every iota, dot, and punctuation mark is a vital part of the whole counsel of

God, as can be seen in Matthew 5:18, "For truly, I say to you, until heaven and earth pass away, not an iota, not a dot, will pass from the Law until all is accomplished" (*English Standard Version Bible*, 2001). Hopefully, English learners will gain the knowledge that if the Lord cares this much about His spoken and written word, then they will as well.

Conclusion

The growing integration of digital technologies into language education, particularly for English Language Learners (ELLs), is driven by recognition of their potential to enhance teaching and learning experiences. Despite representing a significant and rapidly growing student population in the United States, ELLs often face lower graduation rates compared to non-ELL peers, underscoring the urgency and importance of addressing their academic challenges promptly.

The COVID-19 pandemic accelerated the adoption of digital technologies, emphasizing their role in supporting language learning. Technologies such as multimedia, mobile-assisted language learning (MALL), socially mediated learning, and gamification offer promising opportunities to enrich language education. Multimedia tools present concepts engagingly, while mobile devices and applications facilitate self-paced and collaborative learning. Likewise, socially mediated learning leverages online interactions to foster language acquisition, and gamified approaches motivate learners and improve language skills. Thus, comprehending how digital technologies influence language teaching, especially through the lens of constructivist learning theory, empowers educators to reform methodologies and foster collaborative learning settings. Ultimately, this research strives to provide insights into how digital technologies can be harnessed to optimize language education and improve learning outcomes for ELLs and other language learners.

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