Volume 1. Issue 1. March 2023. Pages 54 to 72.

Technology-Assisted Language Education TALE

https://doi.org/10.22126/tale.2023.2945 Document Type: Research Paper

Investigating the Impact of Multimedia and Mobile Applications in English Language Education

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Received: February 15, 2023**; Accepted:** March 17, 2023

Abstract

The integration of interactive technology and multimedia in language education has the potential to revolutionize the teaching of the English language. This research investigates the impact of interactive technology, including multimedia and mobile applications, on second language learning. While existing research has explored the use of interactive technology in language learning, there is a need for a comprehensive review that synthesizes the current evidence and addresses the gaps in the literature. This research seeks to fill this gap by thoroughly analyzing the benefits and challenges of technology integration in language education. The study will critically analyze current experiments and studies in this area to provide a comprehensive understanding of the benefits and challenges associated with technology integration in language learning. Furthermore, the research will discuss teaching strategies for English language instruction using interactive technology and identify the potential benefits of these approaches in enhancing students' reading, writing, listening, and speaking skills. The significance of this research lies in its potential to inform educators, researchers, and policymakers about the impact of interactive technology on second language learning. The findings of this research are expected to have implications for educators, researchers, and policymakers in the field of language education. This study aims to inform the development of practical language education practices that integrate technology in a meaningful and impactful manner. It also seeks to provide insights that can guide the implementation of technology-enhanced language learning programs.

Keywords:
Mobile phone use, academic use, entertainment, mental-behavioral functioning

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Introduction

One of the most influential aspects of intercultural communication is the use of language (Byram, 2020). The use of technology in language acquisition is supported by various studies, emphasizing the benefits of computer-based activities, the importance of teachers' confidence in technology integration, and the potential of collaborative learning approaches to enhance language. They emphasize the importance of teaching and assessing intercultural communicative competence, updating the text in light of recent research and critiques. If sufficiently unfamiliar to users, new technologies may be particularly helpful in raising learners' consciousness of how real/virtual shifts occur in all forms of technologized language use (Chun et al., 2016).

Previous studies emphasized technology and computers for language acquisition, highlighting the benefits of computer-based activities for learners (Ahmadi, 2018). Andrei (2016) also found that teachers' confidence in technology integration increased after taking a course on technology integration in the classroom. Brown (2013) also emphasized the importance of allowing students to access and use Web 2.0 technologies to increase their access to the general education curriculum. McSpadden (2018) highlighted the gap between the desire and ability to integrate technology into classroom teaching, emphasizing the perceived incompatibility between the fundamental goals of classroom education and the nature of interactions between professors, students, and resources. Kew (2021) explored Japanese students' English language learning experience through computer game-based student response systems, demonstrating the potential of collaborative learning approaches to develop students' language proficiency (Kew, 2021).

Cho et al. (2018) conducted a meta-analysis to explore the effects of using mobile devices on student achievement in language learning. The meta-analysis aimed to investigate the questions about mobile technology use in language learning, providing valuable insights into the benefits of mobile learning in language acquisition. Additionally, Yu & Du (2019) discussed implementing a blended learning model in content-based English as a Foreign Language (EFL) curriculum, highlighting the development of new media and the improvement of educational technologies as essential for extending the definitions of blended learning. Furthermore, Singh (2019) emphasized the dire need for technology integration in English Language Teaching (ELT) to develop students' language proficiency, aligning with the focus on integrating technology into language instruction.

However, Chen (2008) emphasizes the critical role of teacher beliefs in transforming technology integration into more constructivist practices. The study highlights that while teachers may believe in the importance of technology integration, there may be challenges in translating these beliefs into effective classroom practices.

Additionally, Mundo (2022) discusses the challenges senior high school teachers encounter in integrating technology into instruction, indicating that despite the emphasis on digital skills and technology integration, teachers may need help effectively utilizing technology in their teaching practices. Furthermore, Singh (2019) presents students' perspectives on technology integration in English language teaching, revealing that while technology integration is perceived as a dire need for developing students' language proficiency, there may be challenges and barriers associated with integrating technology into language instruction. These studies highlight the challenges and barriers associated with technology integration in language instruction, suggesting that while there is an emphasis on the importance of technological advancement, there may be practical challenges in effectively integrating technology into language instruction.

Mobil-assisted Language Learning

The proliferation of mobile devices has led to new teaching and learning paradigms. Chee et al. (2017) examined 144 refereed journal articles to review mobile learning trends from 2010 to 2015. This meta-analysis revealed that most studies on mobile learning focused on higher education (36.17%) and were conducted in the subject area of Language Arts (12.93%). Additionally, using smartphones (14.09%) and quantitative research methods (47.92%) were prevalent in these studies. Furthermore, Sung et al. (2016) reported that the use of mobile devices in education had a modest mean effect size of 0.523, based on a meta-analysis of 110 experimental and quasi-experimental journal publications published between 1993 and 2013 (Chang et al., 2012). This indicates the positive impact of mobile learning on educational outcomes. (Turmuzi et al., 2023).

Moreover, Wu et al. (2012) examined 164 articles published between 2003 and 2010, indicating that most mobile learning research concerns efficiency (Chiang et al., 2015). This aligns with the claim that new teaching and learning paradigms have arisen, as efficiency is a crucial aspect of these new paradigms. Additionally, Kacetl and Klímová (2019) highlighted that students using mobile technologies for language learning are more motivated to learn both inside and outside the class, further supporting the idea of technologically supported and improved learning paradigms.

Cho et al. (2018) conducted a meta-analysis to explore the effects of using mobile devices on student achievement in language learning. The meta-analysis aimed to investigate the effects of employing mobile devices in language learning and explore the design of mobile-learning interventions that maximize the benefits of new technologies. Additionally, the study by Dashtestani (2015) explored Iranian students' use of mobile devices for learning English as a foreign language, indicating the need for further research to identify students' use of mobile devices and their attitudes towards them, especially in developing countries. Furthermore, the research by Crompton and Burke (2015) systematically reviewed the literature to summarize the research evidence and gain an

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understanding of the breadth, purpose, and extent of the research activity in the use of mobile learning in mathematics, highlighting the increasing interest in mobile learning across different educational domains.

The benefits of mobile learning and the development of mobile applications in various fields are supported by (Parong and Mayer, 2018), who focused on health education. Additionally, Bekele and Champion (2019) highlighted the rise in interest in studying the efficacy of mobile apps in language learning, emphasizing their convenience and accessibility to learners. Furthermore, Markowitz et al. (2018) demonstrated the efficacy of mobile applications in teaching foreign language vocabulary, while Elaish et al. (2019) discussed their motivating benefit.

In immersive virtual reality applications, Barjesteh et al. (2020) found that VR apps were not more effective than conventional teaching science, and Su et al. (2022) suggested that immersive VR apps might increase students' cognitive burden. Moreover, they indicated that immersive VR simulations on head-mounted displays provide less chance for students to construct learning outcomes in science.

Other studies provide insights into the use of virtual reality in various disciplines. For instance, immersive virtual reality motivates science, chemistry, math, history, nursing studies, and intracultural awareness (Klemm et al., 2021). However, studies have shown that conventional instructional media has proven superior to VR applications in transmitting well-structured information and declarative knowledge and enhancing scientific self-efficacy (Alqahtani, 2015). Additionally, immersive virtual reality has been found to enhance cultural learning and enable visitors to have their interpretation of cultural assets (Wang et al., 2022).

Mihaylova et al. (2020) conducted a meta-analysis on mobile-assisted language learning applications, evaluating the benefits and risks of their use. The meta-analysis results demonstrated that while experimentally validated applications exist, conventional instructional media has proven superior to virtual reality applications in transmitting well-structured information and declarative knowledge and enhancing scientific self-efficacy. Additionally, the study by Yang (2022) evaluated popular vocabulary-learning mobile applications in China and their implications for language learning. It indicates that while several vocabulary-learning mobile applications have been unveiled, there are concerns about their affordance and effectiveness compared to conventional teaching methods. Furthermore, the research by Kruchinin & Bagrova (2021) assessed the quality of mobile apps for language learning, highlighting that tutors, educational groups, and other regular forms of education cannot be fully substituted by mobile apps for language learning, suggesting limitations in the complete replacement of traditional teaching methods with mobile apps.

These studies above highlighted the limitations and concerns associated with mobile learning applications, suggesting that conventional instructional media may be superior

in certain aspects compared to virtual reality and mobile applications in language learning.

According to Allely (2019), integrating iPads in learning environments can enhance student engagement, which aligns with the findings that students were more present in VR. Similarly, Hayashi et al. (2019) found that a PowerPoint presentation may be more successful in teaching scientific material than an equal session in an immersive VR environment. However, it may also be less entertaining and motivate pupils. This is consistent with the research by Putko et al. (2019), which suggests that augmented reality has affordances in science learning, indicating that the choice of technology can impact learning performance. Furthermore, studies focusing on history and mathematics showed contradictory results, documenting a statistically significant difference favoring the VR condition in academic performance and motivation (Chester, 2019; Trujillo et al., 2019). This is in line with the research by Alméida and Filho (2019), which supports the idea that virtual reality affects learning performance and motivation. Hochet and Tailleux (2019) also discuss the trends and issues related to virtual reality and learning, providing further insights into the impact of VR on motivation.

These studies provide a comprehensive understanding of the impact of virtual reality on student engagement, learning performance, and motivation across various academic disciplines. Recent research on the impact of virtual reality (VR) on language acquisition has produced conflicting findings. While some studies have shown potential benefits regarding cultural engagement and vocabulary acquisition (Huang et al., 2021), others have failed to find significant differences between VR and non-VR conditions for language learning (Chen et al., 2022). The educational role of language in experiences with virtual reality has been a focus of research, indicating the potential of VR technology to promote language acquisition (Marić, 2019). Additionally, a meta-analysis on the effects of VR-assisted language learning has provided insights into the potential impact of VR on language acquisition, highlighting the influence of learners' cognitive style and testing environment supported by VR on learning achievement (Cai et al., 2021).

Furthermore, a scoping review has found evidence supporting the positive impact of VR on willingness to communicate and learner autonomy (Alizadeh & Cowie, 2022). These studies collectively suggest that VR can potentially enhance language learning outcomes, particularly regarding cultural engagement and vocabulary acquisition. However, the effectiveness of VR in improving language learning outcomes may be influenced by factors such as learners' cognitive style and the testing environment. Therefore, while VR shows promise in language acquisition, further empirical evidence is needed to determine its effectiveness in language learning. Overall, the research indicates that VR can potentially create immersive and engaging language learning environments. However, more empirical evidence is required to understand its full impact on language acquisition.

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Previous literature raised concerns about using VR and AR in language education. Dalgarno and Lee (2009) discuss the learning affordances of 3-D virtual environments. The study emphasizes the need for further investigation into the precise relationships between the unique characteristics of 3-D virtual learning environments and their potential benefits, suggesting that the learning benefits of virtual reality applications should be considered contingent on further investigation. Additionally, the study by Parmaxi and Demetriou (2020) provides a state-of-the-art review of augmented reality in language learning, highlighting the popularity of mobile-based augmented reality for supporting vocabulary, reading, speaking, writing, and generic language skills. This suggests that augmented reality has gained significant attention in language learning, potentially competing with the focus on virtual reality applications. Furthermore, the study by Marić (2019) focuses on the educational role of language in experiences with virtual reality, providing practical and theoretical insights into the capabilities of virtual reality in foreign language education. This indicates that the educational role of virtual reality in language learning has been a subject of significant research interest, potentially competing with the focus on virtual reality applications for language learning.

These studies above highlighted the need for further investigation into the learning affordances of virtual environments, the popularity of augmented reality in language learning, and the educational role of virtual reality in language education, potentially challenging the exclusive focus on virtual reality applications for language learning.

Technology in Language Teaching and Learning

Technology has become an integral part of language classrooms, with various studies highlighting its positive impact on language learning. Shadiev and Yang (2020) reviewed studies on technology-enhanced language learning and teaching, providing evidence that technology-facilitated improved language learners' learning performance in terms of output, interaction, feedback, affect, motivation, and metalinguistic knowledge. Furthermore, Yu (2022) emphasized the relationship between technology integration in language classrooms and learners' beliefs and perceptions of technology, indicating the significance of technology in language teaching and learning processes.

In addition, Lou & Xu (2015) experimented with computer-assisted language learning in teaching intensive reading to graduate students, demonstrating the practical application of technology in language instruction. Fisher (2017) analyzed the effectiveness of language pedagogies with technology, finding that language instruction with technology was as effective as language instruction without technology, further supporting technology integration in language education. Moreover, Alghasab et al. (2020) highlighted the influence of teachers' pedagogical practices and attitudes as the main factors affecting the successful integration of technology in EFL classrooms.

Collectively, these studies emphasize the positive impact of technology on language learning, supporting the trend of technology integration in language instruction and the potential benefits it offers teachers and learners.

The existing literature on the effectiveness of technology use in language education must be expanded in several aspects. Zhao (2013) highlights the need for more systematic, well-designed empirical evaluative studies of the effects of technology on language learning, with studies being limited to higher education and adult learners, often short-term, and focused on one or two aspects of language learning. Salaberry (2001) questions the pedagogical benefits of new technologies in second language teaching, suggesting that their revolutionary impact on human interaction may have yet to translate to equal degrees of benefit in language education. Additionally, Devries et al. (2020) provide insights into the interaction of individualized assignments, group work, and discussions with class size, low socioeconomic status, and second language learners, suggesting that while group work can facilitate classroom learning for second language learners, discussions may not yield similar gains.

These studies collectively highlight the limitations in the existing literature on the effectiveness of technology in language education, question the pedagogical benefits of new technologies in second language teaching, and provide insights into the interaction of different instructional methods with class size, socioeconomic status, and second language learners.

Distance Education

Distance education has been significantly influenced by integrating various digital technologies, including multimedia teaching systems, social media, and innovative approaches to healthcare education. The following studies provide a comprehensive overview of the evolution of remote education and the diverse range of technologies incorporated into this education. Integrating various digital technologies has significantly influenced remote education, including multimedia teaching systems, social media, and innovative approaches to healthcare education. Han (2018) highlighted the fundamental changes brought about by multimedia technology in remote education, enabling interaction and independent study through network-based teaching systems. Stroeva et al. (2019) emphasized the continuous implementation of new remote technologies in the education system, indicating a shift towards smart technologies. Lahti et al. (2017) explored the use of social media by nurse educator students, shedding light on the potential of social media in educational settings. Brown et al. (2022) discussed the innovative approach to remote electronic health onboarding record education amid a global pandemic, demonstrating the adaptability of remote technologies in healthcare education. Despite existing shortcomings in the distance education system, Pobegaylov

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(2021) provided insights into the positive impact of digital tools on educators' work and students' training.

Lee and McLoughlin (2010) emphasize the potential of social media to enhance language instruction and study. The study highlights the role of digital technologies, such as websites, digital libraries, email, virtual learning environments, social networking, and blogging, in distance education, supporting the use of these technologies for remote learning and teaching of a second language Dedeilia et al. (2020). Additionally, Dawabi et al. (2003) provide insights into the development of Personal Learning Environments (PLEs) and Virtual Learning Environments (VLEs) as distinct types of learning environments, indicating the evolution of technology in language education and its impact on instructional strategies (Koehler et al., 2013). Furthermore, the study by Dedeilia et al. (2020) discusses the challenges and innovations in medical and surgical education during the COVID-19 era, highlighting the shift towards remote education and the adoption of mobile learning as a valuable adjunct to computer-based technology in remote education (König et al., 2020).

These studies collectively support using digital technologies, social media, and mobile learning as valuable tools in remote education, emphasizing their potential to enhance language instruction and study.

Mobile Learning

Mobile-assisted language learning, also known as MALL, has gained significant attention due to the proliferation of mobile devices such as smartphones, PDAs, and iPods. Traxler Alsaadat (2018) categorizes mobile learning into three emerging categories: technology-driven, miniature but portable e-learning, and connected classroom learning. This highlights the diverse applications and possibilities of mobile learning. Furthermore, Suartama et al. (2019) emphasize the role of mobile internet technology as a critical promoter for implementing mobile learning in higher education. The study by Refat et al. (2020) underscores the importance of motivational-based instructional design for effective outcomes in mobile learning, particularly in areas such as grammar learning.

Additionally, Caudill (2007) discusses the parallel developments of m-learning and mobile computing, shedding light on the technological advancements driving mobile learning. Moreover, Quan (2016) presents an experiment demonstrating the use of mobile apps for vocabulary learning, indicating the practical application of mobile technology in language education. However, it is essential to note that the usability of mobile devices for learning can be constrained by factors such as small screen sizes and additional costs, as identified in a study on graduate students' attitudes toward mobile learning.

Some previous studies highlighted the potential limitations in the widespread acceptance of mobile learning, the need for effective pedagogical strategies in using mobile devices for learning, and the challenges and limitations associated with mobile

learning. Wang et al. (2008) investigate the determinants and age and gender differences in the acceptance of mobile learning. The study highlights the need for further investigation into the determinants of mobile learning acceptance, suggesting that the acceptance of mobile learning may vary across different age groups and genders, indicating potential limitations in the widespread acceptance of mobile learning. Additionally, the study by Costa et al. (2020) discusses collaborative learning associated with mobile devices, emphasizing the need for effective pedagogical strategies for using mobile devices for learning, suggesting that adopting mobile learning may require specific training and support for educators. Furthermore, the study by Uther (2019) explores the trends and practices in mobile learning, highlighting the challenges and limitations associated with mobile learning, suggesting that while mobile learning offers benefits such as mobility and 'just-in-time' learning, there are also potential limitations and challenges that need to be addressed.

Use of Technology in English Language Class

Technology facilitates learning, and it has been shown that both classroom instruction and student learning benefit from incorporating technology (Ahmadi, 2018). Mobile technology is advancing dramatically, making it challenging to keep up with the transformations in the mobile market, particularly in the context of language learning (Yurdagül & Öz, 2018). The use of technology in language learning has been found to promote cooperative learning, improve motivation, and reduce anxiety in the language learning process. Technology integration in language learning has also been shown to foster communication, develop language skills, and promote cooperative learning. Furthermore, technology in language learning can benefit students by providing a better and more effective use of class time and individualizing their learning, allowing them to work at their own pace (Chen, 2015).

In language learning, technology has been found to promote learners' autonomy, increase their confidence, and enhance their motivation to effectively learn a foreign language (Widyana et al., 2022). Moreover, the role of technology is considered influential in language learning, as it has transformed the language learning process, involving excessive communication through technological devices both inside and outside the classroom (Hanif & Sajid, 2020). Mobile technologies have been identified as beneficial for language learning, particularly in the context and situations in which learning occurs (Yurdagül & Öz, 2018). Additionally, technology-based language teaching activities have been found to enable students to use language in communication very proficiently (Barzani et al., 2021).

Overall, integrating technology into language learning has been shown to have numerous benefits, including promoting cooperative learning, improving motivation, reducing anxiety, fostering communication, and developing language skills. Furthermore,

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technology has enhanced learners' autonomy, confidence, and motivation, transforming the language-learning process inside and outside the classroom.

Mobile-assisted Language Learning (MALL) has been shown to encourage and include ESL students in the self-directed study of literacy and language development (Lei et al., 2022). Softa's survey of 230 students highlighted the value of MALL as a motivating item to enhance language learning, particularly in terms of students' willingness to learn when using apps as a learning tool (Azli et al., 2018). Furthermore, recent advances in app development have made it possible for English-language learners to use applications that incorporate text, images, animations, audio, and video to engage students and pique their curiosity about the subject matter (Qian & Tang, 2020). The impacts of learning and interaction with knowledge can be amplified via digital tools, including multimedia presentations, student contributions, and connections to relevant content (Qian & Tang, 2020). Additionally, MALL has been found to affect vocabulary learning strategies, autonomy, and reading comprehension, providing students with more opportunities to be exposed to and practice reading skills due to the broadening of time, location, and speed (Hazaea & Alzubi, 2018).

Moreover, MALL has been found to promote constructive English language learning experiences in various language skills, including vocabulary learning, reading skills, writing skills, and speaking skills (Mustaffa & Sailin, 2022). MALL has also been associated with improving students' reading skills, spelling, grammar, and reading comprehension (Harmanto, 2021; Keezhatta & Omar, 2019; Sudiatama, 2023). Furthermore, MALL has been shown to enhance learners' second language acquisition and improve knowledge of vocabulary, grammar, and listening skills (Qian & Tang, 2020). Students' positive attitudes towards using MALL have been reported, indicating its potential to support language learning in university contexts (Tra, 2020).

In conclusion, the evidence supports that MALL can effectively encourage and include ESL students in the self-directed study of literacy and language development. It has been shown to positively impact various language skills, including vocabulary learning, reading skills, writing skills, and speaking skills. It has the potential to enhance learners' second language acquisition.

Demerits of Mobile Learning

The use of mobile phones in educational settings has been a topic of debate, with various constraints and challenges identified. Some students have expressed disinterest in using mobile phones for learning, citing feelings of boredom and lack of interest (Thapa et al.,2018). Additionally, the issue of distractions has been raised, with concerns about students using mobile phones for activities such as watching videos, listening to music, conversing, uploading images, or playing games instead of focusing on educational tasks (Yudhiantara & Nasir, 2017). This has led to concerns about the classroom becoming

noisy and out of control, impacting the learning environment (Yudhiantara & Nasir, 2017).

Furthermore, the constraints associated with mobile phone usage in educational settings have been highlighted. These include the small size of mobile device screens, technology obsolescence, problems with printing without network access, and the potential health risks associated with excessive screen time (Etwire et al., 2017; Rao et al., 2021; Motlik, 2008). Additionally, the issue of limited access to electricity and the Internet in less-developed communities has been identified as a significant challenge, affecting the effective utilization of mobile learning (Mtenzi, 2016). Moreover, concerns have been raised about the high cost of Internet access, the limited size of mobile devices, and potential health risks for students not using their phones during class (Rao et al., 2021).

The impact of mobile phone usage on students' behavior and morality has also been a subject of study, with findings indicating that mobile phone use did not promote morality among students (Hayat et al., 2021). Additionally, the issue of mobile phone dependence and its negative impact on social functioning has been highlighted, emphasizing the need to address the potential adverse effects of excessive mobile phone usage (Yang, 2022).

The evidence suggests that various societal constraints and challenges influence the use of mobile phones in educational settings. These include disinterest and disengagement among students, distractions, technological limitations, health concerns, and issues related to access and dependence. Addressing these constraints is crucial for effectively integrating mobile learning technologies into educational practices.

Conclusion

Mobile education represents a pivotal asset within the information and communication technology sector. Traditional methods of engaging young learners in educational settings have often proven ineffective, highlighting the efficacy of mobile learning as a compelling alternative. The contemporary educational landscape is characterized by increased portability, adaptability, and engagement facilitated by integrating mobile technology. Learners are empowered to take the initiative, benefiting from the seamless transition between indoor and outdoor learning environments across formal and informal settings. The ubiquity of mobile devices has redefined the boundaries of education, enabling learning to transcend physical constraints and occur irrespective of the presence of an instructor. The industrialized world has demonstrated remarkable progress across various domains, particularly in science and technology, where innovative methods have supplanted traditional approaches. The pervasive influence of the Internet and other contemporary technologies has precipitated significant transformations in the educational sphere, reflecting the broader societal advancements driven by human endeavor. The

dynamic evolution of science and technology has consistently led to the obsolescence of erstwhile state-of-the-art technologies, giving way to more advanced innovations. This paradigm shift, coupled with the proliferation of the Internet, has exerted profound effects on the field of education, catalyzing a paradigm shift in pedagogical practices. Furthermore, educators in EFL/ESL classes have adeptly leveraged high-quality smartphones to enhance language learning experiences for students within and beyond the confines of the classroom.

References

Ahmadi, M. (2018). The use of technology in English language learning: a literature review. International Journal of Research in English Education, 3(2), 115–125. https://doi.org/10.29252/ijree.3.2.115

Alghasab, M., Al-Fadley, A., & AlAdwani, A. (2020). Factors affecting technology integration in EFL classrooms: the case of Kuwaiti government primary schools. Journal of Education and Learning, 9(4), 10. https://doi.org/10.5539/jel.v9n4p10

Alizadeh, M. and Cowie, N. (2022). Language learning and virtual reality: a scoping review. ASCILITE Publications, e22258. https://doi.org/10.14742/apubs.2022.258

Allely, C. S. (2019). Understanding and recognising the female phenotype of autism spectrum disorder and the "camouflage" hypothesis: a systematic prisma review. Advances in Autism, 5(1), 14-37. https://doi.org/10.1108/aia-09-2018-0036

Alméida, J. S. and Filho, M. (2019). Triaxiality can explain the alleged dark matter deficiency in some dwarf galaxies. Research Notes of the AAS, 3(12), 191. https://doi.org/10.3847/2515-5172/ab6202

Alqahtani, M. (2015). The importance of vocabulary in language learning and how to be taught. International Journal of Teaching and Education, III(3), 21-34. https://doi.org/10.20472/te.2015.3.3.002

Alsaadat, K. (2018). Mobile learning technologies. International Journal of Advances in Applied Sciences, 7(3), 298. https://doi.org/10.11591/ijaas.v7.i3.pp298-302

Andrei, E. (2016). Technology in teaching English language learners: the case of three middle school teachers. TESOL Journal, 8(2), 409–431. https://doi.org/10.1002/tesj.280

Azli, W. U. A. W., Shah, P. M., & Mohamad, M. (2018). Perception on the usage of mobile assisted language learning (mall) in English as a second language (ESL) learning among vocational college students. Creative Education, 09(01), 84-98. https://doi.org/10.4236/ce.2018.91008

Barjesteh, H., Movafaghardestani, E., & Modaberi, A. (2020). COVID-19's impact on digitalization of education: incorporating visual vocabulary learning application to foster

vocabulary knowledge. Asian Education and Development Studies, 11(1), 172-187. https://doi.org/10.1108/aeds-05-2020-0111

Barzani, S. H. H., Aslam, M., & Aslam, T. (2021). The role of technology in all classes in the Turkish Republic of Northern Cyprus. International Journal of Language Education, 5(2), 30. https://doi.org/10.26858/ijole.v5i2.14109

Bekele, M. K. and Champion, E. (2019). A comparison of immersive realities and interaction methods: cultural learning in virtual heritage. Frontiers in Robotics and AI, 6. https://doi.org/10.3389/frobt.2019.00091

Brown, A., Patel, R., Edmister, K., Gemberling, T., Griffin, E., Kuehn, S., … & Sunderland, S. (2022). An innovative approach to remote electronic health onboarding record education amid a global pandemic. CIN: Computers, Informatics, Nursing, 40(10), 711–717. https://doi.org/10.1097/cin.0000000000000912

Brown, M. (2013). Mathematics, secondary students with disabilities, and web 2.0 technologies. Intervention in School and Clinic, 49(1), 54–58. https://doi.org/10.1177/1053451213480032

Byram, M. (2020). Teaching and assessing intercultural communicative competence. https://doi.org/10.21832/byram0244

Cai, J., Wang, R., Wang, C., Ye, X., & Li, X. (2021). The influence of learners' cognitive style and testing environment supported by virtual reality on English-speaking learning achievement. Sustainability, 13(21), 11751. https://doi.org/10.3390/su132111751

Caudill, J. (2007). The growth of m-learning and the growth of mobile computing: parallel developments. The International Review of Research in Open and Distributed Learning, 8(2). https://doi.org/10.19173/irrodl.v8i2.348

Chang, C. C., Yan, C. F., & Tseng, J. S. (2012). Perceived convenience in an extended technology acceptance model: mobile technology and English learning for college students. Australasian Journal of Educational Technology, 28(5). https://doi.org/10.14742/ajet.818

Chen, B., Wang, Y., & Wang, L. (2022). The effects of virtual reality-assisted language learning: a meta-analysis. Sustainability, 14(6), 3147. https://doi.org/10.3390/su14063147

Chen, C. (2008). Why do teachers not practice what they believe regarding technology integration? The Journal of Educational Research, 102(1), 65–75. https://doi.org/10.3200/joer.102.1.65-75

Chen, Y. (2015). The impact of technology-integrated instruction on elementary students' language learning motivation and performance. Journal of Literature and Art Studies, 5(8). https://doi.org/10.17265/2159-5836/2015.08.013

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Chester, V. (2019). Autistic women and girls: increasingly recognized, researched, and served. Advances in Autism, 5(3), 141–142. https://doi.org/10.1108/aia-07-2019-052

Chiang, F., Zhu, G., Wang, Q., Cui, Z., Cai, S., & Yu, S. (2015). Research and trends in mobile learning from 1976 to 2013: a content analysis of patents in selected databases. British Journal of Educational Technology, 47(6), 1006-1019. https://doi.org/10.1111/bjet.12311

Cho, K., Lee, S., Joo, M., & Becker, B. J. (2018). The effects of mobile devices on student achievement in language learning: a meta-analysis. Education Sciences, 8(3), 105. https://doi.org/10.3390/educsci8030105

Chun, D. M., Smith, B., & Kern, R. (2016). Technology in language use, language teaching, and language learning. The Modern Language Journal, 100(S1), pp. 64–80. https://doi.org/10.1111/modl.12302

Costa, R. S., Medrano, M. M., Ostáriz, P. L., & Moreno-Guerrero, A. (2020). How to teach pre-service teachers to make a didactic program? The collaborative learning associated with mobile devices. Sustainability, 12(9), 3755. https://doi.org/10.3390/su12093755

Crompton, H. & Burke, D. (2015). Research trends in the use of mobile learning in mathematics. International Journal of Mobile and Blended Learning, 7(4), 1–15. https://doi.org/10.4018/ijmbl.2015100101

Dalgarno, B. and Lee, M. J. W. (2009). What are the learning affordances of 3-D virtual environments? British Journal of Educational Technology, 41(1), 10-32. https://doi.org/10.1111/j.1467-8535.2009.01038.x

Dashtestani, R. (2015). Moving bravely towards mobile learning: Iranian students use mobile devices to learn English as a foreign language. Computer Assisted Language Learning, 29(4), 815–832. https://doi.org/10.1080/09588221.2015.1069360

Dedeilia, A., Sotiropoulos, M. G., Hanrahan, J., Janga, D., Dedeilias, P., & Sideris, M. (2020). Medical and surgical education challenges and innovations in the COVID-19 era: a systematic review. In Vivo, 34(3 suppl), 1603-1611. https://doi.org/10.21873/invivo.11950

DeVries, J. M., Szardenings, C., Doebler, P., & Gebhardt, M. (2020). Individualized assignments, group work, and discussions: how they interact with class size, low socioeconomic status, and second language learners. Frontiers in Education, 5. https://doi.org/10.3389/feduc.2020.00065

Etwire, P. M., Buah, S. S. J., Ouédraogo, M., Zougmoré, R. B., Partey, S. T., Martey, E., … & Bayala, J. (2017). An assessment of mobile phone-based dissemination of weather and market information in the upper west region of Ghana. Agriculture &Amp; Food Security, 6(1). https://doi.org/10.1186/s40066-016-0088-y

Fisher, G. (2017). Pure pedagogy: educational tools to maintain student interest and

engagement in language courses. Revista Comunicación, 26(1-17), 5-13. https://doi.org/10.18845/rc.v26i1-17.3319

Han, W. Z. (2018). Fundamentals of financial accounting course multimedia teaching system based on Dokeos and Bigbluebutton. International Journal of Emerging Technologies in Learning (iJET), 13(05), 141. https://doi.org/10.3991/ijet.v13i05.8433

Hanif, N. and Sajid, M. (2020). The usefulness of WhatsApp in English language learning among undergraduate students: a perception study. Journal of Communication and Cultural Trends, 1(2), 27-42. https://doi.org/10.32350/jcct.12.03

Harmanto, M. D. (2021). The influence of malls on enhancing students' literacy skills. Premise: Journal of English Education, 10(1), 88. https://doi.org/10.24127/pj.v10i1.3566

Hayashi, H., Oda, Y., Birch, A., Konstas, I., Finch, A., Luong, M., … & Sudoh, K. (2019). Findings of the third workshop on neural generation and translation. Proceedings of the 3rd Workshop on Neural Generation and Translation. https://doi.org/10.18653/v1/d19-5601

Hayat, M. F., Ahmad, S., & Ullah, M. K. (2021). Impact of mobile phone use on students' moral and learning behavior at higher secondary school level. International Research Journal of Education and Innovation, 2(2), 356-368. https://doi.org/10.53575/irjei.36-v2.2(21)356-368

Hazaea, A. N. and Alzubi, A. A. F. (2018). Impact of mobile assisted language learning on learner autonomy in EFL reading context. Journal of Language and Education, 4(2), 48-58. https://doi.org/10.17323/2411-7390-2018-4-2-48-58

Huang, X., Zou, D., Cheng, G., & Xie, H. (2021). A systematic review of AR and VR enhanced language learning. Sustainability, 13(9), 4639. https://doi.org/10.3390/su13094639

Kacetl, J. and Klímová, B. (2019). Use of smartphone applications in English language learning—a challenge for foreign language education. Education Sciences, 9(3), 179. https://doi.org/10.3390/educsci9030179

Keezhatta, M. S. and Omar, A. (2019). Enhancing reading skills for Saudi secondary school students through mobile assisted language learning (mall): an experimental study. International Journal of English Linguistics, 9(1), 437. https://doi.org/10.5539/ijel.v9n1p437

Kew, S. (2021). Japanese students' English language learning experience through computer game-based student response systems. Turkish Journal of Computer and Mathematics Education (Turcomat), 12(3), 1993-1998. https://doi.org/10.17762/turcomat.v12i3.1036

Klemm, P., Kleyer, A., Tascilar, K., Schuster, L., Meinderink, T., Steiger, F., … & Simón, D. (2021). A virtual reality–based app on educating health care professionals and medical students about inflammatory arthritis: a feasibility study. JMIR Serious Games, 9(2),

e23835. https://doi.org/10.2196/23835

Koehler, M. J., Mishra, P., & Cain, W. (2013). What is technological pedagogical content knowledge (tpack)? Journal of Education, 193(3), 13-19. https://doi.org/10.1177/002205741319300303

König, J., Jäger-Biela, D., & Glutsch, N. (2020). Adapting to online teaching during COVID-19 school closure: teacher education and teacher competence effects among early career teachers in Germany. European Journal of Teacher Education, 43(4), 608-622. https://doi.org/10.1080/02619768.2020.1809650

Kruchinin, S. V. & Bagrova, E. V. (2021). Quality of mobile apps for language learning. SHS Web of Conferences, 93, 01009. https://doi.org/10.1051/shsconf/20219301009

Lahti, M., Haapaniemi-Kahala, H., & Salminen, L. (2017). Use of social media by nurse educator students: an exploratory survey. The Open Nursing Journal, 11(1), 26-33. https://doi.org/10.2174/1874434601711010026

Lei, X., Fathi, J., Noorbakhsh, S., & Rahimi, M. (2022). The impact of mobile-assisted language learning on English as a foreign language learners' vocabulary learning attitudes and self-regulatory capacity. Frontiers in Psychology, p. 13. https://doi.org/10.3389/fpsyg.2022.872922

Lou, Y. & Xu, P. (2015). Integrating internet-based language laboratory in teaching intensive reading to non-English majors at the graduate level. Creative Education, 06(14), 1610–1615. https://doi.org/10.4236/ce.2015.614162

Marić, S. (2019). The educational role of language in experiences with virtual reality. Educational Role of Language Journal, 2019-1(1), 47–59. https://doi.org/10.36534/erlj.2019.01.05

Markowitz, D. M., Laha, R., Perone, B., Pea, R., & Bailenson, J. N. (2018). Immersive virtual reality field trips facilitate learning about climate change. Frontiers in Psychology, 9. https://doi.org/10.3389/fpsyg.2018.02364

McSpadden, E. (2018). An educational paradigm in the midst of shifting: students' and professors' attitudes toward classroom technology. Journal of Teaching and Learning With Technology, 7(1), 59–69. https://doi.org/10.14434/jotlt.v7i1.23368

Mihaylova, M., Gorin, S., Reber, T. P., & Rothen, N. (2020). A meta-analysis on mobile-assisted language learning applications: benefits and risks.. https://doi.org/10.31219/osf.io/ux93y

Mtenzi, F. (2016). A new educational mobile devices platform for social inclusion in Tanzania. International Journal of ICT Research in Africa and the Middle East, 5(2), 49–58. https://doi.org/10.4018/ijictrame.2016070105

Mundo, H. J. C. D. (2022). 21st century digital skills, technology integration in instruction

and challenges encountered by senior high school teachers in Muntinlupa National High School. International Journal of Multidisciplinary Research and Analysis, 05(05). https://doi.org/10.47191/ijmra/v5-i5-35

Mustaffa, N. U. C. & Sailin, S. N. (2022). A systematic review of mobile-assisted language learning research trends and practices in Malaysia. International Journal of Interactive Mobile Technologies (iJIM), 16(05), 169–198. https://doi.org/10.3991/ijim.v16i05.28129

Parmaxi, A. & Demetriou, A. A. (2020). Augmented reality in language learning: a state-of-the-art review of 2014–2019. Journal of Computer Assisted Learning, 36(6), 861–875. https://doi.org/10.1111/jcal.12486

Patong, J. and Mayer, R. E. (2018). Learning science in immersive virtual reality. Journal of Educational Psychology, 110(6), 785–797. https://doi.org/10.1037/edu0000241

Pobegaylov, O. (2021). Digital education facing COVID-19 pandemic: technological university experience. E3S Web of Conferences, p. 273, 08090. https://doi.org/10.1051/e3sconf/202127308090

Putko, J., Alméida, J. S., Muñoz–Tuñón, C., Ramos, A. A., Elmegreen, B. G., & Elmegreen, D. M. (2019). Inferring the 3d shapes of extremely metal-poor galaxies from sets of projected shapes. The Astrophysical Journal, 883(1), 10. https://doi.org/10.3847/1538-4357/ab365a

Qian, K. and Tang, J. (2020). Researching mobile-assisted English language learning among adult distance learners in China. Mobile Devices in Education, 180-209. https://doi.org/10.4018/978-1-7998-1757-4.ch012

Quan, Z. (2016). Introducing "mobile ddl (data-driven learning)" for vocabulary learning: an experiment for academic English. Journal of Computers in Education, 3(3), 273–287. https://doi.org/10.1007/s40692-016-0067-0

Rao, N., Paul, A., Verma, A., Prajapati, D., Chauhan, K., Yadav, M., … & Yadav, S. (2021). A descriptive study to assess the impact of mobile phone usage on human behaviour among undergraduate students of Lucknow. Young Nurses Journal of Research, 01(02), 15-20. https://doi.org/10.53926/ynjr/0008

Refat, N., Hafizoah, K., Rahman, A., & Razali, R. (2020). Measuring student motivation on the use of a mobile-assisted grammar learning tool. Plos One, 15(8), e0236862. https://doi.org/10.1371/journal.pone.0236862

Salaberry, M. R. (2001). The use of technology for second language learning and teaching: a retrospective. The Modern Language Journal, 85(1), 39-56. https://doi.org/10.1111/0026-7902.00096

Shadiev, R. & Yang, M. (2020). Review of studies on technology-enhanced language learning

and teaching. Sustainability, 12(2), 524. https://doi.org/10.3390/su12020524

Singh, R. (2019). Students' perspectives on technology integration in ELT. Journal of NELTA, 24(1-2), 95-106. https://doi.org/10.3126/nelta.v24i1-2.27682

Stroeva, O., Zviagintceva, Y. A., Tokmakova, E. N., Petrukhina, E. V., & Polyakova, O. V. (2019). Application of remote technologies in education. International Journal of Educational Management, 33(3), 503-510. https://doi.org/10.1108/ijem-08-2018-0251

Su, Y., Cheng, H., & Lai, C. (2022). Study of virtual reality immersive technology enhanced mathematics geometry learning. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.760418

Suartama, I. K., Setyosari, P., Sulthoni, S., & Ulfa, S. (2019). Development of an instructional design model for mobile blended learning in higher education. International Journal of Emerging Technologies in Learning (iJET), 14(16), 4. https://doi.org/10.3991/ijet.v14i16.10633

Sudiatama, Dehghani, S., & Zamorano, A. (2023). The efficacy of mobile-assisted language learning in improving learners' reading skills in relation to metacognitive strategy. Journal of Language and Literature Studies, 3(1), 53-66. https://doi.org/10.36312/jolls.v3i1.992

Thapa, K., Pokharel, R., Sigdel, R., & Rimal, S. P. (2018). The pattern of mobile phone use among students of an institution. Journal of Nepal Medical Association, 56(209), 522-526. https://doi.org/10.31729/jnma.3442

Tra, P. T. (2020). Mobile-assisted language learning in a university context in Vietnam: students' attitudes. VNU Journal of Foreign Studies, 36(1). https://doi.org/10.25073/2525-2445/vnufs.4502

Trujillo, I., Beasley, M. A., Borlaff, A., Carrasco, E. R., Cintio, A. D., Filho, M., … & Vazdekis, A. (2019). A distance of 13 mpc resolves the claimed anomalies of the galaxy lacking dark matter. Monthly Notices of the Royal Astronomical Society, 486(1), 1192-1219. https://doi.org/10.1093/mnras/stz771

Turmuzi, M., Suharta, I. G. P., Astawa, I. W. P., & Suparta, I. N. (2023). Mapping of mobile learning research directions and trends in Scopus-indexed journals: a bibliometric analysis. International Journal of Interactive Mobile Technologies (iJIM), 17(03), 39-69.

Uther, M. (2019). Mobile learning—trends and practices. Education Sciences, 9(1), 33. https://doi.org/10.3390/educsci9010033

Wang, D., Xiao, Z., Wang, B., & Lin, J. (2022). P-2.1: Application of virtual reality in primary school English teaching. SID Symposium Digest of Technical Papers, 53(S1), 625-625. https://doi.org/10.1002/sdtp.16044

Wang, Y., Wu, M., & Wang, H. Y. (2008). Investigating the determinants and age and gender differences in the acceptance of mobile learning. British Journal of Educational

Technology, 40(1), 92-118. https://doi.org/10.1111/j.1467-8535.2007.00809.x

Widyana, A., Jerusalem, M. I., & Yumechas, B. (2022). The application of text-to-speech technology in language learning. Proceedings of the Sixth International Conference on Language, Literature, Culture, and Education (ICOLLITE 2022), 85-92. https://doi.org/10.2991/978-2-494069-91-6_14

Yang, Y. (2022). An evaluation of popular vocabulary learning mobile applications in China and their implications for language learning. World Journal of Educational Research, 9(1), p47. https://doi.org/10.22158/wjer.v9n1p47

Yang, Y. (2022). Analysis of mobile phone dependence among students in higher vocational institutions. SHS Web of Conferences,148, 02027. https://doi.org/10.1051/shsconf/202214802027

Yu, W. & Du, X. (2019). Implementation of a blended learning model in content-based EFL curriculum. International Journal of Emerging Technologies in Learning (iJET), 14(05), 188. https://doi.org/10.3991/ijet.v14i05.8546

Yu, X. (2022). The English as a foreign language learners' psychological and emotional perceptions on technology integration in language classrooms. Frontiers in Psychology, p. 13. https://doi.org/10.3389/fpsyg.2022.906750

Yudhiantara, R. A. and Nasir, I. A. (2017). Toward mobile-assisted language learning (mall): reaping mobile phone benefits in classroom activities. Register Journal, 10(1), 12. https://doi.org/10.18326/rgt.v10i1.12-28

Yurdagül, C. and Öz, S. (2018). Attitude towards mobile learning in English language education. Education Sciences, 8(3), 142. https://doi.org/10.3390/educsci8030142

Zhao, Y. (2013). Recent developments in technology and language learning. CALICO Journal, 21(1), 7–27. https://doi.org/10.1558/cj.v21i1.7-27