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**Second Language Learning in the Digital Age: How Technology
Shapes Language Acquisition at Universities in Karachi,
Pakistan**



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Abstract

The research studies technology's enabling effects on language learning while focusing on Second Language Acquisition through improved accessibility, student engagement, and flexibility. Integrating Information and Communication Technology into teaching offers students' access to interactive learning approaches alongside virtual classrooms and immediate educational materials. A research group of eight university students in Karachi from three institutional locations was recruited through purposive sampling. Semi-structured interviews using an interview protocol served as the data collection method, which received thematic analysis. The findings revealed the key themes: second language acquisition, technology in the educational system, the importance of technology and collaborative learning. Through language learning apps and online discussions alongside gaming platforms, technology advances second language acquisition through opportunities for autonomous learning, cooperative collaboration, and multicultural education. The students observed that technological instruments enhance language education through active student involvement which results in better results regarding fluency development along with scheduling flexibility and convenient learning access. The technology faces barriers like slow internet speeds alongside aging equipment but remains a recognized transformational tool for better language instruction that delivers flexible, accessible learning experiences leading to academic and occupational growth.

Keywords: Second Language Acquisition, Technology in Educational System, Importance of Technology, Collaborative Learning

Introduction

The word technology carries multiple definitions for different people because everyone understands it according to their understanding. Technology functions as an instrument that assists individuals in reducing daily complexity providing tools to enhance human potential (Ahmadi, 2018). The definition of technology as a scientific approach to problem-solving hides its distinction from scientific concepts because science serves technology in finding unique solutions. Modern technology dictates every interaction in modern human existence because people consider it pivotal for everyday tasks. People use technology across workplace activities alongside communication needs, vehicular movement, and data transfer

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operations while also needing it for educational objectives and handling business requirements. Different tasks in their daily routine; in short, technology is a tool that people use to simplify their daily lives; we use it to extend our abilities (Ahmadi, 2017). Technology is also a scientific application to solve problems, but one should know that technology and science are different topics that work together to solve a specific problem. People use technology in almost everything in their everyday lives; it becomes the most important thing in human life. It is used at the workplace, in the field of communication, transport, data transfer, and educational purposes and in business. Industrial applications of human knowledge discovered as tools with systems produce useful end products through proper implementation. Correct use of technology generates valuable outcomes for society, while improper utilization causes significant damage (Mouza, 2008).

Historically the researcher analyzed how technology functions across multiple elements of human activity. The author focuses in this research specifically on technology applications within both education systems and second language education. International language learning proved essential for the researcher to select this topic because it provides survival skills needed for global success. Asian and developing nation populations work extensively to master global Standard English. People assume that language expertise in English makes a person exhibit intellectual prowess and scholarly abilities or objects to measure their knowledge through English ability. Asia's mental mindset shows they want to understand English better than their cultural language since English brings society respect with excellent future job prospects that lead to successful foreign residence survival, which reflects Asian cultural thinking patterns though foreign languages remain beyond their natural proficiency, thus creating language challenges in communication. Many vocabulary and pronunciation challenges, alongside other problems, can be addressed by technology (Raza, 2015).

Learning a foreign language that is not yours has never been easier; technology has revolutionized the process like many of the things in our lives. Technology has changed the way of learning languages. Before ages, things were very difficult to do, especially learning a new language; the person did not have the culture and background knowledge of that language nor the environment to learn it; at that time, the person suffered a lot he had to buy the target language textbook, dictionaries, magazine, and newspapers but now technology has comprised the world with the help of the internet, online dictionaries, social media platform.

Use this approach if you want interactive direct student experiences although all development tools improving academic results should remain in place (Prakasha, et al., 2024; Bell, 1996).

Auto-correction in mobiles and other gadgets helps no native speakers to interact with native ones easily without any hesitation; if someone does not have a strong command of his spelling so, he can improve spelling with the help of auto-correction, auto-correction helps in grammar and make then able to write a good sentence structure without an error. The use of technology outside and inside the class motivates the students; learners can practice the language through different features in a device such as a voice recognition tool or any other interactive exercise by using social media or watching any video lecture or informative video on YouTube. For young people, it is more facilitating to learn with mobile, tablet, iPad or laptop rather than a traditional book or dictionary (Naeem, Zaheer, & Khan, 2024). Technology is changing its approach from passive to active, converting the classroom into English courses and additional language skills to make it an environment that encourages the exchange of opinion, discussion, creation and formation of opinion (Firdos, Khan, & Atta, 2024). English sessions are neither boring nor pleasant with a teacher who explains something on board and becomes more active and involved in everything (Nikolov, 2007). New technology allows the students to be more active, creative and involved in the classroom. When students come to the class they are preparing a knowledge base outside the class that covers all the content. They shared the learned language with their friends and with other students as well as their teacher to make them realize that they have learned deeply and in a coordinated manner. Educational technologies allow students to prepare for classes in a better way and provide the teachers with more interesting resources to make the classroom more humane and sociable, and all students can attend them at any level (Silva, 2024). This study aims to improve understanding of technology-driven second language education benefits and explore student perceptions about technology's role in university-level language acquisition (Khan, & Waqas, 2024).

Related Literature Review

English is a global language. The increasing daily need for the English language has become too immense to express through words because evasion is impossible in today's modern world. Technology plays an important function in enhancing national educational systems despite its essential value (Hossain, 2018). Pakistan gained independence following British rule, during which time English became its official language, and many citizens wished to

learn this adopted tongue as their second language (Nawaz, et al., 2024). Pupils throughout institutions ranging from schools to universities strive to master English because they believe these second language skills will create valuable opportunities with elevated social status (Tariq, Khan, & Atta, 2024). Second language learners experience difficulties during their study because they lack native speaker abilities together with insufficient native language instructors, insufficient cultural understanding, and limited support for language acquisition and curriculum (Tariq, 2024; Dilshad, Shah, & Ahmad, 2023).

Second Language Acquisition

According to Hossain (2018) foreign language learners experience discomfort at their first encounter with a new vocabulary because its structure stands apart from their native language. Less fluent learners tend to respond differently to foreign languages when compared to students who learn easily, so their socio-cognitive abilities determine their skill acquisition in the field (Azhar, 2024; Ismat, et al., 2016). Instructors face substantial barriers to effective second-language education across all levels because they lack relevant training skills alongside insufficient control of their subjects, deficient classroom materials, and insufficient classroom resources. Abdullah (2015) reported that cultural differences cause the most learning hassle since they disrupt students during language acquisition, but insufficient vocabulary and weak comprehension abilities also affect students who cannot understand native-speaker sentences because of cultural gaps. Pakistani learners' main struggle with proper language grammar implementation, English grammar, along with structures and expressions, differs fundamentally from learners' native tongues, making word-for-word translation into their mother language an unsuitable practice since correct understanding of English becomes impossible this way (Kanwal, Shahzad, & Shahzad, 2024; Shah, Ali, & Ahmad, 2024).

Technology in Educational System

Many organizations now make Information and communication technology (ICT) essential for their operations (Zhang & Aikman, 2007). Since its introduction in 1980, academic institutions and numerous experts expect that ICT will emerge as a primary factor in shaping future education systems (Brandsford, Brown & Cocking, 2000; Ali, et al., 2023). Educational staff worldwide lauds the value of ICT implementation in schools even though they encounter multiple obstacles when integrating these technologies into teaching activities (Balanskat, Blamire, & Kefala, 2006). Research by Venkatesh and Davis (2000) mapped out

both the instructor and student technology barriers in language acquisition across formal learning environments (Ahmad, et al., 2016). Teachers express complaints regarding system challenges even though they value the potential for using technology during instruction (Sicilia, 2005). Students need to book computers ahead of time for class, but many teachers fail to remember this sufficient time in advance, resulting in many missed opportunities for ESL for improving the educational system of a country technology has a big role that cannot be ignored (Ahmed, Alwi & Akhtar, 2022; Hossain, 2018).

England ruled the subcontinent, there was a huge influence of English, and it became the official language of the country after independence. The English language maintained its status as an official language in Pakistan, so everyone here in Pakistan wants to learn the English language, which is the second language for them (Kolachi et al., 2024; Imran et al., 2023). In schools, colleges, universities and other educational institutions, learners are trying their level best to learn it because they think learning English as a second language will bring opportunities and prestige for them. Learners face many problems while they are learning a new language because they are not native speakers, do not have native language teachers, background knowledge of targeted culture and a healthy environment of new language learning (Tariq, 2024).

Kurt (2010) discovered that most educational institutions lacked appropriate internet connectivity essential for technological utilization. Technological glitches as the leading barriers affecting language instructors who teach with technology because internet speed reduces classroom time and printers malfunction alongside outdated computer hardware. The flaws in teacher training programs to work with modern technology remain evident (Pelgrum, 2001). Teacher training stands as one of the major obstacles to implementing modern technological teaching methods in language education because educators need proper training programs to understand effective technological implementations for students (Haider, Ahmad & Ali, 2024). All teachers consistently report that their technology-supported language lessons have short access times as one of their main challenges (Hossain, 2018).

Second Language Acquisition

Hossain (2018) explained that when learners first acquire a new foreign language, they feel uncomfortable because the new language seems different from their native language. Foreign language has different structures, rules, systems etc, but some learners pick it easily, and some of them need to improve their skills in the field; it depends on their socio-cognitive

system (Yasmeen, Khan, & Imran, 2024). The big problem of learning and teaching a second language at every level is teachers' lack of training. They have no command and expertise on their given subject, inappropriate material is taught in the classrooms, and there is no proper infrastructure in classrooms (Hafeez, & Akhtar, 2022).

Abdullah (2015) believes that one of the problems that learners face in the new language learning process is cultural differences that mostly disturb the learner while learning; less vocabulary and not having a good comprehension level are also problems faced by learners they are unable to comprehend and understand the sentences and expressions by native speakers because of cultural gap. Kanwal, Shahzad, and Shahzad (2024) stated that one of the chief problems that Pakistani learners face is the appropriate use of grammar. The grammar of their mother tongue and the second language are entirely different from each other as well and word-to-word translation is also there, which is a very bad practice. One cannot English language by translating it into his/her mother tongue because rules are different, structures, expressions and idioms are different that are difficult to translate word to word. You can only get the contextual meaning.

Methodology

A qualitative investigation analyzes B.Ed student perspectives from Karachi, Pakistan, who enrolled in B.Ed programs about the influence technology has on teaching second languages. The research employed individual semi-structured interviews to gather qualitative data according to Creswell et al. (2011) recommendation for effective research methods. An interview protocol developed alongside experts contained open-ended questions together with prompt structures to unearth participant views about technological effects on second language learning. A sample of 10 participants was chosen for this research using purposive sampling (Fraenkel et al., 2012; Cohen et al., 2007; Creswell, 2014), with two participants in the pilot study followed by eight participants in the main research phase. This approach followed qualitative research recommendations for sample sizes from 1 to 20 participants (Fraenkel et al., 2012; Cohen et al., 2007). Participants spent approximately 30 to 40 minutes in each interview session while researchers recorded the conversations, checked the transcripts and received participant verification for accuracy. The analysis used inter-coder reliability assessments to establish trustworthiness by obtaining over 80% agreement from both researchers and expert judges (Creswell & Creswell, 2017; Patton, 1990). The analysis involved transcript coding with themes through data triangulation to collect in-depth, mainly

qualitative data on how students sense that technology impacts second language acquisition (Azhar, 2024; Rubin & Rubin, 2011). The interview protocol, developed with expert input, included open-ended questions and prompts to investigate participants' perceptions about the effect of technology on second language learners. A purposive sampling technique was employed, selecting ten participants (two for a pilot study and eight for the main study), in line with qualitative research guidelines suggesting sample sizes of 1 to 20 (Nawaz, et al., 2024; Ahmad & Hamid, 2021). Interviews lasted 30 to 40 minutes, adhering to recommended durations, and were recorded, transcribed, and validated by participants for accuracy. The study emphasized trustworthiness, ensuring validity and reliability through inter-coder reliability checks, with consensus among peer researchers and experts exceeding 80% (Creswell & Creswell, 2017; Patton, 1990). Data analysis involved verbatim transcription, thematic coding, and triangulation to identify and elaborate on emerging themes, providing a comprehensive narrative of students' perceptions about exploring the effects of technology on second language learners.

Findings

The study's findings have been presented from various perspectives, as outlined below.

Technology as a Facilitator

Technology provides a robust platform to boost operational productivity net, work connections, and instant access to information from different functional areas. Through education technology, users experience interactive learning experiences and virtual study spaces as well as extensive knowledge bases are accessible. Through business applications, Technology enables workflow automation, which enhances both team collaboration and generates innovative solutions. Social interaction benefits through Technology because people can unite across distance boundaries by using instant communication tools and social media systems. According to Respondent 1, the viewpoint is as follows:

“The role of Technology serves as an enabling instrument across many domains. Education benefits from the implementation of Technology, which produces interactive learning environments and virtual classroom settings together with boundless academic resources. The study and classroom communication practices of students have undergone a total revolution because of this transformation. Technological advancements in business environments enable process optimization through new communicating tools but also create innovative solutions. Technological absence causes multiple business processes to operate at reduced speed and

efficiency”.

The fourth participant stated: “Technology serves as an outstanding tool to make language education more effective. Thanks to Technology all content becomes simpler to access and more interactive. Language learning apps Duolingo and Babbel help me understand the language through their instant feedback system while providing interactive educative content. Online courses, together with virtual classrooms, enable me to interact with native speakers and perform actual discussions. Technology has transformed language education into an accelerated process that combines convenience with practical, interactive learning.

Technology in Educational System

The integration of Information and Communication Technology (ICT) stands essential for education yet educators encounter multiple obstacles when trying to merge it with language education. Technical difficulties, together with limited internet accessibility, out-of-date equipment, and restricted classroom time, represent the main hurdles faced by instructors when integrating technology. Teacher training deficits remain a primary hindrance that prevents teachers from using contemporary technological tools effectively. The learning experience is impeded by both the need to book equipment in advance and the delays caused by slow network speeds. The education system uses technology, according to Participant 6, through these words:

“Most educational institutions now see ICT as an obligatory teaching component while it poses multiple implementation issues when applied to language instruction. Technology raises educational standards but teachers encounter multiple barriers when applying it properly for instruction”.

Respondents 8 described in the following words: “Language learning technology shows great promise, but operational barriers prevent maximum usage”.

Importance of Technology

Students acquiring second languages achieve better results through website-enabled interactive methods, which include games, music, musical pieces, and social dialogues. Technology promotes linguistic understanding by creating opportunities for cultural interaction and authentic resource sharing, as well as supporting collaborative learning between students. Through online activities, including gaming together with chatting and video calls, students acquire fluency capabilities through native speaker observation and replication. Technology builds exciting learning environments outside standard classrooms,

which improves the efficiency and pleasure of language acquisition. Student 7 replied the following:

“My experience shows that second language learners succeed best when they participate in gaming activities combined with singing and group discussions. New educational resources available online enable teachers to easily blend engaging elements into their lessons because internet platforms offer deep engagement opportunities”.

Student 2 discussed that:

“Through technology, I have experienced learning that combines high interaction with enhanced engagement. I maintain a playful learning experience through games combined with songs and online discussions which help me practice language skills. The activities help me both remain driven and convert instruction into an enjoyable experience”.

Interactive and Collaborative Learning

Students who study languages for their future careers discover convenience through self-directed learning. Through technology, students can improve their independent learning abilities while also advancing collaborative skills through research-based interactions and flexible situation adaptation. Technology shifts traditional learning spaces into adaptable skill-focused settings that support team-based projects and curriculum enrichment experiences. Students learn better with online platforms because these platforms enable a global educational connection that stimulates their interest in learning languages and cultures. Through technological tools, learners can engage more deeply with linguistic features, which help them enhance their pronunciation ability. Students learning a second language must learn to recognize phoneme variations since their natural language acquisition process might not be sufficient. Successful language acquisition depends directly on students' ability to detect linguistic elements in their learning environment. Respondent 3 revealed in the following words:

“Through technology, students gain multiple advantages that address their learning needs, whether they face academic challenges or other responsibilities while providing self-directed flexible lesson opportunities. The system removes dependencies on scheduled instructions so adults can enhance their English skills for professional advancement. Studying at one's own pace gives learners full independence to self-learn anytime they choose while building their independent learning skills that result in better language acquisition”.

Respondents 5 exposed in the following words:

“Technology functions as a revolutionary factor that transformed my life. I use this learning method because it lets me study while waiting for work breaks and while traveling between different locations. This approach is very helpful because having access to language practice on schedule is not necessary. The ease of access meets the needs of workers trying to enhance their English skills even with demanding work routines”.

Discussion

Referenced technology applications in language learning education have reorganized conventional teaching environments by creating different ways for students to participate and learn independently while connecting with others. Language acquisition in education has benefited substantially from Information and Communication Technology (ICT) as a fundamental enabling tool for professional development (Ali, Ahmad, & Sewani, 2022). Technology facilitates extensive language acquisition through lively digital resources plus virtual learning environments which produce expanded accessibility with adaptable learning paths alongside lively interactivity.

Technology offers students studying a second language excellent interactive learning spaces that make their experience more engaging. Study participants noted that such tools, alongside songs and online discussions, enhance learner engagement and combat language learning challenges (Respondents 2 and 7). Thanks to the internet, learners can now easily access genuine materials and participate in cross-cultural dialogue (Vygotsky, 1978). The learning process demands social interactions together with cultural context (Vygotsky, & Cole, 2018). Through video calls and chat rooms, learners can practice conversations while learning from native speakers about cultural elements of the language who teach them linguistic awareness.

Technology enables learners to develop self-guided language learning competencies through flexible systems that benefit adults studying and people who handle schoolwork alongside their language studies. According to Respondents 3 and 5, technology allows learners to decide their study timing and control their progression through content material (Ali et al., 2023). This strategy proves incredibly helpful to people who want language fluency to move up in their careers. According to research findings, self-regulated learning methods, which technology enables, produce superior language results through individualized educational paths (Deci & Ryan, 2000). Users of language apps, including Duolingo and Babbel, benefit from built-in feedback systems and intelligent adaptations, which enable

them to lead their learning progress.

The utilization of technology in language learning encounters multiple obstacles to implementing it successfully. Educational professionals face training limitations together with barriers from technologically slow internet and outdated classroom devices (Respondents 6 and 8). Problems in these areas create barriers that prevent technology from effortlessly finding its place in classrooms, thus reducing its power to improve learning. Ertmer (1999) found that teacher training stands as a fundamental factor that determines the success of educational technology implementation. Teachers need professional programs that focus on technology skills and instructional methods because those programs empower them to implement digital tools properly inside their language teaching practice (Ahmad et al., 2023; Akram, Fatima, & Ahmad, 2024).

Wide technology adoption in language learning leads to troubling situations where digital platforms create excessive dependency, which denies important human connections. Technological systems provide immediate learning content, but institutions need to find equilibrium between digital and conventional education methods and pedagogical skills (Akram, Ahmad, & Sewani, 2024). The essential elements for language acquisition, including collaborative learning and peer interaction together with teacher feedback, cannot be perfectly duplicated by artificial machines.

Language learning benefits hugely from technological infrastructure yet planned execution calls for handling simultaneous technical difficulties and teaching obstacles (Akram, Khan, & Ahmad, 2022). The clear advantages of technology-dependent instruction are obscured by the need for sufficient support to assist educators in teaching with interactive and flexible materials. The appropriate application of technology transforms language learning thereby offering students digital tools which help them become successful learners in our computer-based society.

Conclusion

Modern language education shifted its direction when technology was integrated because it created different learning methods that combine student participation with adaptable programs and independent studying possibilities. Through technology, learners experience enhanced language development in interactive systems and cultural exchanges, which support practical application. Through self-directed learning and adaptable platforms, technology provides students with control over their language development, resulting in achievable and

accessible educational experiences.

The deployment of technology for language education faces multiple obstacles in achieving maximum learning effectiveness. Current teaching approaches meet various obstacles including shortfalls in teacher training and nonexistent technical abilities coupled with traditional instructional methods needing digital implementation. Many educational institutions require assistance from training and technological integration support together with teacher educational development to implement mobile learning successfully. Addressing existing challenges will highlight the real potential of technology for transforming language learning while students acquire essential skills vital to success in the current world. Technical resources managed with targeted methodologies will sustain their capability to boost the language learning experience, which lets students achieve higher educational success.

Recommendations

- The results demonstrated that implementing thorough teacher training initiatives aimed to advance the use of Information and Communication Technology (ICT) in language acquisition programs to enhance the integration of Information and Communication Technology (ICT) in language learning. Through classroom implementation of interactive and collaborative learning tools, students at the university level experience improved language proficiency, thereby showing a key role in enhancing both their motivation and fluency.
- The findings of the research highlight that access to technology in educational settings is very important in language learning, so studies could investigate strategies for improving access to technology in language learning environments, especially at the university level.
- Role of Interactive and Collaborative Learning Tools play an important role in enhancing language proficiency in students at the university level, so it is suggested that collaborative and interactive learning tools should be provided in the classroom context to improve learner motivation, fluency, and engagement, particularly in second language learners.
- Outcomes of the research showed that technology's role in motivation and engagement is more important to engage students in language classrooms, so it is recommended to develop effective digital tools tailored to various learning preferences and needs of language learners.

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