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EXPLORING POSTGRADUATE STUDENTS' PERSPECTIVES ON THE USE OF DIGITAL TOOLS AND ARTIFICIAL INTELLIGENCE IN ENGLISH LANGUAGE TEACHING AND RESEARCH: TRENDS, CHALLENGES, AND FUTURE PROSPECTS

(Research article)

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Abstract

This study investigated the experiences and perceptions of MA and Ph.D. students majoring in English Language Teaching regarding the use of digital tools and AI in teaching English skills and their inclination to use technology in their research studies. The students were asked open-ended questions through Google Forms at the beginning of a four-day training project that was supported by TUBITAK (The Scientific and Technological Research Council of Türkiye). The training was designed to inform the participants about current digital technologies and AI research trends in ELT research. Fifty-three participants who voluntarily participated in the training were asked to respond to a series of questions regarding the use of technology and AI in their classes and research studies. The research employed a qualitative design to analyze the content of questionnaire replies. The study gathered participants' feedback regarding their sense of adequacy in their prior training. The objective was to ascertain which language skills—speaking, listening, reading, and writing—are prioritized in their instruction and research. The study attempted to clarify the rationale behind these preferences and determine potential trends in applying and investigating these skills for academic and professional advancement. Finally, the study examined the perceived problems associated with digital and AI research in language instruction and acquisition.

Keywords: Digital tools, AI, language teaching, students' perspectives, graduate students

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1. Introduction

For the last decade, educators and researchers have been constantly exploring innovative ways to integrate digital tools and AI into their curricula to enhance student learning (Yu & Zadorozhnyy, 2021). Consequently, the proper implementation of these tools and the challenges encountered by researchers, teachers, and academics during the incorporation of these tools have emerged as significant research subjects in the field of education (Sim, 2023; Sumarni, 2023). The study aims to examine the research inclinations of MA students and Ph.D. candidates in English Language Teaching regarding skill-based investigations and classroom implementations with specific emphasis on digital tools and AI technologies. The study mainly investigates four main topics: insights into previous education they received (if any) on the incorporation of digital tools and AI, skills-based investigation tendencies in their thesis dissertations, suggestions for skills-based digital and AI research, and barriers when conducting research with digital tools and AI. Therefore, the results are expected to provide valuable recommendations to researchers, educators, and policymakers aiming to improve the utilization of digital resources and training for researchers and teachers in English language instruction.

2. Literature Review

As technological advancements continue to evolve and impact language education, an essential requirement highlighted in literature is the imperative for continuous professional development and training in digital tools and pedagogical strategies. The teacher's role as a "prosumer"—both a producer and consumer of educational content—has been emphasized as a crucial necessity in the digital age. Cabrera et al. (2021) suggest that educators must cultivate innovative and long-lasting pedagogical techniques that demonstrate a dedication to social transformation. In line with this need, more research studies must delve into skills-based language education practices and research inclinations of practitioner academics to shed more light on contextual factors that affect the incorporation of digital tools and AI in their classrooms and research studies.

Integrating digital resources into language instruction has introduced innovative teaching methods in language classes, which made learners engage more and facilitated diverse learning experiences (Choi & Chung, 2021; Maruf, 2023). Some pedagogical approaches have been taken to teach language skills more effectively with digital tools and AI technology. For example, to enhance speaking ability, the instructional effects of digital storytelling, digital games, or digital platforms that help have been investigated, and their instructional effects have been documented. Digital storytelling has been acknowledged as an effective instructional instrument that enriches speaking ability by enabling students to articulate their creativity while improving their linguistic abilities (Aktaş & Yurt, 2017; Maruf, 2023; Robin, 2008; Rodríguez et al., 2020). Furthermore, digital feedback in writing has been found to offer more opportunities for formative feedback, improving overall writing quality (Zhang &

Hyland, 2023). Another prominent finding in improving writing skills is that digital collaboration fosters advanced cognitive processes and motivates learners to engage more critically with their writing assignments (Al-Yafaei & Mudhsh, 2023). Language teachers have also taken advantage of tools assisting in improving reading skills. For example, Chen and Chen (2014) shared that digital annotation tools enable students to interact with texts, fostering enhanced comprehension critically. Another study found that multimodal reading materials help students who are having trouble reading by giving them more than one way to access the information and by using both audio and visual methods to reinforce understanding (Januarty & Nima, 2018). Lastly, listening skills, which are thought to be Cinderella Skill, have been researched more with the aid of technology. Research conducted by Bal (2019) indicates that video-based platforms, like YouTube and educational applications, provide learners with authentic listening resources, facilitating their practice in understanding accents, idioms, and diverse speaking rates.

Research indicates that integrating digital resources into language instruction is essential in contemporary education, as they enhance student engagement, foster creativity, and improve linguistic knowledge and proficiency. For the proper utilization of these technologies, it is imperative that educators have adequate training, and the tools must be implemented meticulously. Language education is ever-evolving, necessitating continuous research and practice to optimize the utilization of digital resources that enhance language acquisition. Therefore, to present a more thorough understanding of teacher education and practical classroom applications derived from direct experiences, it is essential to gather insights from current MA and Ph.D. students specializing in English Language Teaching and instructing English in diverse classroom settings. This study aims to enhance comprehension of language education and teacher preparation programs at the master's and doctorate levels, focusing on students' prior education, the quality of their training, their research practices, and their utilization of digital resources in the classroom.

Research Questions

1. Have graduate students received instruction on utilizing Digital Tools and their application in scientific research as part of their academic training? If so, what influence did these courses have on their professional and scientific trajectory? If not, did they experience a sense of deprivation? For what reason?
2. What are MA and Ph.D. students' language skills research tendencies to investigate for their thesis or dissertations?
3. According to graduate students, which language skills should digital-based scientific investigations focus on the most? Why?
4. Which obstacles do graduate students confront most while doing scientific studies using digital tools?

3. Method

The study employs descriptive research design, utilizing the survey method to gather data. The primary objective of descriptive research is to systematically depict the current phenomena being investigated (Atmowardoyo, 2018). The survey method, which typically aims to explore the perspective of a wide population regarding a specific event or topic, has been widely used in descriptive studies. Therefore, through the survey method, qualitative research was chosen to elicit participants' perspectives regarding the use of digital tools in English language teaching and learning. This type of research focuses on subjective data such as opinions, experiences, perceptions, and feelings (Arıkan, 2017). As a mode of data collection, open-ended, online structured questions via Google Forms were preferred.

3.1. Participants

The participants were chosen among 159 MA and Ph.D. students who applied to receive 4-day long training on teaching English skills with digital research and artificial intelligence. The program was conducted twice, and 60 MA and Ph.D. students participated in the training. Depending on the eligibility criteria for the training program, participants from different universities were prioritized. Among the total number of 60 participants, only 53 of them were willing to answer questions. As illustrated in Figure 1, the survey participants exhibited a gender distribution with 85% (n=45) being female and 15% (n=8) percent being male.

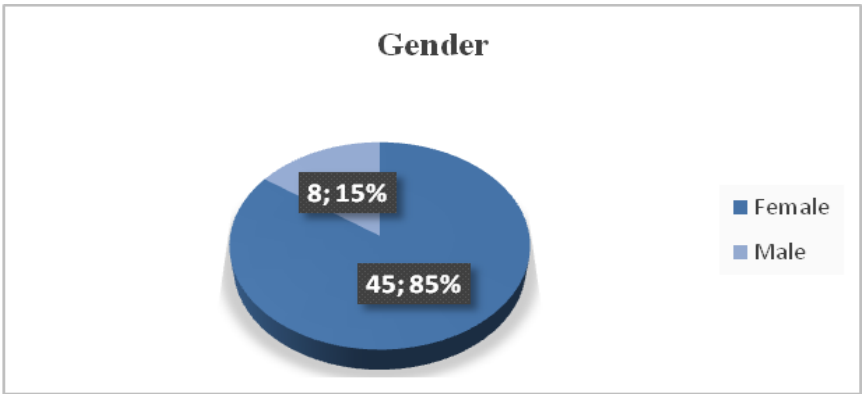

Figure 1. Distribution of Participants by Gender

Figure 2 indicates that the majority of participants fall within the 20-25 (n=18) and 26-30 (n=15) age ranges. These age groups are followed by 11 participants aged 31-35, 7 participants aged 36-40, and a smaller group of 2 participants aged over 40.

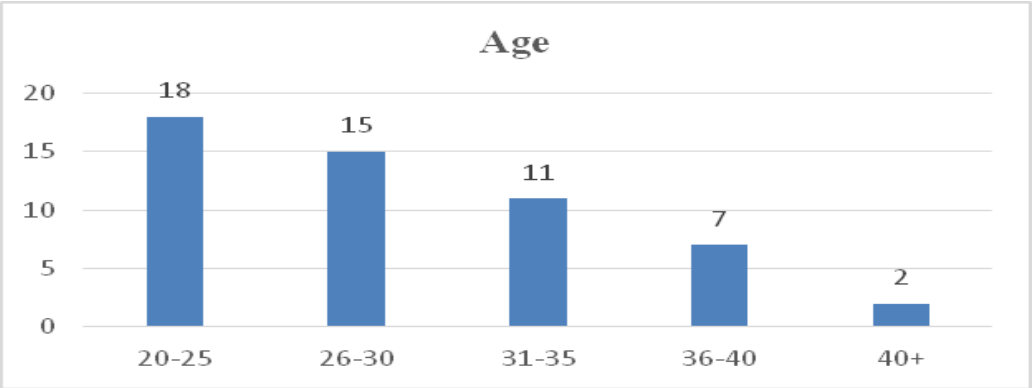

Figure 2. Distribution of Participants by Age Group

Figure 3 depicts the various occupational positions held by participants in the study.

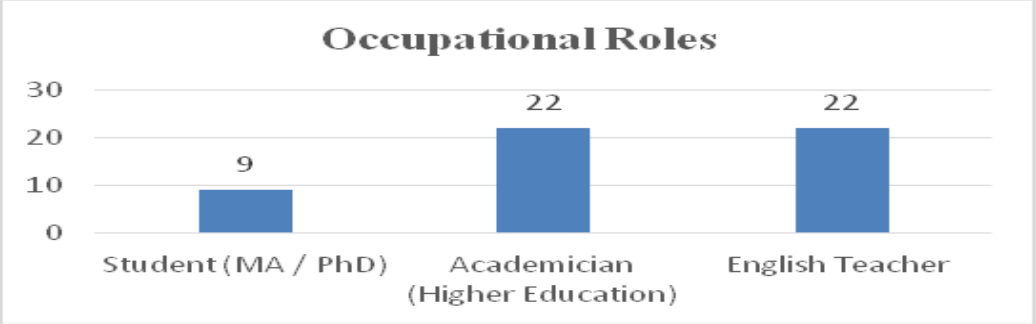

Figure 3. Occupational Roles of Participants

Additionally, their current education levels are displayed in Figure 5. Out of the total participants, 28 are Ph.D. students and 25 are Master's students.

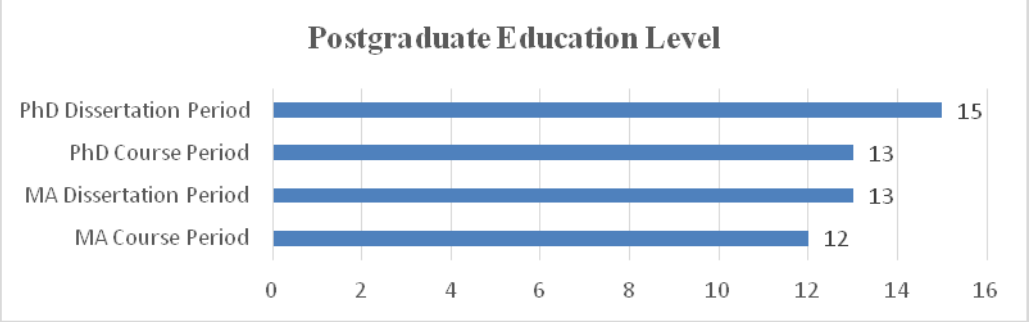

Figure 4. Phases of Education Programs of the Participants

4. Results

RQ 1: The first research question sought answers to participants' previous educational experiences and their feeling of sufficiency to use these tools in their classes and research studies. It also aimed to elicit answers on their feelings about their training and current implementation of digital tools and AI in studies.

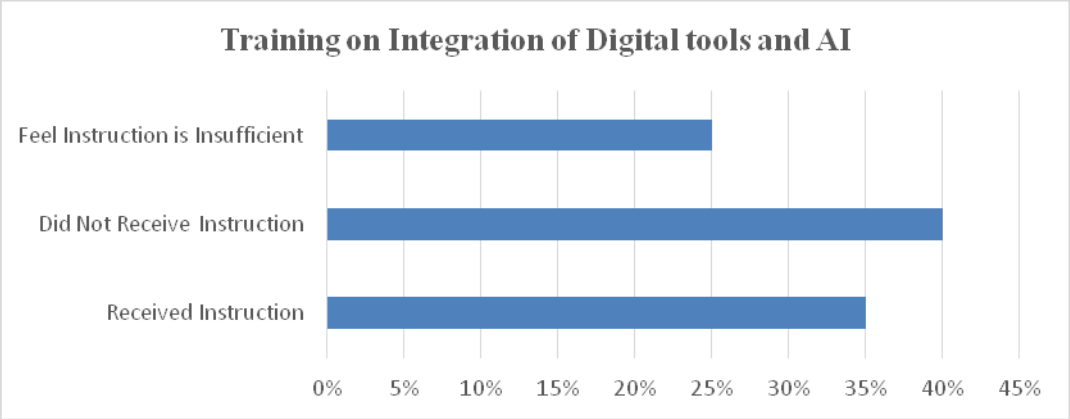

Figure 5. The Percentage of the Training Received on Integration of Digital Tools and AI in Classes and Research Studies

Previous Instruction on Digital Tools: Participants' previous experiences and limitations regarding their training on digital tools and artificial intelligence were elicited, and the following findings were evident. Several participants reported receiving training in applying digital tools and artificial intelligence for English language instruction, which enhanced their teaching methodologies and material development (P1, P18, P26, P48). Several participants indicated that they received inadequate training, limiting their ability to move beyond theoretical knowledge (P6, P33). On the other hand, some participants expressed a need for instruction on digital tools and artificial intelligence, indicating a sense of deficiency in this area (P2, P10, P12, P17, P30). They claimed this deficiency was particularly evident during the pandemic (P29, P35).

Although most participants mentioned receiving no training or feeling inadequate, most think digital tools are motivating and active in language teaching (P19, P46, P50). It was stated that these tools positively affect students' learning processes (P10, P45, P19). Some participants stated that digital tools were underused or not fully integrated in their classrooms (P5, P43, P44). Additionally, some participants shared that accessing information about technology and implementing it in the school was challenging for some participants (P35, P23).

When it comes to designing research studies on digital tools and AI, many participants stated that they had insufficient knowledge of how to use digital tools in scientific studies (P3,

P11, P14, P27, P32, P49). This was emphasized as a deficiency in their academic careers (P41).

Despite their feelings of insufficiency, participants stated that they are aware of the importance of digital tools and artificial intelligence in today's education and want to take steps to improve themselves in this regard (P7, P13, P17). They emphasized the importance of attending workshops and training (P15, P17, P20, P32).

Many participants indicated inadequate training in the utilization of digital tools and artificial intelligence. They reported experiencing negative effects of this deficiency in their teaching processes and scientific research. Conversely, some participants indicated that the training they received significantly benefited them, enabling the integration of these tools into their lessons. Significant emerging factors are openness to technological advancements and a commitment to self-improvement in this area.

RQ2: The second research question aimed to reveal graduate students' tendency to investigate language skills in their thesis or dissertations. All responses were analyzed, and the percentages of each skill are tabulated in Table 1.

Table 1. Graduate students' Tendency Towards Investigating Language Skills in their Thesis/Dissertations

Main Themes	**Participants**	**Percentage (%)**
Speaking Skill	P1, P3, P4, P7, P8, P12, P15, P19, P25, P35, P38, P42, P45, P49	26%
Writing Skill	P2, P5, P10, P18, P21, P23, P27, P37, P39, P40, P45, P46, P49	26%
Listening Skill	P19, P22, P26, P35, P42, P47, P51	14%
Reading Skill	P17, P20, P28, P30, P53	10%
Vocabulary Learning	P6, P27, P31	6%
Technology Integration	P1, P14, P18, P27	8%
Corpus Linguistics	P2, P10, P43	6%
Critical Literacy	P17, P13	4%
Differentiated Instruction	P9	2%
Teacher Education & Attitudes	P9, P41, P50, P32	8%

Speaking and Writing skills were the most frequently mentioned themes, with 26% of respondents stating that they planned to work on speaking skills and 26% on writing skills. Listening skills and reading skills were indicated at a rate of 14% and 10%, respectively, and it was observed that interest in these skills was also significant. Technology integration and corpus linguistic studies are also areas of frequent emphasis (8% and 6%).

RQ3: The third research question elicited participants' Skills-based Suggestions for conducting research. All of their responses were demonstrated in Table 2.

Table 2. Participants' Skills-based Suggestions for Conducting Digital Scientific Investigations

Skills	Common Reasons	Percentage
Speaking Skill	• A productive skill demanding assistance via digital means. • Provides increased input possibilities and delivers substantial, authentic data. • Offers practice potential and prompt feedback, decreasing anxiety and facilitating adaptable learning settings. • Overcomes psychological obstacles and facilitates innovative, dynamic production. • Insufficiently developed competence in Turkey. • Digital tools facilitate use both within and outside the classroom. • Essential for communication, making language operational. • Essential for linguistic proficiency, although frequently overlooked. • Students encounter difficulties with direct involvement and require further experience. • Digital tools may reduce anxiety and offer increased opportunities for practice.	%70
Listening Skill	• Presents increased input possibilities and delivers substantial, authentic data. • Automatically connected with technology, offering customized and accessible educational settings. These skills represent fundamental deficiencies among Turkish EFL learners. • There is a deficiency in research; further emphasis is required for developing the skill. • Listening is frequently overlooked and requires greater emphasis. • Video and audio offer effective input without inundating pupils. • These represent the essential competencies for effective communication. • Common skill deficiencies seen in pupils relate to productive and responsive listening. • Offers authentic environments for language practice and may be accessed through several means.	%45
Writing Skill	• A productive skill necessitating assistance via digital means. Encounters challenges with individualized feedback and cultural inclusivity, complicating the learning process. • Necessitates active production; digital technologies can facilitate innovation and overcome obstacles. Frequent obstacles pertain to individualized learning and assessment. • Crucial for academic achievement and necessitates personal endeavor.	%30
All Skills	• Language acquisition necessitates the integration of all competencies hence each must be cultivated. • Prioritize innovation across all competencies. • Language acquisition needs to be regarded comprehensively. • Emphasis should be placed on areas where skill deficits are present. • Language competencies must be cultivated uniformly for equitable advancement. • Digital technologies enhance all linguistic domains. • Research needs to inform educators on all four fundamental language competencies. • Mastery of all four abilities is crucial for comprehensive language mastery. • Every ability is essential for achieving success in language acquisition. • Every ability is essential for comprehensive language development and must be nurtured.	%25
Reading Skill	• These competencies are crucial for academic achievement and require personal endeavor. • Reading has obstacles similar to writing, necessitating active cognitive involvement and assistance.	% 15

RQ4: The fourth research question regarded barriers to researching language skills with digital tools or AI. The responses categorized according to their themes and frequencies were tabulated in Table 3.

Table 3. Emergent Themes

Theme	Explanation	Response Number
Access to Technology and Infrastructure Problems	Participants cited a lack of access to the internet and digital tools as an essential barrier. Technological shortcomings, problems with internet connection, and lack of hardware make scientific studies difficult.	30 (%56.6)
Teacher/Participant Digital Competence Gaps	Conducting research is difficult when teachers and participants lack digital skills and knowledge.	18 (%33.9)
Cost and Financial Barriers	The high cost of digital tools and budget shortfalls are seen as a major obstacle.	8 (%15.1)
Physical and Material Inadequacies of Educational Institutions	Infrastructure deficiencies in educational institutions, especially lack of internet connection and appropriate technological equipment.	7 (%13.2)
Data Security and Privacy Issues	Concerns were expressed about data security and privacy when using digital tools.	5 (%9.4)
Participant Motivation and Digital Skills	Participants' lack of digital skills and motivation can negatively affect the results of the studies.	4 (%7.5)
Standardization and Evaluation Challenges	Rubrics and tests can be difficult to standardize, and results can be difficult to assess reliably.	3 (%5.7)
Research Implementation Challenges	Time and other practical difficulties may be barriers to implementing experimental studies.	3 (%5.7)
Ethical Issues and Risk of Plagiarism	Studies with AI tools may have the potential to lead to ethical issues and plagiarism.	3 (%5.7)

5. Discussion

The initial research question sought to determine whether participants had undertaken any courses on integrating digital resources into language acquisition. Participants who completed

the courses were requested to provide their perspectives on the effects of these courses on their professional lives. Conversely, the participants lacking this kind of instruction expressed their perceptions of the deprivation experienced.

The results revealed that technology courses affected participants' teaching methodologies and material development skills. This is in line with some other studies stressing the importance of technology use in enriching teaching methodologies of teachers, especially in terms of providing better input, timely feedback, or making more authentic communication in language teaching (e.g., Cutrim & Hegelheimer, 2014; Zainuddin, 2023). Furthermore, although most participants recognized the encouraging influence of digital tools in language instruction, they also observed that these resources are frequently underutilized or inadequately incorporated into their classrooms. This observation aligns with research demonstrating that educators often face difficulties properly integrating technology into their instructional methods, especially without sufficient support and training (Gruber, 2023).

As for the participants who had no instruction on technology use before, the findings suggest that the lack of information and communication technology skills (ICT) prevented them from conducting effective research in their fields. Some indicated that the instructions could not go beyond theoretical knowledge. This finding can be linked to the lack of practical pre-service ICT training in teaching, which is accepted as one of the top barriers to in-service teachers' use of ICT in their teaching pedagogies (Taghizadeh & Basirat, 2024; Toprakçı, 2006; Zyad, 2016). Thus, pre-service teacher training programs focused on digital technology should be integrated into teacher education curricula to enhance their digital literacy skills (Ottaviani et al, 2023).

In spite of these obstacles, there is a widespread consensus among participants on the significance of artificial intelligence and digital tools in the field of language education. Literature supports this finding as, according to Wei (2023), a significant number of individuals have indicated that they are willing to demonstrate a proactive attitude to overcome their limits by participating in further professional development activities such as workshops and training. Vadivel (2023) found that educators are increasingly seeking to develop their abilities using artificial intelligence (AI) and digital tools to foster better learning environments. This eagerness to improve corresponds with the larger educational trend that is also found in this study.

The second research question sought to identify graduate students' inclination to investigate language skills in their theses or dissertations. The analysis of responses revealed that the participants are more inclined to conduct research studies on speaking and writing skills. This predominant focus can be attributed to several interrelated factors. Speaking and writing are classified as productive skills, crucial for effective communication and expression in a second language. The literature highlights the importance of both skills in attaining communicative competence (Koesoemah, 2020; Normawati, 2023). This preference may reflect the students' growing interest in communicative competence in second-language education. This

competence can be activated and enhanced using common digital tools such as podcasts, communication labs, or video conferencing (Kuning, 2019). Another potential reason for the increased emphasis on speaking and writing may be their recognized significance in the language acquisition process. Oral communication is frequently regarded as an essential competency, as effective communication relies on the capacity to articulate ideas with clarity and precision (Normawati, 2023). Furthermore, writing is essential for students to structure their ideas and participate in reflective activities, improving their overall language competency (Koesoemah, 2020; Normawati, 2023, Reimers & Gurevych, 2020). Moreover, the emergence of technology and artificial intelligence (AI) in language education must have significantly enhanced interest in these competencies. Relatively more research studies investigate the affordances of technology in improving speaking and writing skills (Kuning, 2019; Zhang & Hyland, 2023)

The third research question elicited participants' skills-based recommendations for doing research using digital tools and artificial intelligence. 70 % of the participants suggested using technology to research speaking skills. The current research revealed that 70% of participants consider the investigation of speaking skills to be beneficial owing to the advantages of digital assistance. Speaking investigations are recommended as they think it is a productive skill that can be enhanced by digital tools, facilitating quick connection, access to authentic content, and exposure to natural language usage. In line with what Eden et al. (2024) and Song et al. (2024) stated, the participants shared that digital tools foster flexible, anxiety-alleviating educational settings, diminishing cognitive load and psychological strain. Another factor that makes investigating speaking skills crucial is the failure to train students to speak better in English. This failure has also been emphasized by researchers like Dağtan and Canbaroğlu (2024) and Çapan (2021); therefore, the participants see digital tools as being a possible solution to address this shortcoming as they believe these tools facilitate both in-class and autonomous learning, equipping individuals with practical skills for real-world applications.

Regarding the last research question, the researchers were interested in finding solutions to the most prevalent challenges that the students who participated in the study had encountered regarding the utilization of digital resources in their courses and research investigations. According to the results, lack of access to technology, schools with limited technological support, and lack of ICT knowledge are among the top three reasons. Several research studies indicate similar results. Sicilia (2005), for example, pointed out the limited access to computers and its negative effect on teachers' use of technology. In a similar vein, Korte and Hüsing (2007) stated that some infrastructure barriers, such as lack of internet access, prevent teachers from utilizing technological tools in their classrooms. Lastly, a lack of ICT knowledge or training is another issue that hinders effective digital use in teaching. Some studies concluded that didactic training in ICT integration and lack of training in digital literacy in initial teacher education are major obstacles to turning teachers' theoretical knowledge into practical knowledge in teaching environments (Khan & Kuddus, 2020). In this

sense, a number of strategies have been put forth by academics and researchers to optimize the use of AI and ICT in language instruction. These consist of thorough teacher training on AI technologies, encouraging cooperation between educators and technologists, creating intuitive AI tools, integrating AI seamlessly into current teaching methods, and supporting pedagogical strategies that prioritize student autonomy and engagement (Bulger & Mayer-Schönberger, 2018; Mehlhorn et al., 2020). Mananay (2024) reported that educators insisting on using AI or digital technologies despite their challenges such as pedagogical alignment and access constrains experienced positive outcome in student engagement, proficiency, and autonomy. In this sense, our study suggests that exploring the dimensions affecting teachers' use of ICT is crucial for identifying factors and barriers to adoption.

6. Conclusions

Integrating digital tools and AI in language education has received increasing attention within the academic community. The increasing potential for incorporating such benefits in language classes has led to a rise in scientific inquiries. Amid the global focus on exploring the instructional impacts of technology integration in language classes, gathering insights into the perceptions, motivations, or challenges novice investigators face would provide a valuable perspective for understanding the landscape of future research endeavors. Therefore, the current study provided important insights into MA and Ph.D. students' preferred language skills for digital-based research, emphasizing trends in language education that could guide future curriculum development. This study has also explored graduate students' experiences, motivations, and challenges in utilizing digital tools for research, highlighting potential deficiencies in digital skill development within graduate programs, particularly in the context of language education research.

Additionally, it has highlighted the significance of providing MA and Ph.D. students with the essential digital and methodological skills needed to make meaningful contributions to the fields of language teaching and research. By addressing the barriers against technology integration, the study also underscores the need for institutions to develop effective training programs on pre-service and in-service language teachers' digital skills. Educational institutions should also prioritize investing in technological infrastructure to enable students and teachers to utilize technology fully in lessons.

7. Implications for Language Teaching Research

This study has highlighted an urgent need for more training in teaching with technology and researching its instructional effects on different language skills in MA and Ph.D. programs. Improved training in digital tools may enable students to engage in more thorough and creative investigations, ensuring their abilities meet the requirements of modern language education and applied linguistics. Tailored support resources are needed to overcome research barriers that are revealed in the study. More pre-service and in-service training programs,

workshops, and awareness and knowledge-raising activities should be integrated to increase the quality of education and research in language teaching. The results of this study highlight the significance of digital literacy within the realm of language teaching research. Language education programs should incorporate digital literacy as a fundamental skill, guaranteeing that students are adequately prepared for academic and professional settings where digital tools are prevalent.

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Declaration of Conflicting Interests and Ethics

The author declares no conflict of interest.

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