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ARTIFICIAL INTELLIGENCE IN LANGUAGE EDUCATION IN TÜRKİYE: POTENTIAL CHALLENGES

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ABSTRACT

This study examines the potential challenges that language learners might encounter during the process of AI-supported foreign language learning (English and German) in Türkiye. Despite the potential benefits of AI technologies in language learning, it is obvious that the use of these technologies also presents certain disadvantages and challenges. AIM: This study aims to address the potential challenges and adverse effects of AI-supported language learning applications, offering recommendations on how these issues can be overcome. METHOD: The study uses the document analysis method to examine possible problems with AI-supported language learning in English and German languages in Türkiye. RESULTS: Technological infrastructure limitations, high costs, reduced human interaction, and data security concerns could hinder the effective and secure use of AI-supported language learning applications. CONCLUSION: Strategies should be developed to ensure the learning experiences of students, enabling safer and more effective use of AI technologies.

Key words: Artificial Intelligence, English Learning, German Learning, Language Learning Challenges, Data Security.

INTRODUCTION

With the rapid advancement of the digital age, artificial intelligence (AI) technologies have created a significant transformation in the field of education. In Türkiye, foreign language education, particularly in terms of English and German learning, has gained a new dimension with the opportunities presented by AI. It is well-known that AI-supported language learning applications offer personalized educational experiences that contribute to the development of language skills (1). These technologies have the potential to make the language learning process more effective, accessible, and engaging (2). However, despite these advantages offered by AI-supported language learning, there are also potential problems that may arise.

Insufficient technological infrastructure, especially limited internet access in rural areas, can hinder the effective use of AI-supported applications (3). Nationwide issues with internet access and technological infrastructure could limit students' access to these innovative applications. Furthermore, the high costs of these applications can pose a financial burden on students and schools (4). The development and continual updating of AI-supported language learning applications can be costly, potentially leading to access issues, especially for low-income families. High costs can deepen educational inequalities and widen the digital divide (5).

Additionally, the reduced human interaction in AI-supported language learning might negatively affect students' motivation and social skills (6). In a traditional classroom setting, the interaction between teachers and students plays a critical role in language learning. AI-supported applications might limit these interactions, reducing opportunities for students to practice the language and develop social skills (7). Active participation and interaction in the language learning process are necessary for the enduring and effective development of language skills. There is also a risk that AI

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technologies might make learners complacent and decrease language exercises (8). Students' research and synthesis skills could weaken due to the conveniences provided by AI applications.

Moreover, the quick and easy solutions offered by AI-supported language learning applications might diminish students' depth of thinking and problem-solving skills. This situation could lead students to adopt a more superficial approach to language learning (9). Damage to the interactive dimension, which is important in classroom language teaching, could negatively affect students' progress in language learning. This could decrease students' motivation to learn languages and adversely affect the development of their language skills in the long run.

Finally, data security and privacy concerns pose significant issues in the use of AI-supported language learning applications. Risks related to the collection and processing of students' personal data and privacy concerns must be addressed. The potential consequences of data security breaches and relevant legal regulations should be examined (6). A lack of trust in these technologies among students, educators, and parents could lead to significant problems in the educational process. By taking these factors into consideration, the aim of this study is to examine the potential issues that language learners will face during the AI-supported foreign language learning process (English and German) in Türkiye. In this sense, the research question for this study is defined as follows:

- "What are the potential benefits and encountered challenges of AI-supported foreign language learning applications for English and German education in Türkiye, and what strategies and solutions can be proposed to evaluate the impact of these technologies in education?"

The study investigates the significant impact of technological infrastructure deficiencies on the effectiveness of AI-supported foreign language learning applications in Türkiye. Weaknesses in technological infrastructure, especially linked to limited internet access in rural areas, hinder the widespread adoption of AI-supported educational applications and deepen educational inequalities. Simultaneously, the study highlights the importance of a balanced approach in education, as AI-supported applications can limit human interaction, potentially obstructing the development of students' social skills. These contents are provided in more detail under two sub-headings for this purpose.

TECHNOLOGICAL INFRASTRUCTURE AND ACCESS ISSUES

The necessary technological infrastructure for effectively implementing AI-supported language education poses serious challenges, especially in rural and disadvantaged areas. The lack of internet access and technological devices hinders the widespread adoption of AI-supported language learning applications. Significant disparities exist in internet access across Turkey, with students in rural areas particularly struggling to access these innovative applications (10, 3).

Deficiencies in technological infrastructure prevent students from effectively utilizing digital tools in education and pose a significant barrier to achieving educational equity (11). This situation can weaken the digital divide, deepening educational inequalities. Additionally, the high costs associated with AI-supported applications make widespread use of these technologies challenging. Hwang (4) notes that these costs can create additional financial burdens for schools and students and may limit access for low-income families. Developing and sustaining AI-supported educational technologies requires substantial investment, which can be a significant barrier to access for students in disadvantaged areas (12). Solving technological infrastructure and access issues could be achieved through collaboration between the public and private sectors. The government needs to strengthen internet infrastructure and provide schools with technological devices. The private sector can play a significant role in this process by developing low-cost or free AI-supported educational applications. This approach can offer equal educational opportunities to all students and help reduce the digital divide (1).

Moreover, as important as the government's efforts to strengthen digital infrastructure are, enhancing the digital skills of teachers and students is also crucial. Digital literacy is essential for the effective and efficient use of AI-supported educational tools. Cheung et al. (6) emphasize the need for education to follow a dual strategy that both strengthens

technological infrastructure and enhances individuals' digital skills.

REDUCED INTERACTION AND SOCIAL SKILLS

In AI-supported language learning, the limitation and reduction of human interaction, especially among learners, can have negative effects on students' motivation and social skills. It is well known that interaction between teachers and students in a traditional classroom plays a critical role in language learning. Luckin and Holmes (2) suggest that AI-supported applications could limit these interactions, thereby reducing opportunities for students to practice the language and develop social skills. Active participation and interaction in the language learning process are necessary for the permanent and effective development of language skills. However, there is a risk that AI technologies might make learners lazy and reduce language exercises. Students' research and synthesis skills could weaken due to the conveniences provided by AI applications (6).

Additionally, the quick and easy solutions offered by AI-supported language learning applications might reduce students' depth of thinking and problem-solving skills. This could lead students to adopt a more superficial approach to language learning. Damage to the interactive dimension, crucial in classroom language teaching, could negatively affect students' progress in language learning. This situation could decrease students' motivation to learn languages and adversely affect the long-term development of their language skills (5).

Lastly, in AI-supported language learning, the necessary group activities and classroom interactions for the development of students' social skills may decrease. This reduction could limit students' social skills and opportunities to practice the language. Cheung et al. (6) emphasize that active participation and interaction in the language learning process are critical for the permanent and effective development of language skills. AI-supported applications cannot fully substitute for teacher-student interaction, and therefore, the importance of human interaction in language learning should not be overlooked.

Despite the advantages of AI-supported language learning, risks such as reduced human interaction and negative impacts on the development of social skills must be considered (13). Therefore, it is necessary to use AI-supported language learning applications in a balanced way with traditional teaching methods and to develop strategies that encourage active student participation (2). This approach will ensure balanced development of both language and social skills, contributing to a more holistic educational experience for students.

METHOD

This study adopts the document analysis method to investigate potential issues associated with AI-supported language learning in English and German language education in Turkey. Document analysis is an effective research method when examining textual data in detail (14, 15).

In the initial phase, the main focus points in the literature on AI-supported language learning were identified; subsequently, relevant publications were selected using academic databases and library resources, based on specific keywords and selection criteria such as date, methodology, and sample size (40). Key terms used include "language learning with AI," "AI-supported language education," "learning English and German," "language education in Turkey," and "AI education challenges."

The selected publications were coded in terms of key themes, concepts, and findings; for example, data related to specific categories such as the use of AI and issues in language learning were identified. These coded data were systematically organized within an analytical framework, and thematic categories were established (9). During the coding process, prominent themes and concepts in the existing literature were focused on, such as potential problems of AI-supported language learning, student motivation, social interaction, and data security (1, 16, 17).

In the document analysis phase, the coded data were thoroughly examined, and relationships and patterns among the themes were identified. The findings were systematically presented based on the results of this analysis; key themes, sub-themes, and notable findings were highlighted. Particularly, findings related to the potential of AI technologies to induce student laziness, reduce language exercises, weaken research and synthesis skills, and damage the interactive dimension of classroom teaching were addressed (4).

RESULTS

According to the document analysis conducted for this study, the primary challenges encountered in AI-supported foreign language learning in Türkiye have been analyzed under four main headings: *technological infrastructure deficiencies, high costs, reduced human interaction, and data security concerns.*

1. **Technological Infrastructure Deficiencies** Inadequate technological infrastructure is a significant issue in AI-supported language learning. Limited internet access, particularly in rural areas, complicates access to these innovative educational methods for students and individuals (18, 19, 20). Nationwide, the insufficiency of internet access and technological devices hinders the effective use of AI-supported applications. According to data from the Turkish Statistical Institute (TÜİK) (21), the digital divide, especially for students living in rural areas and those from lower socio-economic levels, poses a significant barrier to education. TÜİK's (21) 2020 data shows that only 60% of households in Turkey have internet access, highlighting the severity of the digital divide. This limitation restricts access to digital educational resources for students in rural areas.

Koutsopoulos et al. (3) describe this situation as weakening the digital divide and deepening educational inequalities. Technological infrastructure deficiencies prevent students from effectively using digital tools, posing a significant barrier to achieving educational equity. Furthermore, the lack of technological devices hampers the development of students' digital literacy skills (22).

2. High Costs

The high cost of AI-supported language learning applications poses a significant financial burden for students, schools, and faculties. Developing, maintaining, and continually updating these technologies are expensive, leading to access issues for low-income families and schools in disadvantaged areas (23). For instance, the annual licensing fee for an AI-supported language learning platform can amount to thousands of dollars. These costs create a substantial burden on school budgets and limit access to these technologies. Moorhouse (24) points out that the expenses associated with AI-supported educational technologies make it difficult for new teachers to adapt to these technologies, and the costs can be particularly prohibitive for low-budget educational institutions.

Hwang (4) mentions that these high costs impose an additional financial burden on schools and students and limit access for low-income families. While private schools and high-income families can more easily access such technologies, public schools and low-income families find it challenging to access these technologies. This situation can increase educational inequalities and deepen the digital divide (5). In this context, high costs can prevent the widespread adoption of technological innovations in education and widen the digital gap. Andersson and Grönlund (23) note that investments in e-learning in education in developing countries often remain limited due to high initial costs and sustainability challenges.

Leslie (11) emphasizes that many students are unable to use AI-supported language learning applications because they do not possess basic digital devices like smartphones or computers. According to Leslie (11), the high costs of digital devices make it difficult for children from low-income families to access such educational technologies, thereby hindering efforts to achieve educational equity. Kohnke et al. (25) indicate that the cost factor is a significant barrier to the adoption of AI technologies among university language instructors and that this impacts instructors' preparedness levels. They stress that the adoption of these technologies remains limited due to cost and budget constraints.

Lodge et al. (26), in their research on the costs of AI technologies in higher education, state that these costs include not only initial expenses but also ongoing maintenance and update expenses, creating long-term financial pressures on educational institutions. McDonald et al. (27) note that financial barriers encountered by higher education institutions in accessing and integrating AI technologies make it difficult to spread these technologies widely. These barriers could negatively affect educational equity.

Chiu (28) suggests that the high costs of AI technologies in education and specifically in foreign language education could create significant disparities in access to these technologies, potentially impacting educational equity negatively.

3. Reduced Human Interaction

AI-supported language learning can limit human interaction, negatively affecting students' motivation and social skills (29). In a traditional classroom setting, interaction between teachers and students plays a crucial role in language learning. Students develop their language skills and learn more effectively in social learning environments by interacting with their teachers and peers. Cheung et al. (6) note that this reduction in active participation and interaction in the language learning process adversely affects the permanent and effective development of language skills.

While AI-supported applications can personalize individual learning experiences, they cannot fully replace the interactions between students and teachers or among students themselves. Students learn from interactions they encounter in real-life linguistic and social situations, which are not fully replicated by AI applications (30). Similar issues are observed in language teaching in Turkey. Particularly in rural areas, students face difficulties in language learning due to reduced classroom interactions (18).

Research conducted abroad supports these findings. For instance, studies highlight that the lack of human interaction in AI-supported language learning negatively impacts students' motivation to learn languages and can hinder long-term language development. Wang et al. (31) state that insufficient human-AI interactions reduce social learning opportunities in the language learning process, which in turn prevents students from fully developing their language skills. Additionally, Toptaş (32) mentions that AI applications limit opportunities for social interaction and group work, creating challenges in the language learning processes. Dörnyei (33) also emphasizes that language learning motivation largely stems from social interactions, and the absence of these interactions negatively affects students' engagement in the language learning process.

4. Data Security and Privacy Concerns

The use of AI-supported language learning applications brings with it concerns about data security and privacy. The collection and processing of students' personal data can lead to breaches of data security and violations of privacy (34). These applications collect large amounts of data about students' learning processes, and the protection of this data is of great importance (1).

Data security and privacy concerns can affect the confidence of students, teachers, and parents, leading to significant problems in the educational process. The misuse or breach of students' personal data can cause students to lose trust in these technologies and hesitate to use them (35). In this context, high security standards and transparent data processing policies are critical for gaining and maintaining users' trust (36).

Lapses in data security in educational technologies can pose serious risks. Berendt et al. (37) highlight the importance of protecting data security and privacy in AI-supported educational applications. Additionally, Saaida (38) points out that deficiencies in data security can lead to misuse of user data and serious privacy issues. He emphasizes that the lack of data encryption and anonymization techniques in AI applications can lead to security vulnerabilities.

Another important finding is that data security concerns negatively impact the adoption of AI in education (39). Proper management of data can increase users' trust in these technologies and support the effectiveness of the application.

DISCUSSION AND CONCLUSION

This study examined various problems associated with AI-supported language learning in Türkiye and has revealed significant findings. The results highlight not only the potential benefits of AI technologies in language education but also some significant challenges encountered in its implementation.

One of the fundamental problems of AI-supported language learning is technological infrastructure deficiencies. Limited internet access in rural and socioeconomically disadvantaged areas severely restricts access to these innovative educational methods (21). This situation leads to deepening digital divides and educational inequalities (3). Technological infrastructure deficiencies also prevent students from developing digital literacy skills, creating a major barrier to achieving educational equity (22). It is emphasized that enhancing access to technology is necessary for the effective use of AI-supported applications.

Another significant problem is the high costs associated with AI-supported language learning applications. The development, maintenance, and updating of these applications are costly and pose access challenges for low-income families and schools in disadvantaged areas (23). High costs limit access to these technologies for low-income families and public schools, increasing educational opportunity inequalities (5). Developing strategies to overcome these financial barriers could help broaden the reach of technology (28).

The limitation of human interaction in AI-supported language learning also emerges as a significant problem. The critical role of interaction between teachers and students in a traditional classroom setting is well-documented. Cheung et al. (6) suggest that AI applications reduce active participation and interaction in the language learning process, negatively impacting the permanent and effective development of language skills. Reduced human interaction can limit social interaction and group work opportunities in language learning processes, adversely affecting motivation and language development (27; 31). There is a need for further research on how AI-supported applications can complement traditional interactions.

Lastly, data security and privacy concerns form another critical problem of AI-supported language learning. The collection and processing of students' personal data can lead to data security breaches and privacy violations (34). These concerns can undermine users' trust in these technologies, causing difficulties in the educational process (39). High security standards and transparent data processing policies are crucial for gaining and maintaining users' trust (36).

These findings clearly demonstrate the need for urgent and comprehensive interventions to enhance the effectiveness of AI-supported language learning in Türkiye. Initially, improvements in technological infrastructure are essential. Restrictions on internet access in rural areas significantly hinder the dissemination and effective use of AI-supported educational applications. To resolve this problem, large-scale infrastructure projects and technological investments should be made through collaboration between the government and the private sector.

Secondly, high costs are preventing the widespread adoption of AI-supported language learning technologies. Overcoming these financial barriers involves making educational technologies more affordable and accessible. Financial support and incentive programs could facilitate access to these technologies for schools and families in low-income areas, thereby ensuring educational equity and minimizing the digital divide.

Thirdly, concerns about data security and privacy are seriously damaging students' and educators' trust in AI-supported applications. Overcoming these issues requires strengthening data protection standards and adopting transparent data processing policies. Secure and ethical use of educational technologies will increase users' trust in these technologies and support the effectiveness of the application.

Future research should explore strategies to overcome these problems in more detail in different settings and provide solutions that enhance the effectiveness of the application. To fully leverage the potential of AI-supported language learning, necessary steps must be taken to extend the reach of AI technologies in education. These steps can strengthen educational equity and maximize the role of AI technologies in education.

SUGGESTIONS

Strengthening Technological Infrastructure: Improving internet access in rural areas and strengthening technological infrastructure is critical for the effective implementation of AI-supported language learning technologies.

Increasing Financial Support and Incentive Programs: Financial support and incentive programs should be created to reduce the high costs associated with AI-supported language learning applications. Scholarships, subsidies, and affordable licensing agreements should be provided especially for low-income families and schools in disadvantaged areas.

Strengthening Data Security and Privacy Standards: High security standards and transparent data processing policies should be implemented to ensure data security and privacy in AI-supported educational applications. Effective data encryption and anonymization techniques should be used to protect users' data.

Additionally, training on data security should be provided to students and teachers.

Developing Strategies to Support Human Interaction in Education: Strategies should be developed to compensate for the lack of human interaction in AI-supported language learning applications. Integration of traditional teaching methods with AI applications should be facilitated to enhance classroom interactions and promote social learning opportunities. Activities that increase student-teacher and student-student interactions should be planned.

Supporting Research and Development Activities in Educational Technologies: Continuous research and development activities should be supported to maximize the potential of AI-supported language learning. Collaboration among universities, research centers, and technology companies in the field of educational technologies should be encouraged. Additionally, pilot projects and comprehensive evaluation studies should be conducted to assess the effectiveness of innovative applications and strategies in this area.

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