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Original article

Artificial Intelligence for Enhancing English Learning among Technical College Students in Derna

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Abstract
This study explored the role of Artificial Intelligence (AI) in enhancing English language learning among students at the Faculty of Technical Sciences in Derna. With the rapid advancement of AI technologies, educational practices incorporated intelligent tools to improve learning outcomes and student engagement. The research adopted a descriptive-analytical approach, utilizing a structured questionnaire to collect data from a sample of 49 students (males and females) at the Faculty of Technical Sciences in Derna. The study examined students' perceptions of using AI-powered applications, such as Google Translate and Duolingo, in developing language skills, including vocabulary, pronunciation, and writing. The findings indicated that AI-based tools contributed positively to improving English language learning, as students reported increased motivation, ease of use, and enhanced understanding. However, the results also highlighted certain challenges related to over-reliance on these tools and varying levels of digital literacy among students. The study concluded that AI applications played a significant role in supporting language learning when effectively integrated into educational practices. Accordingly, it recommended incorporating AI-based tools into classroom activities and developing strategies that balance technological use with traditional teaching methods to achieve optimal learning outcomes.
Keywords: Artificial Intelligence, AI in Education, English Language Teaching, Technical College Students.

Introduction

In today's rapidly evolving world, advancements in Artificial Intelligence (AI) are transforming multiple sectors, including education. As the demand for innovation and creativity continues to grow, AI emerges as a powerful tool capable of initiating a new era in educational practices. Since English has become the universal language of science, technology, and global communication, mastering it is essential for students in technical fields. Integrating AI into English language instruction offers promising opportunities to enhance learning outcomes and equip students with the linguistic skills necessary to meet modern professional demands. Recent research indicates that AI technologies such as machine learning (ML) and natural language processing (NLP) address specific cognitive and interactional aspects that traditional methods often overlook [1]. For instance, intelligent translation tools and humanoid robots enable students to practice language skills and receive instant AI-generated feedback, fostering confidence and competence [2].

The role of AI in education, particularly in teaching and learning English, has been widely documented [3-5]. English is not merely a language but a critical skill for global employability, academic advancement, and cross-cultural communication [6]. Proficiency in English can open doors to higher education, employment, and international collaboration, given its status as the lingua franca of business, science, diplomacy, and the internet [7]. AI-driven tools such as chatbots and online conversational platforms have shown promise in increasing student engagement and transforming classroom dynamics [8]. Studies also emphasize the importance of teacher support and active participation in AI-assisted learning environments [9]. From an interactionist perspective, AI systems that provide interactive dialogues create valuable opportunities for meaningful communication, an essential component of language acquisition.

Despite these global advancements, there is a significant knowledge gap regarding the application of AI tools among technical college students in Libya. Existing literature has not sufficiently explored how these students engage with AI, the challenges they encounter, or effective strategies for integration within this specific context. This study aims to fill that gap by analyzing the impact of AI tools on the English language skills of students at the College of Technical Sciences in Derna, providing practical recommendations for educators and curriculum developers.

Artificial Intelligence (AI) has become a transformative force in English language education, offering personalized and adaptive learning opportunities that traditional classrooms often struggle to provide [10,11]. AI-powered systems such as TalkPal, Languate, and Praktika AI can evaluate learners' strengths and weaknesses, track their progress over time, and adjust content accordingly to ensure targeted support [12]. This adaptive capability allows learners with strong vocabulary but weak pronunciation, for example, to receive more focused pronunciation training [13].

Beyond adaptability, AI enhances accessibility and convenience. AI-powered chatbots, mobile applications, and virtual tutors are available 24/7, enabling students to practice and improve their English skills at their own pace [4,13]. Language learning apps such as Duolingo, Babbel, and Rosetta Stone use algorithms to deliver interactive, gamified lessons with real-time feedback [14]. AI chatbots, like Microsoft's well-known bot, provide authentic conversational practice with instant corrections, while platforms such as VIPKid and Talki use AI to match students with qualified instructors and deliver customized lesson plans [11]. AI-based approaches improve all four language skills speaking, listening, reading, and writing through unlimited practice opportunities and instant feedback on grammar, vocabulary, and pronunciation [14,15]. Interactive elements and gamification have been shown to increase engagement and retention [16]. Examples include

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Pearson's AI-Powered English Test, VIPKid's AI matching system, and EF English Live, which leverage AI to assess and enhance learner performance.

Research by Adiguzel et al. [8] found that AI-driven chatbots and online conversational systems significantly boost student engagement and classroom dynamics. Chiu [9] stressed the necessity of teacher guidance and student participation for maximizing AI's potential. Similarly, Li and Ni [17], Biletska et al. [4], and Huang et al. [18] have documented AI's broader impact on English teaching and learning, highlighting its role in fostering motivation and authentic communication.

English is widely recognized as a critical skill for employability, academic advancement, and intercultural communication [6,7]. Studies have shown that AI can serve as a catalyst for improving English proficiency in global contexts [2,19,20]. However, some scholars argue that AI reshapes traditional teacher–student roles, potentially causing disruption in conventional educational settings [12]. While Hoffer [19] views AI as empowering students with individualized learning opportunities, others, such as Al-Smadi et al. [21], warn of depersonalization risks in the learning process.

Despite its benefits, AI adoption in language learning comes with challenges. Over-reliance on technology can reduce face-to-face interaction and weaken the social aspects of language acquisition [22]. Godwin-Jones [22] notes that while some AI applications allow live interaction with native speakers or tutors, most rely on self-guided learning, which may lack human communication. Huang et al. [18] and Dugošija [23] also highlight potential ethical, pedagogical, and technical challenges that educators must address.

The importance of this study lies in highlighting the role of artificial intelligence in improving English language learning among technical college students in Libya. This study aims to provide a deeper understanding of how students use artificial intelligence tools, the challenges they face, and their impact on basic language skills, thus contributing to bridging the research gap in this field and providing practical recommendations for teachers and curriculum developers on effectively integrating artificial intelligence tools to enhance students' language proficiency and suitability for the global labor market.

Methodology

Research Design

This study adopts a quantitative survey design to examine the use of artificial intelligence (AI) tools in English language learning among technical college students. This design allows for the collection of descriptive and analytical data regarding students' familiarity with AI tools, their perceived impact on language skills, and the challenges they encounter. It is appropriate for achieving the study objectives and answering the research questions.

The Study Sample

The study sample consisted of 49 students from the Computer Science Department at the College of Technical Sciences in Derna, Libya. In terms of gender distribution, the sample included 25 males (51.0%) and 24 females (49.0%). Regarding academic level, 23 students (46.9%) were in their second semester, while 26 students (53.1%) were in their third semester, as presented in Table 1.

Table 1. Distribution of the Study Sample by Gender and Academic Level

Variable	Category	Frequency	Percentage
Gender	Male	25	51.0%
	Female	24	49.0%
Total	**-**	**49**	**100%**
Academic Level	Second Semester	23	46.9%
	Third Semester	26	53.1%
Total	**-**	**49**	**100%**

Data Collection Instrument

A structured questionnaire was used as the primary data collection instrument. It was designed to be concise, easy to complete, and suitable for statistical analysis. The questionnaire comprised two sections:

Demographic Information, Gender, and Academic Semester.

Main Survey Items: 24 statements rated on a five-point Likert scale (from "strongly agree" to "strongly disagree"), grouped into three dimensions:

- Knowledge and interaction with AI tools.
- Perceived impact of AI on English language skills (reading, writing, listening, vocabulary, and grammar).
- Challenges and recommendations for improving AI integration.

Reliability & Validity

To ensure the quality of the research instrument, both validity and reliability were examined. Content validity was established by designing the questionnaire based on the study objectives and research questions. In addition, the items were developed in alignment with previous literature on artificial intelligence in language learning, ensuring that they adequately measure the intended constructs. To assess the internal consistency of the questionnaire, Cronbach's alpha coefficient was calculated for the three main dimensions. The results indicated acceptable to high reliability levels:

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Knowledge (α = 0.778), Impact (α = 0.826), and Challenges (α = 0.718), with an overall reliability of (α = 0.774), as shown in Table 2. According to commonly accepted standards [23], a Cronbach's alpha value above 0.70 is considered acceptable. Therefore, these results confirm that the instrument is reliable and suitable for the purposes of this study.

Table 2. Cronbach's Alpha Coefficients for the Study Dimensions

Dimension	Number of Items	Cronbach's Alpha	Evaluation
Knowledge and interaction with AI tools	8	0.778	Good
Perceived impact of AI on language skills	8	0.826	Excellent
Challenges and recommendations	8	0.718	Good
Overall Questionnaire	24	0.774	High Reliability

Scale Interpretation

To interpret the mean scores, a five-point Likert scale was used, as presented in Table 3. The scale ranges from 1 (Strongly Disagree) to 5 (Strongly Agree), and the mean values were categorized into five levels: very low, low, medium, high, and very high.

Table 3. Scale interpretation according to the Likert scale and the degree of practice

Average Range	Category on the Likert scale	Weighted Average	Evaluation in comments on outcomes
4.21 - 5.00	Strongly Agree	5	very high
3.41 - 4.20	Agree	4	High
2.61 - 3.40	Neutral	3	Medium
1.81 - 2.60	Disagree	2	Low
1.00 - 1.80	Strongly disagree	1	Very Low

Data Analysis

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistical methods were employed, including frequencies, percentages, means, and standard deviations.

Frequencies and percentages were used to analyze demographic data and the frequency of AI tool usage (Table 4). Means and standard deviations were used to examine students' responses across the three main dimensions: knowledge and interaction with AI tools, perceived impact on English language skills, and challenges related to AI use (Tables 5, 6, and 7). The mean scores were interpreted based on the five-point Likert scale presented in Table 3, allowing the classification of responses into levels (very low to very high). This analysis was conducted to answer the research questions and provide a clear understanding of students' knowledge, perceptions, and challenges regarding the use of AI tools in English language learning.

Results and Discussions

Frequency of Using AI Tools Regularly

This section presents and interprets the findings of the study based on the data collected from the questionnaire. The results are discussed in relation to the research questions and supported by relevant literature.

Table 4. Frequency of Regular AI Tools Usage in English Language Studies

Response	Frequency	Percentage
Strongly Disagree	4	8.2%
Disagree	3	6.1%
Neutral	2	4.1%
Agree	31	63.3%
Strongly Agree	9	18.4%

The results presented in Table 4 indicate that a large proportion of students (81.7%) reported regular use of AI tools in their English language studies. This finding suggests that AI applications have become an integral part of students' learning practices. This high level of usage can be explained by the widespread availability of AI tools, their ease of use, and their ability to provide immediate feedback. In addition, students in technical fields are generally more familiar with digital technologies, which may further encourage the adoption of AI-based learning tools. This result directly answers the first research question and aligns with previous studies e.g., Chen et al. [10] which highlight the increasing reliance on AI tools in language learning environments.

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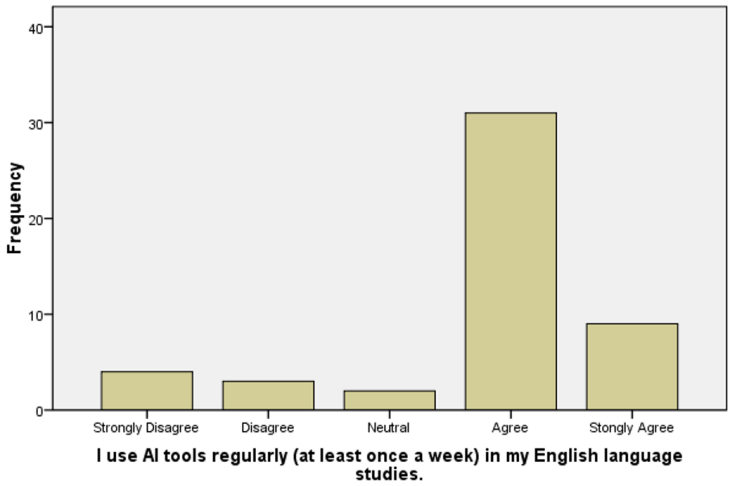

Figure 1. Frequency Distribution of Students' Regular Use of AI Tools in English Language Studies

Knowledge and Interaction with AI Tools

As shown in Table 5, the overall mean score for knowledge and interaction with AI tools was high (M = 3.90), indicating that students possess a strong level of familiarity and engagement with these technologies. The highest-rated item was related to the ease of use of AI tools (M = 4.24), suggesting that usability is a key factor influencing students' adoption. This reflects the importance of user-friendly design in educational technologies. Additionally, students reported positive attitudes toward the diversity and usefulness of AI tools, indicating that these tools meet a wide range of learning needs. However, slightly lower scores in some items (e.g., technical skills) suggest that not all students have the same level of competence. These findings answer the first research question and are consistent with Bilad et al. [13], who emphasized the role of accessibility and adaptability in enhancing student engagement.

Table 5. Descriptive Statistics for Knowledge and Interaction with AI Tools

Statement Text	Mean	Std. Deviation
I have a good understanding of the AI tools and applications available for learning English (such as translation apps, grammar correction software, chatbots, Duolingo, TTS, Orai, elt).	4.02	.924
I use AI tools regularly (at least once a week) in my English language studies.	3.78	1.085
I feel comfortable using AI tools as part of my English learning process.	3.98	.968
I find AI tools easy to use and navigate.	4.24	.662
I recommend AI tools for learning English to my classmates.	3.71	1.155
I have the basic skills to handle different types of AI educational tools.	3.63	1.149
I look for new and innovative AI tools to help me learn English.	3.76	1.071
I find AI tools diverse and meet my different needs in learning English.	4.04	.865
Total	**3.895**	**0.1673**

Perceived Impact of AI on English Language Skills

As shown in Table (6), the findings related to the second research question revealed a high overall mean score (M = 3.75), indicating that students perceive AI tools as effective in improving their English language skills. AI tools were found to be particularly effective in enhancing grammar (M = 4.02), reading skills (M = 3.88), and vocabulary (M = 3.84). This can be attributed to the immediate feedback and interactive features provided by AI systems, which support continuous learning and skill development.

In general, most items scored above (3.50), reflecting a positive perception among students toward the role of AI in language learning. However, the impact on listening skills was relatively lower (M = 3.39), suggesting that AI applications may be less effective in developing auditory skills, which often require more interactive and real-time communication. These findings are consistent with Wei Jones [14], who noted that AI tools tend to be more effective in text-based language skills than in listening comprehension.

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Table 6: Descriptive Statistics for the Perceived Impact of AI on English Language Skills

Statement Text	Mean	Std. Deviation
I believe that using AI tools has improved my ability to understand English texts (reading)	3.88	1.092
AI tools have helped me improve the accuracy and fluency of my English writing (writing).	3.55	1.042
I feel that my ability to understand English conversations and audio materials has improved thanks to AI (listening).	3.39	1.204
AI has contributed to expanding my English vocabulary.	3.84	.874
English grammar has become clearer to me thanks to the explanations and exercises provided by AI tools.	4.02	.901
AI tools have increased my motivation and desire to learn English.	3.78	1.026
AI tools have made me more independent in my English learning process.	3.73	.908
I find that using AI makes learning English more enjoyable and engaging.	3.82	.882
Total	**3.751**	**0.1194**

Challenges and Recommendations for AI Integration

Table 7 shows a moderate to high level of challenges (M = 3.77), indicating that students face several obstacles when using AI tools in their learning process. Among the key challenges were concerns about the accuracy of AI-generated content (M = 3.59), limited access to appropriate tools (M = 3.55), and insufficient technical resources such as internet connectivity and devices (M = 3.45). These challenges may limit the effectiveness of AI integration in educational settings. At the same time, students expressed a strong need for institutional support, particularly in the form of training programs (M = 4.18) and guidance on recommended tools (M = 4.22). This highlights the importance of structured implementation and support from educational institutions.

Interestingly, students showed a preference for human teachers (M = 3.92), suggesting that AI is viewed as a complementary tool rather than a replacement. These findings answer the third research question and align with Godwin-Jones Jones [22], who emphasized the continued importance of human interaction in language learning.

Table 7. Descriptive Statistics for Challenges and Recommendations for AI Integration

Statement Text	Mean	Std. Deviation
I have difficulty accessing appropriate AI tools for learning English.	3.55	1.001
I find some AI tools complex or difficult to use.	3.22	1.246
I don't have sufficient resources (such as high-speed internet or advanced devices) to use AI tools effectively.	3.45	1.174
I doubt the accuracy or reliability of the information and corrections provided by some AI tools.	3.59	1.039
I prefer learning from a human teacher to learning from AI tools.	3.92	1.096
I wish there were training courses or workshops at college on how to use AI for learning English.	4.18	.950
I suggest that college provide a list of recommended AI tools for learning English.	4.22	.963
I believe that further integration of AI into the English curriculum would be beneficial.	4.04	1.098
Total	**3.771**	**0.1033**

Conclusion

This study concludes that Artificial Intelligence (AI) plays a pivotal and influential role in enhancing English language learning among technical college students in Derna. The findings reveal a high level of engagement and interaction with AI tools, driven by their ease of use and the provision of immediate feedback, which has made these applications an integral part of students' daily learning practices. Statistical analysis indicates that the positive impact was most pronounced in foundational skills such as grammar, vocabulary, and reading. Conversely, listening skills recorded the lowest mean scores, highlighting a critical need for the development of AI applications that focus more extensively on live audio interaction. Despite these benefits, students encountered significant challenges, primarily related to inadequate technical infrastructure such as slow internet speeds and concerns regarding the accuracy and reliability of AI-generated content.

Ultimately, the study confirms a strategic insight: AI remains a complementary technological tool rather than a substitute for human instruction. Students expressed a clear preference for human guidance in complex pedagogical situations. Therefore, the successful integration of these technologies within Libyan technical colleges requires a balanced approach that combines digital innovation with sustained institutional and pedagogical support to ensure the preparation of a generation that is linguistically and technically equipped to compete in the global labor market.

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Recommendations

Based on the findings of this study, several practical recommendations can be proposed to enhance the integration of artificial intelligence in English language learning. Educational institutions are encouraged to adopt AI-based language learning tools that support the development of students' language skills through interactive and personalized learning experiences. It is also essential to provide training programs and workshops for both students and instructors to ensure the effective and informed use of AI technologies in educational settings.

Improving technological infrastructure, including reliable internet access and access to appropriate digital devices, is critical to facilitating the effective implementation of AI tools. Furthermore, educators should integrate AI into their teaching practices in a balanced manner, ensuring that these tools complement rather than replace traditional instructional methods. Finally, future research should explore the long-term impact of AI on language learning, particularly in developing listening and speaking skills, and investigate strategies to overcome the challenges identified in this study.

Limitations of the Study

This study has several limitations that should be considered when interpreting the findings. First, the sample was limited to students from the Computer Science Department in Derna, which may restrict the generalizability of the results to other contexts. Second, the study relied on quantitative self-reported data, which may be subject to response bias and may not fully reflect students' actual experiences. Future research is recommended to include larger and more diverse samples from different institutions, as well as to incorporate qualitative methods such as interviews to gain deeper insights. Additionally, longitudinal studies are needed to examine the long-term effects of AI on language learning outcomes.

Conflict of interest. Nil

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