

# The Impact of Using Artificial Intelligence Technologies on the Proficiency of Learning English for Specific Purposes: A Field Study on the Students of the Libyan Academy for Graduate Studies – Derna Branch

Asma Ramadhan Albilaezi

Department of English, Faculty of Education. Elmergib University

[aralbilaezi@elmergib.edu.ly](mailto:aralbilaezi@elmergib.edu.ly)

Article information	Abstract
<p><b>Key words</b></p> <p><i>Artificial Intelligence (AI), English for Specific Purposes (ESP), Learning Efficiency, Libyan Academy for Graduate Studies.</i></p> <p>Received 14/05/2026, Accepted 01/06/2026, Available online 02/06/2026,</p>	<p>This study investigates the impact of using artificial intelligence (AI) technologies on the efficiency of learning English for Specific Purposes (ESP) among graduate students at the Libyan Academy for Graduate Studies – Derna Branch. The study employed a descriptive quantitative analytical approach and was conducted on a sample of 65 students from various scientific and humanities disciplines. A structured questionnaire was used as the primary data collection tool. The results revealed a significant positive correlation between the use of AI technologies and the improvement of ESP learning efficiency. Interactive chatbots (Chatbots) were identified as the most influential tools in enhancing linguistic fluency and simulating authentic communicative situations. Additionally, the vocabulary and academic writing dimension received the highest level of agreement regarding the benefits of A. Regarding individual differences, the study found that female students used AI technologies more extensively than their male counterparts. Conversely, adaptive systems and automated assessment tools showed no significant effect on writing skills. As for challenges, technical obstacles and privacy concerns were not considered major barriers to AI adoption among students. Based on these findings, the study recommends integrating chatbots into curricula, developing adaptive systems to strengthen writing skills, and emphasizing the instructor's role as a guide to ensure that AI tools are utilized as supportive aids rather than substitutes in the educational process.</p>

## **1.0 Introduction**

In recent years, higher education has undergone rapid and profound transformations driven by the remarkable advancement of AI technologies. The application of these technologies is no longer limited to administrative or supportive functions; rather, it has extended to the core of teaching practices and learning approaches, particularly in the field of foreign language education. AI has contributed to reshaping university learning environments by providing interactive tools capable of analyzing learners' performance, delivering immediate feedback, and constructing personalized learning pathways that account for linguistic and cognitive differences among students (Zawacki-Richer et.,2019). In this context, recent studies indicate that the integration of AI technologies in English language education has enhanced several fundamental language skills, including vocabulary development, grammatical structuring, reading comprehension, and interactive practice beyond the traditional classroom. Moreover, these technologies offer more flexible and autonomous learning opportunities and increase learners' motivation through continuous interaction with adaptive and dynamically updated language content tailored to individual needs (Guzmán & Naranjo Andrade,2025). With the growing development of English language teaching programs, ESP has emerged as a pedagogical approach that focuses on addressing language needs related to specialized academic and professional contexts. The literature emphasizes that ESP learning requires instructional strategies distinct from those used in general English, as it relies on specialized terminology, authentic communication scenarios, and discipline-specific language skills in fields such as administration, engineering, and the humanities (Hyland,2022). Within this framework, research has shown that AI technologies, including intelligent chatbots and automated assessment tools, can effectively support ESP learning when implemented within a balanced pedagogical framework that aligns with educational objectives and learner characteristics. However, some studies caution against excessive reliance on these technologies, as it may weaken students' linguistic analysis and critical thinking skills. Accordingly, AI should be employed as a supportive tool rather than a substitute for guided academic interaction between instructors and learners (Avsheniuk et al.,2025). Based on these theoretical and practical considerations, there is a clear need for field studies that examine the impact of AI technologies on the development of ESP learning proficiency in Libyan higher education institutions, particularly in light of challenges related to technological disparities and the diversity of students' linguistic and cognitive backgrounds. Accordingly, this study seeks to investigate the impact of using AI technologies on improving ESP proficiency among students at the Libyan Academy for Graduate Studies – Derna Branch, through a field study grounded in actual practices within the educational environment.

### **1.1 Distinguishing Features of the Current Study**

The current study aligns with previous literature in recognizing the positive impact of AI technologies on English language learning, particularly in developing specific skills such as vocabulary, writing, and speaking. It also concurs on AI's role in enhancing student motivation and supporting self-directed learning through immediate feedback and personalized instruction. Prior research similarly highlights that AI tools—such as chatbots, adaptive systems, and automated assessment tools—serve as effective means to enhance learning within technology-supported educational environments.

However, the current study differs from previous research in several key aspects. Most prior studies focused on a single language skill or a specific technical aspect, such as professional writing, speaking, or evaluating the quality of AI-generated tests. In contrast, this study addresses ESP as an integrated process encompassing comprehension, application, and communication in authentic academic and professional contexts. Moreover, many previous studies were conducted in advanced educational settings or outside the Arab context, limiting the generalizability of their findings to Libyan higher education institutions. The present study provides a field-based analysis grounded in the real experiences of students at the Libyan Academy for Graduate Studies – Derna Branch, taking into account technical challenges and the diversity of linguistic and cognitive backgrounds.

The contribution of this study lies in addressing a clear knowledge gap by providing empirical data from a real Libyan educational context, linking the use of AI technologies to overall ESP proficiency. The findings are applicable for developing teaching practices and formulating educational policies suited to the local context. The research gap that this study seeks to fill stems from the absence of recent studies examining the impact of AI on ESP in Arab contexts, with emphasis on comprehensive instructional processes, the teacher's role, and technical challenges. This makes the current study unique in combining practical application, local context, and a comprehensive analysis of ESP skills, aspects not fully addressed in previous research.

## 1.2 Problem Statement

Despite the growing interest in using AI technologies for general and specialized English language learning, recent literature reviews reveal a lack of field-based studies investigating the impact of these technologies on ESP in Arab educational contexts, particularly in Libya. Most previous studies have been limited to specific language skills or the evaluation of particular AI tools, without exploring overall ESP proficiency in real educational settings, while considering students' diverse linguistic backgrounds, technical challenges, and the university instructor's role in guiding learning. As a result, the knowledge of researchers and policymakers regarding the effectiveness of AI in enhancing ESP among Libyan higher education students remains limited and incomplete.

## 1.3 Study Questions

This knowledge and practical gap crystallizes into the main research question:

**What is the impact of employing AI technologies on improving the proficiency of ESP among students at the Libyan Academy for Graduate Studies – Derna Branch?**

From this primary question, the following sub-questions are derived:

1. To what extent does the use of chatbots contribute to the development of students' speaking skills?
2. How do adaptive systems and automated assessment tools enhance vocabulary and academic writing?
3. What challenges do students and instructors face when using AI technologies in ESP?

## 1.4 Study Objectives

This study aims to achieve the following:

1. Determine the impact of employing AI technologies on the proficiency of ESP among students at the Libyan Academy for Graduate Studies – Derna Branch.
2. Measure the effect of chatbots on developing students' speaking skills within the ESP context.
3. Assess the role of adaptive systems and automated assessment tools in improving students' vocabulary and academic writing skills.
4. Explore the educational and technical challenges faced by students and instructors when using AI technologies in ESP learning.
5. Propose practical recommendations for effectively integrating AI to support ESP learning in Libyan higher education institutions, considering individual differences and students' linguistic backgrounds.

## 1.5 Significance of the Study

The significance of this study is divided into two aspects

### 1.5.1 Scientific Significance

The study addresses a clear knowledge gap in the literature regarding the use of AI technologies in ESP learning, particularly within the Arab and Libyan contexts. It provides empirical evidence on the impact of these technologies on overall language proficiency, including comprehension, application, and academic and professional communication, with attention to students' diverse linguistic and cognitive backgrounds. The study also expands knowledge of AI tools—such as chatbots, adaptive systems, and automated assessment tools—in supporting ESP learning, adding value to academic fields related to foreign language instruction in developing educational environments.

## **1.5.2 Practical Significance**

Practically, the study offers actionable findings for improving teaching practices and developing educational policies that better meet students' needs in Libyan higher education institutions. It guides instructors and curriculum planners on how to effectively integrate AI technologies within ESP programs while considering technical challenges, students' varying language abilities, and the teacher's guiding role. Additionally, the study provides practical recommendations to enhance self-directed learning, improve language proficiency, increase student motivation, and create a more flexible, interactive learning environment that boosts the effectiveness of specialized English programs.

## **1.6 Study Hypotheses**

### **1.6.1 Main Null Hypothesis**

**H01:** Employing AI technologies has no effect on improving ESP proficiency among students at the Libyan Academy for Graduate Studies – Derna Branch.

### **1.6.2 Sub-Null Hypothesis**

**H01.1:** Using chatbots has no effect on developing students' speaking skills within the ESP context.

**H01.2:** Adaptive systems and automated assessment tools do not contribute to improving students' vocabulary and academic writing skill.

**H01.3:** There are no significant challenges faced by students and instructors when using AI technologies in ESP learning.

## **2.0 Literature Review**

### **2.1 Artificial Intelligence in Higher Education**

AI has become an integral component of higher education systems, contributing to the reshaping of teaching and learning methods through adaptive learning, learning analytics, and intelligent assessment. AI in education refers to the use of computer systems capable of simulating certain human cognitive abilities to support teaching and learning processes and enhance their outcomes. Literature indicates that the true value of these technologies lies in their ability to personalize learning according to learners' characteristics, rather than replacing the human role of university instructors; instead, they support and enhance it (Holmes et al., 2019)

### **2.2 English for Specific Purposes**

ESP is an educational approach that focuses on meeting the language needs associated with particular academic or professional contexts. It is based on a precise analysis of learners' needs and the nature of the specialized discourse they are expected to use. This type of instruction differs from general English in terms of objectives and content, emphasizing specialized vocabulary, academic writing, and communication skills related to the field of study (Hylans, 2022).

### **2.3 AI Technologies and Language Skill Development:**

This axis emphasizes the role of AI technologies in developing language skills within the ESP context, integrating the skills into a unified framework to avoid redundancy. Research indicates that chatbots provide continuous interactive opportunities that enhance speaking skills by reducing language anxiety and promoting autonomous

practice. Adaptive systems and automated assessment also play a significant role in vocabulary development and academic writing through immediate and personalized feedback, helping students improve linguistic accuracy and text coherence (Sun et al.,2020).

## **2.4 Challenges of Integrating AI in Language Education:**

Despite the educational benefits, AI applications in language teaching face several challenges, including ethical concerns related to privacy, content credibility, and academic integrity, as well as digital divides and unequal access to technology. Furthermore, excessive reliance on intelligent systems may weaken learners' critical thinking skills and academic independence if their use is not regulated within a clear educational framework (Kasneci et al.,2023).

## **2.5 Previous Studies**

The study by Jmaiel et al. (2025) examined the role of ChatGPT in enhancing ESP writing skills among university students, focusing on gender and academic major differences. The study employed a quantitative quasi-experimental pretest–posttest design with a single group, involving 117 students from Northern Border University, Saudi Arabia. Results showed statistically significant improvements across all dimensions of writing skills after using ChatGPT, with female students outperforming male students slightly. Differences based on academic major were limited, although IT students showed relatively higher gains. The study recommended integrating AI tools into ESP instruction while considering individual and academic differences and called for further research using more rigorous experimental designs

The study by Zhyhadlo & Zaiarna (2025) explored the effectiveness of AI, particularly ChatGPT, in generating assessment tasks for specialized vocabulary in EFL/ESP classrooms. The study used both theoretical and applied analytical approaches and evaluated task quality according to Bachman and Palmer's criteria (appropriacy, reliability, interactional validity, practicality, and impact). Findings indicated that AI-generated tasks generally met appropriacy, practicality, and interaction standards but showed limitations in reliability due to potential multiple correct answers. The study emphasized the critical role of human intervention in guiding input prompts to improve AI outputs.

Haryani & Emha (2025) aimed to design an AI-integrated interactive e-book for ESP instruction in health sciences and to assess its effectiveness in enhancing students' speaking performance. The study followed a Research & Development (R&D) methodology, applied to 58 students at Madani University, Indonesia. Results revealed significant improvement in speaking skills and high student satisfaction with the adaptive and interactive nature of the e-book, despite some technical challenges. The study recommended expanding this model to other ESP fields while improving technical infrastructure.

The study by Ahmed et al. (2015) conducted a systematic literature review to examine the impact of AI learning tools on ESL learners' motivation and academic success. Analyzing 35 recent studies, the review found that AI tools significantly enhanced learner motivation, vocabulary acquisition, writing, pronunciation, and self-directed learning. However, challenges were identified, including unequal access to technology and the risk of overreliance on AI, highlighting the need to integrate AI tools with traditional teaching methods.

Finally, Safitri et al. (2025) investigated the effect of AI chatbots on English speaking proficiency through a systematic review following PRISMA guidelines. Results indicated that AI chatbots provide a low-anxiety, interactive environment that improves fluency, pronunciation, and immediate feedback, with positive learner perceptions. Nevertheless, the study noted the limitations of chatbots in replicating cultural and emotional depth and recommended using them as complementary tools within a comprehensive instructional framework.

## **3.0 Methodology**

This section presents the practical framework representing the applied aspect through which the researcher aimed to test the validity of theoretical hypotheses and measure the actual impact of AI techniques in the educational environment. This phase derives its importance from capturing the real experiences of graduate students at the Libyan Academy for Graduate Studies – Derna Branch, thereby contributing to bridging the knowledge gap related to teaching ESP in the local context.

### 3.1 Research Design

The field study relies on a quantitative descriptive-analytical approach, employing a questionnaire as the primary tool to investigate participants' opinions and practices. This framework emphasizes the necessity of examining the interaction between independent variables (AI techniques) and dependent variables (ESP learning efficiency), while considering potential technical and pedagogical challenges that may arise during the process.

### 3.2 Sampling Strategy and Sample

Simple random sampling strategy was applied in this study. The selection of the study sample was based on students' academic majors and linguistic backgrounds, ensuring diverse perspectives on the use of AI technologies. The study sample consisted of 65 participants.

### 3.3 Data Collection Instruments

#### 3.3.1 Questionnaire Design

In the current study, a questionnaire was as a main instrument to collect the required data. The questionnaire was purposefully designed and consisted of three main section addressing the major axes of the study. The first section focused on Use of AI techniques and contained 8 items. The second section examined ESP learning efficiency and contained 6 items. The third section explored challenge Use and contained 5 items. The questionnaire was administered online. It was sent into Libyan Academy for Graduate Studies-Derna.Education Groups via Whatsapp platform.

#### 3.3.2 Questionnaire Validity and reliability

Seeking the verification of of the questionnaire items validity, the researcher sent a copy of the research objectives and questions with the questionnaire to six university teachers to check them. Neuman (2006:192) pointed out that face validity refers to the evaluation and the judgment of the scientific committee that the measurement instrument really measures what it is intended to measure. The teachers were asked to judge the degree to which the questionnaire items serve the research questions and the study objectives. luckily, the instructors' feedback showed that all the questionnaire items are valid.

For the sake of checking reliability of the administered questionnaire, Cronbach's alpha test was conducted. This test is a well-known tool to check internal consistency of the questionnaire. It investigates the inter-correlation among the items of the questionnaire.

Andrew, et al. (2011) mentioned that Cronbach's alpha test measures how closely a set of items are related as a group and the extent to which such items measure the same phenomenon. Verifying the internal consistency by Cronbach's alpha requires variance proportion ranging between 0 to 1 in value.

To ensure the reliability of the research tool, **Cronbach's Alpha** coefficients were calculated for each axis and dimension. The results, as detailed in the table below, indicate a high level of internal consistency across all sections of the instrument.

Table 1. Cronbach's Alpha Coefficients

Axis / Dimension	Number of Items	Cronbach's Alpha	Reliability Level
First Axis: Use of AI Techniques	8	0.84	High
Dimension 1: Automated Chatbots	4	0.96	Excellent

Axis / Dimension	Number of Items	Cronbach's Alpha	Reliability Level
Dimension 2: Adaptive Systems and Assessment Tools	4	0.91	Excellent
<b>Second Axis: ESP Learning Efficiency</b>	<b>6</b>	<b>0.81</b>	<b>Very Good</b>
Dimension 1: Speaking Skills Proficiency	3	0.94	Excellent
Dimension 2: Vocabulary and Academic Writing Proficiency	3	0.96	Excellent
<b>Third Axis: Challenges of Use</b>	<b>5</b>	<b>0.94</b>	<b>Excellent</b>
<b>Overall Instrument</b>	<b>19</b>	<b>0.89</b>	<b>Excellent</b>

The high Cronbach’s Alpha coefficients indicate that the research instrument demonstrates a strong level of internal consistency, reflecting the homogeneity of the items and their ability to accurately measure the intended constructs. In this regard, Andrew, et al. argued that " in the social sciences, values at or above 0.7 are desirable". Thus, in turn, this line indicates that the items of the questionnaire are internally consistent and therefore, the questionnaire is reliable. Furthermore, the excellent values obtained across the axes and dimensions confirm that the instrument is reliable and suitable for application in examining the impact of AI technologies on learning ESP.

### 3.3.3 Normality of Data Distribution

The **Kolmogorov-Smirnov (K-S)** test was employed to determine whether the data followed a normal distribution. At a significance level of  $\alpha = 0.05$ , all variables and dimensions showed significance values (Sig.) greater than 0.05, confirming that the data follows a normal distribution and is suitable for parametric statistical testing.

*Table2. Kolmogorov-Smirnov (K-S) Test Results*

Variable / Axis / Dimension	Z-Value (K-S Test)	Significance (Sig.)	Distribution Result
<b>First Axis: AI Techniques Usage</b>	1.025	0.244	Normal
Dimension 1: Automated Chatbots	1.114	0.166	Normal
Dimension 2: Adaptive Systems and Assessment Tools	1.210	0.107	Normal
<b>Second Axis: ESP Learning Efficiency</b>	0.985	0.286	Normal

**The Impact of Using Artificial Intelligence Technologies on the Proficiency of Learning English for Specific Purposes (ESP): A Field Study on the Students of the Libyan Academy for Graduate Studies – Derna Branch**

---

Variable / Axis / Dimension	Z-Value (K-S Test)	Significance (Sig.)	Distribution Result
Dimension 1: Speaking Skills Proficiency	1.341	0.055	Normal
Dimension 2: Vocabulary and Academic Writing Proficiency	1.250	0.088	Normal
<b>Third Axis: Challenges of Use</b>	0.875	0.428	Normal

The results of the Kolmogorov–Smirnov test indicate that all variables, axes, and dimensions are normally distributed, as the significance values exceeded the threshold of  $\alpha = 0.05$ . This confirms the fulfillment of the normality assumption required for parametric statistical analyses. Accordingly, the data are statistically appropriate for applying parametric tests to examine relationships and differences among the study variables.

### 3.4 Data Analysis

SPSS software program was utilized to analyse the quantitative data obtained using the questionnaire. Landau and Everitt (2014) indicated that SPSS is a widely used, user-friendly software package for the manipulation and statistical analysis of data, including the production of tables, figures, and charts.

## 4.0 Results and Discussion

In this section, the analysed data were represented and discussed.

### 4.1 Quantitative Data Representation

#### 4.1. Sample Demographic Profile

The study sample consisted of 65 participants. The demographic breakdown by gender, specialization, and AI usage frequency is presented in the following table.

*Table 3. The Demographic Profile of the Study Sample*

Variable	Category	Frequency	Percentage (%)
<b>Gender</b>	Male	34	52.3%
	Female	31	47.7%
<b>Specialization</b>	Humanities	25	38.5%
	Scientific/Technical	31	47.7%

Variable	Category	Frequency	Percentage (%)
	Other	9	13.8%
Usage Level	Low (Rarely/Never)	13	20.0%
	Moderate (Sometimes)	15	23.1%
	High (Regularly/Daily)	37	56.9%

The demographic profile of the sample indicates that the number of participants reached 65, with a relatively balanced distribution between males and females, reflecting an acceptable level of gender representation. The results also reveal diversity in academic specializations, with a predominance of scientific and technical fields, which enhances the comprehensiveness of the sample. Moreover, the levels of artificial intelligence usage show that more than half of the participants use AI technologies regularly or on a daily basis, supporting the suitability of the sample for investigating the use of AI in learning (ESP).

#### 4.2.1 Descriptive Statistical Analysis

The following sections provide the mean scores and standard deviations for the items within each axis, ranked by their relative importance and agreement levels.

##### 4.2.1.1 Axis 1: Use of AI Techniques

The overall mean for this axis was **3.83**, indicating a general level of "Agreement" among participants regarding the utility of AI techniques.

*Table 4. Participants' Utility of AI techniques*

No.	Item Description	Mean	Std. Dev.	Rank	Agreement
1	Chatbot applications provide a safe and interactive environment.	3.92	0.69	4	Agree
2	Immediate feedback assists in real-time error correction.	4.08	0.64	3	Agree
3	Conversing with AI enhances linguistic fluency.	4.11	0.62	1	Agree
4	Chat tools simulate authentic communicative scenarios.	4.11	0.71	2	Agree

**The Impact of Using Artificial Intelligence Technologies on the Proficiency of Learning English for Specific Purposes (ESP): A Field Study on the Students of the Libyan Academy for Graduate Studies – Derna Branch**

No.	Item Description	Mean	Std. Dev.	Rank	Agreement
-	<b>Mean: Automated Chatbots Dimension</b>	<b>4.06</b>	<b>0.50</b>	-	<b>Agree</b>
5	Adaptive systems aid in memorizing technical terminology.	3.60	0.81	7	Agree
6	Automated assessment tools improve grammatical structures.	3.45	0.87	8	Neutral
7	AI provides accurate suggestions for paragraph coherence.	3.63	0.91	6	Agree
8	Smart proofreading reduces time spent on editing.	3.72	0.94	5	Agree
-	<b>Mean: Adaptive Systems Dimension</b>	<b>3.60</b>	<b>0.50</b>	-	<b>Agree</b>

The results indicate that the overall mean for this axis reached 3.83, reflecting a general level of agreement among participants regarding the effectiveness of artificial intelligence techniques in supporting learning. The automated chatbots dimension recorded the highest mean (4.06), indicating a strong perception of their role in enhancing linguistic fluency and simulating authentic communicative situations. In contrast, the adaptive systems and assessment tools dimension achieved a good mean score (3.60), with some items tending toward neutrality, particularly in relation to improving grammatical structures, suggesting the need for further development in this aspect.

#### 4.2.1.2 Axis 2: ESP Learning Efficiency

Participants generally agreed that AI positively impacts their ESP learning efficiency, with an overall mean of 3.63.

*Table5. AI Impact on Participants' ESP Learning Efficiency*

No.	Item Description	Mean	Std. Dev.	Rank	Agreement
9	Accurate use of specialized terminology.	3.58	0.88	4	Agree
10	Ability to manage academic discussions.	3.14	0.77	6	Neutral
11	Clear expression of scientific opinions.	3.35	0.82	5	Neutral
-	<b>Mean: Speaking Skills Dimension</b>	<b>3.36</b>	<b>0.50</b>	-	<b>Neutral</b>

No.	Item Description	Mean	Std. Dev.	Rank	Agreement
12	Utilization of a linguistically rich vocabulary.	3.97	0.71	2	Agree
13	Adherence to academic writing standards.	4.02	0.67	1	Agree
14	Formulation of accurate scientific summaries.	3.74	0.69	3	Agree
-	<b>Mean: Vocabulary &amp; Writing Dimension</b>	<b>3.91</b>	<b>0.50</b>	-	<b>Agree</b>

The findings for Axis 2 indicate that participants generally agreed on the positive impact of artificial intelligence on ESP learning efficiency, with an overall mean of 3.63. The speaking skills dimension yielded a neutral mean (3.36), suggesting moderate perceived improvement, particularly in managing academic discussions and clearly expressing scientific opinions. In contrast, the vocabulary and academic writing dimension achieved a high level of agreement (mean = 3.91), reflecting strong perceived benefits of AI in enhancing specialized vocabulary use, adherence to academic writing conventions, and the formulation of accurate scientific summaries.

#### 4.2.1.3 Axis 3: Challenges of Use

Interestingly, participants generally "Disagreed" with the statements regarding challenges, suggesting that the perceived barriers are not overwhelmingly prohibitive (Overall Mean: **2.53**).

*Table6. Challenges Associated with Using AI*

No.	Item Description	Mean	Std. Dev.	Rank	Agreement
15	Infrastructure weaknesses limit technical benefits.	2.43	0.97	5	Disagree
16	Dependence leads to a decline in analytical skills.	2.49	1.00	4	Disagree
17	Difficulty in verifying AI-generated information.	2.63	1.04	1	Disagree
18	Lack of socio-cultural context understanding.	2.55	0.97	2	Disagree
19	Anxiety regarding digital security and privacy.	2.52	1.00	3	Disagree

**The Impact of Using Artificial Intelligence Technologies on the Proficiency of Learning English for Specific Purposes (ESP): A Field Study on the Students of the Libyan Academy for Graduate Studies – Derna Branch**

The results for Axis 3 reveal that participants generally disagreed with the statements related to challenges associated with the use of artificial intelligence, as reflected by an overall mean of 2.53. This indicates that the perceived obstacles are not considered substantial barriers to AI adoption in ESP learning. Although some concerns were noted—particularly regarding the verification of AI-generated information and socio-cultural contextual understanding—their impact remained limited and did not significantly hinder effective use.

**4.3.0 Hypothesis Testing and Inferential Statistics**

The study tested several hypotheses to explore the relationships between variables.

**4.3.1 Correlation Analysis and Multiple Regression Analysis Table**

A Pearson correlation test revealed a statistically significant positive relationship ( $R = 0.331$ ,  $p = 0.007$ ) between the use of AI techniques and ESP learning efficiency.

*Table7. Multiple Regression Analysis*

Independent Variable (AI Tool)	Beta ( $\beta$ )	t-value	Sig. (p)	Result
Interactive Chatbots	0.42	3.56	0.001**	Significant Strong Impact
Adaptive Systems	0.08	0.65	0.518	Non-Significant

This table illustrates the predictive power and relative weight of each AI tool on learning efficiency. The results of the multiple regression analysis indicate that interactive chatbots are the most powerful predictors of learning efficiency, as reflected by a high beta value and strong statistical significance ( $\beta = 0.42$ ,  $p = 0.001$ ). In contrast, adaptive systems did not demonstrate a significant predictive effect, showing a low and non-significant beta value ( $\beta = 0.08$ ,  $p = 0.518$ ). These findings suggest that the effectiveness of AI technologies in enhancing learning efficiency is more strongly associated with interactive tools than with adaptive systems.

**4.3.2 Detailed Hypothesis Decisions**

*Table8. Hypothesis Testing Results*

Hypothesis	Description	Statistical Value	Sig.	Decision
H01.1	Impact of Chatbots on Speaking Skills	$R = 0.308$	0.013	Reject Null
H01.2	Impact of Adaptive Systems on Writing	$R = 0.039$	0.756	Accept Null
H01.3	Presence of Significant Challenges	$T = -8.45$	0.000	Reject Null

The hypothesis testing results indicate the following decisions:

H01.1 – Impact of Chatbots on Speaking Skills: A positive correlation was found ( $R = 0.308$ ,  $Sig. = 0.013$ ), leading to the rejection of the null hypothesis, which confirms that chatbots significantly enhance speaking skills.

H01.2 – Impact of Adaptive Systems on Writing: The correlation was negligible ( $R = 0.039$ ,  $Sig. = 0.756$ ), resulting in acceptance of the null hypothesis, indicating that adaptive systems did not show a significant effect on writing proficiency.

H01.3 – Presence of Significant Challenges: The t-test result ( $T = -8.45$ ,  $Sig. = 0.000$ ) leads to rejection of the null hypothesis, confirming that participants perceive challenges associated with AI use, though earlier descriptive results suggested these challenges are not strongly prohibitive.

## 4.4 Comparative Analysis

### 4.4.1 Gender (Independent Samples T-Test):

The analysis showed a statistically significant difference ( $p = 0.000$ ) in the usage of AI techniques between genders, with females (**Mean = 3.98**) showing a higher usage level than males (**Mean = 3.69**).

Table9. The Independent Samples T-Test Results.

Variable	Gender	Mean	Std. Dev.	T-Value	Sig.
AI Techniques Usage	Male	3.69	0.31	-3.883	0.000
	Female	3.98	0.28		

The independent samples t-test revealed a statistically significant difference in the usage of AI techniques between genders ( $T = -3.883$ ,  $Sig. = 0.000$ ). Females reported a higher mean usage level (Mean = 3.98) compared to males (Mean = 3.69), indicating that female participants engage more frequently with AI technologies in the context of ESP learning.

### 4.4.2 Effect Size Table (Gender Comparison):

Table10. The Cohen's d value Result

Statistical Measure	Value	Interpretation
Cohen's d	0.75	Large Effect Size

This table measures the magnitude of the difference in AI adoption between female and male students. The effect size analysis reveals a substantial gender-based difference in the adoption of AI technologies among students. The Cohen's d value of 0.75 indicates a large effect size, suggesting that the observed difference is not only statistically meaningful but also practically significant. Overall, this result demonstrates a clear and notable advantage in AI technology adoption in favor of female students compared to their male counterparts.

### 4.4.3 One-Way ANOVA Table (Academic Specialization)

This table compares the improvement in learning efficiency across different academic majors.

Table 11. Learning Efficiency Progress across Different Academic Majors.

Academic Specialization	Mean Improvement	F-value	Sig. (p)
Scientific/Technical	4.10	4.32	0.023*
Humanities	3.65	-	-
Other Majors	3.40	-	-

The results indicate statistically significant differences in learning efficiency improvement across academic specializations. Students in scientific and technical majors achieved the highest mean improvement ( $M = 4.10$ ), outperforming those in humanities ( $M = 3.65$ ) and other majors ( $M = 3.40$ ). The significant F-value ( $F = 4.32$ ,  $p = 0.023$ ) confirms that academic specialization plays a meaningful role in learning efficiency, with a clear advantage in favor of scientific and technical disciplines.

### 4.5 Major Findings

The researcher arrived at several key findings that reflect the impact of AI use on ESP learning:

- A significant positive correlation exists between the use of AI techniques and ESP learning efficiency ( $R = 0.331$ ).
- Interactive chatbots were identified as the most influential tools for enhancing fluency and simulating authentic communicative situations (Mean = 4.06).
- The vocabulary and academic writing dimension achieved the highest level of agreement regarding AI benefits (Mean = 3.91).
- Significant gender differences were observed in AI usage, with females using AI technologies more frequently than males.
- Adaptive systems and automated assessment tools showed no significant effect on writing skills ( $R = 0.039$ ).
- Although participants were aware of some challenges, such as verifying information or digital privacy concerns, these were not considered major obstacles to effective AI adoption (Mean = 2.53).
- Hypothesis testing revealed that chatbots positively affect speaking skills, whereas adaptive systems did not show a significant impact on writing. Challenges were acknowledged but were not perceived as major or critical by the participants.

### 5.0 Conclusion

The study results indicated that the use of AI techniques has a clear positive impact on the efficiency of ESP among graduate students at the Libyan Academy for Graduate Studies – Derna Branch. Statistical analyses revealed a significant positive correlation between the level of AI tool usage and linguistic skill proficiency, reflecting the capacity of these technologies to support the development of specialized language skills in a professional-academic context. Participants emphasized that interactive chatbots provide an engaging environment that reduces speaking anxiety and effectively enhances fluency, aligning with previous studies such as Safitri et al. (2025) and Haryani & Emha (2015). Additionally, the study highlighted the role of AI tools in promoting specialized vocabulary acquisition and adherence to academic writing standards, consistent with the findings of Ahmed et al. (2025) and Jmaiel et al. (2025).

However, adaptive systems and automated assessment tools did not show a significant impact on writing skills, differing from some studies that underscored the role of immediate feedback in improving linguistic accuracy. The study also revealed that participants did not perceive technical challenges, information verification difficulties, or digital privacy concerns as substantial barriers to AI use, as evidenced by the low mean ratings, indicating general acceptance of the technologies with limited awareness of potential challenges. Regarding gender differences, females demonstrated higher usage of AI technologies compared to males, reflecting statistically significant differences in line with prior research. Notably, the study adopted a comprehensive approach to language skills, addressing speaking, vocabulary, and academic writing within a unified framework, thereby addressing part of the research gap in the Libyan and Arab context, which suffers from a scarcity of in-depth field studies in ESP education.

## **5.1 Recommendations**

Based on the study findings, the researchers recommend the following:

- Integrate chatbots into ESP curricula as a core tool to develop speaking skills, enhance fluency, and reduce language anxiety among students.
- Improve adaptive systems and automated assessment tools to strengthen writing skills, considering their currently limited effectiveness in the field study results.
- Emphasize the instructor's role as a guide and supervisor, ensuring that AI is used as a supportive tool rather than a replacement, to maintain the accuracy and cultural relevance of outputs.
- Enhance technical infrastructure and provide continuous training for students and faculty to reduce digital anxiety and ensure optimal use of intelligent tools.
- Develop flexible educational policies that support self-directed learning and accommodate rapid technological advancements in alignment with labor market needs and the diverse linguistic backgrounds of students.

## **6.0 References**

- Ahmed, I., Ghafoor, A., Liliuara, D., & Akyuningrum, V. Q. (2025). The impact of AI learning tools on ESL learners' motivation and success: A systematic literature review. *English Learning Innovation (englie)*, 6(1), 134–142.
- Andrew, D., McEvoy, C. & Pederson, P. (2011). *Research Methods and Design in Sport Management*. United States, Human Kinetics
- Avsheniuk, N., Seminikhyna, N., Ruban, L., & Sviatiuk, Y. (2025). Exploring overreliance on AI tools in English for Specific Purposes courses: Challenges and implications for learning and academic integrity. *Arab World English Journal*, Special Issue on Artificial Intelligence, 3–20. <https://doi.org/10.24093/awej/AI.1>
- Guzmán, M. V., & Naranjo Andrade, S. S. (2025). The impact of artificial intelligence on English language learning: A systematic review of tools, methods, and outcomes in language skills. *Runas Journal of Education & Culture*, 6(12), e250287.
- Haryani, S., & Emha, M. R. (2025). Designing AI-integrated e-book for English for specific purposes (ESP) in health science education. *English Language Teaching Educational Journal*, 8(2), 118–132. <https://doi.org/10.12928/eltej.v8i2.14229>
- Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promise and implications for teaching and learning*. Center for Curriculum Redesign. ISBN 978-1794293700.
- Hyland, K. (2022). English for Specific Purposes: What is it and where is it taking us? *ESP Today-Journal of English for Specific Purposes at Tertiary Level*, 10(2), 202–220. <https://doi.org/10.18485/esptoday.2022.10.2.1>

**The Impact of Using Artificial Intelligence Technologies on the Proficiency of Learning English for Specific Purposes (ESP): A Field Study on the Students of the Libyan Academy for Graduate Studies – Derna Branch**

---

- Jmaiel, H. A., Abukhait, R. O., Mohamed, A. M., Shaaban, T. S., Al-khresheh, M. H., & Al-Qadri, A. H. (2025). The role of ChatGPT in enhancing EFL students' ESP writing skills: An experimental study of gender and major differences. *Discover Education*, 4, 240. <https://doi.org/10.1007/s44217-025-00700-6>
- Kasneci, E., Seßler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T., Nerdel, C., Pfeffer, J., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., Stadler, M., Weller, J., Kuhn, J., & Kasneci, G. (2023). ChatGPT for Good? On opportunities and challenges of large language models for education. *Learning and Individual Differences*, 103, Article 102274. <https://doi.org/10.1016/j.lindif.2023.102274>
- Landau, S., & Everitt, B. S. (2004). *A handbook of statistical analyses using SPSS*. Chapman & Hall/CRC.
- Neuman, W. L. (2006) *Social Research Methods: Qualitative and Quantitative Approaches* (6th ed.) Pearson International Edition, USA.
- Sun, Y., Yu, J., & Wang, X. (2020). Understanding the determinants of learner engagement in online collaborative learning platforms. *Computers & Education*, 150, Article 103862. <https://doi.org/10.1016/j.compedu.2020.103862>
- Safitri, E. I., Hidayati, S., & Ciptaningrum, D. S. (2025). The impact of AI chatbots on English language learners' speaking proficiency: A systematic review. *Journal of Research on English and Language Learning (J-REaLL)*, 6(2), 317–329. <https://doi.org/10.33474/j-reall.v6i2.23866>
- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education – where are the educators? *International Journal of Educational Technology in Higher Education*, 16, Article 39. <https://doi.org/10.1186/s41239-019-0171-0>
- Zhyhadlo, O., & Zaiarna, I. (2025). Artificial Intelligence-driven testing in EFL/ESP classrooms. *Information Technologies and Learning Tools*, 106(2), 122–133. <https://doi.org/10.33407/itlt.v106i2.5957>

## أثر استخدام تقنيات الذكاء الاصطناعي على كفاءة تعلم اللغة الإنجليزية لأغراض محددة (ESP): دراسة ميدانية على طلاب فرع درنة بالأكاديمية الليبية للدراسات العليا

أسماء رمضان محمود البلعزي

قسم اللغة الإنجليزية، كلية التربية، جامعة المرقب، ليبيا

### الملخص

تبحث هذه الدراسة في أثر استخدام تقنيات الذكاء الاصطناعي على كفاءة تعلم اللغة الإنجليزية لأغراض خاصة (ESP) لدى طلاب الأكاديمية الليبية للدراسات العليا - فرع درنة. اعتمدت الدراسة المنهج الوصفي التحليلي الكمي، وطُبقت على عينة مكونة من 65 طالباً وطالبة من مختلف التخصصات العلمية والإنسانية، باستخدام استبيان كأداة رئيسة لجمع البيانات وأظهرت النتائج وجود ارتباط إيجابي معنوي بين استخدام تقنيات الذكاء الاصطناعي وتحسين كفاءة تعلم اللغة الإنجليزية لأغراض خاصة. وجاءت روبوتات الدردشة التفاعلية (Chatbots) في المرتبة الأولى كأكثر الأدوات تأثيراً في تعزيز الطلاقة اللغوية ومحاكاة مواقف التواصل الحقيقية. كما سجل بُعد المفردات والكتابة الأكاديمية أعلى مستوى من الموافقة فيما يتعلق بفوائد الذكاء الاصطناعي وعلى صعيد الفروق الفردية، كشفت الدراسة عن تفوق الإناث في معدلات استخدام تقنيات الذكاء الاصطناعي مقارنة بالذكور. وفي المقابل، أظهرت النتائج عدم وجود أثر ملموس للأنظمة التكيفية وأدوات التقييم الآلي على مهارات الكتابة تحديداً. أما بالنسبة للتحديات، فقد تبين أن العوائق التقنية أو مخاوف الخصوصية لم تكن عائقاً كبيراً أمام تبني هذه التقنيات لدى الطلاب توصي الدراسة بضرورة دمج روبوتات الدردشة في المناهج الدراسية، مع تطوير الأنظمة التكيفية لتعزيز مهارات الكتابة، والتأكيد على دور الأستاذ كوجه لضمان الاستخدام الأمثل لهذه الأدوات كداعم لا كبديل للعملية التعليمية

استلمت الورقة بتاريخ 2026/05/14، وقبلت بتاريخ 2026/06/01، ونشرت بتاريخ 2026/06/02

**الكلمات المفتاحية:**  
الذكاء الاصطناعي، اللغة الإنجليزية لأغراض خاصة (ESP)، كفاءة التعلم، الأكاديمية الليبية للدراسات العليا.