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Institutional Realities and the Transformative Potential of AI in ESP Instruction: Mohamed First University in Oujda as a Case Study

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Abstract

The demand for specialized language skills in the labor market is increasingly rapid, thereby it makes the integration of artificial intelligence (AI) into English for Specific Purposes (ESP) programs in higher education vital. This study examines opportunities and challenges of AI adoption at Mohammed First University (UMP) in Oujda. A qualitative approach was used. Data were collected through professor interviews via Google form. As the results of the analysis, it shows, first, that infrastructural gaps and limited teacher training remain major barriers to effective AI use. Second, AI tools proffer strong potential to support personalized learning and improve professional communication skills. According to the research findings, it indicates both the promise and the constraints of AI integration in ESP. Drawing on the evidence presented, the study concludes that institutional investment, faculty development, and clear policies are needed. Such measures therefore will ensure that AI adoption strengthens curriculum design and prepares students for academic and professional demands.

Keywords: artificial intelligence, English for specific purposes, higher education, curriculum design, teacher training, labor market, personalized learning

1. Introduction

In the 21st century, it is known that Artificial intelligence (AI) is transforming higher education by creating innovative teaching methods and supporting flexible learning, but many universities struggle to harness its potential due to inadequate digital infrastructure and limited teacher

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training (Bensalem & Rajhi, 2024). This study explores the case of Mohammed First University in Oujda (UMP). It examines how AI can support English for Specific Purposes (ESP) programs and what obstacles still remain. The study uses Vygotsky's socio-cultural theory as a guiding lens. Vygotsky shows that learning takes place through interaction and cultural tools. In this view, AI is not a replacement for teachers but a tool that mediates learning. It can guide students from what they can do alone to what they can achieve with support (McLeod, 2025).

Still, Moroccan universities face serious challenges. Internet access is uneven, resources are limited, and teachers often lack training in digital pedagogy (Li & Al-Mahrooqi, 2024). All the given barriers reduce the impact of AI in classrooms. AI often remains a theoretical concept rather than a practical learning tool. At the same time, there is a noticeable gap between university education and labor market expectations. Students must learn to write professional reports, deliver presentations, and adapt their language to different contexts. In this regard, AI tools, such as adaptive learning platforms and workplace simulation technologies, offer practical opportunities to address these demands by supporting skill development in realistic and interactive learning environments (Ana, Shadiev & Liang, 2024; Zhang & Wang, 2023).

This study, therefore, employs a qualitative interview to apprehend precise perspectives from ESP instructors. The main aim is to document barriers and highlight approaches that have shown success in similar contexts. The analysis delivers evidence-based recommendations to address implementation challenges. It optimizes educational benefits from AI integration. The study investigates how AI can enhance ESP programs at UMP, identifies structural and pedagogical barriers, and proposes strategies for effective integration.

It was hypothesized that (1) infrastructural deficits and limited teacher training reduce the effectiveness of AI integration, and (2) AI tools can enhance personalized learning and professional communication skills when supported via institutional investment and faculty development.

2. Literature Review

2.1. Benefits of AI in ESP Programs

Research on artificial intelligence (AI) in education shows both strong potential and serious challenges. In English for Specific Purposes (ESP), AI can create personalized learning, simulate professional contexts, and support communication skills. At the same time, many studies stress problems of access, training, and pedagogy.

2.1.1. *Personalized Learning through Adaptive Technologies*

Recent developments in digital tools have changed how students learn specialized languages. Some platforms now adjust to each learner's needs and help them focus on the most important content. Learners understand information more effectively when they are not overwhelmed with too much content at the same time (Sweller, 1988). When learning materials are carefully selected and organized, students can focus better and avoid confusion. Digital learning tools apply this principle by filtering unnecessary information and presenting content that matches the learner's current level. Platforms such as Knewton and Duolingo provide individualized practice activities based on students' progress and performance. In the Moroccan context, recent studies have reported improvements in students' vocabulary knowledge when such adaptive platforms are used, which suggests that personalized learning can support language development more effectively (Benlaghrissi & Ouahidi, 2023)

Yet, scholars such as Freire (2000) warn against turning learning into passive knowledge transfer. Personalized systems can build accuracy but may fail to encourage questioning and critical thinking. Within ESP, where language use must align with shifting workplace demands, this lack of depth may weaken students' ability to transfer skills into real-world contexts. For this reason, adaptive instruction should remain part of a broader strategy that supports inquiry and active learning.

2.1.2. *Simulated Professional Environments*

AI also supports ESP by creating workplace-like activities. Medical students practice with simulated patients, and business students engage in role-play tasks such as negotiations or presentations (Blaak et al., 2025). Technology based learning give learners confidence and expose them to professional vocabulary and tone. However, they often rely on scripted interactions. Workplace communication often involves improvisation and cultural differences, elements that current AI systems are still unable to fully replicate (Canagarajah, 2006). Simulations may therefore prepare students for controlled contexts but not for the complexity of real professional exchanges.

2.2. Structural Barriers

Unequal access to technology creates a significant barrier to improving education in Moroccan universities. Many Moroccan universities lack stable internet, modern equipment, or technical support (Agence de Développement du Digital, 2022). It leads to unequal educational

experiences among students. Learners in well-connected urban universities benefit from greater access to digital resources and learning opportunities, whereas students in rural or underfunded institutions face serious limitations. The consequences go beyond classroom learning; students without reliable access are less able to develop critical digital and professional skills required in today's labor market. Without targeted policies and investment to address these gaps, educational inequality will continue to grow, which limit the future opportunities and employability of disadvantaged students.

The lack of access affects more than just learning materials. It also impacts how teachers deliver lessons, communicate with students, and assess progress. In universities with poor technology, educators may struggle to use innovative methods or provide timely feedback. Students may feel isolated and less engaged, which leads to lower motivation and higher dropout rates. Thus, unequal access to technology risks deepening existing social and educational inequalities. If left unaddressed, students in underfunded universities may fall further behind their peers, which limits their future career opportunities.

The cost of using advanced digital platforms, including the equipment and technical support they require, causes a heavy burden for multiple universities. They usually come with high price tags, not only for the software licenses but also for the hardware needed to run them smoothly. Thus, without a well-organized plan at the national level to support universities, these expenses can become hard for some institutions to handle. When only a few universities can afford such technologies, the gap between wealthy and less wealthy schools grows even wider instead of shrinking.

2.3. Teacher Training and Pedagogy

Integrating AI into ESP instruction calls for pedagogical awareness and critical reflection (Zawacki-Richter et al., 2019). Teachers must not only know how to operate the tools but also understand how to use them in ways that enhance communication and learning outcomes. The use of such tools becomes superficial without a bottomless grasp of pedagogy. In Morocco, the lack of formal training in digital teaching methods limits educators' capacity to make full use of available technology. When teachers either avoid these tools or use them without clear purpose, the potential benefits for students diminish significantly.

Over-reliance on digital tools can weaken the teacher's role in guiding students (Ghazouani & Azaza, 2025). Human instructors are still essential because automated systems cannot fully

understand social signals, cultural meanings, or the different ways language is used in real life. Teachers provide important feedback that helps students connect what they learn in the classroom to real-world communication. When too much emphasis is placed on technology, instruction can become rigid, less flexible, and less responsive to students' individual needs. Therefore, the excessive reliance on digital tools can make learning mechanical, focusing only on repetitive exercises. Students may lose the chance to practice language in real-life situations or apply critical thinking to their work. Their ability to use language effectively and solve problems independently then becomes limited.

3. Materials and Methods

3.1. Participants

The study involved 12 ESP professors from Mohammed First University in Oujda. They represented different fields, including engineering, medicine, business, and Law. Professors were selected through purposive sampling to capture varied experiences with AI in teaching. This approach ensured diversity of perspectives across disciplines and provided a broad view of how AI is used in ESP classrooms.

3.2. Assessments and Measures

Data were collected through semi-structured interviews administered via Google Forms (See Appendix A and Appendix B). This format was chosen because it allowed participants to respond flexibly and at their own pace while ensuring consistency in the questions asked.

3.2.1. *Interview Guide*

The interview guide focused on four themes: the contribution of AI tools to ESP objectives, barriers faced by teachers and institutions, ethical concerns linked to AI, and recommendations for better integration. Questions were open-ended to encourage reflection and provide rich qualitative data.

3.2.2. *Procedure*

The Google Form was distributed electronically to participants. Professors completed the form within a two-week period. Responses were collected automatically and stored securely. This method reduced logistical constraints and ensured anonymity while still capturing detailed accounts of professors' experiences.

3.3. Research Design

The study followed a qualitative design within a mixed-methods framework. While the broader project acknowledges the value of combining quantitative and qualitative approaches, this phase relied solely on interviews. The design was guided by Creswell and Plano Clark's (2017) framework, which emphasizes triangulation and depth of understanding. This approach allowed the study to explore both observable barriers and subjective perceptions of AI integration.

3.4. Data Analysis

Interview responses were analyzed using thematic coding. The data were read several times to identify recurring ideas. Codes were then grouped into broader themes, including "perceived benefits," "structural barriers," "ethical concerns," and "institutional resistance." These themes provided insight into professors' experiences and highlighted common patterns across disciplines.

3.5. Ethical Considerations

Participation was voluntary, and informed consent was obtained from all participants. Data were collected anonymously through Google Forms, and confidentiality was maintained. The sample size is recognized as a limitation, and findings are not intended to be generalized to all Moroccan universities. Instead, they provide context-specific insights into the case of UMP.

4. Results

4.1. Demographic and Professional Profile Responses

As depicted in figure 1, among the 12 professors, most are between 30–39 years (33.3%) and 40–49 years (33.3%). A smaller group is under 30 (25%), while only one professor is 60 and above (8.3%). No participants report being in the 50–59 age range.

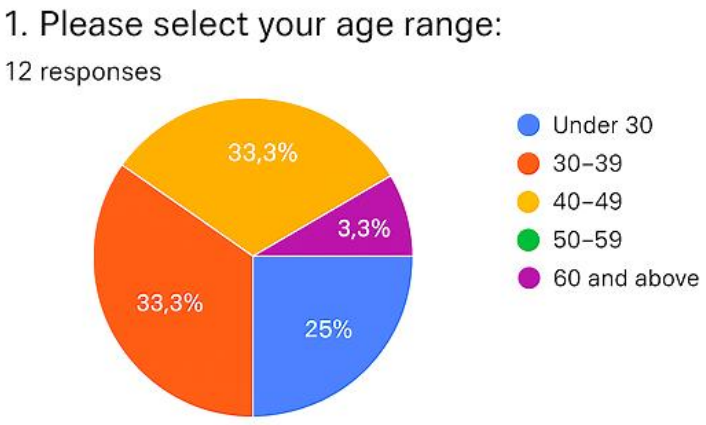

Figure 1. *Use of AI tools in ESP instruction.*

The sample consists of 58.3% female professors and 41.7% male professors, as displayed in figure 2.

The data in figure 3 indicates that teaching experience varies across respondents. The largest group (41.7%) has less than two years of ESP teaching experience. A quarter (25%) reports more than 10 years of experience, while 16.7% has between 2–5 years and another 16.7% has between 6–10 years.

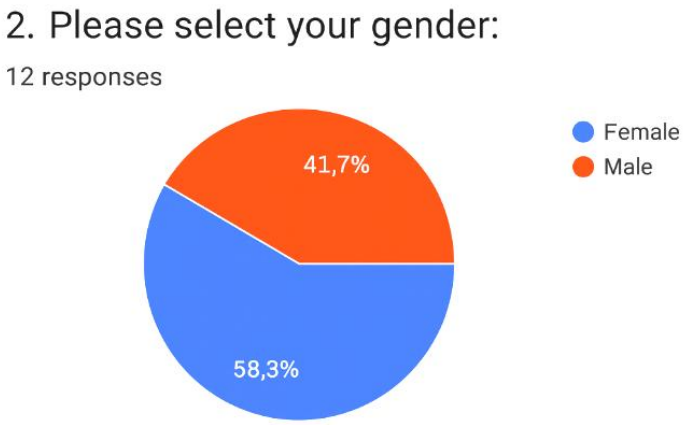

Figure 2. *Reported challenges in integrating AI into ESP teaching.*

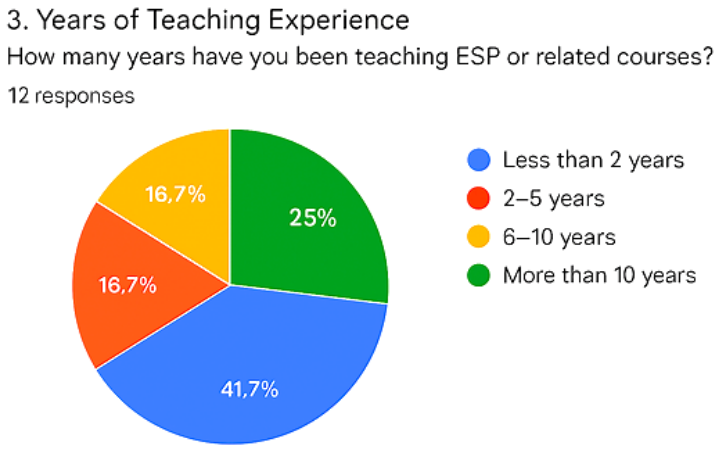

Figure 3. *Professors' self-assessment of AI training and preferred forms of support.*

As it is shown in figure 4, most of the surveyed teachers currently work at either the faculty of Medicine (FM) or ESEF, each making up 33.3% of the responses. EST and ENCG follow with 16.7% each. No responses were recorded for ENSA or FS.

Figure 5 shows that respondents represent a wide range of disciplines. Business is the most common fields are Engineering and Business (25%). For Economics and Computer Science there is (16,7 %). Other areas include Medicine and Law (each 8.3%).

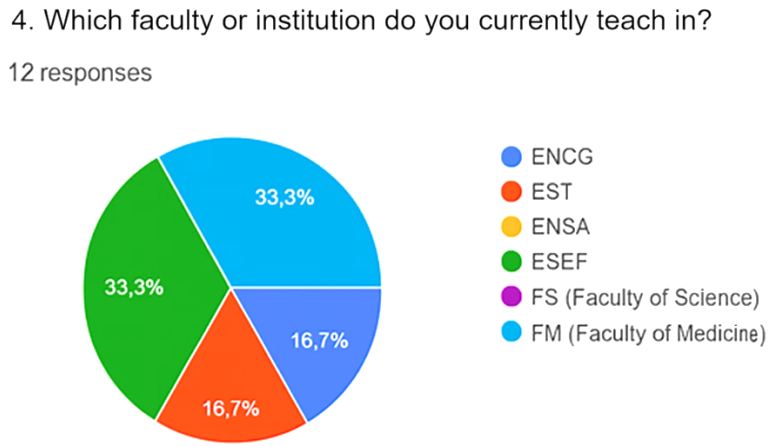

Figure 4. *Perceived impact of AI tools on students' professional communication skills.*

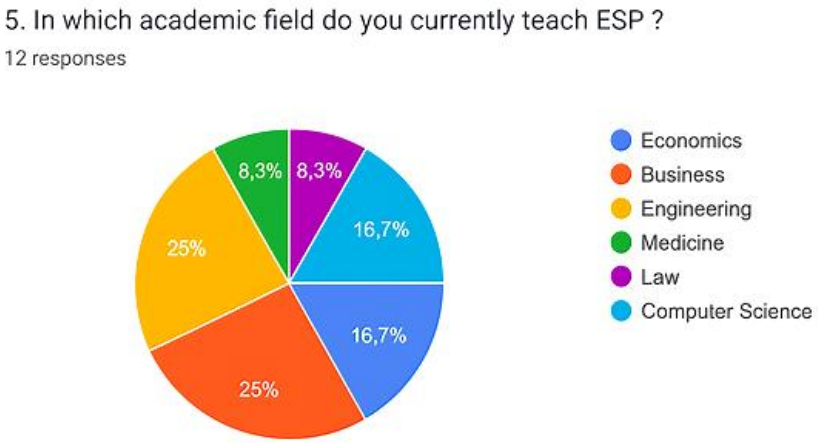

Figure 5. *Ethical concerns related to AI use in ESP instruction: Plagiarism, data privacy, and over-reliance.*

4.2. Interview Responses

4.2.1. *Use of AI Tools in ESP Teaching*

Participants reported using a variety of tools. As detailed in table 1, teachers mentioned ChatGPT, Grammarly, Copilot, Canva, and online games. They used these tools to prepare lessons, design materials, check grammar, and support vocabulary learning. Teachers shared different experiences and gave examples of how these tools helped their students.

4.2.2. *Training and Support Needs*

A lot of professors said they did not receive enough training. Some had a little experience, but most asked for help as indicated in table 2. They want workshops and support from their institutions. They believe training will help them use AI better in their teaching.

Table 1. *AI Tool Applications*

Category of Use	Representative Quote
Lesson planning	*"ChatGPT to generate lesson plans but with my ideas. It has great outcomes."*
Grammar correction	*"I use Grammarly to help students check their grammar and spelling in reports."*
Vocabulary and discipline focus	*"I use ChatGPT to look for learning situations or games that promote vocabulary."*
Student engagement	*"Copilot. It is very effective; students get engaged and motivated."*
Material design	*"I often use ChatGPT and Canva to design engaging materials."*

Table 2. *Challenges and Needs*

Challenges	Representative Quote
Lack of formal training	"I do not have any training on the use of AI tools."
Partial exposure	"Just partly."
Need for hands-on experience	"Yes, hands-on training."
Desire for institutional support	"I need training."

4.2.3. *AI and Professional Communication Skills*

Many teachers said, as shown in table 3, that AI helps students learn how to communicate in professional settings. Students use AI to write emails, prepare presentations, and practice interviews. They confirm that these activities help students learn real vocabulary and tone. They also feel more confident.

Table 3. *Skill Development*

Category of Skill	Representative Quote
Email writing	"Students can practice writing emails using ChatGPT."
Presentation preparation	"Preparing presentations… exposes them to authentic vocabulary and tone."
Interview simulation	"Engaging in simulated job interviews."
Confidence and awareness	"Students gain more confidence and awareness of how to communicate effectively."

4.2.4. *Ethical Concerns*

Respondents raise serious ethical concerns about AI in ESP instruction. The most cited issues include plagiarism, data privacy, and over-reliance on AI (table 4). Many worry that excessive

use of AI may hinder students' critical thinking and creativity. Educators emphasize the importance of guiding students to use AI responsibly.

Table 4. *Cautions About AI Use*

Concerns	Representative Quote
Plagiarism	"Students may copy AI-generated texts without proper citation."
Data privacy	"Most AI tools require user input and internet access."
Over-reliance	"I worry about students relying too much on AI."
Critical thinking loss	"I'm afraid the critical thinking will diminish."
Misuse and laziness	"Misuse of AI tool and over-reliance… laziness."

5. Discussion

5.1. AI's Potential and Role in ESP Instruction

Findings on technology in English for Specific Purposes (ESP) instruction show both potential and limitation. In fact, value appears not in novelty but in the way tools connect to teaching goals. For example, technology can add authenticity and relevance when tasks reflect professional communication. Simulations of workplace situations and immediate feedback create stronger engagement, yet at the same time success depends on alignment with objectives and teacher guidance.

In this regard, Vygotsky's theory of the Zone of Proximal Development explains how scaffolds support learners. Tools act as scaffolds that allow learners to move from independent ability to guided achievement. Differentiated support becomes possible, as feedback adapts to different levels of proficiency (McLeod, 2025). Scaffolds must remain temporary, though. The aim is skill internalization so that learners perform tasks without external aid. However, some teachers noticed a problem. Students sometimes depend too much on AI. They copy answers or follow suggestions without thinking. As a result, the scaffolding process fails. Instead of growing, students stay passive. They do not build their own skills. Teachers must step in and remind students to use AI as a tool, not as a shortcut.

A clear tension also appears between support and independence. Technology extends cognitive capacity and creates authentic practice, but on the other hand heavy dependence reduces critical thought and problem-solving. Automated suggestions may encourage passive acceptance rather

than active reflection. Therefore, balance is required so that learners benefit from support and still develop autonomy. Technology in ESP instruction should serve as a complement to teaching. Its role gains value when connected to clear goals, guided by teachers, and designed with authenticity.

5.2. Barriers and Constraints to AI Adoption

Barriers to the adoption of artificial intelligence in higher education reveal that technological promise is often constrained by systemic and contextual realities. The findings indicate that tools cannot be viewed as neutral interventions; rather, their effectiveness depends on the broader environment in which they are introduced. Infrastructural, pedagogical, and ethical dimensions interact to shape outcomes, demonstrating that adoption is a complex process rather than a straightforward technical upgrade.

Within the Moroccan higher education context, infrastructural limitations emerge as a significant constraint. Unstable internet connections and limited technical support reduce the reliability of digital tools, thereby restricting their integration into teaching and learning. In addition, pedagogical issues such as insufficient training for faculty and weak curriculum alignment further limit the capacity to leverage artificial intelligence.

Moreover, professors in engineering often find it easier to incorporate AI into learning activities. Students in these areas usually possess higher levels of digital literacy and are accustomed to working with digital tools, which allows them to engage with new systems more confidently. By contrast, law professors face other challenges. Their students focus more on reasoning and interpretation. AI sometimes gives answers that feel too simple or automatic. Teachers in law worry about plagiarism and over-reliance. They want students to think deeply and write in their own words. AI must be used with care in this field.

Learning culture and prior student experience play a paramount role. Learners enter higher education with distinct levels of familiarity with technology, shaped by their backgrounds and previous exposure. Consequently, in some contexts AI may be welcomed as a supportive resource, whereas in others it may be viewed with suspicion or resistance. Faculty readiness plays a decisive role, since teachers must mediate between technological possibilities and disciplinary norms, ensuring that integration strengthens rather than disrupts established practices.

5.3. Disciplinary Differences in AI Integration

The findings on disciplinary differences in the integration of artificial intelligence into higher education show that technology-mediated learning is shaped strongly by context. Adoption strategies cannot be uniform across all fields, because each discipline has its own teaching traditions, learning culture, and expectations. The effectiveness of integration depends not only on the digital literacy of students but also on the specific pedagogical practices that define a discipline. Disciplines with a strong technical orientation, such as engineering or computer science, often find it easier to incorporate artificial intelligence into learning activities. Students in these areas usually possess higher levels of digital literacy and are accustomed to working with digital tools, which allows them to engage with new systems more confidently. The situation differs in fields such as law, literature, or philosophy, where emphasis is placed on interpretation, reasoning, and independent analysis. In these disciplines, uncritical reliance on automated systems may conflict with core values, making careful adaptation essential.

Learning culture and prior student experience play a paramount role. Learners enter higher education with distinct levels of familiarity with technology, shaped by their backgrounds and previous exposure. In some contexts, artificial intelligence may be welcomed as a supportive resource, while in others it may be viewed with suspicion or resistance. In this process, faculty readiness plays a decisive role, since teachers must mediate between technological possibilities and disciplinary norms, ensuring that integration strengthens rather than disrupts established practices.

5.4. Practical and Theoretical Implications

Training of teachers is a vital requirement for the integration of artificial intelligence in higher education. Infrastructure alone does not secure effective outcomes; faculty must receive preparation to use tools responsibly and productively. As without proper training, tools remain underused or misapplied, which limits their potential to improve learning. Curriculum alignment is also necessary so that technology becomes part of teaching practice rather than an external addition. Ethical guidance must accompany adoption, with clear frameworks to address plagiarism, data privacy, and over-reliance.

The study consolidates the socio-cultural view of technology as a mediational tool, with a role in shaping interaction and supporting learning. At the same juncture, scaffolding through artificial intelligence is context dependent. Disciplinary norms, institutional structures, and

ethical concerns all influence how technology supports learners. In some contexts, scaffolding refines authenticity and engagement, while in others it conflicts with established practices. It is therefore evident that the impact of technology is not uniform and does not produce automatic improvements.

There is an urgent need for faculty development, curriculum design, and governance structures that secure equitable access and responsible use. It is crucial to conceptualize technology as embedded within socio-cultural and disciplinary contexts rather than as a neutral instrument. Successful adoption is thus contingent upon a functional coordination between technical capacity and human-centered considerations. That being said, only through comprehensive training, alignment, and ethical guidance can artificial intelligence indeed contribute to genuine educational transformation.

6. Conclusion

The conclusion of the study shows that integrating artificial intelligence into English for Specific Purposes programs at Mohammed First University brings both opportunities and challenges. The results confirm that weak infrastructure and limited teacher training reduce the effectiveness of adoption. Artificial intelligence works as a mediational tool that supports teachers via aiding learners reach higher levels of performance, but its ramification is restricted by unstable internet, high costs, and ethical concerns such as privacy, bias, and over-reliance. Since 80 percent of professors cited a lack of training, we recommend offering clear and practical support. Teachers need hands-on workshops, stronger infrastructure, and clear rules to guide ethical use. All these steps can aid teachers feel more confident and use AI tools in a responsible way. The study also registers its limitations, since the sample size was small and focused on a single institution. Future research should examine larger populations and investigate long-term effects, especially in relation to employability, to provide a deeper understanding of how artificial intelligence can shape English for Specific Purposes education.

Disclosure Statement

The authors declare that there is no conflict of interest regarding the publication of this article. No financial, personal, or professional relationships have influenced the research, analysis, or conclusions presented in this work.

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Appendix A

Demographic and Professional Profile Questions (Graph-Based)

1. Please select your age range.
2. Please select your gender.
3. Years of Teaching Experience: How many years have you been teaching ESP or related courses?
4. Which faculty or institution do you currently teach in?
5. Academic Major / Field of Specialization: In which academic field do you currently teach ESP?

Appendix B

Interview Questions Used in the Study

1. Can you describe a specific situation where you used an AI tool (e.g., ChatGPT, Duolingo, Grammarly) in your ESP teaching? What was the result?
2. What are the main challenges you face when trying to use AI in your ESP instruction (e.g., infrastructure, training, institutional support)?
3. Do you feel adequately trained to use AI tools in your teaching? What kind of support or training would help you more?
4. In your experience, does AI help students develop professional communication skills for the workplace? Please explain.
5. Are there any ethical concerns you have about using AI in ESP instruction (e.g., plagiarism, data privacy, over-reliance)?