



Akademik Eğitim ve Sosyal Bilimler Dergisi (AJESS Journal)

Enhancing the Specialized Language Competence of EMI Trainees through AI-Assisted Tools via New Media Platforms: A Case Study of the Faculty of Biology, University of El Oued

Ph.D. Mammam KHOU, Faculty of Foreign Languages/ Department of English , Abdelhamid Ibn Badis University-MOSTAGANEM-ALGERIA. mammam.khou@etu.univ-mosta.dz

Article History

Received: 01/04/2026; Accepted: 01/08/2026; Published: 12/09/2026

Abstract

Since English became a lingua franca, AI tools and social media platforms are widely used in academia. Educators, researchers, and university teachers from different countries, backgrounds, and specialties often seek to enhance their linguistic competence by using AI tools to learn specialized English, as well as digital platforms for interacting and communicating. This study examines the role of AI and new media platforms in enhancing the specialized English competence of Biology teachers participating in an EMI training programme at the University of El Oued, Algeria. A mixed-methods approach is adopted. A combined descriptive-analytical design for analysing quantitative data with thematic analysis of open-ended responses based on Braun and Clarke's (2006) framework reinforces the overall validity and depth of the study. Data are collected using a semi-structured questionnaire. Twenty Biology teachers enrolled in the EMI training programme participated. The findings demonstrate that AI tools and new media platforms contribute significantly to the development of specialized English proficiency. Participants' linguistic skills are notably enhanced, specifically discipline-specific vocabulary, scientific terminology, and professional communication. However, several challenges and restrictions are discussed, including subscription costs, limited free versions, and occasional inaccuracies in AI-generated content. The study concludes that AI tools and new media platforms contribute to the development of Biology teachers' academic, professional, and digital communicative competence when their use is supported by institutional guidance, continuous professional training, and responsible evaluation.

Keywords: Artificial Intelligence Tools, English as a Medium of Instruction, New Media Platforms, Specialized English.

Introduction

Driven by ongoing global integration, English has emerged as the primary language of international collaboration, science, and technology. In response, higher education policymakers across non-English-speaking polities have increasingly institutionalized English as a Medium of Instruction (EMI) to advance internationalization, facilitate access to global scientific literature, and promote cross-border academic research (Galloway & Rose, 2021; Macaro et al., 2018). Within tertiary contexts, EMI is conceptualized as "the practice of offering academic subjects such as engineering, business studies, or medicine through the medium of English in countries where the first language (L1) of the majority of students is not English" (Macaro et al., 2019, p. 144). Aligning with this global trajectory, Algeria's Ministry of Higher Education and Scientific Research (MHESR) introduced strategic nationwide directives in 2019 to transition university-level instruction to English, prioritizing Science, Technology, Engineering, and Mathematics (STEM) disciplines. Nevertheless, this accelerated top-down transition introduces complex pedagogical and linguistic challenges for faculty members, many of whom navigate limited general English proficiency, insufficient command of specialized academic register, and inadequate methodological training for English-medium delivery (Dearden & Macaro, 2016; Lasagabaster, 2022; Yuan et al., 2022). Such institutional and instructor-level constraints threaten the efficacy of EMI implementation, underscoring the critical necessity of systematic linguistic and pedagogical support for academic staff.

The rapid proliferation of AI tools, such as automated writing assistants, large language models, and machine translation applications, alongside emerging communicative digital platforms, offers promising avenues for autonomous, adaptive, and domain-specific language learning (Bouguerba, 2025; Lee et al., 2024; Ngo & Hastie, 2025). Although global literature underscores the necessity of systematic pre-service and in-service professional development frameworks (Galloway & Rose, 2021; Yuan et al., 2022), empirical research addressing the role of AI and digital platforms in fostering the specialized English competence of content-area faculty within institutional EMI training remains scarce. This empirical gap is especially pronounced in the Algerian context, where university Biology teachers encounter pronounced linguistic obstacles regarding discipline-specific terminology, scholarly writing, and instructional communication. Critical examination of the affordances and constraints of these digital technologies is imperative; without tailored linguistic support, instructors' communicative efficacy in EMI classrooms is compromised, ultimately jeopardizing the operationalization of national higher education language policies. Accordingly, this study investigates the role of AI tools and digital platforms in enhancing the domain-specific English competence of Algerian Biology faculty participating in an institutional EMI training program.

English continues to consolidate its status as the primary medium of global scientific discourse, academic dissemination, and research. Within Algeria, recent structural reforms mark a strategic shift to align the tertiary education sector with this global reality, gradually replacing decades of French linguistic dominance in academic and administrative spheres. Key policy milestones, such as the institutionalization of English in primary education in 2022 and its mandated use for scientific correspondence and administrative documentation across universities in 2023, reflect a nationwide language planning trajectory. Despite these policy shifts, English frequently remains restricted to a standalone subject rather than functioning as a fully operationalized medium of instruction. To bridge this gap, targeted EMI training initiatives have been established to enhance university faculty members' domain-specific linguistic repertoire. Concurrently, the integration of AI tools and modern digital media platforms has transformed specialized language acquisition by offering adaptive learning environments, facilitating peer collaboration, and supporting real-time terminology acquisition, accurate pronunciation, and discipline-specific vocabulary use. To address these intersecting instructional and technological developments, this study investigates the following research questions:

1. To what extent do AI tools contribute to the development of specialized English competence among Biology teachers participating in an institutional EMI training program?
2. In what ways do digital media platforms facilitate continuous learning and professional communication in specialized English among academics within the biological sciences?

Theoretical Background

Specialized English

The growing need for specialized English has become particularly essential in academic settings. In Algeria, General English (GE) skills are taught during early learners' stages in primary, middle, and secondary education. The main focus of GE is explicitly on everyday activities, basic grammar, and general vocabulary. On the other hand, specialized English aims to meet the specific academic or professional needs of learners in a particular field, especially when GE skills are not sufficient to fulfil learners' requirements (Hutchinson & Waters, 1987). This approach shifts the focus from learning the language for general proficiency to acquiring the language as a means for performing tasks within a certain discipline. Therefore, courses and curricula are designed through a rigorous analysis to identify the specific needs and then equip learners with the required necessities to function effectively in their academic or occupational environments (Paltridge & Starfield, 2013).

Specialized English is implemented through the framework of English for Specific Purposes (ESP). This branch has grown into a major approach in English language teaching. ESP is generally categorized into two main types: English for Academic Purposes (EAP) and English for Occupational Purposes (EOP) (Dudley-Evans & St John, 1998). Within EAP courses, language instruction is tailored to various scientific and humanistic disciplines to prepare learners to actively perform their activities in academic environments. For instance, in English for Biology, the focus extends beyond general teaching of biological scientific vocabulary. More complex biological nomenclature, the specific syntax of laboratory reports, and the linguistic competence required are provided to master discipline-specific terminology correctly (Bocanegra-Valle, 2014).

English Medium Instruction

It is noticeable that there is a variation in the definitions proposed by scholars in the field. However, they converge to a considerable extent around the same general purpose. English-Medium Instruction (EMI) is commonly defined as the use of English to teach academic subjects in contexts where English is not the first language (L1) of the majority of learners and teachers (Dearden, 2014). Macaro (2018) suggests that EMI is the use of English to teach academic subjects other than English itself in countries where English is not the dominant language. EMI is understood as the teaching and learning of an academic subject (i.e., economic history, chemistry, aeronautical engineering, etc.) using English as the language of instruction, and usually without an explicit focus on language learning or specific language aims (Dafouz & Smit, 2020).

These definitions demonstrate EMI as a content-based approach that uses English to teach academic subjects in non-Anglophone settings. They also show that the main focus of EMI is not language learning, but the transmission of disciplinary knowledge through English. In other words, EMI is primarily designed to support academic communication and subject

learning. This orientation explains why the different definitions, although phrased differently, remain close in their general meaning. EMI is sometimes also referred to as a bilingual teaching approach because it may integrate English with students' native languages to help them understand complex topics and access learning resources more effectively.

However, English has become an increasingly dominant language in academia, science, and international collaboration (Dearden, 2014). Despite ongoing debates about the extent of EMI implementation worldwide, its widespread adoption across higher education systems and academic communities, including the Algerian higher education system, is undeniable. The importance of EMI lies in its role in internationalizing higher education and strengthening academic communication. Although English has become essential for the dissemination of knowledge across a wide range of disciplines worldwide, it continues to assert its dominant position, particularly in science and technology (Macaro et al., 2018). Consequently, it has become a fundamental language for higher education institutions seeking to enhance their global academic competitiveness. Furthermore, EMI supports the development of specialized language competence, since it requires learners to use English in discipline-based contexts rather than in isolated language exercises. It also provides opportunities for students and professors to pursue international education and employment. At the local level, EMI is viewed as an effective policy for promoting knowledge acquisition and keeping pace with global developments across diverse fields of research (Dearden & Macaro, 2016).

EMI: Growth and Implementation

Historically, the early beginnings of English as a medium of instruction can be traced back to the colonial period under British rule. English first appeared as a language of administration and elite schooling before it became a medium of instruction in formal education. Many nations in Asia and Africa, such as India, Malaysia, Singapore, and Ghana, adopted English as the main language of instruction even after their independence. Rapid technological advancements led to radical changes. Specifically, in the education field, English has continued to replace indigenous languages in these countries, becoming the dominant language in many fields, including diplomacy, higher education, and administration. Following the widespread global spread of English, many countries outside former British colonies adopted it as the language of instruction in education and higher education, and in international relations. English remained influential in many countries because of its strong contributions in science and technology. As a result, the historical growth of EMI reflected the necessary demand for English in academia, science, and international communication (Dearden, 2014; Macaro et al., 2018).

The implementation of EMI programmes in contexts where academic subjects are delivered in English, as it is a second or foreign language, is challenging (Dafouz & Smit, 2016). To achieve the goals of an EMI programme, educational policies must be adapted to meet learners' needs based on a comprehensive needs analysis. Well-trained teachers are critical for EMI to be developed, along with authentic materials and real support for students who may face difficulty understanding subject content in English. Additionally, universities need assessment systems that match the goals of EMI for future improvements. Generally speaking, in non-English-speaking countries, EMI is basically implemented to improve learners' linguistic skills. Recent research studies demonstrate that many reasons, including institutional circumstances, might hinder the real implementation of EMI programs, leading to a considerable gap between the educational policies and what actually takes place (Galloway et al., 2015).

EMI: Purpose and Effectiveness

Generally, EMI aims to achieve two main purposes in higher education contexts. First, to improve learners' English competence by focusing more on their discipline-specific content. In this situation, learners are regularly exposed to specialized language instead of being taught general language skills. Second, it supports universities in effectively communicating with the international academic community and improving students' career mobility (Lai & Idris, 2025). In many non-English-speaking countries, EMI is not only a language choice, but also a strategic educational decision that links teaching, institutional planning, and employment opportunities. It also reflects the increasing adoption of English as a lingua franca under global transformations. Furthermore, promoting universities to align their programmes with international standards and respond to the demand for English in higher education, research, and workplace necessities.

AI in Higher Education

Recently, AI-assisted learning has become a major direction in higher education. AI tools support language proficiency through discipline-specific instruction and enhance academic performance. The combination of AI-assisted tools' features, such as personalized learning, instant feedback, and learner autonomy, makes learning more interesting, fruitful, and effective. In the same framework, Recent reviews show that AI tools are widely adopted in academic environments. In general, many AI-assisted tools, such as chatbots, grammar checkers, writing assistants, and adaptive learning platforms, are commonly employed among learners. Some universities provide students and researchers with paid AI tool accounts. Language proficiency levels of learners, especially the four language skills and specialized terminology knowledge, are notably improved among learners who utilize those tools (Pham, 2023; Luo et al., 2025). In EMI settings, learners are required to smoothly manage the linguistic demands of mastering disciplinary content in English. Hence, these tools are useful for linking language support to subject learning. New studies also reveal that AI-based tools improve self-regulated learning through personalized learning, real-time guidance, and reflective feedback (Pham, 2023; Lan & Zhou, 2025).

New Media Platforms and Language Learning

New media spaces have explicitly become a prominent aspect of contemporary life. Social media platforms, particularly Facebook, YouTube, Telegram, WhatsApp, and X, are the most preferred applications by internet users. The intensive use of these platforms is no longer limited to entertainment and personal communication, but is also used to access information, share knowledge, express opinions, create instructional content, and exchange experiences. The exceptional capabilities of new media spaces, such as speed, interactivity, and multimedia mode, have increasingly encouraged their adoption into educational environments. Regarding language learning, learners can be continuously exposed to authentic English learning through these platforms in different forms: videos, podcasts, online discussions, comments, interviews, and other digital content (Barrot, 2022).

These platforms also offer opportunities to practice reading, writing, listening, and speaking in more active and meaningful contexts. In contrast to traditional classroom instruction, learners are encouraged to practice the language outside the classroom and according to their individual needs, interests, and learning pace via a private group, where the learning process is more flexible, interactive, motivating, and closely connected to real-life communication (Istifci & Ucar, 2021).

New media platforms support teachers' professional communication. Teachers use academic social networking sites and online communities to contact colleagues in their fields. They communicate with professionals from different institutions and countries. This contact helps them share teaching experiences, research ideas, and educational materials. It also helps them discuss common challenges in language teaching. Academic social networking sites give teachers access to scholarly information and recent research (Hailu & Wu, 2021). Teachers can also follow specialists in their fields. They can join online academic discussions. They can attend virtual conferences and workshops. They can exchange information with international colleagues. These activities help teachers develop their professional knowledge. They also support international cooperation and continuous professional development (Richter et al., 2022).

New media platforms increasingly use artificial intelligence. This technology supports communication and language learning. AI tools correct grammatical mistakes and improve sentence structure. They also suggest suitable words and expressions. These features help users write English more clearly. They are useful for learners who study specialized subjects in English. AI tools can suggest field-related vocabulary and academic expressions. They also provide feedback on pronunciation through speech-recognition systems (Zou et al., 2023). Learners can practice difficult words several times. They can identify pronunciation problems and improve their speaking. AI chatbots also allow learners to practice communication in English. However, AI tools do not always provide perfect answers. Teachers should therefore guide learners in using these tools (Peña-Acuña & Durão, 2024).

Methods

This study adopts a mixed-methods approach to investigate the perceptions and experiences of 20 Biology faculty teachers enrolled in the EMI training programme. The quantitative component is used to analyze the closed-ended questionnaire items. The qualitative component is applied to the open-ended questions to explore participants' views, experiences, challenges, and suggestions in greater depth. These responses are analyzed thematically according to Braun and Clarke's (2006) framework, which involves identifying initial codes, grouping related ideas into categories, and developing broader themes.

The instrument was subjected to a pilot group before launching the final version. The suggested feedback by the pilot participants helped identify areas that needed clarification or modification, and the questionnaire was revised accordingly. Regarding the reliability of the instrument, Cronbach's alpha coefficient was calculated (as shown in Table 1).

Table 1. Reliability Statistics

N of Items	Cronbach's Alpha
17	.813

The results revealed an acceptable level of internal consistency among the questionnaire items. After the questionnaire was reviewed, it was distributed to all 30 participants. Only 20 completed questionnaires were returned, representing a response rate of approximately 66.7%. The responses obtained from these participants constituted the primary data for the descriptive statistical analysis conducted to address the objectives of the study.

Results

Table 2 shows the general information of the 20 participants. The age distribution shows that most participants are between 30 and 50 years old. Participants aged 30–40 represent 40% of the sample, while those aged 40–50 represent 35%. Female participants form the larger group, with 60% of the sample. The participants also come from different biological specialties. Plant Physiology has the highest representation, with 20%, while Biochemistry, Agricultural Sciences, Plant Protection, and Environment and Ecology each represent 15%. Animal Ecology and Microbiology account for 10% each.

Table 2. Participants' General Information

Variable	Category	N	%
----------	----------	---	---

Age	30–40 years	8	40
	41–50 years	7	35
	51–60 years	4	20
	More than 60 years	1	5
Gender	Male	8	40
	Female	12	60
Specialty	Plant Physiology	4	20
	Biochemistry	3	15
	Agricultural Sciences	3	15
	Plant Protection	3	15
	Environment and Ecology	3	15
	Animal Ecology	2	10
	Microbiology	2	10
Professional Experience	Less than 5 years	11	55
	5–10 years	5	25
	10–20 years	3	15
	More than 20 years	1	5
English Proficiency	Beginner	2	10
	Intermediate	10	50
	Upper-Intermediate	8	40
	Advanced	-	-
Duration of Studying English for Biology	Less than 1 year	5	25
	1–2 years	15	75
	More than 2 years	-	-

Regarding professional experience, most participants have less than five years of experience, representing 55% of the sample. Concerning English proficiency, 50% of the participants report an intermediate level, while 40% report an upper-intermediate level. Only 10% report a beginner level, and none report an advanced level. In addition, 75% of the participants have studied English for Biology for one to two years, while 25% have studied it for less than one year. Overall, the participants have varied academic backgrounds and professional experiences, but most have an intermediate or upper-intermediate level of English and limited experience in studying English for Biology. This background is relevant to their use of AI tools and new media platforms in developing English communicative competence.

The main observation is that most participants are between 30 and 50 years old, while more than half have less than five years of professional experience. This shows that the sample includes participants from different age groups but contains a large proportion of relatively less experienced professionals. Although 90% of the participants report an intermediate or upper-intermediate level of English, none report an advanced level. Moreover, most participants have studied English for Biology for only one to two years. This suggests that they may still need support in using specialized vocabulary, understanding scientific terminology, and communicating professionally in English. The variety of biological specialties adds different academic perspectives to the study. However, the small purposive sample limits the generalization of the findings to all Biology teachers. Overall, these characteristics suggest that the participants may benefit from AI tools and new media platforms that provide accessible language practice, specialized vocabulary, and opportunities for professional communication.

Table 3. Participants' Use of AI Tools in Learning and Communication

Dimension	Category/measure	n	%	M	SD
Previous AI use	Yes	18	90	—	—
	No	2	10	—	—
Frequency of AI use	Daily	5	25		
	Several times/week	7	35	3.65	1.14
	Occasionally	5	25		
	Rarely	2	10		
	Never	1	5		
Confidence in AI use	Very confident	4	20		

AI improves professional English communication	Confident	9	45	3.75	0.91
	Neutral	5	25		
	Not confident	2	10		
	Not at all confident	0	0		
	Strongly agree	6	30		
	Agree	9	45	4.00	0.86
	Neutral	4	20		
	Disagree	1	5		
	Strongly disagree	0	0		

The findings indicate that artificial intelligence tools are widely used among the participants, as 90% report previous experience with AI, compared with 10% who do not use such tools. ChatGPT is the most frequently used application (70%), followed by Google Translate (60%), Grammarly (50%), QuillBot (30%), Zoom AI Companion (20%), and other tools (10%). Regarding the purposes of use, writing and editing English texts rank first (75%), followed by understanding scientific terminology (70%), translating Biology content (60%), practicing speaking or pronunciation (40%), preparing lessons or presentations (35%), and other purposes (10%). In terms of frequency, 25% use AI daily, 35% use it several times a week, 25% use it occasionally, 10% use it rarely, and 5% never use it. This distribution produces a mean of 3.65 and a standard deviation of 1.14, which suggests relatively regular use but noticeable variation among the participants.

The results concerning confidence and perceived usefulness also reveal a generally positive attitude toward AI tools. Regarding confidence, 20% of the participants are very confident, 45% are confident, 25% are neutral, 10% are not confident, and none are not confident at all. These responses produce a mean of 3.75 and a standard deviation of 0.91, indicating a relatively high and fairly consistent level of confidence. Concerning the improvement of professional English communication, 30% strongly agree, 45% agree, 20% remain neutral, 5% disagree, and none strongly disagree. The resulting mean of 4.00 is the highest among the three measures, while the standard deviation of 0.86 is the lowest, demonstrating stronger agreement and greater consistency in the participants' perceptions. Overall, the results suggest that the participants view AI tools positively, although variation in usage frequency and the presence of neutral or less-confident responses indicate a need for further guidance on their effective academic use.

The data in Table 4 indicate a generally positive perception of the role of AI tools in developing communicative competence and specialized discourse. Regarding the improvement of English accuracy, grammar, and vocabulary, 8 participants (40%) strongly agree, and 8 (40%) agree, while 3 (15%) remain neutral and 1 (5%) disagrees; no participant strongly disagrees. This distribution produces the highest mean score, $M = 4.15$, with $SD = 0.88$, indicating strong agreement and relatively limited variation. Concerning the improvement of fluency and coherence in writing or speaking, 7 participants (35%) strongly agree, and 9 (45%) agree, whereas 3 (15%) are neutral and 1 (5%) disagrees; again, no participant strongly disagrees. The mean of 4.10 and standard deviation of 0.85 demonstrate a similarly positive and relatively consistent response pattern. These results suggest that participants mainly perceive AI tools as effective in improving the formal accuracy and organization of their English communication.

Table 4. Participants' Perceptions of AI-Mediated Communicative Competence and Specialized Discourse

Dimension	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	M	SD
Accuracy, grammar & vocabulary	-	1	3	8	8	4.15	0.88
Fluency & coherence	-	1	3	9	7	4.10	0.85
Scientific terminology	-	1	3	10	6	4.05	0.83
Academic/professional style	-	1	4	8	7	4.05	0.89
Interactional/pragmatic strategies	-	2	5	8	5	3.80	0.95

The responses to the remaining items also reflect positive attitudes, although with some differences in strength and variability. In relation to the appropriate use of scientific and specialized Biology terminology, 6 participants (30%) strongly agree, 10 (50%) agree, 3 (15%) are neutral, and 1 (5%) disagrees, producing $M = 4.05$ and $SD = 0.83$. Regarding the adaptation of language style to academic and professional contexts, 7 participants (35%) strongly agree, 8 (40%) agree, 4 (20%) remain neutral, and 1 (5%) disagrees, resulting in $M = 4.05$ and $SD = 0.89$. Finally, concerning the development of interactional and

pragmatic strategies, 5 participants (25%) strongly agree, and 8 (40%) agree, while 5 (25%) are neutral and 2 (10%) disagree; no participant strongly disagrees. This item records the lowest mean, $M = 3.80$, and the highest standard deviation, $SD = 0.95$, suggesting that participants still view AI-mediated communication positively but show greater uncertainty and individual variation in relation to politeness, turn-taking, clarification, and other interactional strategies. Overall, all five items obtain means above the neutral midpoint of 3.00, while the absence of the “strongly disagree” response across the items reinforces the generally favorable evaluation of AI tools.

Table 5 demonstrates that WhatsApp is the most frequently used digital platform for communication in English, selected by 15 participants (75%), followed by Telegram, selected by 12 participants (60%), and Facebook, selected by 8 participants (40%). X is used by 3 participants (15%), whereas only 1 participant (5%) reports using other platforms. Since participants are allowed to select more than one platform, these percentages do not represent mutually exclusive categories and therefore do not total 100%. Regarding the frequency of discussing academic or professional topics in English, 4 participants (20%) do so daily, 8 (40%) several times a week, 5 (25%) occasionally, 2 (10%) rarely, and 1 (5%) never. The mean score of 3.60 and standard deviation of 1.10 indicate that participants engage with academic or professional content relatively regularly, although the relatively higher variation shows that the frequency of use differs across the sample.

Table 5. Participants' Use of Digital Platforms and Their Role in English Communication

Item	Response distribution, n (%)	Mean	SD
Most frequently used platforms for communication in English*	Facebook: 8 (40%); Telegram: 12 (60%); WhatsApp: 15 (75%); X: 3 (15%); Others: 1 (5%)	—	—
Frequency of discussing academic or professional topics in English	Daily: 4 (20%); Several times a week: 8 (40%); Occasionally: 5 (25%); Rarely: 2 (10%); Never: 1 (5%)	3.60	1.10
Platforms help participants express ideas clearly and confidently	Strongly agree: 8 (40%); Agree: 8 (40%); Neutral: 3 (15%); Disagree: 1 (5%); Strongly disagree: 0 (0%)	4.15	0.88
Interaction helps develop professional vocabulary and scientific terminology	Strongly agree: 7 (35%); Agree: 9 (45%); Neutral: 3 (15%); Disagree: 1 (5%); Strongly disagree: 0 (0%)	4.10	0.85
Participation increases awareness of tone, politeness, and intercultural communication	Strongly agree: 6 (30%); Agree: 8 (40%); Neutral: 4 (20%); Disagree: 2 (10%); Strongly disagree: 0 (0%)	3.90	0.97
Platforms contribute to digital communicative competence among future teachers	Strongly agree: 7 (35%); Agree: 8 (40%); Neutral: 4 (20%); Disagree: 1 (5%); Strongly disagree: 0 (0%)	4.05	0.89

The responses to the attitudinal items reveal an overall positive evaluation of digital platforms as tools for English communication. Regarding the ability to express ideas clearly and confidently, 8 participants (40%) strongly agree, and 8 (40%) agree, while 3 (15%) remain neutral and 1 (5%) disagrees; no participant strongly disagrees. This item records the highest mean, $M = 4.15$, and a relatively low standard deviation, $SD = 0.88$, indicating strong and fairly consistent agreement. Similarly, 7 participants (35%) strongly agree, and 9 (45%) agree that platform interaction develops professional vocabulary and scientific terminology, whereas 3 (15%) are neutral and 1 (5%) disagrees, producing $M = 4.10$ and $SD = 0.85$. Concerning awareness of tone, politeness, and intercultural communication, 6 participants (30%) strongly agree, 8 (40%) agree, 4 (20%) are neutral, and 2 (10%) disagree, resulting in $M = 3.90$ and $SD = 0.97$. Finally, 7 participants (35%) strongly agree, and 8 (40%) agree that digital platforms develop digital communicative competence, while 4 (20%) remain neutral and 1 (5%) disagrees, producing $M = 4.05$ and $SD = 0.89$. The absence of strongly negative responses across all four statements and the means above 3.00 demonstrate a generally favorable perception, although the slightly lower mean and higher variation for intercultural and pragmatic awareness suggest that this aspect may require more structured guidance.

To complement the quantitative findings, the open-ended responses in Section Five of the questionnaire are analyzed qualitatively using thematic analysis based on Braun and Clarke's framework (Braun & Clarke, 2006). This method helps identify recurring ideas, patterns, and meanings in the participants' responses (Jowsey et al., 2021). As shown in Table 6, the analysis focuses on the perceived benefits and challenges of using AI tools, the contribution of digital platforms to English communication, and the suggestions to integrate these technologies into English for Biology courses. The responses are coded, grouped into related categories, and subsequently organized into broader themes.

Table 6. Themes Derived from Qualitative Thematic Analysis

Item	Initial codes	Emerging theme
Q23: Influence of AI on English communication	Improved English communication; better understanding of terms and concepts; expanded vocabulary; acquisition of specialized terminology	Improvement in English communication and specialized vocabulary
Q24: Challenges of using AI tools	Paid subscriptions; limited free versions; inaccurate answers; occasional errors	Financial limitations and concerns about accuracy

Q25: Contribution of digital platforms	Correcting language errors; improving responses; making discourse more formal and professional; paraphrasing; facilitating translation; improving communication skills.	Enhancement of professional and digital communication
Q26: Suggestions for better integration	Providing paid subscriptions; institutional support; supporting teachers in communication, research, and English learning; teacher training.	Institutional support and professional training

Thematic Analysis

Theme 1: Improvement in English Communication and Specialized Vocabulary

The responses indicate that AI tools improve participants' English communication, vocabulary, and understanding of scientific concepts. They also help learners acquire Biology-related terminology, suggesting that AI supports both general English development and English for Specific Purposes in academic and professional contexts.

Theme 2: Financial Limitations and Accuracy Concerns

Participants identify the cost of paid subscriptions and the limitations of free versions as major challenges. They also report that AI tools sometimes produce inaccurate information. Therefore, AI-generated content needs to be critically evaluated and verified, particularly in scientific and educational contexts.

Theme 3: Enhancement of Professional and Digital Communication

The responses show that AI-powered digital platforms help participants correct linguistic errors, improve their responses, paraphrase and translate texts, and communicate in a more formal and professional manner. These platforms therefore provide opportunities to practice English and develop professional and digital communicative competence.

Theme 4: Institutional Support and Teacher Training

Participants emphasize the need for institutional support, including access to paid AI subscriptions and training programmes for teachers. Effective integration of AI requires not only technological access but also professional development, responsible use, and guidance on evaluating AI-generated information.

The thematic analysis shows that participants perceive AI tools as beneficial for improving English communication, expanding vocabulary, and developing specialized biology terminology. However, they also identify financial barriers, limitations in free versions, and occasional inaccuracies as important challenges. The findings also indicate that AI-powered digital platforms support language correction, paraphrasing, translation, and the development of more formal professional communication. Participants therefore recommend providing institutional access to paid tools and organizing teacher-training programmes. Overall, the responses reflect a positive view of AI and digital platforms, while emphasizing the importance of systematic guidance, critical evaluation, and responsible integration into English for Biology courses.

Discussion

The overall findings indicate that the participants' academic and professional backgrounds provide a relevant context for examining the role of AI tools and digital platforms in English for Biology and EMI-related learning. The participant profile reflects a group with varied levels of English proficiency and professional experience, which allows the study to capture different perspectives on language learning and professional communication. The results generally suggest that participants are familiar with AI-assisted tools and use them for several academic purposes, including writing and editing, translation, understanding scientific terminology, preparing lessons, and improving spoken communication. Their responses also reveal a generally positive attitude towards AI, particularly regarding the development of English accuracy, vocabulary, fluency, confidence, and the ability to communicate in academic and professional contexts.

The findings concerning digital platforms further show that online communication provides meaningful opportunities for practicing English, exchanging academic ideas, developing professional vocabulary, and improving the clarity and formality of communication. Participants also recognize the contribution of these platforms to digital communicative competence, although they appear to require greater support in developing pragmatic skills related to politeness, tone, turn-taking, and intercultural communication. The qualitative responses reinforce these findings by highlighting improvements in communication and specialized vocabulary, while also drawing attention to financial limitations, restricted access to premium tools, and the occasional inaccuracy of AI-generated content.

In the same framework, the present findings are broadly consistent with previous research on EMI teacher development, which shows that EMI trainees and lecturers need support that combines language development, disciplinary communication, pedagogy, and digital skills. Yuan (2020) posits that effective EMI development should include classroom language, discipline-specific pedagogical competence, and collaboration within a community of practice. Additionally, a systematic review conducted by Macaro et al. (2018) identifies formal training, teacher collaboration, and self-directed learning as the main pathways for EMI professional development. This supports the current participants' positive views of AI tools and digital platforms for improving scientific terminology, writing, translation, fluency, confidence, lesson preparation, and professional communication. The findings also align with research indicating that EMI educators require more than general

English proficiency, as they must explain disciplinary content, manage classroom interactions, and communicate effectively in academic contexts.

However, the present study adds a digital aspect that has received less attention in earlier EMI training research. Previous studies mainly emphasize institutional courses, workshops, language support, and collaboration. The current findings show that AI tools and new media platforms can provide flexible and immediate support for specialized English learning, especially through writing correction, translation, vocabulary development, and online communication. This result is also consistent with evidence that EMI programmes often provide limited and uneven support for teachers, with in-house training and online materials being among the most common forms of assistance. Nevertheless, the participants' concerns about subscription costs, restricted access to premium functions, occasional inaccuracies, and weaknesses in pragmatic communication indicate that AI cannot replace structured teacher development. Consistent with the recommendations of Yuan (2020) and Galloway et al. (2017), the findings suggest that AI should be integrated into EMI training through institutional funding, continuous professional development, and critical evaluation of AI-generated content. In this sense, the study confirms the value of AI-assisted learning while showing that its effectiveness depends on responsible pedagogical guidance and support for communication.

Limitations

This study has several limitations that must be considered. First, the study depends on participants' questionnaire responses, which may not always reflect their actual English proficiency, AI-use habits, or communicative performance. Some participants may overestimate or underestimate their abilities. Second, the study focuses on a small group of Biology faculty trainees from one institution. Therefore, the findings may not be generalizable to teachers from other Algerian universities, academic disciplines, or EMI programmes. Also, participants are purposively selected because they are directly involved in the EMI training programme. Although this is suitable for the research objectives, the sample may not represent all Biology teachers or all university educators.

Third, data are collected at one point in time. Consequently, the study cannot show how participants' English competence, AI use, or digital communication skills change as they receive further EMI training or gain more experience. Also, the study does not include English proficiency tests, written assignments, oral tasks, or direct assessments of communicative competence. As a result, the findings mainly reflect participants' perceptions rather than objectively measured language improvement. Fourth, the open-ended questionnaire responses provide useful insights, but they may be brief and less detailed than interview or observation data. Future studies could use interviews, classroom observations, or focus groups to obtain richer explanations of participants' experiences.

Implications

Despite its effectiveness in enhancing trainees' linguistic competence, the successful implementation of EMI in Algerian higher education requires more than official policy decisions. It depends on addressing structural, pedagogical, and institutional challenges through effective training, continuous support, institutional alignment, and cooperation among educators. The following implications highlight practical measures that can contribute to more sustainable and effective EMI practices.

Universities should provide continuous training programmes that improve teachers' English proficiency, classroom communication skills, and ability to explain specialized Biology content in English.

EMI programmes should include guidance on the responsible use of AI tools and digital platforms for vocabulary development, writing, translation, lesson preparation, and professional communication. Teachers should also be trained to verify the accuracy of AI-generated information.

Universities should provide reliable internet access, suitable digital platforms, and necessary AI subscriptions. Such institutional support can reduce inequalities in access and help teachers use digital tools for teaching, research, and language development.

The EMI programmes must be frequently updated rather than a one-time adjustment. Institutions should therefore provide regular workshops, peer mentoring, and reflective teaching opportunities to help Biology teacher trainees and educators strengthen their specialized English proficiency.

EMI implementation should encourage cooperation among Biology teachers, English-language specialists, and university administrators. Continuous evaluation through feedback, classroom observation, and language-performance assessment can help identify difficulties and improve EMI practices over time.

Conclusion

In conclusion, this study demonstrates that the integration of English-medium instruction, artificial intelligence tools, and digital communication platforms offers promising opportunities for developing the English language and communicative competence of Biology faculty trainees. The findings show that participants use AI and digital platforms to improve language accuracy, expand specialized vocabulary, understand scientific terminology, prepare academic materials, and communicate in more formal and professional ways. The qualitative responses also indicate that these technologies support English for Biology while revealing challenges related to subscription costs, restricted access to advanced tools, and the occasional

inaccuracy of AI-generated information. Therefore, AI should be viewed as a supportive educational resource rather than a substitute for teachers' expertise or critical judgement. The study concludes that effective EMI implementation requires continuous teacher training, institutional and technological support, access to reliable digital resources, specialized language materials, and cooperation among Biology teachers, English specialists, and university administrators. With appropriate guidance and systematic evaluation, the responsible integration of AI and digital platforms can contribute significantly to more sustainable EMI practices and to the development of teachers' academic, professional, and digital communicative competence.

References

- Allik, J., & Realo, A. (1997). Intelligence, academic abilities, and personality. *Personality and Individual Differences*, 23(5), 809–814. [https://doi.org/10.1016/S0191-8869\(97\)00103-7](https://doi.org/10.1016/S0191-8869(97)00103-7).
- Barrot, J. S. (2022). Social media as a language learning environment: A systematic review of the literature (2008–2019). *Computer Assisted Language Learning*, 35(9), 2534–2562. <https://doi.org/10.1080/09588221.2021.1883673>.
- Bocanegra-Valle, A. (2014). English is my default academic language: Voices from LSP scholars publishing in a multilingual journal. *Journal of English for Academic Purposes*, 13, 65–77. <https://doi.org/10.1016/j.jeap.2013.10.010>.
- Bouguerba, K. M. (2025). Artificial intelligence in the service of English for specific purposes. *Studies in Linguistics, Literature and Education*, 7(2), 1–15. <https://revue.univ-oran2.dz/slle/index.php/slle/article/view/24>.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>.
- Chamorro-Premuzic, T., & Furnham, A. (2003). Personality traits and academic examination performance. *European Journal of Personality*, 17(3), 237–250. <https://doi.org/10.1002/per.473>.
- Dafouz, E., & Smit, U. (2020). *Road-mapping English medium education in the internationalised university*. Palgrave Macmillan.
- Dearden, J. (2014). English as a Medium of Instruction: A Growing Global Phenomenon. British Council.
- Dearden, J., & Macaro, E. (2016). Higher education teachers' attitudes towards English medium instruction: A three-country comparison. *Studies in Second Language Learning and Teaching*, 6(3), 455–486. <https://doi.org/10.14746/sllt.2016.6.3.5>.
- Dollinger, S. J., & Orf, L. A. (1991). Personality and performance in "personality": Conscientiousness and openness. *Journal of Research in Personality*, 25(3), 276–284. [https://doi.org/10.1016/0092-6566\(91\)90020-Q](https://doi.org/10.1016/0092-6566(91)90020-Q).
- Dudley-Evans, T., & St John, M. J. (1998). *Developments in English for specific purposes: A multidisciplinary approach*. Cambridge University Press.
- Galloway, N., & Rose, H. (2021). English medium instruction and the English language practitioner. *ELT Journal*, 75(1), 33–41. <https://doi.org/10.1093/elt/ccaa063>.
- Galloway, N., Kriukow, J., & Numajiri, T. (2017). *Internationalisation, higher education and the growing demand for English: An investigation into the English medium of instruction (EMI) phenomenon in Japan*. British Council.
- Hailu, M., & Wu, J. (2021). The use of academic social networking sites in scholarly communication: Scoping review. *Data and Information Management*, 5(2), 277–298. <https://doi.org/10.2478/dim-2020-0050>.
- Hutchinson, T., & Waters, A. (1987). *English for specific purposes: A learning-centered approach*. Cambridge University Press.
- Istifci, I., & Dogan Ucar, A. (2021). A review of research on the use of social media in language teaching and learning. *Journal of Educational Technology and Online Learning*, 4(3), 475–488. <https://doi.org/10.31681/jetol.922968>.
- Jowsey, T., Deng, C., & Weller, J. (2021). General-purpose thematic analysis: A useful qualitative method for anaesthesia research. *BJA Education*, 21(12), 472–478. <https://doi.org/10.1016/j.bjae.2021.07.006>.
- Lai, H., & Idris, H. B. (2025). A Review on English-Medium Instruction (EMI) in Teaching and Its Effects on University Students' English Proficiency and Content Learning. *Forum for Linguistic Studies*, 7(1), 834–846. <https://doi.org/10.30564/fls.v7i1.8107>.
- Lan, M., & Zhou, X. (2025). A qualitative systematic review on AI empowered self-regulated learning in higher education. *npj Science of Learning*, 10, Article 21. <https://doi.org/10.1038/s41539-025-00319-0>.
- Lasagabaster, D. (2022). *English-Medium Instruction in Higher Education*. Cambridge University Press. <https://doi.org/10.1017/9781108903493>.
- Lee, Y. J., Davis, R. O., & Lee, S. O. (2024). University students' perceptions of artificial intelligence-based tools for English writing courses. *Online Journal of Communication and Media Technologies*, 14(1), Article e202412. <https://doi.org/10.30935/ojcm/14195>.
- Luo, J., Zheng, C., Yin, J., & Teo, H. H. (2025). Design and assessment of AI-based learning tools in higher education: A systematic review. *International Journal of Educational Technology in Higher Education*, 22, Article 42. <https://doi.org/10.1186/s41239-025-00540-2>.
- Macaro, E. (2018). *English medium instruction: Content and language in policy and practice*. Oxford University Press.

- Macaro, E., Akıncıoğlu, M., & Han, S. (2019). English medium instruction in higher education: Teacher perspectives on professional development and certification. *International Journal of Applied Linguistics*, 30(1), 144–157. <https://doi.org/10.1111/ijal.12272>.
- Macaro, E., Curle, S., Pun, J., An, J., & Dearden, J. (2018). A systematic review of English medium instruction in higher education. *Language Teaching*, 51(1), 36–76. <https://doi.org/10.1017/S0261444817000350>.
- Macaro, E., Tian, L., & Chu, L. (2018). First and second language use in English medium instruction contexts. *Language Teaching Research*, 24(3), 382–402. <https://doi.org/10.1177/1362168818783231>.
- Ngo, T. N., & Hastie, D. (2025). Artificial Intelligence for Academic Purposes (AIAP): Integrating AI literacy into an EAP module. *English for Specific Purposes*, 77, 20–38. <https://doi.org/10.1016/j.esp.2024.09.001>.
- Paltridge, B., & Starfield, S. (Eds.). (2013). *The handbook of English for specific purposes*. Wiley-Blackwell.
- Peña-Acuña, B., & Durão, R. C. F. (2024). Learning English as a second language with artificial intelligence for prospective teachers: A systematic review. *Frontiers in Education*, 9, Article 1490067. <https://doi.org/10.3389/feduc.2024.1490067>.
- Pham, T., Nguyen, T. B., Ha, S., & Nguyen Ngoc, N. T. (2023). Digital transformation in engineering education: Exploring the potential of AI-assisted learning. *Australasian Journal of Educational Technology*, 39(5), 1–19. <https://doi.org/10.14742/ajet.8825>.
- Yuan, R., Chen, Y., & Peng, J. (2022). Understanding university teachers' beliefs and practice in using English as a medium of instruction. *Teaching in Higher Education*, 27(2), 233–248. <https://doi.org/10.1080/13562517.2020.1715936>.
- Zou, B., Du, Y., Wang, Z., Chen, J., & Zhang, W. (2023). An investigation into artificial intelligence speech evaluation programs with automatic feedback for developing EFL learners' speaking skills. *SAGE Open*, 13(3). <https://doi.org/10.1177/21582440231193818>.
- Yuan, R. (2020). Promoting EMI teacher development in EFL higher education contexts: A teacher educator's reflections. *RELJ Journal*, 51(2), 309–317. <https://doi.org/10.1177/0033688219878886>.