



A double-blind, peer-reviewed, open-access, and an HEC-recognized Y-category Journal

## Research Journal of Human and Social Aspects

Web link: <https://rjhsa.com/index.php/rjhsa>

P-ISSN: [3006-9696](https://doi.org/10.71085/rjhsa.04.03.112), E-ISSN: [3006-970X](https://doi.org/10.71085/rjhsa.04.03.112)

Volume 4 Issue 3, 2026, Page Rang: 271-291



## English as a Medium of Instruction in the Age of AI: Challenges, Opportunities, and Linguistic Implications

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### Article information

#### Article History:

Received: 2026-06-17

Received in revised form:  
2026-07-15

Accepted: 2026-07-27

Published Online: 2026-08-12

#### Keywords:

English as a Medium of Instruction (EMI); Artificial Intelligence; Higher Education; Classroom Discourse; Language Learning; Academic Integrity; Linguistic Implications.

### ABSTRACT

This study aims to explore the role of AI in transforming EMI teaching and learning, the opportunities and challenges this brings, and the linguistic implications. The study has qualitative characteristics (thematic analysis) and uses secondary and documentary data, including peer-reviewed EMI and AI-in-education literature and sources, institutional literature and publications, policy guidance, and literature from discussions of higher-education practice. Sources have been coded iteratively and synthesised into nine analytical domains. AI provides access to vocabulary, grammar, translation, pronunciation practice, and immediate feedback, enables differentiated instruction, and frees up teachers' time to focus on instructional design and/or critical mediation. But benefits depend on pedagogical purpose. Without careful use, it can facilitate dependency and reduced interaction, lower verification, undermine assessment, and worsen the digital divide for students. Practices, expectations, and teacher readiness; student AI proficiency; ethical guidelines; digital access; and the commitment to maintaining the integrity of human interaction are all essential to linguistic outcomes. The article proposes a 5-dimensional framework for the responsible use of AI in EMI. It suggests that AI is not meant to replace the linguistic, pedagogical, and intellectual involvement of the human factor during the mediation action.



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## Introduction

### Background of the Study

English as a Medium of Instruction (EMI) has made a huge leap, as universities engage in international recruitment, transnational research and want to prepare graduates for mobility in academia and the workplace in English. English-based media are a teaching method for presenting academic subjects in English, which is not the language learners mostly use. At the same time, English itself is not the formal language taught and learned as the main language (Macaro, 2018). The appeal to institutions is obvious: through programmes in English it is possible to have expanded access to academic sources, increased enrolment from other countries and express international orientation at the same time.

(Dearden, 2014; Galloway et al., 2017). However, one policy can inequitably redistribute educational opportunity, while another can equitably redistribute opportunity. While some students with academic English can process new ideas and language concurrently, others have to deal with new ideas and two languages at once. Lecturers are also required to perform a range of communicative roles which go beyond a generic level of English proficiency, such as explanation, questioning, disciplinary vocabulary, pronunciation and interactional management (Macaro et al., 2018; Macaro, 2020).

Hence, opportunity costs and constraints are produced simultaneously while using an EMI. It can meet educational requirements and help to increase exposure to academic English and intercultural communication, though this doesn't guarantee language development. A large number of programmes leave L2 needs implicit within the programs, which are institutional and structural separation of content and L2 teaching (Pecorari & Malmström, 2018). As a result, students might know the content but cannot

ask questions, create English-worthy arguments for or against the content, or take an authoritative stance on the content. These tensions are more impactful with the introduction of AI tools to everyday processes of students reading, drafting, translating, rehearsing, and communicating.

### AI and the Changing EMI Environment

Currently, AI in higher education includes Generative Chatbots, Auto-completion of writing, Machine translation, Speech recognition, adaptive platforms, intelligent tutoring systems, and analytics-based feedback. In contrast to previous educational software, the generative systems that are readily available can be used to create fluent explanations, summaries, questions, translations and drafts, afforded by conversational prompts. Before speaking, in the EMI mode, students may ask for a simpler version of the lecture; they can create a bilingual glossary, get feedback on grammar, practice pronunciation, and/or compare how they used the words in different forms. Differentiated materials, anticipating language issues and creating examples of varying complexity are made available to teachers. Literature surveys in the field of higher education artificial intelligence (AI) reveal several common uses of AI, including but not limited to assessment, tutoring, assistance, prediction, and learning management (Zawacki-Richter et al., 2019; Crompton & Burke, 2023).

These affordances change the location and author of academic English. No longer is there only a continuum of linguistic support by a lecturer, language centre or peer; support is now continuous via an interface. It has pedagogically important implications, as AI can mediate between the understanding of disciplinary knowledge and the creation of apparently competent English. With the delegation of performance of cognitive and linguistic tasks to generative AI – as OECD

emphasises (2026) – there is no guarantee that learning has actually occurred.

### Problem Statement

It is therefore not the question whether the use of AI is good or bad but when it is assistance and when it is replacement. AI has the potential to decrease linguistic obstacles and alleviate anxieties. However, it can also mask understanding gaps, cause reliance on AI-generated prose, diminish the process of source verification, and lessen the communicative journey through which language is developed. The content in a fluent product is not necessarily correct, and some invented supporting ideas and/or references may be included, which can lead to an erroneous assessment of the epistemic reliability (Lo, 2023; UNESCO, 2023a). The very same tools hinder student authorship and the understanding of written learner work: a set and highly edited assignment might be student work, intensive machine editing, and/or mass production.

### Research Gap

Research on policy implementation has explored aspects of policy expansion, deficiencies in students' proficiency levels, teacher capacity, and classroom interaction; in the field of AI in education, research has focused on personalisation, tutoring, automated assessment, and ethics. Writing assistants, translation, and speech recognition have been studied individually in the field of language learning. Such negotiations are rarely maintained in discussions around the whole sociolinguistic ecology of AI-supported EMI. In particular, little consideration has been given to the impact AI has on content access, the creation of academic language, teacher-student dialogue, peer dialogue, and evaluation of linguistic authenticity at the same time. In addition, extant reviews highlight that AI research tends to be more oriented towards technical performance than towards educators' standpoints and contextualised

descriptions of their experiences of learning (Zawacki-Richter et al., 2019; Bond et al., 2024). There is a need for a cross-field thematic synthesis, hence.

### Research Questions

- RQ1:** How is the integration of Artificial Intelligence reshaping teaching and learning practices in English as a Medium of Instruction in higher education?
- RQ2:** What opportunities, challenges, and linguistic implications emerge from the use of AI in EMI environments?

### Research Objectives

- Objective 1:** To examine how AI technologies are transforming teaching, learning, and classroom discourse in EMI-based higher education.
- Objective 2:** To analyse the opportunities, challenges, and linguistic implications associated with AI-supported EMI and identify pedagogical and policy strategies for its responsible implementation.

### Significance of the Study

This is a single analytical narrative of EMI, AI language learning and higher education governance. It explains why the competence of the AI teacher in EMI must be bilingual, not simply on how to use AI tools; why there is a need for a balance between teaching students about AI and language education; and why correct use of AI is essential for integrity policy, separating revealed AI use from the substitution of what students have to do themselves. The strategic framework can serve institutions as a starting point for teacher education, assessment redesign, equity planning, and quality assurance, all within a framework that does not compromise the educational outcomes of authentic communication.

## Literature Review

### Conceptualising English as a Medium of Instruction

One of the main distinguishing features of EMI is the main purpose of the teaching: the language is not, as such, the content and learning object. English language teaching and English as a Foreign Language explicitly work on English knowledge, whereas English for Academic Purposes (EAP) develops knowledge of genres, vocabulary, and practices for academic participation. Interestingly, for most programs, the concept of Content and Language Integrated Learning (CLIL) usually embeds two goals: content and language; most EMI programs tend to prioritise content and assume that language learning outcomes will follow naturally without them being set as one of the goals for assessment (Macaro, 2018; Pecorari & Malmström, 2018). These differences are analytical, not absolute. Some of these issues will be handled by an EMI lecturer, even if the policy refers to content-only lessons; for instance, by explaining the terminology, reformulating the learner's answer, or allowing the discussion to be strategic and carried out in more than one language.

This is significant for how AI is customised into the banking system's applications. It can seem like an AI paraphraser is a solution to an incidental language problem if EMI is considered linguistically neutral. When thinking about the wording of the AI, if language is considered as a means of disciplinary reasoning, then we must take a pedagogical perspective on the wording of the AI. In keeping with this, Macaro (2020) concludes that language has to be an integral part of the analysis of the outcomes of EMI. AI, in this instance, can more radically distinguish conceptual intention from its realisation in language than dictionaries or traditional proofreading.

### EMI and the Internationalisation of Higher Education

At University level, EMI is implemented to improve the University's ranking and partnerships, to attract international students and international staff and make them more employable. Yet, it is observed from the survey conducted here, as well as the case studies in Asia, that often policy aspirations exceed classroom space (Dearden, 2014; Galloway et al., 2017; Aizawa & Rose, 2019). Programmes can be introduced at institutions with no parallel entrance requirements/semester, language assistance, recognition of workload, or institutional development. Such a disjuncture of policy and practice is not only operational. This can be used to accentuate English as the language of worth, and to marginalise the academic languages of the locality, and the students who do not have access to privileged English preparation.

The ROAD-MAPPING framework that Dafouz and Smit (2020) propose conceptualises English-medium education as a dynamic multilingual university ecology which combines the roles, academic disciplines, language management, agents, practices, internationalisation and glocalisation. The ecological perspective can also be applied to AI, because technology does not enter the neutral classroom; it is part of disciplinary norms, language ideologies, commercial platforms, and institutional policies. Finally, while AI has the potential to expand participation through the provision of just-in-time support, it could also increase Englishisation as learners are facilitated in producing standardised English output and reduce the need to maintain multilingual academic repertoires.

### Linguistic Challenges in EMI

The main linguistic problems are in the receptive (listening/reading), productive (writing/speaking), and interactional (listening, speaking, and reading) areas. Students will need to take notes from lectures given at speed; they will need to take

any specialised vocabulary into account and understand the way that 'claims' are organised within a discipline; and they will need to do this while reading dense texts. In writing, they need to be productive by writing arguments, using sources, pronouncing technical terms, and responding spontaneously. Rose et al. (2020) found that while proficiency is important, it is not enough alone: academic skills and academic motivation also play a role in predicting academic success. Even if students are willing to engage in discussion, they may not be willing to say anything that isn't obvious because it puts more demands on them to think of something that is intellectually defensible in response to a query on the spot than it does to recognise content.

The ability to modify statements, cue structure, elicit elaborations and interpret partially developed responses are other aspects of teachers' language competence. Classroom studies show that using three languages in questions and interactions refutes the monolingual assumptions of what is legitimate EMI (Pun & Macaro, 2019). Students' concept access can be supported through the strategic use of their broader linguistic resources, and participation can be reduced when using only English. The main focus is thus on comprehensibility rather than frequent opportunities to write academic English. AI may assist students in their preparation for participating, but it can shift the interactional problem from students' shoulders without actually addressing it if it is the only interlocutor.

## **Artificial Intelligence in Higher Education**

The use of AI in the higher education sector is not new; it dates back to before the introduction of generative chatbots. Intelligent tutoring systems model written work and learner performance; automated systems serve to identify patterns in written work; adaptive systems recommend resources; and predictive models make decisions at the institutional level. Systematic reviews identify the potential to personalise and provide timely feedback; there are indications of minimal engagement with educators and a lack of focus on ethics, theory and context (Zawacki-Richter et al., 2019; Bond et al., 2024). The so-called generative AI takes things a step further by generating open-ended language and prompting users to interact. Generative AI goes one step further by generating open-ended language and engaging the user in dialogue, which is highly relevant in the EMI field.

The applications and trade-offs of Table 1 reveal that learning can be supported and/or bypassed with the same function. A translation tool might be allowed with a challenging text, for instance, but then it may not be evident whether the student can later explain the concept in English. This is because a duality runs counter to technology-centred evaluation. It is not just the quality of output that is an appropriate outcome; it is the learner's ability to understand, communicate, and evaluate without inappropriate dependence.

**Table 1:** *AI Applications and Their Functions in EMI Environments*

| AI application                | EMI function                                               | Potential benefit                                | Potential risk                                         |
|-------------------------------|------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------------|
| Generative chatbot            | Explains concepts, generates examples, rehearses questions | Scaffolds comprehension and low-stakes practice  | Hallucinated content; substitution for reasoning       |
| Writing assistant             | Flags grammar, cohesion, style, and register               | Rapid formative feedback during revision         | Homogenised voice; acceptance without understanding    |
| Machine translation           | Moves between English and students' other languages        | Improves access and enables contrastive analysis | Hidden comprehension gaps; loss of disciplinary nuance |
| Speech recognition            | Transcribes and responds to spoken English                 | Repeatable pronunciation and fluency practice    | Accent bias; privileging machine-recognisable speech   |
| Intelligent tutor             | Adapts prompts, hints, and task difficulty                 | Individual pacing and targeted remediation       | Opaque learner modelling; reduced teacher oversight    |
| Automated feedback/assessment | Evaluates features of responses and recommends revision    | Scalable, immediate practice cycles              | Narrow construct coverage; false precision and bias    |

### AI-Supported Language Learning

Vocabulary, writing, pronunciation and translation. While their immediacy is often positively received by learners, it should not be mistaken for automated writing that may highlight frequent errors. However, it needs to be interpreted by the reader (O'Neill & Russell, 2019). Generative systems can be used to generate examples, simulated audiences, or counterarguments (and change their apparent complexity if requested). In second-language

However, writing plausibly written prose successfully camouflages factual issues; sentences seem to lack any outstanding voice or identity of the author, and learners can be tempted not to do the same kind of work in planning and formulating sentences, as Barrot (2023) found. Machine translation is also thought to aid academic access. However, it requires translation literacy

(Groves & Mundt, 2015), which is the ability of users to compare alternatives, be aware of the possible occurrence of terminological error, and know when they need human intervention.

Speech recognition can enable autonomous/private repeated practice and might lead to greater control over pronunciation.

(McCrocklin, 2016). However, these recognition rates are not indicative of intelligibility per se: they may differ depending on accent, speech style, or technical speech. In all modalities, AI-marked feedback is most informative for prediction, comparison, substantiation, and revision, processes that involve rather than passive receipt of an AI-marked answer. Table 2 consequently considers any gain in language as hinging upon a pedagogical countermeasure.

**Table 2: Linguistic Implications of AI-Supported EMI**

| <b>Linguistic dimension</b> | <b>Positive implication</b>                             | <b>Negative implication</b>                          | <b>Pedagogical consideration</b>                        |
|-----------------------------|---------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------|
| Vocabulary                  | Contextual definitions and discipline-specific examples | Shallow recognition without durable retrieval        | Require reuse in speaking, writing, and concept mapping |
| Grammar and style           | Immediate noticing and iterative revision               | Rule opacity and uncritical correction               | Ask students to explain and selectively accept changes  |
| Academic writing            | Scaffolds structure, cohesion, and audience awareness   | Voice homogenisation and uncertain authorship        | Preserve drafts, prompts, rationales, and oral defence  |
| Translation                 | Enables multilingual access and comparison              | Terminological drift and concealed dependence        | Teach back-translation and source-text verification     |
| Pronunciation               | Private rehearsal with repeatable feedback              | Accent bias and conformity to system norms           | Prioritise intelligibility and human listener response  |
| Oral interaction            | Supports preparation and anxiety reduction              | Rehearsed fluency may replace spontaneous exchange   | Use AI before, not instead of, peer discussion          |
| Pragmatics and voice        | Provides genre and register, models                     | Normalises dominant cultural and rhetorical patterns | Compare outputs and retain situated authorial choices   |

### **AI and EMI Classroom Discourse**

Understanding is constructed and made evident and negotiable in the medium of discourse that occurs in the classroom. Generative AI has the potential to expand participation by enabling students to generate questions, or translate important terminology, or even check an explanation to make sure a student is ready to contribute in public. Teachers can use AI-generated misconceptions as objects of discussion and set up groups to discuss different answers and analyse how these answers are wrong. These designs can promote and enhance communication and knowledge sharing. Conversely, when uncertainty experiences are more directed toward private tools, away from teachers and peers, then dynamic evaluation and feedback lessen in class. Incompleteness in answer formulations is reduced, and the lecturer does not lose important evidence for adapting teaching.

The interactional order of the emerging order is thus a triangular one consisting of teaching and learning discourse actions between the teacher, student and AI. However, these jobs available are not identical. AI predetermines words in its "linguistic-choreographic" fantasies; teachers sense limits, identities, self-knowledge and interpersonal implications within the space of hesitation. There's also some negotiation and accountability in peer dialogue that cannot be reproduced in a compliant, chatbot dialogue. While AI could be used to set the stage for or elicit conversation, it is the authentic classroom conversation where claims could be challenged and where membership could be done fairly.

### **AI, Academic Integrity, and Linguistic Authenticity**

The nature of proofreading, collaboration and authorship is changed due to Generative AI.

While a traditional view of plagiarism revolves around the reuse of text from other sources (without any sort of citation), it's quite possible that the prose being generated is new, but not from the student's work. Integrity, then, is not the issue of text overlap (Perkins, 2023; Eaton, 2023), but it's about transparency of process and the validity of the inference drawn from the assessment. The matter is quite sensitive as linguistic support has always been needed and acceptable in EMI. Banning all support services may negatively impact multilingual learners because it is possible that a student's disciplinary understanding is not determined and/or that a student's English development is not determined due to unrestricted generation.

Linguistic authenticity is not the quality of unaided, error-free prose. Academic writing is repeatedly written using a dictionary, feedback and collaboration in various languages. It's defensible that when we refer to the work in which the learner was supported, it would be an extension of the learner's control. In cases of substitution, it wouldn't mask the source of the reasoning or language work that was assessed. This distinction will need to be clarified by rules at the student task level, by disclosure, by process evidence, and by providing space for students to explain their decisions. Detection software is an unreliable long-term solution to the pedagogical and ethical problem and lies in the design of the assessments and shared norms (Cotton et al., 2024; UNESCO, 2023a).

### Research Gap and Conceptual Position

There are 3 propositions supported by the literature, each of which is considered separately: EMI is linguistically consequential even if content is claimed as the goal; AI makes personalised language support possible through the externalisation of cognition; and classroom discourse and assessment require interpretable evidence of

student thinking. The above are combined within the context of the present study. This takes an institutional, rather than a tool-centred, approach to AI impacts on the role of language (Williamson & Eynon, 2020; Selwyn, 2019). Whether AI enhances English language output or not, the “what” is extended to encompass the capacity of the learners to comprehend, produce, negotiate and critically evaluate academic English.

### Conceptual Framework

Figure 1 visualises the integration of AI as an input that reframes EMI teaching and learning. These practices expand or inhibit the productive language support (e.g., feedback, translation, rehearsal, and adaptive explanation) that tools offer, and how that support becomes part of classroom interaction. Factors of interaction then impact the language outcomes such as academic words, writing control, oral participation, or the voice of a discipline, or critical awareness with language. Opportunities and challenges throughout the chain, not necessarily at the end – immediate feedback can lead to immediate revision – but conditions can also lead people to expect feedback to be available, creating dependency.

Later on, the arrows are purposely two-way. An interaction with classroom learners identifies language needs. It influences the use of AI supports, while increasing the use of AI supports can affect linguistic outcomes, which in turn shape future design and implementation. Teacher readiness, student ability with AI, institutional policy, ethical usage, access to digital tools, and teaching and learning methods all play a role in the entire process. These contextual factors can explain why the same technology yields different outcomes across institutions and groups of learners. The technology itself is thus not determinate in the Framework. Therefore, only activities that maintain an essential role for the learner in terms of

agency, critical judgement, and authentic human interaction are educationally valuable AI integration.

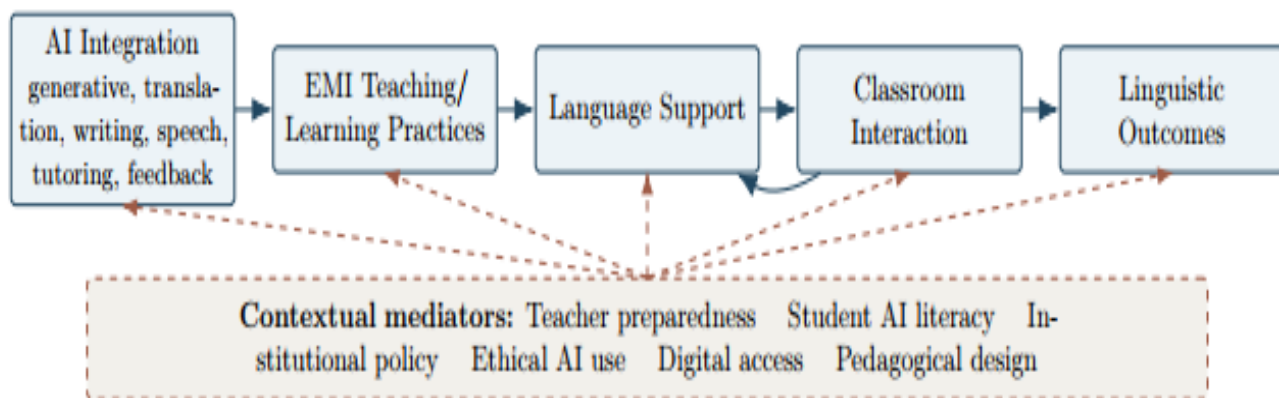
This framework identifies and differentiates access to support from appropriation of language. While an immediate learning-to-understand gain can be gained from an AI-generated explanation, a linguistic consequence can only be derived when the learner can use the AI-generated vocabulary, rhetorical structure or pronunciation in the next task. This transfer is guided by how prepared the teacher is as well as his or her pedagogical design, where modelling, guided comparison, collaborative use and independent performance are sequenced. Student AI literacy determines whether students will challenge and tweak outputs, and policy and ethical guidelines define what legitimate usage and disclosure are. Strategies that engender digital access rights for all who can be part of the process. These connections offer the analytical logic needed to interpret the findings, both in terms of the affordances and the risks.

## Research Methodology

### Research Design

In this study, the research design was qualitative, with documentary and thematic analysis techniques. This is suitable as the research questions focus on the meanings and tensions in relation to changes in a heterogeneous EMI setting, and not on the estimation of a single intervention effect. Thematic analysis can assist in the systematic identification of patterned ideas and the attention to contradiction and context (Braun & Clarke, 2006, 2021). Documentary analysis is also appropriate for examining how an emerging educational problem is created in policy, research, and professional discourse (Bowen, 2009). The study involved no interviews, surveys or classroom observations, and the results were not empirical, but a synthesis of secondary sources, so there can be no claims made for a new sample of people.

**Figure 1:** *Conceptual Framework of AI Integration into EMI*



**Note:** *AI influences EMI outcomes through pedagogical and interactional processes; contextual factors mediate every relationship.*

### Data Sources

The documents included in the corpus were peer-reviewed research about EMI and AI in higher education,

Experiences and observations on the use of AI in language learning, classroom discussion and academic honesty; book reports by major academics; institutional reports; and policy recommendations and guidelines such as

UNESCO and OECD. The only published classroom-practice discussions that informed plausible strands of use or consequences of AI in higher education were considered professional or conceptual evidence by this study. The sources were limited to foundational EMI and qualitative methods for definitions and analysis procedures, and recent studies were mostly included to provide generative AI.

### **Data Selection Criteria**

The inclusion of sources was limited to those articles that (a) investigated aspects relating to higher education or had a clear higher education implication for language learning at university; (b) examined aspects of EMI, academic English, educational AI, machine translation, automated feedback or speech recognition – or had an implication for automated feedback – or investigated aspects of academic integrity or academic dishonesty and their relationship with AI; (c) were peer reviewed and/or published by a credible international or educational institution; and (d) provided conceptual, empirical, methodological and/or policy-based evidence to at least one of the research questions. Key publications to focus on were identified as those published more recently (2020-2026), with foundational work used when required. Texts that contained only model performance data, lacked implications or transferability for schooling, or focused on promotion or unverifiable writers' comments were excluded. Given the fleeting nature of AI, assertions of its educational impact were examined with a healthy dose of scepticism and differentiated by source type.

### **Data Analysis**

Seven recursive procedures were followed in the analysis. Initial familiarity was gained with the sources by reading, and annotations were made to each source regarding its use of language, pedagogy, interaction, integrity and inequality. Second, initial semantic (and interpretive) codes were applied, such as

rapid corrective feedback, hidden language work, voice homogenisation, and the policy – practice gap. Third, the codes were compared between the three types of literature (EMI, Language-learning literature and AI literature) to find similarities and differences. The fourth step was to cluster the various codes to form themes. Fifthly, the themes were contrasted with the source set and the research questions and over-generalised claims and overlapping categories were collapsed. Sixth, it was determined and named what was to be the theme for each item. Seventh, themes were interpreted through a conceptual framework, and conclusions were drawn in terms of Pedagogical and Policy implications. No frequency count was completed; rather, a reflexive analysis was conducted, and the importance of the theme was determined based on relevance and explanatory value, rather than how many documents included a term(s).

### **Analytical Themes**

Analysis was guided by nine sensitising domains, which did not predefine the analysis: AI-enabled linguistic support, learner autonomy, teacher transformation, AI dependency, critical thinking, linguistic authenticity, classroom discourse, academic integrity, and digital inequality. These domains were further reduced to the seven findings themes below, into which the iterations could be consolidated. Teacher change and classroom talk were left as separate themes, as they belong to different levels of change, and autonomy and dependency were analysed in relation to each other to avoid the simple dichotomy of the concepts.

### **Trustworthiness and Ethical Considerations**

To establish trustworthiness, transparent selection criteria, an explicit analytical sequence, source triangulation (both within each research phase and between the three

phases of research, policy and practice), and disconfirming evidence were all considered. Thus, conceptual claims have been matched with the literature for both EMI and AI, and not inferred from either of the study fields alone. Reflexivity involved recognising the contextual nature of, and the normative judgements within, the categories of support, authenticity, and responsible use. No private information or human subjects was used in the study. Thus, the hallmark of ethical practice included pointing to and citing proper sources, copying accurately, passing arguments from sources, avoiding false materials and facts, and, especially, restricting claims to documentary interpretations.

## Results and Findings

### Theme 1: AI as a Tool for Linguistic Support

AI's ability to provide linguistic support in an immediate, iterative and multimodal way was the most consistent theme. Writing systems can detect grammar violations and lack of cohesive connection, whilst chatbots can easily explain words at various levels, machine translation can ease access to hard-to-read texts, and speech recognition can help with repeated pronunciation exercises. This is important in content because content and language difficulty are related – just because a student understands a concept after the lesson is taught to them in a more understandable paraphrase doesn't mean they don't need to re-enter the English lecture or text, using a generated glossary. It builds on previous research on automated feedback and translation that place these items in a language-listening/exercises context (Groves & Mundt, 2015; O'Neill & Russell, 2019) and moves them into a disciplinary-learning context.

But, in the educational sense, support was most effective when it drew the learner's attention to the language, allowing it to be revised. A correction, whereby a learner

compares it to an original sentence, allows reflection, whereas a replacement paragraph received as a whole is not comparable to showing the same learning. Another feature of generative fluency is that it entails a contrast between surface and epistemic quality. The test of conceptual correctness, therefore, should be integrated into AI-based tasks for EMI teachers to perform, as they may tend to equate grammatical polish with conceptual correctness.

### Theme 2: Enhanced Learner Autonomy and Access

Reach out to help at the widest possible time/space, extending temporally and psychologically! Students have an opportunity to ask questions outside of class time, have a chance to practice/learn privately without the fear of committing mistakes in public, and choose the depth of explanation from a set of options. In some situations, access could prove to be particularly useful in areas where there is low availability of language-support staff. Along with the AI acting as a prompt for scaffolding or challenging, personalised prompts can also provide opportunities for establishing goals, receiving feedback, and repeating tasks at their own pace.

However, just because a student uses a tool on their own doesn't necessarily mean they are autonomous. Authentic independence includes source planning, monitoring, evaluation and the decision on whether or not to seek help. They can also become technologically dependent through continuous delegation, seeming self-sufficient and losing confidence in the ability to read or write without assistance. So, "withdrawal, withdrawal, withdrawal" was the final mode and the winning mode. Productive use takes the modelling out of AI control and into the student's control, while dependency takes the modelling without careful consideration from the student.

### Theme 3: Transformation of the EMI Teacher's Role

The teaching role changes from the primary information giving to language facilitating, learning designing, AI mediating and critical evaluating. It's not about the end of expertise; it's about the expertise being expanded. There is a need to think carefully about where AI can be useful and to design tasks which reveal reasoning, provide students a chance to correct erroneous output, and/or require students to apply specific language processes on their own. They also have to demonstrate a good role model for timely critique, disclosure, and verification. This is shown in Figure 2: disciplining explanations are not thrown out in later roles but added on.

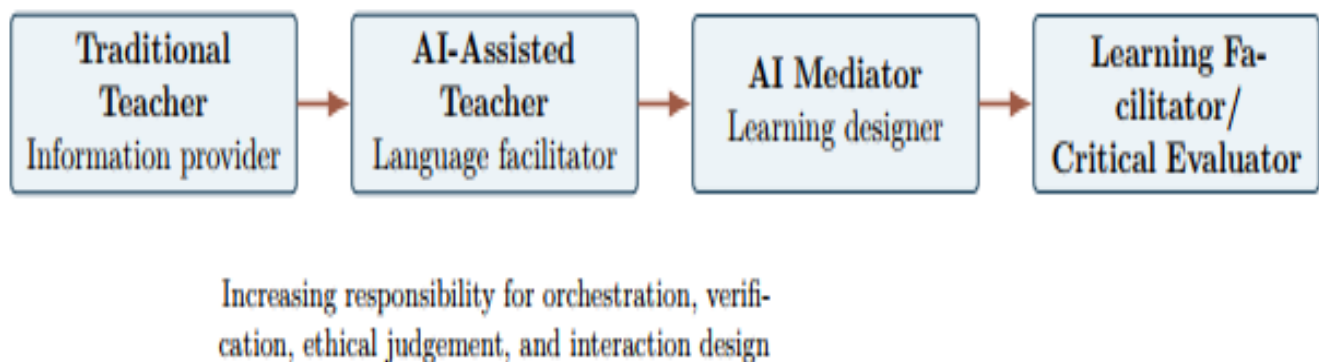
In the case of EMI, this transformation is especially challenging as teachers play a dual role as interpreters/translators of both content and the language with which content is learned. While AI can produce examples quickly, it's up to the lecturer to determine if

the examples are appropriate and within the scope of the discipline, suitable for the rhetorical context, and accessible for a specific class. If those considerations aren't addressed, there is a potential for devolving decision-making to educators and a potential false impression of the added value of AI adoption.

### Theme 4: AI Dependency and Critical Engagement

A key and recurring difference between scaffolding and offloading was discovered in the analysis. An answer may have been left ambiguous, and the students may want to interrogate it to see what they think needs to be added and to compare other sources, stimulating further critical thinking. It diminishes engagement if the first fluent response leads to the end of questioning. Some of these risks involve a decrease in independent writing, limited "productive struggle" in writing, weak checking of citations, and allowing oneself to "vowless mistakes" (Lo, 2023; OECD, 2026).

**Figure 2:** Transformation of the EMI Teacher's Role in the AI Era



**Note:** The progression is cumulative: disciplinary expertise remains necessary as mediation and evaluative responsibilities increase.

A linguistic aspect also falls under dependency. Constructing lexical control is difficult; grasping the basis for its operation is difficult; but retrieving a generated (new) phrase is easier. High-quality English delivered at the time of submission may, over time, lead to a lack of progress in

spontaneous explanation and unaided writing. The discovery is not the glorification of battle if that's what it means. Instead, pedagogical design needs to provide for maintaining these mental and linguistic operations which are specific to the desired products.

### Theme 5: Linguistic Authenticity and Classroom Communication

AI impacts authenticity on levels of voice, interaction and evidence of competence. Generated texts often have smooth, traditional academic text styles, which may make the learner aware of the genre's requirements but can obscure culturally and/or discipline-specific decisions. Students may use the generic Voice of an editor instead of making their own Voice. While machine-recognisable pronunciation could be used for speech enhancements, it should not become a substitute for real English, and AI rehearsals in speech may help gain confidence. Recipients' intelligibility, awareness and the negotiation of meaning have been more easily justified objectives (McCrocklin, 2016; Kohnke et al., 2023).

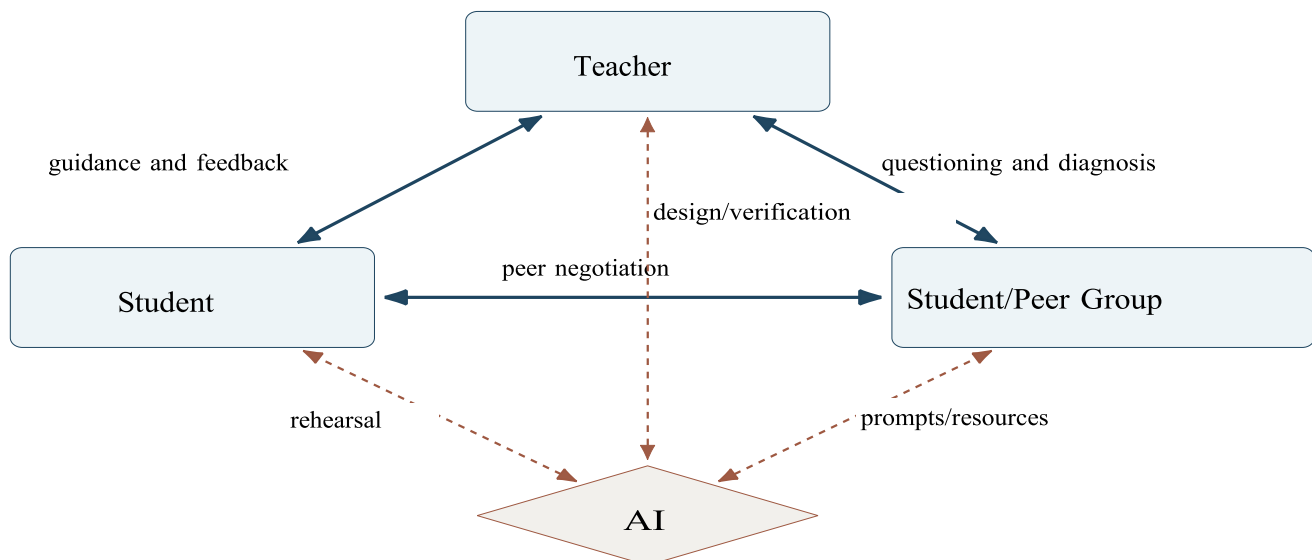
Communication with the classroom also shifts from allowing only two people to communicate to introducing a mediated network, as illustrated in Figure 3. While AI can provide explanations and prompts for teacher-student and peer interactions, it is important to maintain the overall human

structure of the relationship. The interaction between teacher and student can be to provide immediate follow-up and relational support, while student-student interaction will involve turn-taking, dissenting and co-constructing. Where uncertainty is the assumed goal of AI, these interactional resources are reduced.

### Theme 6: Academic Integrity

When AI creates the final text, the text may not reflect an author's viewpoint and may be unable to be traced back to the original author. The main pattern in the centre was a shift from policing products to validating processes. Institutions need to indicate which types of brainstorming, translation, editing and/or generation are allowed for each task or activity and what needs to be reported. Teachers need to have proof of student decisions on sources, annotated words, staged drafts, prompt logs (as appropriate), oral explanation, and that students explain in class. These measures assess students' ability to explain the ideas and words presented on the paper, rather than relying on detection, which isn't secure.

**Figure 3:** *AI-Mediated EMI Classroom Interaction Model*



**Note:** Solid lines represent indispensable human communication; dashed lines represent AI-mediated support that should feed back into human interaction.

EMI policy should not be all-encompassing and view all linguistic aid as wrongdoing. The student who reads the feedback to make sense of an error, and adjusts, is not identical to the student who turns in some “made up” reasoning. The substantive criterion is whether there was help in keeping with the construct being measured and what kind of assistance was/provided. Integrity therefore becomes a curriculum question; students do need explicit instruction on how to attribute, on how to verify, on privacy, and the bounds of AI evidence.

### Theme 7: Digital and Linguistic Inequality

While AI can help with inclusion, access depends on the quality of the device, the Internet connection, subscription, support for disability, digital literacy level, and the institution's infrastructure. A higher level of English may also enable students with stronger language skills to write more exact prompts and to be more effective at identifying subtler errors, giving more value to the same system. There, a technology claimed to have a “compensatory effect” can

re-create a language advantage. This could further disadvantage less represented languages and accents in the cases of biases in translation and speech recognition, and exacerbate biases in data practices for students who rely on free commercial services (UNESCO 2023a, b).

The capacity of teachers is likewise inconsistently geared up. Some programmes will have the resources to offer (assessment redesign support) as well as speakers of the target language to offer their help, or even secure platforms. Access alone thus does not represent equity. Institutions need to provide: tools that are easy to use, alternatives for students if they cannot or do not want to use tools, and explicit instruction in the critical use of tools.

Table 3 provides a match-up for the main opportunities and some of the risks and design responses. Table 4 then illustrates logical responses of each of the thematic interpretations to the research questions without reducing the force of AI to a positive or negative force.

**Table 3: Opportunities and Challenges of AI Integration into EMI**

| Opportunity                 | Corresponding challenge                             | Design implication                                          |
|-----------------------------|-----------------------------------------------------|-------------------------------------------------------------|
| Immediate language feedback | Uncritical acceptance and opaque corrections        | Require explanation, comparison, and selective revision     |
| Personalised pacing         | Persistent dependence on automated support          | Plan movement from scaffolded to unaided performance        |
| Multilingual access         | Reduced English processing and terminological error | Use translation contrastively and verify disciplinary terms |
| Low-anxiety rehearsal       | Withdrawal from spontaneous human communication     | Link rehearsal to live peer and teacher interaction         |
| Efficient material design   | Inaccurate or culturally narrow generated content   | Preserve teacher review and contextual adaptation           |
| Expanded idea generation    | Homogenised arguments and weakened originality      | Assess source use, decision-making, and authorial rationale |
| Scalable support            | Unequal premium access, literacy, and               | Provide institutional access,                               |

infrastructure

training, and non-AI alternatives

**Table 4:** *Themes, Sub-Themes, and Interpretations*

| Major theme                | Sub-theme                         | Evidence/pattern                                                  | Interpretation                                          |
|----------------------------|-----------------------------------|-------------------------------------------------------------------|---------------------------------------------------------|
| Linguistic support         | Feedback, translation, speech     | Assistance is immediate and multimodal but unevenly reliable      | Value depends on noticing and verification              |
| Autonomy and access        | Pacing, privacy, availability     | Independent access can coexist with extensive delegation          | Tool use is not itself learner autonomy                 |
| Teacher transformation     | Design, mediation, evaluation     | Teachers assume new orchestration and integrity work              | Human expertise becomes more, not less, consequential   |
| Dependency                 | Offloading, weak checking         | Fluent output can terminate inquiry and mask skill gaps           | Product quality may diverge from learning               |
| Authenticity and discourse | Voice, interaction, participation | AI can prepare talk but also divert uncertainty from people       | Human exchange must remain the communicative centre     |
| Academic integrity         | Authorship, validity, disclosure  | Final products provide insufficient evidence of process           | Assessment should elicit accountable performance        |
| Inequality                 | Access, literacy, bias            | Benefits vary by resources, English proficiency, and preparedness | Equity requires infrastructure plus critical capability |

The findings are integrated into themes to achieve paired effects towards AI. It may be able to reduce the language required to enter disciplinary activity and make it more difficult to see if the student is competent; at the same time, it may be able to allow students to practise on their own and help them to become dependent, and it may be able to enhance the discussion, to privatise the uncertainty. What can be achieved depends on the design of the task, its disclosure, the interaction between human beings and equitable access.

## Discussion

### AI as an Enabler Rather Than a Replacement

The findings addressed RQ1 by revealing the redistributed actions of linguistic and pedagogical labour under AI in terms of its reshaping of EMI. They provide ongoing

support for comprehension and production for students, help teachers transition toward design, mediation, and evaluation, and transform classroom dialogue from a teacher-student dynamic to a teacher-student-AI configuration. However, some areas fall outside the scope of AI in determining curricular priorities, learner identity, and memory of relations for misunderstanding, or understanding in particular contexts. It can therefore play an augmentative role in the educational landscape. This finding is consistent with sociotechnical perspectives which foreground system configurations of the interplay between people, institutions, and technologies as the basis for determining the effects on learning (Williamson & Eynon, 2020; Selwyn, 2019).

When the idea of augmentation is referred to, there is an idea of principled division of

labour. AI can be very effective in creating alternatives, allowing for low-stakes repetition, and providing provisional feedback as teachers and learners know and control the purpose, evidential criteria, interpretation and consequential judgement. This division counteracts the one in which one of the main parameters that characterise the educational process – efficiency – becomes a prevailing one. A higher draft speed will only add value if the learning outcome that specifies the knowledge or language ability will be enhanced during the activity. Human oversight is therefore not just attendance at the "outside" but is an integral aspect of the pedagogy of becoming meaningful in the educational context by means of AI.

### **Implications for Language Learning**

To answer RQ2, the language support available is contextualised vocabulary, grammatical feedback, academic register, writing models, and pronunciation practice in which learners can practice and translate. The major dangers are superficiality of input, monotony of voices, a risk of dependence and the overlaid gap between the polished product and the spontaneous competence. These align with language-technology studies, which prioritise the value of swift feedback but also warn of the importance for learners to interpret such feedback (O'Neill & Russell, 2019; Barrot, 2023). They build on that work, determining transfer to be the main criterion for EMI: The language used in the addressed discipline should be available later in unaided writing, speaking, and reasoning of the students in the supported language(s). Vocabulary items produced during a reading, for instance, ought to be repeated in discussion or during retrieval practice; practice in the pronunciation of items ought to lead to some real-life listeners.

### **Implications for Classroom Discourse**

Switching from different roles Teacher to Student or Teacher to Student to AI can have

benefits for preparation, reduce anxiety, and present more to be critiqued. What may be lost is also important: teachers don't see as many signs of developing understanding, colleagues don't see as many draft formulations, and students do less negotiating. It is an interpretation that builds on the research conducted in the EMI classroom about language choice and questioning, which was performed by Pun and Macaro (2019). What's new is not just the particular human orthographic language; the question is also whether there is any human interlocutor at all! Oral defence, think-pair-share, and collaborative verification exercises assist students in engaging in debates and bringing the issues back into public discourse while dealing with mediations designed to be productive.

### **Academic Integrity and Assessment**

Old-fashioned take-home papers are less useful and reliable if institutions are attributing both mastery of content and an unknown process of how the final product was created and how well the English is. This doesn't render writing redundant, though. It needs to be more aligned than it is between the learning outcomes, allowed support and evidence. Authorship and understanding can be triangulated with explicit use-statements for AI, process portfolios and version histories, oral questioning, and in-class synthesis. The findings align with pleas for a shift from detecting plagiarism to ethical, transparent coproduction in the generative stage (Eaton, 2023; Perkins, 2023). Assessment in EMI should be graduated so, for example, translation in content might be acceptable but not for the assessment of the competence to translate as such, as might be the case for grammar feedback.

### **Equity and Inclusion**

The analysis puts into perspective the notion of automatic AI democratisation of language support. Free access is not a similar benefit because the capacity to prompt and detect

errors takes an investment of previous linguistic and digital resources. There are inconsistencies in systems, connectivity and privacy protection. This is in line with UNESCO's assertion that technology in education can exacerbate educational inequalities (UNESCO, 2023b). Inclusive policy ensures that tools for inclusion are supported as part of the institution, and that non-AI means of learning and assessment are included.

### **Comparison with Previous Research**

The results align with EMI scholarship, which considers language proficiency, academic skills, teacher competence, and policy coherence to be mutually dependent, rather than distinct, variables (Macaro et al., 2018; Rose et al., 2020). They align with AI insights about the importance of personalisation and feedback (Crompton & Burke, 2023; Bond et al., 2024) and the lack of evidence based on pedagogical practice. This also manifests itself as a productive contradiction. AI can help reduce some of the problem areas related to language that have been identified in EMI research; however, by generating the language that students used to have to create themselves, it can be said that AI diminishes the justification for claiming language as developed in these scenarios. In the present study, classroom discourse and linguistic authenticity are moved to the foci, contributing to both literatures. What is new and unique is its ability to move responsible use of AI tools in EMI beyond an individual choice to use or not use these tools to a coordinated institutional system.

### **Strategic Framework for Responsible AI Integration in EMI**

As a result of the thematic findings, a five-dimensional strategic framework was created and is shown in Figure 4. AI literacy helps students and staff to learn the capabilities, limitations, prompting, bias, verification, privacy and disclosure. Teacher preparedness is aligned with transforming

that literacy to language-sensitive task design, feedback and assessment. Use of AI should be defined by what is ethical and should have clear parameters, liminal points where the boundaries between the roles of human and AI are defined, as well as safeguards for data and authorship. Ensuring the authenticity of the language interaction means that there can be no shortcuts to having humans speak, write, negotiate and participate in the discipline: AI-supported preparation means human speaking, writing, negotiation and disciplinary participation. Governance provides consistency of policy, fair access, secure infrastructure, teacher training and quality control.

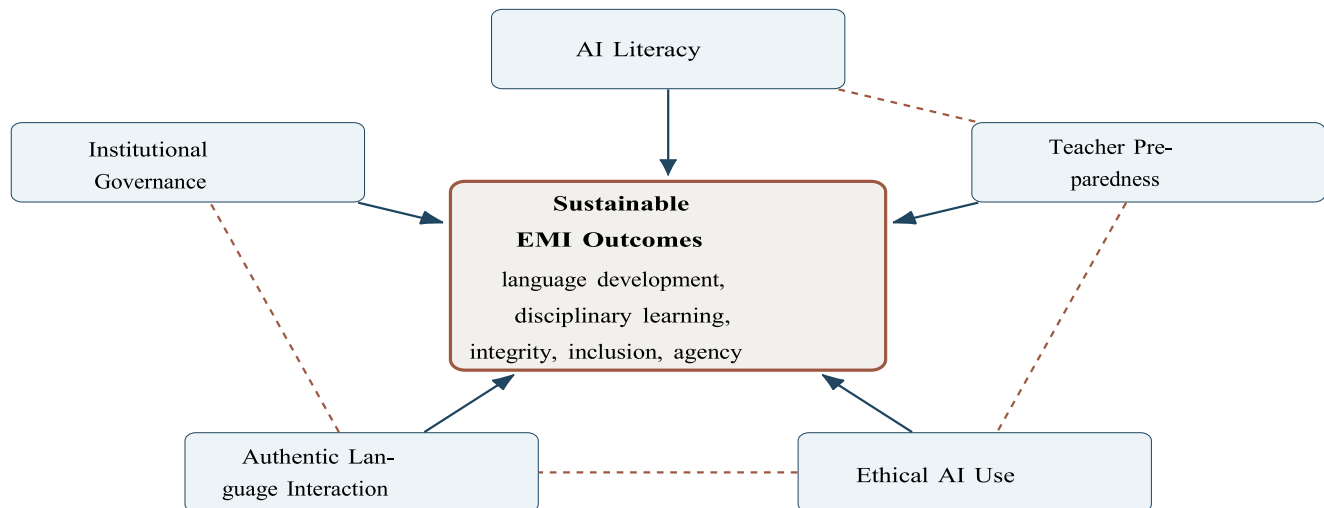
The five dimensions go hand-in-hand. In this case, policy that does not build teacher capacity is symbolic; access without literacy can exacerbate error, and interaction without supporting attendance is further evidence of normalcy and the continuation of historically unequal linguistic exclusion. Sustainable EMI outcomes occur when the dimensions of the teacher and classroom work together to create opportunities and foster disciplinary learning, language development, integrity, inclusion, and learner agency. The framework is thus designed to be a university design and audit tool, so that before implementing a new tool, the roles played by the use of AI can be assessed at the university level through examination of the dimensions.

At an operational level, a programme can be applied at course, assessment and institutional levels within the framework. Designers should identify what language process is being supported by each proposed use, the ensuing human interaction, evidence the learner might show of independent learning, the permitted level of automation, and arrangements for access by all learners. Later, implementation should be monitored according to students' work, teachers' experience, integrity examples, accessibility to the work, and participation quantities. If there is weakness in one dimension, then

there is a need to redesign that dimension, and not necessarily for these to be prohibited, but if it's one of literacy, then guided evaluation tasks are required; if it's one of interaction, then more oral or collaborative tasks are required; if it's one of

access, then there needs to be institutional access or alternative non-AI pathway. Thus, the framework provides for iterative governance and not merely a "one-time compliance checklist.

**Figure 4:** *Strategic Framework for Responsible AI Integration in EMI*



**Note:** *Sustainable outcomes require coordinated development across all five dimensions; the dashed perimeter represents their interdependence.*

## Recommendations

Publish task-specific AI policies for higher education that specify what kind of support can be provided, necessary transparency, data security, and strategies to handle disputes. Without a combination of policies, secure access, and language-support provision and subsequent teacher and professional learning, responsibility is shifted to teachers and students. QA should check whether programmes measure the planned content and language transfer in realistic conditions of AI availability.

Instructing teachers on how to use the tools to generate contrasting examples, diagnose language demands, and assist in rehearsal is an AI skill that EMI teachers must master. Advise them to compare the outputs to a reliable source and to explain why the outputs were accepted for revision. Interaction should be provided naturally, namely through peer problem-solving,

spontaneous questions, and oral follow-up. Assessment should be a mix of products and process evidence such as drafts, oral defence, in-class assessment and/or commentaries related to the learning outcome.

Students should use AI to produce content to serve as preliminary material and not as authoritative material. Some responsible practices are: verifying claims and citations, comparing translations, using independent drafting and speaking, and revealing material assistance. Students should regularly revisit similar activities performed without the use of AI to check whether they are gaining more autonomy in academic English with the support of AI.

Curriculum developers should try to integrate AI literacy, critical awareness of language, source assessment and the comparison of sources across the EMI courses and not in additional workshops. Activities should be carefully planned to

progress from the modelled or AI-assisted work towards independent and collaborative work. There should be a clear indication in the learning outcomes of whether linguistic accuracy, disciplinary reasoning, interaction or evaluation of the tool is being focused on.

Policymakers need to link to language policy, equity and integrity, and ethical governance of AI. Procurement standards should include consideration of accessibility, privacy, bias, and transparency and where tools are not available and/or suitable, institutions should make alternatives available. National and institutional policies should not impose blanket bans, nor make policy decisions based on people or a total lack of evidence. Academic-integrity personnel, language teachers, disciplinary teachers and students should all be part of a continuous evaluation process.

## Conclusion

Changes in access to content with the help of AI technology, students' academic English production, feedback-seeking, and classroom discourse in EMI higher education are reshaping the role AI plays in teaching and learning. At the same time, it provides immediate scaffolding opportunities from a linguistic perspective, personalised practice opportunities, multilingual access, pronunciation rehearsal and new forms of pedagogical design. It can simultaneously lead to dependency, a blurring of the Rainbow of voices, imitation of voice, a decrease in face-to-face communication, a

deficit in verification, and an increase in online and language inequalities.

The study addresses RQ1 by revealing a shift in roles and practices of education: from teacher-student relationships to a teacher-student-AI ecosystem, students are users and evaluators of machine-generated language, while teachers act as language facilitators, learning designers, AI mediators, and critical evaluators. It addresses RQ2 by demonstrating that opportunities and risks are inextricably intertwined and negotiated through issues of teacher preparedness, student AI literacy, institutional policies and practices, ethical considerations, digital access, and pedagogical design. The findings demonstrate that they achieve the two objectives, focusing on classroom transformation and also articulating this transformation into real language, integrity and governance implications.

Hence, effective AI-assisted EMI does not rely solely on the amount of its technological use, but instead on pedagogically engaging with this technology. Opportunities for learners to express, share and argue meaning with others should be maintained and facilitated by universities while leveraging AI to enhance opportunities' accessibility and productivity. The future of EMI should be viewed not as a technological replacement model, but as a human-AI pedagogical ecosystem: while the human maintains control over the language, judgement, relationship, and intellectual work, AI augments the learning process.

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## Declaration of Conflicting Interest

The author declared no potential conflicts of interest with respect to research.

## Funding Statement

No funding is received for this project.