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# Discipline-sensitive EMI in Algerian higher education: Comparative perspectives from STEM and humanities

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**Abstract**

This study investigated how disciplinary variations influence the implementation of English Medium Instruction (EMI) in higher education, comparing science, technology, engineering, and mathematics fields with humanities disciplines. Although EMI is widely promoted as a means of fostering academic internationalization, limited research has explored how disciplinary contexts shape its effectiveness and challenges. A mixed methods approach was employed, combining questionnaire data from 120 participants with qualitative insights from 15 interviews. Participants were selected through convenience sampling from diverse academic departments. Findings revealed shared challenges such as insufficient institutional support and language proficiency constraints, alongside clear disciplinary differences in pedagogical adaptation, relevance of English use, and interactional styles. STEM instructors emphasized content delivery and technical support, whereas humanities lecturers prioritized interactive pedagogy and linguistic precision in academic discourse. The results underscore the necessity for discipline-sensitive professional development that integrates linguistic and content-focused training. The study advocates for institutional reforms aligning EMI practices with integrated content and language approaches to enhance instructional quality and inclusivity.

***Keywords***: Academic disciplines; English Medium Instruction; higher education; language pedagogy; professional development.

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## 1. INTRODUCTION

English as a Medium of Instruction (EMI) expansion has been prominent globally in higher education, especially in non-Anglophone settings (Wächter & Maiworm, 2014; Macaro, 2018; Zheng & Choi, 2024). The disciplinary institutional approach of EMI implementation, though, is under-theorized. While EMI models propagate widely in both STEM and the Humanities, there are substantial discrepancies in pedagogic dynamics and teachers' and students' challenges (Doiz et al., 2012; Mao & Peng, 2024).

For example, disciplines in STEM fields, defined by formulaic speech, visualization, and international symbols, might come across as more EMI-compatible due to often reduced interpretation in linguistic terms (Mauranen, 2010; Airey, 2011). On the contrary, in Humanities and Social Science, discursive sophistication, argumentation, and critical interpretation of texts predominate, such that discursive content is a central aspect of meaning-making (Kuteeva & Airey, 2014; Klaassen, 2002). In this regard, differences in disciplines heavily influence learning as well as instruction.

Numerous studies underscore that the STEM discourse is viewed as more "transparent" as it gets supported by equations, diagrams, and procedural problem-solving (Airey & Linder, 2009; Pecorari & Malmström, 2018). Hence, engineering students, as a case in point, might use short expository writing less and turn more to symbolic representation, which helps reduce difficulties in limited English proficiency. However, STEM EMI requires strong academic literacy in explaining processes, writing reports, and oral defense of findings (Wilkinson, 2013).

Conversely, Humanities subjects (history, philosophy, literature, political science) are heavily dependent upon discursive finesse, idioms of culture, and intertextuality. Consequently, EMI in such contexts compounds trouble both for teachers and students, as understanding and participation necessitate high-level proficiency in language (Kuteeva & Airey, 2014; Smit & Dafouz, 2012). For instance, Ouarniki (2023) stresses that Algerian EMI teachers of Humanities understand English not simply as a medium of instruction, but as the added epistemological load, so that the "voice of the subject" gets suppressed by linguistic barriers.

Teachers' preparation is crucial to EMI performance (Macaro et al., 2018). In particular, science, technology, engineering, and mathematics (STEM) teachers favor multimodal methods, using visual support, demonstration, and stepwise problem solving (Airey, 2012). In contrast, Humanities teachers take concern in sustaining discursive richness in English and critical debate in undergraduates (Wilkinson, 2005).

In addition, Ouarniki's (2025) most recent research shows that Algerian EMI teachers across disciplines adopt adaptation strategies such as translanguaging, inclusively switching French and Arabic with English, to ensure understanding. Translanguaging's occurrence and purpose, however, vary by discipline: code-switching is primarily used by lecturers in Science, Technology, Mathematics, and Engineering (STEM) to translate technical terms, while teachers of the Humanities use it extensively in order to clear up abstract concepts as well as cultural references. Thus, adaptation is not voluntary but imperative to make EMI effective.

Students' perceptions also show divergent difficulties. For instance, STEM EMI students will only show confidence in comprehending visualized materials, while failing to write lab reports or to give presentations of research in English (Evans & Morrison, 2011; Pecorari & Malmström, 2018). Likewise, Humanities majors show difficulties in reading assignments, note-taking, as well as participating actively in debate (Doiz & Lasagabaster, 2020).

Additionally, EMI may favor students with better pre-existing profiles in English, therefore reproducing inequalities in the classroom (Sahan, 2020). In particular, Ouarniki (2023) specifies that Algerian students of Humanities with poor English proficiency refrain from debate participation, while students of STEM majors schedule participation by practicing symbolic logic.

In theory, EMI includes discipline literacy theory (Shanahan & Shanahan, 2008) and the approach of academic literacies (Lea & Street, 1998). They advocate that literacy requirements are different in disciplines:

STEM requires precision and procedural clarity, while the Humane disciplines value critical comprehension and sophistication of interpretation.

**This categorization also corresponds to Bernstein's (2006) theory of knowledge structures, whereby there is a distinction made between "hierarchical knowledge" in STEM fields and "horizontal discourse" in the Humanities. The EMI, therefore, does more than translate instructional content into English; it reformats disciplines' epistemic practices. Hence, it is important to understand such dynamics in planning EMI policies that refrain from taking a "one-size-fits-all" approach and are cognizant of disciplinary realities.**

Over the past two decades, English as a Medium of Instruction (EMI) has become a dominant trend in global higher education, mainly because of pressures from internationalization, student mobility, and access to global scientific knowledge (Macaro, 2018; Wächter & Maiworm, 2014). Although EMI adoption has accelerated, it has not evolved uniformly across disciplines. In particular, the epistemological traditions of “hard sciences” (STEM) and “soft sciences” (Humanities and Social Sciences, HSS) appear to shape both faculty and student experiences (Kuteeva & Airey, 2014). Therefore, understanding differences in disciplines is imperative in fine-tuning EMI implementation strategies, professional development plans, as well as policy regimes.

Importantly, disciplines don't differ by subject alone; disciplines are different cultures of epistemology (Uzunboylu & Altay, 2021; Elçi & Uzunboylu, 2020). Specifically, STEM fields emphasize objective knowledge transmission, precision, and technical mastery, whereas Humanities disciplines prioritize interpretation, argumentation, and contextual sensitivity (Becher & Trowler, 2001; Kuteeva, 2020). As a result, EMI cannot be regarded as a neutral pedagogical innovation; instead, it is mediated by the ways knowledge is constructed and communicated. Therefore, inquiries about EMI's interlinkage with disciplinary epistemologies could yield fruitful insight into how best to optimize instruction, learning, and policy interventions.

### 1.1. Purpose of the Study

**This work aims to compare how EMI is understood, enacted, and experienced in STEM and in Humanities disciplines in Algerian postsecondary education. Through such a comparison, it hopes to be able to establish if differences in disciplines have substantial bearings upon EMI's effectiveness as well as to contribute toward specialized policy and practice recommendations.** The research questions include the following:

- What are the main challenges of implementing EMI in STEM and Humanities disciplines?
- How do faculty in STEM and Humanities perceive the use of EMI?
- In what ways do disciplinary traditions influence EMI’s successes or limitations?
- What are the implications of disciplinary differences for EMI training and policy in Algeria?

## 2. METHOD AND MATERIALS

### 2.1. Research design

This research, following a mixed-methods comparative case study design, explored how English Medium Instruction (EMI) is viewed and implemented across two prominent clusters of disciplines: STEM (hard sciences) and Humanities (soft sciences). The selection of this design was inspired by the need to reveal complex experiences, difficulties, as well as strategies of teachers in varying academic disciplines (Creswell & Poth, 2016). The fact that the study was comparative enabled us to reveal both convergences and divergences in both clusters. The disciplines in the field of STEM usually make use of brief technical discourse as well as standard terms, while the Humanities disciplines focus on discursive, interpretive, as well as argument-based communication. The insight into such differences constituted a great foundation of results to analyze disciplines' sensitivity of EMI policies as well as practices.

### 2.2. Participants

The 120 respondents were approached by convenience sampling because they happened to be easily available in three Algerian universities that set out EMI initiatives. According to Creswell (2013), educational studies that use questionnaires prefer more than 100 respondents in sample sizes to permit effective statistical investigations. The 120 responses, therefore, provide a good foundation both for descriptive as well as inferential investigation, while the 15 subsequent interviews supplement this data with qualitative richness as well as contextual insight.

120 lecturers in total (65 in STEM and 55 in Humanities and Social Sciences) filled out a structured questionnaire that solicited perceptions of EMI benefits, issues, as well as EMI training needs. In order to enrich the interpretation of such findings, 24 lecturers were approached to be interviewed in a follow-up, of which 15 consented (8 in STEM, 7 in Humanities). The interviews enabled participants to discuss in more detail their questionnaire responses, offering discipline-eliciting insights, as well as representative examples. The questionnaire, therefore, generated a wide statistical panorama, while in turn, the interviews yielded contextualized stories that made such patterns quantitatively explicable.

Table 1 below shows the interview participants' characteristics:

**Table 1**

*Participants data*

| Cluster | Discipline | Role | Code | Years of EMI Experience |
|---|---|---|---|---|
| STEM | Engineering | Instructor | P1 | 5 |
| STEM | Computer Science | Instructor | P2 | 3 |
| STEM | Biology | Instructor | P3 | 6 |
| STEM | Computer Science | Instructor | P4 | 4 |
| STEM | Engineering | Instructor | P5 | 2 |
| STEM | Physics | Instructor | P6 | 3 |
| STEM | Chemistry | Instructor | P7 | 4 |
| STEM | Mathematics | Instructor | P8 | 5 |
| Humanities | History | Instructor | P9 | 7 |
| Humanities | Sociology | Instructor | P10 | 2 |
| Humanities | Philosophy | Instructor | P11 | 6 |
| Humanities | History | Instructor | P12 | 3 |
| Humanities | Sociology | Instructor | P13 | 5 |
| Humanities | Philosophy | Instructor | P14 | 2 |
| Humanities | Literature | Instructor | P15 | 4 |

Participants came from several Algerian universities, encompassing a whole range of experience and disciplines, varying in terms of enriching qualitative results by reflecting different perspectives of instruction.

### 2.3. Data collection instruments

Data collection instruments included a questionnaire and an interview. Data collection was concentrated over two significant periods:

**Sent to 120 faculty to obtain perceptions of EMI readiness, issues, and disciplinary influences**, t**he survey contained Likert-scale closed items and a few open questions.** The **Semi-structured interviews** were conducted using 15 teachers, in about 20–25 minutes. Since participants included people with differing university backgrounds, interviews occurred over distance, and audio-recorded responses were transcribed. In English, French, or Arabic, in accordance with participants' wishes, transcriptions were converted to English in order to remain consistent.

Interviews centered on themes such as:

- Assumed differences in EMI adoption across STEM and Humanities disciplines,
- Linguistic issues in abstract concepts in teaching.

- Availability of resources and institutional support, and
- Techniques for reducing EMI issues.

### 2.4. Data analysis technique

The quantitative survey data were descriptively summarized (frequencies, percentages, and mean scores) in SPSS 27 in order to unveil overarching patterns of perception by disciplines. Qualitative interview data underwent thematic analysis following Braun and Clarke's (2006) six-phase approach: familiarization, initial code generation, searching in data, reviewing themes, specifying and naming themes, and writing the report. The codes emerged both inductively (bottom-up, out of data) and deductively (hypothetically, following EMI research to date).

To guarantee credibility, triangulation was attained by merging the results of questionnaires with accounts of conversations. Member checking was used: transcripts and coded sections were distributed to informants to verify, underpinning the credibility of interpretation.

## 3. RESULTS

**These findings of this questionnaire-based (n = 120) and semi-structured (n = 15) interview-based survey reflected five overarching themes in terms of implementing English as a Medium of Instruction (EMI) in Algerian higher education across disciplines under STEM and across disciplines in Humanities and Social Sciences (HSS).**

### 3.1. Quantitative results

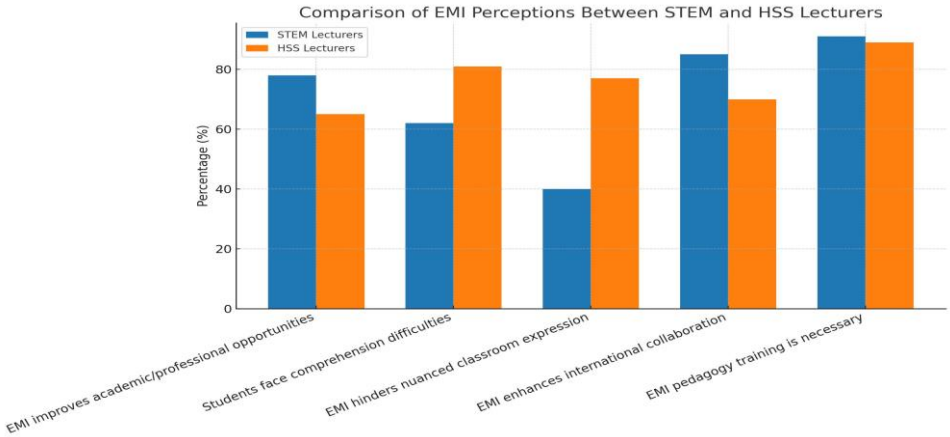
**Table 2**

*Comparison of STEM and HSS lecturers' perceptions of EMI (n = 65 STEM, n = 55 HSS)*

| Theme | STEM Lecturers (%) | HSS Lecturers (%) |
|---|---|---|
| EMI improves academic/professional opportunities | 78 | 65 |
| Students face comprehension difficulties | 62 | 81 |
| EMI hinders nuanced expression | 40 | 77 |
| EMI enhances international collaboration | 85 | 70 |
| EMI pedagogy training is necessary | 91 | 89 |

**Figure 1**

*Comparison of STEM and humanities lecturers' perceptions of EMI across five themes*




To determine if differences in perceptions found between STEM and Humanities lecturers in this research were of statistical significance, chi-square tests were conducted. The significant differences and non-significant differences revealing general agreement across disciplines, as found in the results, appear in Table 2 and Figure 1.

**Table 3**

*Chi-square analysis of differences between STEM and humanities lecturers on EMI perceptions*

| Theme | $\chi^2$ (df = 1, N = 120) | p-value | Interpretation |
|---|---|---|---|
| EMI benefits (academic/professional opportunities) | 3.85 | .050 | Marginally significant; STEM lecturers are more optimistic |
| Comprehension difficulties | 5.12 | .024 | Significantly, Humanities lecturers face more comprehension challenges |
| Nuanced expression | 12.40 | < .001 | Strong association: HSS lecturers perceive greater expression difficulties |
| International collaboration | 3.90 | .048 | Significantly, STEM lecturers are more aligned with global networks |
| Pedagogical training needs | 0.08 | .78 | Not significant; consensus across disciplines |

The data in Table 3 revealed strong patterns:

- **EMI Benefits**

Both STEM lecturers also expressed more positivity about EMI enhancing scholarly and professional prospects (78% compared to 65% HSS) and hence demonstrated higher compatibility of world-English medium networks across STEM fields.

- **Comprehension Difficulties**

Humanities lecturers also indicated higher understanding difficulties (81% versus 62% STEM), in concordance with discursive disciplines' linguistic nature.

- **Nuanced Expression**

Fewer than 40% of STEM lecturers saw EMI as obstructing expression, while 77% of HSS lecturers did, underscoring the role of language in Humanities teaching.

- **International Collaboration**

STEM lecturers also preferred EMI more emphatically as a means of facilitating global collaborations (85% versus 70% HSS), in harmony with the crucial role of English in science studies.

- **Pedagogical training**

Both categories agreed very highly that training was needed (91% STEM, 89% HSS) and professional development was key to EMI success.

Altogether, STEM fields value international opportunities, while the Humanities value linguistic obstacles and teaching limitations

### 3.2. Qualitative insights

#### *3.2.1. EMI as an opportunity for academic advancement*

Both specialties' teachers recognized EMI's importance in providing students with more access to worldwide knowledge and professional networks.

- STEM: "English opens doors for our students. They can read international research and attend more conferences more easily." (P2)

- HSS: “When students master English, they feel more confident to apply for scholarships abroad. But unfortunately, only the top students can take advantage of this.” (P8)

#### *3.2.2. Comprehension issues in a learning setting*

Difficulty in following was also experienced in both groups, though more so in Humanities.

- STEM: "When I use technical English, students hardly relate to the explanation, though it is clear in terms of writing the equation." (P7)
- HSS: "Critical essays fall apart because students cannot write in English." (P9)
- HSS: "Occasionally students will request that I remain in French as they get lost in English while arguing." (P10)

#### *3.2.3. Discipline-specific conceptions of knowledge and language*

- STEM lecturers regarded English as value-neutral, while Humanities lecturers saw it as being at the core of meaning-making.
- STEM: "Formulas and equations do not vary in any language. English is nothing more than a mode of transport to us." (P3)
- HSS: "Language in philosophy never remains neutral. Each word involves history, background, and nuances. Translations into English always amount to betrayal." (P9)

#### *3.2.4. EMI and international collaboration*

- STEM lecturers also saw EMI as critical to global integration, while there were more cautious views by humanities lecturers.
- STEM: "Research networks function in English. Our students are left behind without EMI." (P4)
- HSS: "Even if students understood English, they could not participate in international debates about literature." (P15)

#### *3.2.5. Professional development and pedagogical training*

All of the lecturers emphasized pedagogic training to successfully apply EMI.

- HSS: "We never learned how to teach content in English. What we need are strategies, not mere translation." (P10)
- STEM: "Workshops could help us match our technical content to students' real proficiency in language." (P6)

In general, qualitative findings corroborated quantitative patterns: STEM lecturers pursued opportunities and technical integration, while Humanities lecturers capitalized on linguistic challenges and instruction support.

## 4. DISCUSSION

This research explored the impact of differences in disciplines in applying EMI in Algerian higher education. Both STEM and humanities clusters, although having similar issues of linguistic constraints and lack of institutional support, differ fundamentally in terms of strategies of instruction, beliefs about the relevance of English, and forms of instructional interaction. The results shed new light upon how differences in disciplinary epistemologies in fashion EMI practice and support the importance of contextualized approaches.

It is a critical insight that regards how both STEM and humanities teachers encounter EMI. The former tends to view English as a non-partisan content transmission medium. As P3 clarified: *Equations in engineering are mightier than words. Even though I won't describe anything in English, it is a universal formula*. This strategy aligns with Becher and Trowler's (2001) definition of hard and soft disciplines, in that hard disciplines are grounded in accumulative, symbolic knowledge that can be transmitted without regard for linguistic flourishes. Lecturers in humanities, by contrast, centered around language as a focus of meaning-making. P7 noted: "*Teaching philosophy in English is not like teaching mathematics. Every word counts, and if I deviate to slip in losing precision, then I lose the meaning of that term.*" These comments corroborate Airey (2012), who notes that soft disciplines require robust linguistic ability so that knowledge can be transmitted successfully.

On this score, EMI in the humanities is not a question of translating work but of sustaining the delicacy of disciplinary discourse.

Implementation of EMI also requires specialized teaching practices in disciplines. Lecturers of STEM often use bilingual descriptions, pictures, and translanguaging practices to guarantee that students understand: *"I often draft the idea in English first and then describe it in Arabic to ensure students get it" (P1).* By contrast, teachers of humanities were concerned about code-switching because excessive translation might suppress students' English academic thinking: *"If I keep translating, then students will never get a chance to think in English. But if I do English, then it becomes a very restrictive conversation" (P8).* These narratives underpin Ouarniki (2023) in arguing that EMI-based instruction in the humanities reveals weak spots in linguistic proficiency, especially if knowledge in a discipline relies upon argumentation, interpretation, and subtle textual analysis. Hence, adaptations in pedagogy are a must, rather than a luxury, to address linguistic-based constraints.

One of the disciplinary differences also manifests in terms of students' participation and dynamics in the classroom. The STEM students could generally be characterized as being task-oriented and in a situation to handle technical exercises despite low English proficiency in speech. Conversely, humanities students tended not to handle participation due to linguistic limitations: *"Students comprehend the narrative but are unable to develop complex arguments, so discussion is extremely challenging"* (P15).

These qualitative attitudes closely align with findings of surveys, which also detected higher issues of understanding (62% STEM versus 81% Humanities) and more difficulties in fine-grained expression at the classroom level (40% STEM versus 77% Humanities). What emerges is that EMI strategies must be specialized to the linguistic and cognitive needs of each discipline, as opposed to one-size-fits-all strategies.

The results substantiate EMI's imperative to be reconceptualized as a discipline-sensitive approach to pedagogy, shifting away from content-centricity and inclusivity towards Integrated Content and Language (ICL) strategies (Coyle et al., 2010). In Algerian education, dominant EMI approaches always favor the delivery of content, particularly in the fields of science, engineering, mathematics, and technology (STEM), but often do so at the expense of caring for language. The incorporation of ICL would involve injecting teaching with language-aware approaches such that students achieve discipline knowledge and English academic proficiency simultaneously.

STEM education might bring together conceptual scaffolding and accelerated linguistic support, like discipline vocabularies and English stepwise problem-solving and explicit technical discourse teaching. Humanities education could require discourse scaffolding, as controlled debate, structured writing activities, and vocabulary building that enables critical argument and cultural interpretation. In synchronizing pedagogic strategies and disciplines' literacy demands (Shanahan & Shanahan, 2008), ICL could enhance reception and expression, and make EMI more effective and inclusive.

Equity is paramount. Sahan (2020) underscores that EMI could reinforce inequalities, favoring EMI students with more developed English proficiency at the expense of more limited proficiency. ICL-based frameworks, by situating language support as integral to content-based instruction, can reduce such inequalities, granting equal access to knowledge and opportunities for effective participation to all students. Algerian EMI programs should, therefore, move in this direction, blending content expertise with systematic language acquisition, in line with disciplinary cultures and linguistic profiles of learners.

Customized professional development becomes imperative to successful EMI implementation. In case of STEM fields, professional development would address technical terms, multimodal instruction, and translanguaging practices, hence facilitating closure of linguistic gaps without loss of disciplinary robustness. In the case of humanities fields, professional development should address academic discourses, debate mediation, and critical writing in English, hence facilitating instruction in scaffolding discussion and retention of nuances of meaning-making.

Institutional support also comes into focus. Universities can establish collaborative sites in which instructors from different disciplines exchange strategies, develop EMI materials cooperatively, and address

discipline-based issues. Professional development alignment across policy frameworks also ensures sustainability, as EMI effectiveness resides more in contextualized solutions rather than blanket solutions. In fact, through investment in specialized training and materials, Algerian higher education can use EMI to enhance global connectivity, disciplinary literacies, and learning results and cross linguistic divides.

## 5. CONCLUSION

This study examined whether discipline has a bearing on undertaking English-Medium Instruction (EMI) using STEM and Humanities disciplines in Algerian universities. With a mixed-methods design consisting of survey results and qualitative interviews, the results recorded noticeable differences in using the two fields. STEM lecturers in general perceive EMI positively as enhancing world recognition and professional careers and highlighting collaboration opportunities in research and technology transfer. Humanities lecturers ranked EMI lowest in professional status but highest in aiding critical debate, interpretative accomplishment, and cultural linkage.

Overall, the investigation finds EMI is neither generic nor universal. Instead, it is moderated through disciplinary cultures, teaching traditions, and tutor beliefs. STEM fields require terminological accuracy and worldwide integration, whereas the Humanities value sophisticated wording, critical argumentation, and discursive coherence. As a result, discipline-aware policies and professional development programs are needed in order to achieve EMI effectiveness and inclusiveness.

Based on the results above, the following are the proposed recommendations:

- Programs must consider the pedagogical requirements of varying disciplines. STEM teachers might be well served by training in how to simplify technical vocabulary and encourage student multimodality, while Humanities teachers might be well served by strategies to ensure critical debate and writing in English.

- Support for languages using co-teaching, workshops, or language mentoring could be employed to assist teachers in transcending linguistic boundaries. This is particularly applicable in STEM courses, where an understanding of technical English could be an issue, and Humanities courses, where writing and discourse skills in academic life are critical.

- While world textbooks are as applicable in STEM subjects as possible, Humanities units require locally applicable teaching content bridging English usage and Algerian literary and political contexts.

- Policymakers cannot issue broad-based EMI mandates. Instead, frameworks need to recognize discipline-based differences and incorporate consultation with faculty in establishing thoroughness, ownership, and pedagogical appropriateness. The Algerian Ministry of Higher Education could:

  - Create institution-wide discipline-sensitive EMI training programs for STEM and Humanities lecturers.

  - Provide earmarked funding and assistance to support EMI professional development.

  - Develop national standards in the application of language support and discipline-specific approaches in EMI courses.

- Algerian universities may be enriched by collaboration with foreign universities, like:

- The partnership with the Columbia Teachers College on ICL-based professional preparation.

- EU-sponsored EMI/ICL projects providing cross-institutional training, sharing of resources, and co-designed curriculum.

Such partnerships might facilitate the transfer of knowledge, mutual course content co-development, and Algerian EMI programs vs. international best practices comparisons. Future investigations could involve:

- Examining the longitudinal impact of EMI on teachers' teaching methods and transmission of disciplinary knowledge and students' professional and academic accomplishments.
- For comparing usage and attitude towards EMI in other Algerian universities or in other domestic setups to determine inter-institutional differences.
- Investigating simultaneously how teachers' English proficiency and their teaching styles affect EMI effectiveness in STEM and Humanities fields.

As a whole, in recognition and resolution of STEM and Humanities lecturers' differing opinions on the matter, Algerian higher education is capable of transitioning to an inclusive, efficient, and sustainable EMI system.

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## REFERENCES

Airey, J. (2011). Talking about teaching in English. *Ibérica* (22), 35-54. http://revistaiberica.org/index.php/iberica/article/view/317

Airey, J. (2012). I don't teach language. *The linguistic attitudes of physics lecturers in Sweden. AILA Review*, *25*(1), 64-79. https://www.researchgate.net/profile/John-Airey/publication/261070822_I_Don't_Teach_Language_The_Linguistic_Attitudes_of_Physics_Lecturers_in_Sweden/links/0a85e533291a7db832000000/I-Dont-Teach-Language-The-Linguistic-Attitudes-of-Physics-Lecturers-in-Sweden.pdf

Airey, J., & Linder, C. (2009). A disciplinary discourse perspective on university science learning: Achieving fluency in a critical constellation of modes. *Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching*, *46*(1), 27-49. https://onlinelibrary.wiley.com/doi/abs/10.1002/tea.20265

Becher, T., & Trowler, P. (2001). *Academic tribes and territories*. McGraw-Hill Education (UK). https://books.google.com/books?hl=en&lr=&id=7GlEBgAAQBAJ&oi=fnd&pg=PP1&dq=+Becher,+T.,+%26+Trowler,+P.+(2001).+Academic+tribes+and+territories:+Intellectual+enquiry+and+the+culture+of+disciplines+(2nd+ed.).+Open+University+Press.&ots=HmZHt6oydx&sig=_bEc5KFBQnkgA5oj8nTA9WZ2NSA

Bernstein, B. (2006). Vertical and horizontal discourse: An essay. In *Education and society* (pp. 53-73). Routledge. https://www.taylorfrancis.com/chapters/edit/10.4324/9780203964248-11/vertical-horizontal-discourse-essay-basil-bernstein

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, *3*(2), 77-101. https://www.tandfonline.com/doi/abs/10.1191/1478088706QP063OA

Coyle, D., Hood, P., & Marsh, D. (2010). *Content and language integrated learning* (Vol. 221). Cambridge: Cambridge university press. https://drupal-s3fs-prod.s3.eu-west-1.amazonaws.com/files/8413/8071/2345/clil-hardback-frontmatter.pdf

Cresswell, J. (2013). Qualitative inquiry & research design: Choosing among five approaches. https://repositorio.ciem.ucr.ac.cr/handle/123456789/501

Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.

Doiz, A., & Lasagabaster, D. (2020). Dealing with language issues in English-medium instruction at university: A comprehensive approach. *International Journal of Bilingual Education and Bilingualism, 23*(3), 257–262. https://doi.org/10.1080/13670050.2019.1689918

Doiz, A., Lasagabaster, D., & Sierra, J. M. (Eds.). (2012). *English-medium instruction at universities: Global challenges*. Multilingual matters. https://www.degruyterbrill.com/document/doi/10.21832/9781847698162/html

Elçi, E., & Uzunboylu, H. (2020). The development of a universal and cultural values scale for values education. *South African Journal of Education*, *40*(1), S1-S8. https://www.ajol.info/index.php/saje/article/view/196012

Evans, S., & Morrison, B. (2011). Meeting the challenges of English-medium higher education: The first-year experience in Hong Kong. *English for Specific Purposes*, *30*(3), 198-208. https://www.sciencedirect.com/science/article/pii/S0889490611000020

Klaassen, R. G. (2002). The international university curriculum. Challenges in English-medium engineering education. *LOS Contact*, *22*(2), 24-26. https://research.tudelft.nl/en/publications/the-international-university-curriculum-challenges-in-english-med

Kuteeva, M. (2020). Revisiting the 'E'in EMI: Students' perceptions of standard English, lingua franca and translingual practices. *International Journal of Bilingual Education and Bilingualism*, *23*(3), 287-300. https://www.tandfonline.com/doi/abs/10.1080/13670050.2019.1637395

Kuteeva, M., & Airey, J. (2014). Disciplinary differences in the use of English in higher education: Reflections on recent language policy developments. *Higher education*, *67*(5), 533-549. https://link.springer.com/article/10.1007/s10734-013-9660-6

Lea, M. R., & Street, B. V. (1998). Student writing in higher education: An academic literacies approach. *Studies in higher education*, *23*(2), 157-172. https://www.tandfonline.com/doi/abs/10.1080/03075079812331380364

Macaro, E. (2018). *English medium instruction*. Oxford University Press.

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://www.cambridge.org/core/journals/language-teaching/article/systematic-review-of-english-medium-instruction-in-higher-education/E802DA0854E0726F3DE213548B7B7EC7

Mao, Y., & Peng, J. E. (2024). Exploring Chinese university students' learning strategy use in English-medium instruction courses. *The Asia-Pacific Education Researcher*, *33*(1), 209-218. https://link.springer.com/article/10.1007/s40299-023-00720-6

Mauranen, A. (2010). Features of English as a lingua franca in academia. *Helsinki English Studies*, *6*(6), 6-28. https://www.academia.edu/download/80801956/Mauranen_HES_Vol6.pdf

Ouarniki, O. (2023). Exploring teachers' perspectives on the implementation of English as a medium of instruction (EMI) in Algerian higher education institutions: Challenges and opportunities. *Horizons for Science, 8(*3), 176-192. https://asjp.cerist.dz/en/article/223062

Ouarniki, O. (2025). Listening Beyond Silence: Subject Matter's Echoes from the EMI Classroom. *Journal of Studies in Language, Culture and Society (JSLCS)*, *8*(2), 172-182. https://asjp.cerist.dz/en/article/273152

Pecorari, D., & Malmström, H. (2018). At the crossroads of TESOL and English medium instruction. *Tesol Quarterly*, *52*(3), 497-515. https://www.jstor.org/stable/44987078

Sahan, K. (2020). Inequality in English medium instruction: Evidence from Turkish higher education. *Language Policy, 19*(2), 225–247. https://doi.org/10.1007/s10993-019-09525-1

Shanahan, T., & Shanahan, C. (2008). Teaching disciplinary literacy to adolescents: Rethinking content-area literacy. *Harvard educational review*, *78*(1), 40-59. https://meridian.allenpress.com/her/article-abstract/78/1/40/31935

Smit, U., & Dafouz, E. (2012). Integrating content and language in higher education. *Aila Review*, *25*(1), 1-12. https://www.academia.edu/download/98085217/aila.25.01smi20230201-1-yf4ux8.pdf

Uzunboylu, H., & Altay, O. (2021). State of affairs in multicultural education research: A content analysis. *Compare: A Journal of Comparative and International Education*. https://www.tandfonline.com/doi/shareview/10.1080/03057925.2019.1622408

Wächter, B., & Maiworm, F. (Eds.). (2014). *English-taught programmes in European higher education: The state of play in 2014*. Lemmens Medien GmbH.

Wilkinson, R. (2005). The impact of language on teaching content: Views from the content teacher. *Konferencebidrag, Bi-and Multilingual Universities–Challenges and Future Prospects. Helsinki, Finland*.

Wilkinson, R. (2013). English-medium instruction at a Dutch university: Challenges and pitfalls. *English-medium instruction at universities: Global challenges*, *324*(10.21832), 9781847698162-005.

Zheng, Q., & Choi, T. H. (2024). English-medium instruction as an internationalisation strategy at a second-tier Chinese University: instructors' challenges and their shaping factors. *Asian-Pacific Journal of Second and Foreign Language Education*, *9*(1), 76. https://link.springer.com/article/10.1186/s40862-024-00295-9