Original Research Article

English as a Medium of Instruction for Science: Teacher and Student Perspectives

ABSTRACT :

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| This study explores the attitudes of Moroccan high school science students and teachers toward English as a Medium of Instruction (EMI). It addresses the challenges linked to French as a medium of instruction. Based on survey responses from 110 students and interviews with nine teachers, the research highlights a growing preference for English, fueled by exposure to digital media, global ambitions, and perceived academic benefits. While students find it difficult to understand scientific concepts in French, they consider English more accessible and relevant for learning and future opportunities. Teachers, although supportive of EMI, report facing linguistic and pedagogical obstacles and emphasize the need for structured training and curriculum reforms. Additionally, the study emphasizes the limitations of using Arabic and Tamazight for scientific instruction due to terminology gaps and epistemological issues. The findings reinforce the urgent need to review language policies in Moroccan education, especially the role of English in science learning. This study contributes to the debate on EMI by providing empirical insights into how language preferences, instructional challenges, and policy implications intersect in a dynamic, multilingual, and educational context.  |

*Keywords: English as a Medium of Instruction, language attitudes, Moroccan high schools, science education, student perspectives, teacher perspectives*

1. INTRODUCTION

The language of instruction refers to the language or languages used to teach and communicate the curriculum in formal or informal educational settings. it encompasses both spoken and written forms of classroom discourse, which may be new to learners and are essential for understanding and engaging with educational content (Council of Europe, 2007; UNESCO, 2006), which means that it plays a pivotal role in shaping students’ learning experiences and academic success. Also, it is not merely a medium through which content is delivered but a fundamental tool that influences cognitive development, comprehension, and participation in educational settings. Choosing the appropriate language of instruction can significantly affect students’ ability to access knowledge, engage with complex concepts, and develop critical thinking skills. In this regard, Lev Vygotsky underlines that the language of instruction is the primary tool through which thinking is mediated and developed, stating that “language and culture play essential roles both in human intellectual development and in how humans perceive the world” (Vygotsky,1978).

The Moroccan government has worked to improve its education system since independence, focusing on instruction effectiveness and student achievement, especially in science. An aim is to promote foreign languages, notably English, due to its global importance in STEM fields. While English is valued for scientific progress, Moroccan high schools primarily teach science subjects in French, creating a multilingual environment that reflects the country's heritage. Recently, there have been increasing calls and policies advocating for more English-medium instruction (EMI) at various levels, including in Morocco (Dearden, 2014; Macaro et al., 2018).

This shift is often justified by the benefits of EMI in enhancing students’ international competitiveness, academic mobility, and access to knowledge. Recent research shows that AI-mediated English instruction can significantly improve learners’ achievement, motivation, and self-regulation compared to traditional methods (Wei, Wang, & Ma, 2023; Zawacki-Richter et al., 2019). These findings highlight the potential of combining EMI policies with educational technologies to create more effective, personalized learning experiences.

Recognizing these developments, policymakers and educators in Morocco are increasingly exploring strategies to implement English as a medium of instruction (EMI) across educational institutions. This shift aims to improve students' English skills, digital literacy, and readiness for international academic and professional opportunities (Dearden, 2014; Macaro et al., 2018). The Moroccan Ministry of Education has recently introduced reforms supporting the gradual adoption of EMI, especially in science and technology fields, reflecting a broader effort to align the country's education with global standards. At the same time, the integration of AI-supported English instruction is gaining attention, with recent studies showing its effectiveness in boosting learners' academic performance, motivation, and self-regulation (Wei, Wang, & Ma, 2023; Zawacki-Richter et al., 2019). These changes suggest a promising synergy between EMI policies and emerging educational technologies to enhance language education in Morocco.

1. **English language and linguistic situation in Morocco**

Morocco is a multilingual country with a complex language scene where varieties of Arabic and Amazigh vie for prestige and use. The official languages are Amazigh and Modern Standard Arabic; French is the main foreign language, followed by English, with Spanish and German spoken by smaller groups (Ezzaki, 2007). Classical Arabic holds prestige, especially in North Africa and Morocco (Grandguillaume, 1990; Ennaji, 2005). During French rule (1912-1956), French was mainly used by elites and institutions, creating separate educational paths for Europeans, Jews, Muslims, and Berbers (Baker, 2012). Most Muslims and Berbers received basic French, while Europeans and Jews got advanced training and social advantages. After independence, Morocco promoted Arabization to reduce French influence, but French remains valued in government, business, and higher education, linked to social status and opportunities (Baker, 2012). Today, French and Arabic serve different roles in society, causing debates on language policy and identity (Baker, 2012).

Unlike the French language, the presence of English in Morocco was primarily confined to diplomatic and economic relations with countries such as the United Kingdom and the United States. Aside from this, English lacked native speakers or learners in Morocco, as noted by historians. Following independence, and given the widespread use of English as an international language, media language, and lingua franca, Morocco, similar to many other nations, has, whether by necessity or choice, adapted to the influence of this dominant linguistic variety (Zouhir, 2013, as cited in *English Today*, 2022).

1. **English as the language of science**

English has become the most widely used language in science globally, a trend that started after World War I and became more established after World War II (Englander, 2014). This change has given scientists around the world access to extensive scientific literature and improved international communication (Drubin & Kellogg, 2012). The rise of English in science is linked to various factors, such as geopolitical shifts and the decline of other languages within specific scientific fields (Wood, 2001). Notably, in Morocco, English is gradually emerging as the primary language for technological transfer and modernization, slowly replacing French as Morocco's second language among youth and educators (Soussi, 2020). This shift is evident in official policies, with the Ministry of Higher Education encouraging English through requirements at the doctoral level and in faculty hiring (El Kirat El Allame & Laaraj, 2016). Additionally, the recent expansion of private schools offering English, moving away from what public schools traditionally provided, reflects a significant change in societal attitudes that aligns with economic demands. The growth of American schools in the country is part of a broader trend toward internationalization in higher education (Othmane Zakaria, 2023).

Furthermore, globalization, internet access, and social media have led to the increasing popularity of the English language in Morocco. This has prompted discussions about the role of language in education and its potential impact on other languages, especially Arabic and French (El Allame, El Kirat & Laaraj, 2016; Soussi, 2020). Additionally, the rising preference for English as the medium of instruction in Moroccan higher education, particularly in science and technology, is a new and debated aspect of the country's language policy. Both professors and students generally have positive attitudes toward English, seeing it as essential for academic research, career opportunities, and international competitiveness (Belhiah & Abdelatif, 2016; Chihab et al., 2024).

1. **Language** **attitudes**

Language attitudes are vital in shaping educational policies and predicting future decisions. Baker (2011) notes that these attitudes reflect societal values and help anticipate how policies will be received or resisted. This study focuses on how teachers and students view the use of English as the medium of instruction. Research indicates that positive attitudes toward mother tongue education are crucial for stakeholder engagement and successful policy implementation (Jones, 2012). In multilingual countries like the Philippines, longstanding language policies favoring English have fostered attitudes that may impede mother-tongue-based education efforts (Cruz & Mahboob, 2013).

In the Moroccan context, language attitudes play a vital role in shaping language education policy and classroom practices. Bouziane (2020) finds that students' perceptions of local and foreign languages reveal a strong preference for English and French, mainly driven by personal motivation and goals rather than official language policies. Similarly, Aknouch (2023) shows that high school students’ attitudes toward English as a foreign language are consistently positive, fueled by aspirations for academic success, global mobility, and self-development. Expanding the scope to educators, Ben Hammou and Kesbi (2023) examined secondary school science teachers’ perceptions of EMI, noting that there is general support for its implementation but also highlighting practical challenges such as limited English proficiency and a lack of pedagogical training.

While these studies provide valuable insights, they mainly focus on students and teachers in isolation or emphasize higher education. What remains less explored is the interaction between teachers' and students' attitudes toward EMI at the high school level, especially considering Morocco’s ongoing educational reforms that promote the use of English across various subjects. This study aims to examine the attitudes of both high school teachers and students toward the growing use of English in Moroccan secondary education, to support more context-aware curricular planning and teacher training. Understanding these attitudes helps educators gain deeper insights into students' and teachers' fears, motivations, anxieties, and preferences. Consequently, this research seeks to explore their perspectives on incorporating English as the medium of instruction for science subjects and to identify the challenges faced when using French in science education as currently practiced. The key questions we wish to address are as follows.

a. What are the challenges that the change in the medium of instruction to the French language poses for students and teachers?

b. What attitudes do students and teachers hold toward English as a medium of instruction (EMI) for science subjects, and how prevalent are these attitudes?

1. **English as a Medium of Instruction (EMI)**

As discussed, due to globalization and the competitive global educational market, English as a medium of instruction (EMI) has rapidly grown worldwide, sparking research and debate among educators and policymakers. In Morocco, recent years have seen efforts to expand English teaching, driven by economic needs and the global demand for English in employment. Studies show Moroccan society’s positive attitudes toward English, as it is regarded as a lingua franca, a science, and an ICT language. A British Council study on the “Shift to English in Morocco” found that young people mostly associate English with the internet, movies, and media. The study also found that 74% of young Moroccans support making English the country's first foreign language.

Abdelatif and Belhiah (2016) found that using English as the main language for teaching science in Moroccan higher education has become essential. Their research shows that Moroccan doctoral students increasingly see English as crucial in higher education. However, the study also points out that current efforts to promote English are ineffective, even though policymakers stress its importance for national development. An additional key finding is that French is becoming less useful for these students, despite being the first foreign language and the language used for science instruction in Morocco.

 The ongoing debate over using English as a teaching language, especially in science, combined with students' difficulties in pursuing university studies where English is the primary language and accessing scientific resources in English, creates a major challenge. To better prepare students for academic achievement and global opportunities, introducing English as a medium of instruction in high schools, particularly in the last three years of secondary education, is crucial, considering its importance at the post-secondary level. Prior research in Morocco (Bouziane, 2020; Aknouch, 2023; Ben Hammou & Kesbi, 2023) has shown generally positive attitudes toward English among students and teachers. These studies highlight strong instrumental motivations for learning English and emerging challenges in implementing English-medium instruction. Building on these findings, this study examines how these attitudes appear in high school settings, where recent policy changes directly affect both teachers and students.

2. Methodology

1. **Introduction**

The study aims to investigate the opinions of scientific instructors and students regarding the employment of English as a teaching language in Moroccan high schools. Along with identifying the difficulties they encounter amid the recent switch to French as the language of instruction. A total of 110 students participated in the study, comprising 53 females (48.2%) and 57 boys (51.8%), all from various high schools in Morocco. An online survey was given to them as our quantitative data. Our participants for the qualitative data were 17 teachers in all.

1. **Research design**

This research uses a mixed-methods approach, combining exploratory and descriptive elements, and employs both quantitative and qualitative data collection methods through surveys (questionnaires) and interviews. According to Creswell (2012), quantitative research often involves surveys given to samples or entire populations to gather information about personal attributes, opinions, or behaviors. Complementing this, interviews are considered one of the most effective qualitative methods for exploring human attitudes and perceptions (Krueger, 2014). This study adopts a Convergent Design, where quantitative and qualitative data are collected at the same time and analyzed separately before merging the findings during interpretation. This design was chosen to thoroughly understand high school students’ and teachers’ attitudes toward English as the medium of instruction in science subjects, aligning with the research objectives.

1. **Participants**

Our first concerned participants are high school students of the common core to the second baccalaureate. These students were all enrolled in the science stream, ranging in age from approximately 16 to 20 years. A total of 110 of these students completed the questionnaire shared with them, including 53 females (43.2%) and 57 males (51.8%).

The other concerned participants are teachers. A total of 17 teachers were interviewed, virtually and face-to-face, accordingly to their choice of means of participation. These teachers teach biology, chemistry, physics, and math for the levels of the students targeted for this study.

1. **Procedure**

The study was carried out over 3 weeks during the 2024-2025 academic year. Science-track students from Common Core to Second Year Baccalaureate completed a short online questionnaire that took about 4 minutes to complete. The purpose of the study was clearly stated at the start of the form. Notably, the students were reached through teachers and administrations, and their participation was completely voluntary. Teachers were contacted through school administrations and personal networks. They participated in individual interviews conducted either virtually or in person, each lasting between 30 and 40 minutes. All data collection was scheduled flexibly to fit participants' availability.

1. **Data collection**

To collect data for this research paper, two main tools were used: a questionnaire and interviews. The questionnaire was used to gather information from students, given the need for a large number of participants and the study's time constraints.

The questionnaire included 30 items, written in both English and Arabic. It included a combination of open-ended and scaled questions.

 The items were selected based on the research's purpose or predefined question that was meant to serve the objectives of the research. It was distributed digitally (online) through social media, specifically WhatsApp, to high school students from various parts of Morocco, including the cities of Tanger, Sale, Agadir, Tinghir, Ouarzazate, and Errachidia. We believe this method ensured a fair distribution and reached a diverse group of students representing Morocco's multilingual society.

As for the second tool, the interview consisted of nine questions, some of which contained compound questions. Interviews were conducted in both Arabic and Tamazight online via different platforms, depending on the participants' preferences. We chose to conduct interviews with teachers for two reasons. First, interviews are the best way to explore teachers’ views and attitudes because they are among the most effective research methods for understanding human attitudes and perceptions (Krueger, 1994), and they provide immediate insight into participants’ perceptions, feelings, and thought processes. Additionally, interviews often produce richer and more detailed responses than questionnaires. When participants are willing to engage in a conversation with an interviewer, it typically indicates genuine interest in sharing their thoughts and experiences.

1. **Validity and reliability**

The validity and reliability of research depend heavily on the validity and reliability of its instruments. Therefore, during the piloting stage, we focused on enhancing the validity of our questionnaire, paying particular attention to the face validity of its presentation and the feasibility of the questions. The structure of the questionnaire is divided into three sections: the first provides an overview of the research topic and the researcher. In comparison, the two subsequent sections address the main questions supporting our research objectives. The feasibility of the questions is evident in the translation of each item and the ease with which participants can select and answer them. This same approach applies to the interviews concerning validity. For the reliability (the internal consistency) of the questionnaire, we tested it using the SPSS Cronbach’s Alpha test. The result of the test is as follows:

*Table 1: Cronbach’s Alpha test.*

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| *Reliability statistics*  |  |
| Cronbach’s Alpha N of Items | .60330 |

The internal consistency reliability of the questionnaire was measured using Cronbach’s alpha, which yielded a coefficient of 0.603. Although this is below the ideal cutoff of 0.7, it is considered acceptable for the exploratory studies involving perceptual constructs (Bernstein & Nunnally, 1994), notably, that the questionnaire here includes open-ended responses and a modest number of scaled items, which tend to produce variable responses. Empirical studies also support this range, like Daub et al. (2018), who found that alpha values between 0.6 and 0.8 can still represent a moderate and acceptable reliability for mixed-format questionnaires.

Concerning interviews, we would say that the reliability of our interviews is in their convenience and effectiveness in serving research purposes, with no subjective or biased questions.

3. Results

This part is divided into two main sections. The first one will present the data gathered from students, presenting their perspectives. The second will be devoted to teachers’ answers. A general emerging summary will follow both sections.

**3.1. Students’attitudes**

The findings of this research highlight some interesting issues related to the challenges students face when using the French language in science subjects, as well as their attitudes toward the English language.

* *French language as a Medium of instruction: challenges*

The results showed that most students find studying their scientific subjects in the French language challenging, while a significant number of students appear to rely on translation. On the other hand, an equal weight of votes admitted that they found no difference with the new change of the language of instruction, or they found it better in terms of understanding. Concerning their comprehension of the lessons, students have shown their comprehension is partial, as they rely on translation and the aid of experiments and visual aids. In accordance, students revealed that the major difficulties they encounter with the use of the French language as the language of instruction are related, at first place, to the wide gap between scientific terms and everyday speech, and translation of scientific terms to Arabic is not helpful. A significant number of students agree on their inability to communicate.

* *English language as a medium of instruction: attitudes*

Results have revealed that a significant number of students have shown strong support for English as the medium of instruction in their science subjects, indicating a positive attitude toward the language. This is reflected in their understanding of what makes the English language an effective medium of instruction, as most have agreed on several points: the global nature of the language, its use outside the classroom in video games, music, and social media, and its status as the language of science. Furthermore, the respondents confirmed that they enjoy the language and find it easy to learn.

When it comes to their scientific careers, most students showed interest in English as the international language and its broader communication. The remaining participants expressed equal interest in studying abroad and improving job opportunities. Additionally, fewer votes were given for English as the language of research and science, although higher education research and references are primarily in English. This indicates that these students are not yet fully aware of the importance of English in a scientific career, especially in higher education where research and literature are mostly in English. However, it is clear that communication, better job options, and studying abroad are their main goals. Notably, students have chosen English as their preferred language of instruction, receiving a very high number of votes, while the current language of instruction, French, received only two votes out of 110. This suggests that Moroccan attitudes are changing towards these two languages, with English gradually gaining significant importance according to students’ views.

**3.2 Teacher’s attitudes:**

The main challenges to science education, as raised by teachers, are ***linguistic*** and ***educational.*** We present each theme separately below.

* *Proficiency in French*

Teachers claimed to have a good command of the French language, of moderate to advanced. However, when it comes to students’ Proficiency in the French language, teachers have described it as weak and substandard. Hence, they are obliged to provide translation and correct the language from time to time.

* *Translation To Arabic and Tamazight*

The translation is an indispensable tool for understanding scientific terms, given the change in the medium of instruction at high school levels. However, according to the teachers, it is not without problems. Most of the teachers have confirmed that they use Arabic or Tamazight and then represent the lesson in French; otherwise, their lesson objectives and transmission of scientific knowledge would have been in vain, yet they are required to do it again in French. This may affect lesson time, especially if teachers are obliged to finish the

programs, as in the case of the second baccalaureate year. Furthermore, participants revealed

 The use of experiments, visual aids, and images helps them avoid the use of translation to an extent. However, the remaining problem is to what extent the Moroccan high schools are equipped with the necessary materials used for science experiments, which teachers described as poor.

* *Communication & performance*

Teachers have revealed that due to the limited command of French that students have, their communication and performance are unsatisfactory and unachievable. students sometimes choose to remain silent because of their inability to form well-structured sentences in the French language or opt for their mother tongues, such as Arabic and Tamazight, when approved by their teachers. the absence of communication from students will affect their learning process. If teachers do not get insights on students’ understanding of the course, there will be no feedback, as a result, students will walk out of their class with either not fully understanding or misunderstanding the lesson. We can also conclude that students’ poor proficiency in the French language raises their class anxiety, which eventually will affect their motivation and confidence in learning.

* *English as a language of instruction:*

The results showed that teachers had a very positive view of using English as the language of instruction. The introduction of English as a subject in primary and secondary schools, along with its use as the medium of instruction, is an example of practical actions and decisions aimed at strengthening the status of English as a medium of instruction for science education in high schools and Moroccan education overall. This will help students learn and recognize scientific English terminology and become familiar with these scientific terms. It will also reduce students ' dependence on a literal translation to understand scientific terms. On the other hand, teachers should also be offered basic training that will improve their English language competencies as a language and a medium of instruction. Finally, teachers have implicitly and explicitly argued that decision- makers should not continue to underscore the importance of English for the country’s development, which aligns with the findings of this study that shows that French seems to be less valuable and helpful for students even though it is the first foreign language in the country and the language of instruction for science and technology. Indeed, many participants in the study explicitly expressed this fact, arguing that French has become a significant burden to the Moroccan educational system.

1. Discussion & Conclusion

This study has confirmed the persistent gap between the Language of instruction (French) in Moroccan high schools and the linguistic capabilities and preferences of both students and teachers. The limited comprehension of scientific content in French, expressed by students, aligns with earlier findings by Bouziane (2020), who emphasized that students’ attitudes towards foreign languages, particularly French, are shaped more by necessity than motivation. Our findings build on this by showing how the French language use affects actual classroom performance, including communication breakdowns and reliance on translation.

Similarly, the positive orientation towards the English language echoes Ankouch’s (2023) study, which reported consistently favorable attitudes among high school students toward English, driven by aspirations for Global mobility, career opportunities, and academic advancement. In our study, students expressed a strong preference for EMI, for its utility in online media, gaming, and global communication. This supports the argument made by the British Council (2021), where 74% of Moroccan youth advocated for English to replace French as the country’s primary foreign language. Notably, students’ enthusiasm appears to extend beyond the classroom, and their positive attitudes towards EMI stem from their engagement with the language in an extracurricular digital context such as games. In this regard, and despite that our study did not examine English language acquisition per se, Sabiri (2025) found that passive or entertainment-driven exposure to English, such as games, may not significantly improve vocabulary or comprehension unless the interaction is rich and linguistically focused. This suggests that such digital engagement may increase motivation; however, it does not necessarily guarantee academic preparedness for EMI, especially among students who receive limited formal English instruction.

Beyond language preferences, students in this study have voiced specific challenges mainly related to learning scientific subjects (biology, math, physics, chemistry) through French. They struggle with comprehension, especially of technical terms, which often depend on memorization rather than understanding. This differs from teachers’ experiences, who, while also concerned with French, were more focused on the difficulties of translating into Arabic and Tamazight. While teachers report that students find it hard to engage and communicate in French as the language of instruction, Bouziane (2020) noted that students’ engagement with foreign languages in Moroccan schools is often driven by necessity rather than motivation, which he explained as being related to extrinsic motivation like grades and curriculum demands. Also, as teachers explained, the lack of material and visual aids that scientific content usually relies on presents an additional challenge, leading us to interpret that students’ performance struggles stem not just from language issues but also from limited resources and lack of institutional support. In this regard, Syomwene (2021), regarding the Kenyan higher education context, found that systemic limitations, such as poor institutional EMI, significantly impact students’ ability to succeed. Overall, this suggests that positive or negative attitudes are not always enough; introducing EMI without addressing broader structural and instructional gaps risks reinforcing existing inequalities in science education.

On the teachers’ side, our findings align with Ben Hammou and Kesbi (2023), who observed that while science Teachers are open to EMI, they face Linguistic and pedagogical challenges. Similarly, this study reveals that while teachers recognize the necessity of the English language for scientific advancement and better student engagement. In addition, the teachers call for structured training and curriculum support. The challenge of translating from French to Arabic, or Tamazight, deserves significant attention. While Arabic and Tamazight play important roles as the official languages of the country, they remain insufficient for science education; however, critics of the Moroccan Arabization policy argue that translating science into Arabic has contributed to the degradation of educational quality, due to vocabulary gaps, lack of proper materials, and insufficient academic support in STEM fields (Alalou, 2017). Jalid (2024) illustrates that scientific translation into Arabic faces deep *epistemological* and *linguistic* [italics are added] hurdles, such as the lack of standardized technical terminology, challenges in preserving scientific objectivity and logical structure, which hinder accurate meaning transfer in science texts. These patterns confirm what Abdelatif and Belhiah (2016) found in Moroccan higher education, where Doctoral students perceive the French language as outdated and the English language as essential for research access and academic success. While the French language struggles to meet the demands of internationalization and research communication, Arabic and Tamazight face fundamental linguistic and epistemological limitations in scientific vocabulary and standardization (Jalid, 2024).

Our findings affirm the relevance of introducing EMI gradually into Moroccan high schools. As noted by Dearden (2014) and Macaro et al. (20218), English language as a language of instruction is not only a global phenomenon but also a strategic educational reform, particularly in non-anglophone contexts. In Morocco, this reform is now reinforced by both data and public sentiment. Nevertheless, its success hinges on policy coordination, teacher training, and curricular adaptation. If well-planned, the integration of the English language as a medium of instruction could bridge the gap between high school and university science instruction, especially since Moroccan universities are increasingly English-driven (El Allame, El Kirat & Laaraj, 2016).

## **Recommendations and implications**

Like any research, this study is limited by its focus on public high school science major students, which may not fully represent the broader Moroccan student population. Moreover, the reliance on self-reported data through questionnaires and interviews, without classroom observation, may also limit the depth of pedagogical insights. Nevertheless, the findings point to a clear direction for educational reform. To support a meaningful switch toward EMI in Moroccan high schools, a strategic overview of steps is recommended.

A successful transition to English as a medium of instruction (EMI) in science education requires a comprehensive, multi-level strategy that addresses both student readiness and teacher preparedness while re-evaluating the current role of French. The first step is to strengthen the status of the English language, which should include teaching it across the elementary, secondary, high school, and university levels. Offering more English language courses and English medium courses from the elementary level will give students a natural and authentic exposure to the language and a foundation for learning in years to come. Teachers, particularly those who teach science, need more than just general language skills; they need focused training that helps them feel confident using the English language in the classroom. In addition, establishing training centres and programs tailored to EMI can make a real difference, not only by developing teachers’ language competence, but also by providing EMI-based programs through hands-on workshops in science-specific terminology, classroom culture and discourse strategies, lesson planning in English, and resources. Moreover, looking outward to build partnerships with international universities that already use EMI can bring fresh expertise, resources, and models for success. At the same time, it is important that the Ministry of Education, along with lawmakers and language planners, revisit the role of French in science education. For many students, after years of learning the French language, their proficiency remains limited, making it harder to access information in class and be confident when communicating. If EMI is to move forward, we need to acknowledge these challenges and create a realistic, inclusive, and future-oriented approach to language in education.

Ethical approval

This study involved voluntary participation from teachers and students, and all participants provided informed consent prior to data collection. The research followed ethical guidelines for educational research, including anonymity, confidentiality, and the right to withdraw at any time. Formal ethical approval was not required under the policies of Sultan Moulay Slimane University for non-clinical, self-led research projects.

**Disclaimer (Artificial intelligence**)

I, Fatima Ezzahra Oubni, hereby declare that generative AI technologies such as Large Language Models, etc., have been used during the writing or editing of manuscripts. Details of the AI usage are given below:

1. Name of the model: **Grammarly (enhanced grammar AI and writing assistant)**

2. Grammarly is used throughout the process of writing this manuscript for punctuation, grammar correction, sentence rephrasing, and style improvements to ensure readability and academic tone.

3. This model does not require any prompts; it is integrated into a Word document with settings configurations such as the style of writing, specialty, etc.

References

Abdelatif, A., & Belhiah, H. (2016). English as a Medium of Instruction in Moroccan Higher Education. *Arab World English Journal.*

Abdnour, S. (2025). The Impact of Video Games on the Vocabulary Size of EFL Learners in Morocco. The *International Journal of Applied Language Studies and Culture, 9–11*. https://doi.org/10.34301/alsc.v8i1.47

Aknouch, L. (2023). Moroccan high-school students’ attitudes towards learning English as a foreign language*. Indonesian TESOL Journal, 5*(1), 1–13. Retrieved July 26, 2025, from <https://www.researchgate.net/publication/376104747_Moroccan_High-school_Students%27_Attitudes_towards_Learning_English_as_a_Foreign_Language>.

Alalou, A. (2017). The question of languages and the medium of instruction in Morocco. *Current Issues in Language Planning, 19*(2), 136–160. <https://doi.org/10.1080/14664208.2017.1353329>

Allame, Y. E. K. E., & Laaraj, Y. (2017). Reframing Language Roles in Moroccan Higher Education: Context and Implications of the Advent of English. *Arab World English Journal*. https://doi.org/10.31219/osf.io/2a3mj

Baker, J. (2012). *Bourdieu’s linguistic market and the spread of French in protectorate Morocco* (Doctoral dissertation). University of Texas at Austin. https://repositories.lib.utexas.edu/items/5339909f-ba22-4ce8-aea0-64a23bae89cf

Ben Hammou, S., & Kesbi, A. (2023). English Medium Instruction in Moroccan secondary schools: Science teachers’ perceptions. *Studies in Second Language Learning and Teaching, 13*(2), 271–292. https://doi.org/10.14746/ssllt.2023.13.2.4 Retrieved July 26, 2025, from <https://pressto.amu.edu.pl/index.php/ssllt/article/download/38275/32805/84821>

Bouziane, A. (2020). Moroccan students’ attitudes towards local and foreign languages: The role of self-directed and language policy forces. *English Studies at NBU, 6*(2), 295–320. Retrieved July 26, 2025, from https://esnbu.org/data/files/2020/esnbu.20.2.7.pdf

British Council. (2021). *Shift to English in Morocco*. [Report]. Omnibus Marketing Research & Consultancies. [https://www.britishcouncil.ma/sites/default/files/shift\_to\_english\_in\_morocco\_16042021\_v 2.pdf](https://www.britishcouncil.ma/sites/default/files/shift_to_english_in_morocco_16042021_v%202.pdf)

Chihab, N. M., Benmhamed, N. M., Belmekki, N. M., Belmekki, N. L., & Koumachi, N. B. (2024). Attitudes towards language(s) of instruction in higher education institutions of science and technology in Morocco. International Journal of Linguistics, Literature & Translation, 7(8), 137–152. <https://doi.org/10.32996/ijllt.2024.7.8.18>

Council of Europe. (2007). *Guide for the development of language education policies in Europe: Main version*. Council of Europe Publishing

Creswell, J. W. (2012). Research design: Pendekatan kualitatif, kuantitatif dan mixed (Cetakan ke-2) [Research design: Qualitative, quantitative, and mixed methods approaches] (Indonesian ed.). Pusaka Belajar

Daud, K.A.M., Khidzir, N.Z., Ismail, A.R. and Abdullah, F.A. (2018). “Validity and reliability of instrument to measure social media skills among small and medium entrepreneurs at Pengkalan Datu River”, *International Journal of Development and Sustainability*, Vol. 7 No. 3, pp. 1026–1037. Retrieved on 15.07.2022 from: <https://isdsnet.com/ijds-v7n3-15.pdf>

Dearden, J. (2014). English as a medium of instruction - A growing global phenomenon. British Council. <https://www.britishcouncil.org/sites/default/files/e484_emi_-_cover_option_3_final_web.pdf>

Drubin, D. G., & Kellogg, D. R. (2012). English as the universal language of science: opportunities and challenges. *Molecular Biology of the Cell, 23*(8), 1399. <https://doi.org/10.1091/mbc.e12-02-0108>

Englander, K. (2013). The rise of English as the language of science. *In Springer briefs in education* (pp. 3-4). <https://doi.org/10.1007/978-94-007-7714-9_1>

Ennaji, M. (2005). *Multilingualism, Cultural Identity, and Education in Morocco*. Springer.

Ezzaki, A. (2007). Formal schooling in Morocco: The hopes and challenges of the current educational reform. In C. Brock & L. Z. Levers (Eds.), Aspects of education in the Middle East and North Africa (pp. 209–222). Symposium Books

Ferguson, G. (2006). Language planning and education. Edinburgh University Press

Fjarraud. (2018, March 8). *Langues: Le gouvernement choisit la certification externe*. Café pédagogique. https://www.cafepedagogique.net/2018/03/08/langues-le-gouvernement-choisit-la-certification-externe/

Hughes, W., & Lavery, J. (2004). Critical thinking: An introduction to basic skills (7th ed.). Broadview Press.

Jalid, M. (2024). (Im) Possibilities of Scientific Translation into Arabic. *Journal of Translation and Multilingualism, 02(02).*

Jones, J. (2012). *The effect of language attitudes on Kenyan stakeholder involvement in mother tongue policy implementation*. <https://www.semanticscholar.org/paper/The-effect-of-language-attitudes-on-Kenyan-in-Jones/7747af314729beacc042eb37b27dcebf1a032e1e>

Kingdom of Morocco. (2009). *Conseil Supérieur de l'Éducation, de la Formation et de la Recherche 2008 report on the evaluation of learning outcomes*. <https://www.csefrs.ma/wp-content/uploads/2017/10/synthetique_ar.pdf>

Kinsella, K. (2010). Academic language function: Toolkit. Sweetwater District-Wide Academic Support Teams

Krueger, R. A. (2014). Focus groups: A practical guide for applied research (2nd ed.). SAGE Publications.

Loutfi, A. (2020). The status of mother tongues and language policy in Morocco. The International Journal of Applied Language Studies and Culture. [The Status of Mother Tongues and Language Policy in Morocco - HAL-SHS - Sciences de l'Homme et de la Société](https://shs.hal.science/halshs-01623045v2)

Macaro, E., Curle, S., Pun, J., An, J., & Dearden, J. (2018). A systematic review of English medium instruction in higher education. *Language Teaching, 51*(1), 36–76. <https://doi.org/10.1017/S0261444817000350>

Mahboob, A., & Cruz, P. (2013). English and mother-tongue-based multilingual education: Language attitudes in the Philippines. *Asian Journal of English Language Studies, 1*, 1–17. <https://doi.org/10.59960/1.a1>

Mauranen, A. (2003). The Corpus of English as a Lingua Franca in academic settings. *TESOL Quarterly, 37*(3), 513–527. https://doi.org/10.2307/3588404

Sadiqi, F. (n.d.). *The shifting status of Moroccan languages in Morocco: Berber and language politics in the Moroccan educational system*. Academia.edu. <https://www.academia.edu/28158247/>

Soussi, H. (2020). *World Englishes in multilingual Morocco*. *World Englishes, 40*(2), 259–267. <https://doi.org/10.1111/weng.12512>

Speakers in millions. (2022, April 1). *The most spoken languages worldwide in 2022*. Statista. <https://www.statista.com/statistics/266808/the-most-spoken-languages-worldwide/>

Syomwene, A. (2021). Graduate students’ perspectives on challenges encountered in research work in higher education: The Kenya experience. Journal of Scientific Research and Reports, 27(7), 45-52.[10.9734/jsrr/2021/v27i730410](https://doi.org/10.9734/jsrr/2021/v27i730410)

UNESCO. (2006). *Education for all: Literacy for life; EFA global monitoring report, 2006*. UNESCO Publishing.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes* (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds. & Trans.). Harvard University Press.

Wei, H., Wang, Y., & Ma, X. (2023). The effects of artificial intelligence on English language learning: A meta-analysis. *Computers & Education, 196*, 104719. <https://doi.org/10.1016/j.compedu.2023.104719>

Why is English the main language of science? (n.d.). *Author Services*. https://scientific-publishing.webshop.elsevier.com/manuscript-preparation/why-is-english-the-main-language-of-science/

Wright, W. E., Boun, S., & García, O. (Eds.). (2015). *The handbook of bilingual and multilingual education* (1st ed.). Wiley-Blackwell.

Wood, A. (2001). International scientific English: The language of research scientists around the world. In J. Flowerdew & M. Peacock (Eds.), *Research perspectives on English for academic purposes* (pp. 71–83). Cambridge University Press.

Zakaria, O. (2023). Personal growth and intercultural awareness development through studying abroad: The case of American university students in Morocco. *World Journal of Advanced Research and Reviews, 18*(1), 708–715. <https://doi.org/10.30574/wjarr.2023.18.1.0674>

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education. *International Journal of Educational Technology in Higher Education, 16*(1), 39. <https://doi.org/10.1186/s41239-019-0171-0>

Zouhir, A. (2022). The spread of English in Morocco. *English Today, 38*(2), 72–79. <https://doi.org/10.1017/S0266078422000231>