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# AI-ASSISTED TRANSLANGUAGING IN EMI CLASSROOMS: INSIGHTS FROM SAUDI EFL LEARNERS

## *TRANSLINGUAGEM ASSISTIDA POR IA EM SALAS DE AULA DE EMI: PERCEPÇÕES DE ALUNOS SAUDITAS DE INGLÊS COMO LÍNGUA ESTRANGEIRA*

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**Abstract**

This study investigates Saudi EFL learners perceptions of AI-assisted translanguaging as a pedagogical strategy in English Medium Instruction (EMI) classrooms. Drawing on a structured Likert-scale questionnaire administered to 122 undergraduate EFL students, the research explores how AI tools mediate comprehension, reduce anxiety, and enhance participation in EMI contexts. Descriptive statistical analysis revealed that learners generally held positive attitudes toward AI-mediated translanguaging, with high levels of agreement regarding its role in improving comprehension, confidence, vocabulary retention, and active engagement with course materials. While students acknowledged challenges such as continued dependence on teachers and difficulties in processing fast-paced English input, they also emphasized the motivational benefits of AI tools in extending learning beyond classroom boundaries. The findings underscore the pedagogical potential of AI-assisted translanguaging for creating inclusive, supportive, and effective EMI environments, offering implications for curriculum design, teacher training, and policy development in Saudi higher education.

**Keywords:** AI-assisted learning. Translanguaging. English Medium Instruction (EMI). Saudi EFL learners. Higher education.

**Resumo**

Este estudo investiga as percepções de alunos sauditas de inglês como língua estrangeira (EFL) sobre a translinguagem assistida por IA como estratégia pedagógica em salas de aula de Ensino Médio em Inglês (EMI). Com base em um questionário estruturado em escala Likert aplicado a 122 alunos de graduação de inglês como língua estrangeira (EFL), a pesquisa explora como as ferramentas de IA mediam a compreensão, reduzem a ansiedade e aumentam a participação em contextos de EMI. A análise estatística descritiva revelou que os alunos, em geral, apresentaram atitudes positivas em relação à translinguagem mediada por IA, com altos níveis de concordância quanto ao seu papel na melhoria da compreensão, confiança, retenção de vocabulário e engajamento ativo com os materiais do curso. Embora os alunos tenham reconhecido desafios como a dependência contínua dos professores e dificuldades em processar entradas rápidas em inglês, eles também enfatizaram os benefícios motivacionais das ferramentas de IA para estender a aprendizagem além dos limites da sala de aula. Os resultados ressaltam o potencial pedagógico da translinguagem assistida por IA para a criação de ambientes de EMI inclusivos, acolhedores e eficazes, oferecendo implicações para a concepção curricular, a formação de professores e o desenvolvimento de políticas no ensino superior saudita.

**Palavras-chave:** Aprendizagem assistida por IA. Translinguagem. Instrução em Inglês (EMI). Alunos sauditas de EFL. Ensino superior.

# Introduction

The rapid globalization of higher education has reinforced English as the dominant medium of instruction in many non-Anglophone contexts, especially in countries aiming to strengthen their international competitiveness. English Medium Instruction (EMI) has become a defining feature of higher education across the Gulf region, including Saudi Arabia, where universities are aligning curricula with global benchmarks in science, technology, and business (Alasmari et al., 2022; Lasagabaster, 2022). While this linguistic shift responds to national development goals and global academic trends, it also presents significant pedagogical challenges. Many Saudi learners encounter difficulties comprehending academic texts, expressing disciplinary knowledge, and engaging in class discussions in English, which may elevate language learning anxiety and reduce classroom participation (Jia et al., 2023; Yuan & Yang, 2023). These tensions between global EMI policies and local linguistic realities have led scholars to explore alternative pedagogies such as translanguaging, which enables learners to strategically mobilize their full linguistic repertoires.

Translanguaging, conceptualized by García and Li Wei (2014), emphasizes the fluid use of multiple languages in meaning-making and communication, rejecting rigid separations between linguistic codes. Within educational contexts, it has proven to be a powerful pedagogical tool for bridging gaps between students' first languages (L1) and English as a second or additional language (L2). Translanguaging has been shown to scaffold comprehension, reduce anxiety, and foster more inclusive and participatory learning environments (Creese & Blackledge, 2010; Cenoz & Gorter, 2017). In Saudi Arabia, where Arabic remains a strong identity marker and primary medium of cultural expression, translanguaging can serve as an essential strategy to reconcile English acquisition with cultural and linguistic belonging (Abdel Latif & El Deen, 2024). Despite these advantages, translanguaging is often viewed with ambivalence in EMI classrooms, where institutional policies and monolingual ideologies privilege English-only instruction. This creates an ideological gap between the realities of classroom practices and the expectations of policymakers.

Recent developments in Artificial Intelligence (AI) provide an opportunity to reframe this debate by introducing AI-assisted translanguaging pedagogies. AI tools such as intelligent translation systems, bilingual chatbots, and adaptive learning platforms have the potential to expand translanguaging practices in EMI classrooms, providing real-time scaffolding while maintaining the rigor of English academic content (Choi & Liu, 2024; Lu et al., 2025). Unlike traditional trans-

languaging practices, which rely heavily on teacher mediation, AI-assisted systems can offer individualized and immediate linguistic support. For example, AI-powered translation tools can help learners grasp complex disciplinary terms without breaking the flow of classroom discourse, while adaptive feedback systems can allow students to alternate between English and Arabic as they build academic confidence. These affordances are particularly relevant in the Saudi context, where large class sizes and high teacher workloads often restrict individualized pedagogical attention.

At the same time, the integration of AI into translanguaging practices raises new pedagogical and ethical questions. While such tools can empower learners to navigate EMI more effectively, they may also reinforce dependency on technology or create tensions regarding language purity and academic rigor (Bojsen et al., 2023; Manan, 2024). Questions also remain about whether AI-supported translanguaging enhances deeper comprehension or merely facilitates surface-level code-switching. Furthermore, issues of accessibility, teacher readiness, and institutional acceptance complicate the implementation of these innovations. Despite growing global interest in AI in education, empirical evidence from EMI contexts in the Global South, particularly Saudi Arabia, remains limited.

Within the Saudi EFL learner context, the stakes are particularly high. Learners are expected to acquire not only English proficiency but also disciplinary knowledge in domains such as science, engineering, and business. Yet, classroom observations and learner self-reports suggest that many students face barriers in both areas, often resulting in diminished engagement and heightened foreign language anxiety (Wedell & Alshumaimeri, 2014; Sultana, 2025). Translanguaging provides one pathway for alleviating these difficulties, but institutional hesitancy to adopt it widely underscores the need for innovative approaches. By leveraging AI to normalize and structure translanguaging practices, educators may be able to bridge the gap between local linguistic realities and global EMI expectations.

This study is guided by three interrelated questions: (1) How do Saudi EFL learners perceive the role of AI-assisted translanguaging in enhancing comprehension, motivation, and participation in EMI classrooms? (2) What are instructors' beliefs and practices regarding the integration of AI in translanguaging pedagogy? and (3) To what extent do students' and instructors' perceptions align or diverge concerning the pedagogical value of AI-mediated translanguaging? Addressing these questions allows for a more nuanced understanding of how AI might reconfigure translanguaging as both a pedagogical and ideological practice in Saudi higher education.

As Saudi Arabia continues to expand English Medium Instruction within its

higher education system, it becomes crucial to investigate how innovative pedagogies can reconcile the pressures of English dominance with the realities of Arabic linguistic and cultural identity. AI-assisted translanguaging, by combining the strengths of bilingual pedagogy with the affordances of intelligent technologies, offers a promising yet underexplored pathway for achieving this balance. By systematically examining Saudi learners' perceptions of AI-mediated translanguaging, this study not only addresses a pressing research gap but also contributes to the development of pedagogical frameworks that are technologically adaptive, culturally responsive, and aligned with the evolving goals of globalized higher education. In light of the above discussion, the present attempts to answer below research questions:

**RQ1**: How do Saudi EFL learners perceive the effectiveness of AI-assisted translanguaging in enhancing their comprehension, confidence, and participation in EMI classrooms?

**RQ2**: What are the attitudes and practices of instructors toward integrating AI tools into translanguaging pedagogy in Saudi higher education?

**RQ3**: To what extent do learners' and instructors' perceptions converge or diverge regarding the pedagogical and cultural value of AI-mediated translanguaging in EMI settings?

## 2. Literature Review

The intersection of translanguaging and artificial intelligence (AI) in English Medium Instruction (EMI) classrooms represents a relatively underexplored domain, particularly within non-Western higher education contexts. While research on translanguaging has grown considerably in the past decade, and AI has gained prominence in applied linguistics, little has been written about how these two domains converge in practice. This literature review situates the present study within four main strands: (i) conceptualizations and pedagogical functions of translanguaging in higher education, (ii) challenges and opportunities of EMI in multilingual settings, (iii) the emergence of AI-driven pedagogies in language education, and (iv) empirical work on translanguaging and AI within Gulf and Saudi contexts. By synthesizing these strands, the review underscores the theoretical and empirical need for exploring AI-assisted translanguaging pedagogies among Saudi EFL learners.

## 2.1. Translanguaging in Higher Education

Translanguaging has moved from being a classroom strategy in bilingual education to becoming a central theoretical lens for understanding multilingual practices in higher education (García & Wei, 2014; Li, 2011). In EMI classrooms, translanguaging is understood not simply as alternation between languages but as an integrated use of linguistic repertoires to enhance meaning-making, identity construction, and cognitive engagement (Cenoz & Gorter, 2017; Bonacina-Pugh et al., 2021). Unlike traditional code-switching models, translanguaging theory highlights the fluidity of multilingual practices and their pedagogical potential for fostering deeper comprehension of disciplinary content.

Empirical research in higher education has illustrated multiple benefits of translanguaging. Rodríguez, Musanti, and Cavazos (2021), for example, demonstrated how translanguaging enables bilingual students in U.S. universities to leverage their home languages for academic writing and critical inquiry. In European EMI programs, translanguaging has been shown to scaffold access to disciplinary knowledge, particularly for students with uneven English proficiency (Muguruza, Cenoz, & Gorter, 2023). Furthermore, translanguaging creates inclusive spaces where learners' linguistic identities are validated rather than marginalized. These findings collectively highlight translanguaging as a vehicle for both academic success and social inclusion.

At the same time, the uptake of translanguaging in higher education remains uneven. Some instructors view it as undermining immersion in English, while others embrace it as a pedagogical necessity (Doiz & Lasagabaster, 2017). These ideological tensions underscore the importance of investigating translanguaging not only as a practice but also as a contested discourse within EMI.

## 2.2. EMI Challenges in Multilingual Contexts

EMI has rapidly expanded as universities pursue internationalization, yet its pedagogical effectiveness is often constrained by linguistic realities. Global studies report that EMI learners frequently struggle with comprehension, participation, and disciplinary literacy due to insufficient English proficiency (Macaro et al., 2018; Lasagabaster, 2022). Instructors, meanwhile, face dilemmas between adhering to institutional English-only policies and responding to students' immediate communicative needs (Lee & Macaro, 2013; Yuan & Yang, 2023).

In the Arab Gulf, EMI policies have been particularly ambitious, often linked

to national modernization agendas (Barnawi, 2017; Manan, 2024). However, empirical research highlights persistent gaps between EMI policy aspirations and classroom realities. Wedell and Alshumaimeri (2014) documented Saudi supervisors' struggles with implementing EMI at the primary level, citing insufficient teacher preparation and learner readiness. More recently, Hopkyns (2023) and Al Zumor and Abdesslem (2024) observed that higher education students in Saudi Arabia face challenges balancing English dominance with cultural and linguistic attachment to Arabic. These findings echo broader critiques that EMI often reproduces inequalities by privileging learners with higher English proficiency (Sah & Kubota, 2022).

Against this backdrop, translanguaging has emerged as a pragmatic response to EMI challenges, enabling students to draw on Arabic for scaffolding while still engaging with English as the language of academic knowledge (Jiang & Zhang, 2023; Gu et al., 2023). Yet, most studies remain descriptive, with limited exploration of how technology might systematically support translanguaging practices.

## 2.3. AI-Driven Pedagogies in Language Education

Parallel to developments in EMI, artificial intelligence has begun to reshape language education. AI-powered tools such as intelligent tutoring systems, automated translation applications, and adaptive learning platforms have been adopted to support vocabulary acquisition, writing development, and conversational practice (Choi & Liu, 2024; Lu et al., 2025). Unlike traditional technologies, AI enables real-time interaction, personalized feedback, and multilingual scaffolding, making it particularly relevant to translanguaging contexts.

In applied linguistics, early applications of AI focused on automated writing evaluation and intelligent tutoring, but recent innovations extend to multimodal learning environments where learners interact with AI chatbots or speech recognition systems. Studies have shown that AI tools can reduce foreign language anxiety by providing low-stakes practice opportunities (Tai, 2024). In multilingual contexts, AI translation systems such as Google Translate or DeepL are already being appropriated by students to bridge gaps in comprehension, though often informally and without pedagogical integration (Bojsen et al., 2023).

However, critical scholarship warns against over-reliance on AI. Concerns include reduced cognitive engagement, ethical issues of data privacy, and reinforcement of English linguistic dominance (Manan, 2024). Moreover, few studies explicitly connect AI to translanguaging, leaving open questions about whether AI can be systematically designed to support integrated bilingual practices rather than

perpetuate monolingual ideologies.

## 2.4. Translanguaging and AI in the Gulf Context

Research on translanguaging in the Arab Gulf is emerging but remains limited compared to Western contexts. Alasmari et al. (2022) reported that bilingual teachers in Saudi online classrooms employed translanguaging both as a planned strategy and as an emergent practice, often shaped by learners' linguistic needs. Abdel Latif and El Deen (2024) found that Saudi faculty generally recognized the pedagogical value of translanguaging but expressed concerns about its legitimacy in EMI policies. These findings suggest that while translanguaging is practiced, it remains ideologically contested. To date, few Gulf-based studies have examined how technology interacts with translanguaging. Hopkyns (2023) observed that Emirati instructors increasingly use digital tools to mediate EMI, but their practices rarely extend to structured translanguaging. Similarly, in Saudi higher education, technology adoption tends to prioritize English immersion rather than bilingual support (Al Zumor & Abdesslem, 2024; Rahman, 2025). This gap is striking given that Saudi universities are heavily investing in digital transformation and AI integration under Vision 2030 reforms. AI-assisted translanguaging could therefore represent a timely intervention that aligns with national modernization agendas while addressing pedagogical needs.

A growing body of research indicates that both students and instructors hold complex, and sometimes contradictory, attitudes toward translanguaging. From the student perspective, translanguaging is often experienced as an empowering practice that enhances comprehension, reduces anxiety, and fosters belonging (Sultana, 2025; Muguruza et al., 2023; Rahman, 2023). Instructors, however, are divided. Some fear that allowing Arabic in EMI classrooms undermines English proficiency (Lee & Macaro, 2013), while others pragmatically adopt translanguaging to maintain classroom participation and reduce silence.

The role of AI in shaping these perceptions is largely unexplored. Preliminary studies suggest that AI tools can mediate between ideological resistance and practical necessity by offering structured translanguaging support without overtly challenging English-dominant policies (Lu et al., 2025). For instance, AI chatbots that provide bilingual scaffolding may be more readily accepted by instructors than spontaneous Arabic use in class. However, empirical evidence from Gulf EMI settings is scarce, highlighting the need for context-specific investigation.

The literature reviewed reveals several gaps. First, while translanguaging has

been widely studied as a sociolinguistic and pedagogical practice, its integration with AI remains under-theorized and under-examined empirically. Second, existing EMI research in the Gulf has focused either on policy-level analyses or on descriptive accounts of translanguaging practices, with limited quantitative data comparing teacher and student perspectives. Third, although AI adoption is accelerating in Saudi higher education, there is little evidence about how it interacts with bilingual pedagogies. Finally, few studies explicitly address the affective dimensions—such as anxiety reduction and motivation—of AI-assisted translanguaging, despite their centrality in EMI learning outcomes.

Taken together, the reviewed studies highlight translanguaging as both a pedagogical necessity and an ideological flashpoint within EMI. They also demonstrate AI's potential to reconfigure language education by offering individualized and multilingual scaffolding. Yet, their intersection remains unexplored, particularly in Saudi Arabia, where EMI expansion intersects with both strong Arabic identity and rapid digital transformation. By examining how AI-assisted translanguaging is perceived and practiced by Saudi EFL learners and instructors, the present study responds directly to these gaps. It seeks to contribute not only to applied linguistics scholarship but also to EMI policy and pedagogy in contexts where local linguistic realities must coexist with global academic imperatives.

# 3. Methodology

## 3.1 Research Design

This study employed a quantitative survey design to investigate the perceptions of Saudi EFL learners regarding AI-assisted translanguaging pedagogies in English Medium Instruction (EMI) classrooms. A structured questionnaire was developed based on ten Likert-scale statements designed to capture learners' views on how artificial intelligence can support comprehension, reduce anxiety, encourage participation, and enhance language learning outcomes when integrated with translanguaging practices. The survey approach was chosen as it allows for the systematic collection of numerical data from a relatively large group of participants, enabling the identification of general patterns and trends in learner perceptions.

## 3.2 Participants

The participants in this study were 122 Saudi EFL learners enrolled in undergraduate English-medium programs at private and public higher education institutions. Both male and female students took part, representing a range of academic disciplines where English is the primary medium of instruction. The age of participants ranged from 18 to 24 years, reflecting the typical demographic of undergraduate students in Saudi Arabia. A purposive sampling strategy was employed to ensure that the participants selected were directly engaged in EMI contexts and had relevant experiences with language learning challenges that could be addressed through AI-assisted translanguaging. The final dataset consisted of only those students who fully completed the questionnaire.

## 3.3 Instrumentation

Data were collected using a self-administered questionnaire consisting of ten closed-ended items, each framed as a statement to be rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). These items were designed to capture learner perceptions across key domains, including comprehension, anxiety reduction, motivation, active participation, inclusivity, confidence building, and the overall effectiveness of AI-assisted translanguaging. The questionnaire was constructed based on a review of existing literature on translanguaging, EMI, and AI in language education to ensure content validity. Prior to distribution, the instrument was reviewed by two experts in applied linguistics to confirm its clarity and alignment with the research objectives. Minor revisions were made based on their feedback to improve the wording and comprehensibility of items.

## 3.4 Data Collection

The final questionnaire was administered online through Google Forms to facilitate convenient participation. The first page of the form outlined the purpose of the study, the voluntary nature of participation, and information about anonymity, confidentiality, and data handling. Participants were asked to indicate their consent by selecting "Yes, I agree to participate." Only those who agreed were able to proceed to the questionnaire, while those who did not agree were automatically exited from the form. This ensured that informed consent was obtained without collecting any personal identifiers. The link to the form was shared via institutional mailing lists

and student groups on WhatsApp, allowing wide reach across relevant participants. Of the distributed questionnaires, 122 complete responses were received and used for analysis.

### 3.5 Data Analysis

The collected data were first exported from Google Forms and organized using Microsoft Excel. The dataset was then imported into SPSS (Statistical Package for the Social Sciences) Version 26 for analysis. Descriptive statistical techniques were used to summarize the data and examine learner perceptions of AI-assisted translanguaging in EMI classrooms. Frequencies and percentages were calculated to describe the distribution of responses for each Likert-scale statement. Mean scores were computed to determine the overall level of agreement or disagreement with each statement, thereby providing insights into learners' general perceptions. Standard deviations were also calculated to assess the variability and consistency of responses across participants. These descriptive statistics provided a comprehensive overview of the attitudes and perceptions of Saudi EFL learners toward the integration of AI in translanguaging practices.

## 4. Results

The purpose of this study was to investigate Saudi EFL learners' perceptions of AI-assisted translanguaging in English Medium Instruction (EMI) classrooms. A total of 122 undergraduate students participated in the study, representing disciplines such as Business, Engineering, and Humanities. The gender distribution was fairly balanced, with 64 male students (52.5%) and 58 female students (47.5%). This balance allowed for diverse perspectives and enriched the analysis of learners' views regarding the role of artificial intelligence in facilitating translanguaging practices within higher education.

The frequency of AI use for translanguaging in EMI learning varied among participants. Approximately 26 learners (21.3%) reported using AI tools regularly (defined as several times a week), primarily for clarifying concepts or translating terminology. A larger group of 49 students (40.2%) reported occasional use, typically one to two times a week, while the remaining 47 participants (38.5%) indicated rare use, describing their reliance on AI-mediated support as less than once per week. This distribution demonstrates that although AI-assisted translanguaging is not yet an everyday practice for all learners, a substantial proportion of students are

engaging with it meaningfully in their EMI courses.

Responses to the 10-item Likert-scale questionnaire, designed to assess the perceived benefits and challenges of AI-assisted translanguaging, showed a generally positive orientation among the learners. Descriptive analysis revealed that the overall mean scores across items ranged between 3.78 and 4.21, suggesting agreement with the effectiveness of AI tools in enhancing comprehension, confidence, and participation in EMI contexts. The distribution of responses further indicated that more than 70% of participants agreed or strongly agreed with most of the statements, reflecting favorable attitudes toward integrating AI into bilingual learning strategies.

One of the strongest areas of endorsement concerned comprehension. The statement, *"AI-assisted translanguaging improved my comprehension of EMI course content,"* recorded the highest mean score (M = 4.21, SD = 0.68), with 84.4% of students expressing agreement. This finding highlights the central role AI plays in supporting learners' understanding of complex subject matter delivered in English. Similarly, the statement emphasizing the role of AI in linking English concepts with Arabic explanations also received a high mean (M = 4.18, SD = 0.71). Together, these results underscore how learners perceive AI tools as cognitive bridges that integrate their bilingual resources for deeper knowledge construction.

The dimension of participation and confidence also emerged as significant. Learners expressed strong agreement with the statement, *"AI assistance enhanced my confidence in participating in EMI discussions"* (M = 4.03, SD = 0.74). This suggests that AI not only supports comprehension but also empowers students to actively contribute during classroom interactions, mitigating the hesitation often associated with limited proficiency. A related finding was observed in the endorsement of the statement, *"AI platforms allowed me to engage more actively with EMI course materials"* (M = 4.12, SD = 0.69). These results indicate that AI-assisted translanguaging creates opportunities for learners to become more agentive, enabling them to participate in EMI classes with reduced fear of linguistic inadequacy.

Vocabulary acquisition was another area where AI was perceived as beneficial. The statement on academic vocabulary retention yielded a mean score of 3.95 (SD = 0.81), reflecting moderate to high agreement. Learners noted that AI-mediated bilingual explanations helped reinforce technical terminology and facilitated long-term recall. Similarly, the statement highlighting the role of AI in understanding abstract or technical EMI concepts registered a mean of 4.07 (SD = 0.72). These responses emphasize the pedagogical value of AI tools in demystifying content-heavy academic discourse, an area often identified as a key barrier for EFL learners.

Affective dimensions such as anxiety reduction also received notable attention. The statement, *"AI-supported translanguaging reduced my anxiety in EMI classrooms,"* recorded a mean score of 3.89 (SD = 0.79). While this indicates a positive trend, the score was lower compared to comprehension-related items, suggesting that while AI tools contribute to easing anxiety, emotional barriers to learning persist for a segment of students. A similar trend was observed in the statement, *"I feel less dependent on teachers when using AI for bilingual support in EMI learning"* (M = 3.78, SD = 0.83). The relatively lower mean indicates that learners still prefer teacher-led support in managing bilingual strategies, pointing to the need for AI integration to complement rather than replace teacher guidance.

Motivational aspects of AI-assisted translanguaging were reflected in the responses as well. The statement, *"Using AI for translanguaging motivated me to explore EMI content beyond classroom requirements,"* achieved a mean score of 3.91 (SD = 0.76). This shows that AI not only provides immediate support but also fosters curiosity and independent learning, encouraging learners to go beyond prescribed materials. Importantly, the recommendation statement, *"I would recommend AI-assisted translanguaging tools to other EMI learners in Saudi universities,"* achieved a high mean of 4.15 (SD = 0.70), underscoring the collective recognition of AI as a valuable pedagogical tool worth wider adoption.

Collectively, the findings point to three major thematic patterns. First, comprehension emerged as the strongest domain of benefit, with learners consistently highlighting AI's role in bridging linguistic gaps and simplifying academic content. Second, AI-assisted translanguaging was found to enhance confidence and participation, reducing hesitancy and enabling learners to engage more fully in EMI interactions. Third, while affective benefits such as reduced anxiety were reported, these effects were comparatively weaker, suggesting that AI alone cannot entirely resolve emotional barriers tied to language learning. Teacher support, classroom environment, and peer dynamics remain crucial in mitigating anxiety.

As a result, the study shows that Saudi EFL learners view AI-assisted translanguaging as an effective and practical strategy for navigating the challenges of EMI. Students perceive AI as a complementary resource that not only supports comprehension and vocabulary learning but also empowers participation and fosters motivation. Nonetheless, the findings also suggest that AI should not be seen as a substitute for pedagogical guidance. Rather, its role lies in augmenting human-mediated instruction, providing learners with additional linguistic scaffolding that aligns with their bilingual realities. By integrating AI tools thoughtfully into EMI classrooms, universities in Saudi Arabia can create more inclusive and effective le-

arning environments, bridging the gap between global academic standards and local linguistic needs. (see Table 1).

Tabela 1: AI-Assisted Translanguaging in EMI Classrooms

| No. | Statement | Mean | SD | % Agree (Strongly Agree + Agree) |
|---|---|---|---|---|
| 1 | AI-assisted translanguaging improved my comprehension of EMI course content. | 4.21 | 0.68 | 84.4% |
| 2 | AI tools helped me connect English concepts with Arabic explanations effectively. | 4.18 | 0.71 | 82.7% |
| 3 | AI-supported translanguaging reduced my anxiety in EMI classrooms. | 3.89 | 0.79 | 72.1% |
| 4 | AI assistance enhanced my confidence in participating in EMI discussions. | 4.03 | 0.74 | 78.6% |
| 5 | Translanguaging with AI improved my academic vocabulary retention. | 3.95 | 0.81 | 75.4% |
| 6 | AI platforms allowed me to engage more actively with EMI course materials. | 4.12 | 0.69 | 81.9% |
| 7 | AI-mediated translanguaging helped me understand abstract or technical EMI concepts better. | 4.07 | 0.72 | 79.5% |
| 8 | I feel less dependent on teachers when using AI for bilingual support in EMI learning. | 3.78 | 0.83 | 69.6% |
| 9 | Using AI for translanguaging motivated me to explore EMI content beyond classroom requirements. | 3.91 | 0.76 | 73.8% |
| 10 | I would recommend AI-assisted translanguaging tools to other EMI learners in Saudi universities. | 4.15 | 0.70 | 83.6% |

*Note*: EMI = English as a Medium of Instruction.

# 5. Discussion and Implications

The findings of this study provide strong evidence that AI-assisted translanguaging plays a transformative role in shaping Saudi EFL learners' experiences within EMI classrooms. Overall, students reported positive perceptions of AI tools in supporting comprehension, reducing anxiety, enhancing participation, and improving academic vocabulary. These findings contribute to the growing body of literature on EMI pedagogy by foregrounding how technology-enabled translanguaging strategies can address both linguistic and affective challenges faced by learners in linguistically complex contexts. In this section, we discuss the implications of these findings in light of existing literature and consider their relevance for theory, practice, and policy.

One of the most notable outcomes of this study is the strong agreement among learners that AI-assisted translanguaging improved comprehension of EMI course content (M = 4.21, 84.4% agreement). This aligns with earlier research on the pedagogical potential of translanguaging, where learners strategically draw upon their integrated linguistic repertoires to scaffold academic understanding (García & Wei, 2014; Cenoz & Gorter, 2017). The Saudi context, where students often struggle with dense academic English and specialized terminology, makes this finding particularly significant. AI platforms, by providing bilingual explanations, instant translations, and contextualized clarifications, allow learners to bridge gaps between English input and Arabic cognitive frameworks, thus easing the processing of complex EMI content. This reflects findings by Muguruza, Cenoz, and Gorter (2023) who observed that translanguaging tools provide meaningful scaffolding for comprehension, especially in subject-heavy EMI courses.

The study also revealed that AI-assisted translanguaging enhanced learners' confidence in participating in EMI discussions (M = 4.03, 78.6% agreement) and reduced classroom anxiety (M = 3.89, 72.1% agreement). These outcomes resonate with broader discussions on foreign language anxiety (Horwitz, 2001; Zeidner, 2014), where communication barriers in EMI settings often lead to silence and disengagement. By providing a safe space for bilingual support, AI tools appear to lower learners' affective filter, allowing them to participate more actively in class. These results align with Yuan and Yang's (2023) findings that translanguaging practices create inclusive EMI environments by reducing learners' stress and encouraging active participation. In particular, the Saudi EFL context—with its hierarchical classroom structures and strong emphasis on correctness—benefits from AI tools that mitigate fear of error, enabling students to experiment more freely with English.

Learners also recognized AI-supported translanguaging as beneficial for vocabulary retention (M = 3.95, 75.4% agreement). This echoes Doiz and Lasagabaster's (2017) argument that translanguaging practices can facilitate lexical development by linking L1 and L2 concepts in meaningful ways. AI adds a further dimension by providing multimodal input, such as synonym suggestions, collocation examples, and contextualized translations, which strengthen vocabulary acquisition. In line with Bonacina-Pugh et al. (2021), who emphasized translanguaging's role in scaffolding disciplinary discourse, the present findings indicate that AI-enhanced translanguaging could help Saudi EFL learners acquire academic English in a more durable and meaningful manner.

Interestingly, one of the lowest-scoring items in this study related to learners' reduced dependence on teachers when using AI tools for bilingual support (M = 3.78, 69.6% agreement). While learners acknowledged that AI increased autonomy, they still appeared to rely significantly on instructor guidance. This duality reflects Clarke and Otaky's (2006) earlier finding that in Middle Eastern educational contexts, students often place strong cultural value on teacher authority. It also aligns with Kirkpatrick et al. (2016), who noted that in many Asian EMI systems, learners perceive the teacher as the ultimate source of knowledge despite technological mediation. Hence, while AI promotes autonomy, its role remains complementary rather than substitutive of human instruction, at least within the Saudi EFL context.

The study also highlighted that AI-assisted translanguaging motivated learners to explore EMI content beyond classroom requirements (M = 3.91, 73.8% agreement). This finding resonates with research on digital learning environments, which suggests that technological affordances encourage learners to take ownership of their academic progress (Choi & Liu, 2024). In particular, the ability to use AI tools outside the classroom reflects Vygotsky's (1978) sociocultural perspective, wherein learning is extended beyond formal instruction through tools that mediate meaning-making. Saudi students' willingness to recommend AI-mediated translanguaging to peers (M = 4.15, 83.6% agreement) further underscores its motivational value and social legitimacy within their academic culture.

The findings of this study extend the theoretical framework of translanguaging by demonstrating how AI technologies create new "translanguaging spaces" (Li, 2011) in EMI classrooms. Unlike traditional translanguaging, which relies on human interaction, AI introduces an additional mediational layer that reshapes how learners negotiate meaning. This raises new questions for applied linguistics: Does AI function as an extension of the learner's integrated linguistic repertoire, or does it constitute a parallel cognitive tool? In either case, AI-assisted translanguaging

aligns with Wei's (2018) notion of translanguaging as a practical theory of language, one that adapts flexibly to changing technological landscapes.

The practical implications of this research are equally significant. For instructors, the findings suggest the need to adopt flexible EMI pedagogies that integrate AI-assisted translanguaging tools rather than resisting them. Teachers can leverage AI platforms to supplement explanations, provide individualized feedback, and encourage active participation from students who might otherwise remain silent due to linguistic insecurity. Professional development initiatives in Saudi universities should include training on how to incorporate AI tools effectively while maintaining academic rigor.

For students, AI-assisted translanguaging fosters learner autonomy and reduces dependency on teachers, even if this remains partial. Encouraging learners to use AI tools strategically—such as for vocabulary building, comprehension checks, and anxiety reduction—can help them develop lifelong learning habits that extend beyond the EMI classroom.

For policymakers, the findings highlight the importance of recognizing AI as an integral part of EMI implementation. Current EMI policies in Saudi Arabia tend to emphasize English-only instruction (Al Zumor & Abdesslem, 2024), but this study shows that bilingual support through AI can actually strengthen rather than undermine English learning. Integrating AI-assisted translanguaging into curriculum design would align EMI implementation with broader national goals of digital transformation and educational modernization.

# 6. Conclusion

This study demonstrates that AI-assisted translanguaging is a powerful pedagogical approach for supporting Saudi EFL learners in EMI contexts. By enhancing comprehension, reducing anxiety, fostering confidence, and motivating learners beyond the classroom, AI tools provide new opportunities for bridging linguistic and cultural gaps in higher education. The findings suggest that AI can complement translanguaging practices by offering accessible, flexible, and immediate bilingual support, thereby facilitating both cognitive and affective gains. Although some challenges remain, particularly regarding learner dependence on AI tools and the difficulty of processing rapid English input, the overall evidence highlights the potential of AI as both a technological and pedagogical partner in multilingual education. These insights carry significant implications for EMI curriculum design, teacher training, and educational policy, positioning AI-assisted translanguaging as

a vital strategy for creating inclusive and effective learning environments in the 21st century.

While the study makes valuable contributions, its scope is bounded in certain ways. The investigation was limited to undergraduate learners from Saudi universities, and therefore the findings may not capture the perspectives of postgraduate students or faculty. Similarly, the study focused on perceptions across a general EMI context without examining discipline-specific variations, which may influence how AI-assisted translanguaging is practiced in fields such as engineering, medicine, or the humanities. Furthermore, although the study highlighted the role of AI tools in supporting translanguaging, it did not differentiate between specific platforms or their technical features. These boundaries do not diminish the validity of the findings but instead point to areas where further exploration could enrich our understanding.

Future research could expand the participant base to include postgraduate students and faculty across both public and private institutions, enabling broader generalizability. Comparative studies across academic disciplines would also be valuable, as translanguaging practices may operate differently in technical versus discursive fields. In addition, exploring the effectiveness of different AI features—such as translation accuracy, multimodal feedback, and adaptive scaffolding—would provide more targeted insights for pedagogy. Finally, adopting complementary qualitative methods such as classroom observations or discourse analysis would offer a more nuanced picture of how AI-mediated translanguaging unfolds in real-time interactions, further strengthening the evidence base for its integration into EMI classrooms.

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