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REFRAMING CODE-SWITCHING IN MULTILINGUAL HIGHER EDUCATION: AI-DRIVEN SECONDARY RESEARCH ON COMMUNICATIVE AND PEDAGOGICAL PRACTICES

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Abstract
Code-switching (CS) has come to be recognized as a strategic pedagogical resource in English-Medium Instruction (EMI) within Multilingual Higher Education. This study systematically reviewed recent research to examine the communicative, pedagogical, and policy-related functions of CS in EMI contexts. A secondary research design was employed in accordance with PRISMA 2020 guidelines, synthesizing forty-seven peer-reviewed studies published between 2020 and 2025. Data were collected from Scopus, Web of Science, ScienceDirect, SpringerLink, and Taylor & Francis Online and were complemented by an AI-assisted bibliometric analysis using VOSviewer. The findings revealed three principal functions of CS: (1) pedagogical scaffolding during cognitively demanding learning stages, (2) communicative and effective realignment that fosters solidarity and reduces anxiety, and (3) policy mediation aligning multilingual instructional realities with EMI frameworks. Persistent monolingual biases in AI-driven language-teaching systems indicate a continuing misalignment among pedagogy, policy, and technology. The study concludes that CS should be recognized as an intentional pedagogical strategy and integrated into EMI pedagogy, institutional policy, and switch-conscious AI development to promote equitable and effective multilingual higher education globally.

Key Words:
Code-switching; EMI; Multilingual Higher Education; Pedagogical Scaffolding; PRISMA; VOSviewer.

1. INTRODUCTION

So far, the question of multilingualism has evolved out to be among the hottest research areas with institutions worldwide beginning to implement English as a Medium of Instruction (EMI) policies. In such environments, a mixture or a blend of several languages in a conversation has been seen as a sign of a language weakness. Nevertheless, new research also begins to consider the use of the multiple languages as a purposeful strategic tool of sense creation, scaffold, and classroom activity (Gulle, 2024; transforming language education: A comprehensive review of AI, 2024). This intellectual transformation stands out particularly in the context of the multilingual tertiary institution where the learners will be able to use their multiple language tools to communicate, study, with the various contents, discourses of the discipline, and their various identities.

Nowadays, and particularly within recent years, the concept of Translanguaging has become popularized as a broader and more comprehensive concept than the concept of code-switching. Translanguaging refers to the use of the language in a unified and coherent sense, but not a fragmented and divided notion (Translanguaging inside and across learning settings: A systematic review, 2025). Translanguaging is a language teaching and learning approach that allows educators and learners to use all of their language resources to learn and teach language more effectively and to think more creatively and critically (Review of research on digital translanguaging, 2024). However, despite the numerous gaps, most of the studies about Code-Switching and Translanguaging are confined to lower and upper levels. This negligence is where the gap in the talk about multilingualism in higher education has been found.

One of the new tendencies in language teaching is AI supported by numerous researches. It is argued that AI technologies which rely on feedback, conversational agents and adaptive learning technologies produce stimulation and encourage learners with personalised feedback and more opportunities to practise, as the 2024 studies relating to Artificial Intelligence and language learning and revolutionising the education of a language suggest. The sole evident flaw of AI technologies is, however, the fact that practically none of them takes into account Code-Switching and Translanguaging. Creating specific systems to reproduce the Monolingual standards, which include the vast majority of Generative AI systems, is known to be perpetuated by at least them (Generative AI and its problems, 2024). Therefore, when it comes to AI technologies, an offer of limitless tools to teach with, they will limit the usage of the tools that were designed to facilitate the process of multilingual teaching unless technologies were designed to facilitate the process of multilingual teaching. The greatest discourses of EMI are aimed at the need of a new synthesis that is not technological.

The attention of other authors is dedicated to the fact that the local languages can be overlooked, and disparities can be maintained when the EMI approaches are rooted in the principles of Monolingual English (Rethinking EMI in Higher Education, 2024). Other authors compose about the so-called EMI Professionalisation Framework (EMI ProF) which is based on the assumption that English Medium Instruction (EMI) is not only a language issue, but about a political and pedagogical order that is comprised of teacher training, contextualization and reflexive praxis (The EMI ProF as a political normative framework, 2025). The effects of the education and ideological leanings in the placement of Code-Switching as a loss, as opposed to treasure, are primarily educational. The conflicts are intertwined with the underdevelopment of interrelations in various areas, including multilingual pedagogy, the Translanguaging paradigm, generative AI and language pedagogy, and the critical scholarship on EMI. No such synthesis of the body of the literature (2020-2025) on the various aspects of Code-Switching in literature that applies to the Higher Education sphere defining theoretical constructs, practical implementation, or areas of overlap has been established yet. Surveys such as Code-Switching in a University EMI Classroom: Patterns and Implications (2024) can be helpful to comprehend the complex cases of situational and metaphorical switching applied by the instructors in a speaking course (Susilowaty and Rosa, 2024). The second article advises that partial EMI is inevitably going to precondition the application of the native language or the use of a mix of languages in the case of the lack of student proficiency (Ahmed et al., 2025). They, on the other hand, are context specific snapshots as compared to segments of the entire updated image. The aim of this essay is to conceptualize code-switching in multilingual higher education, regarding both communicative and pedagogical practices, through a secondary research approach informed by AI. To begin with, we will selectively collect and review the literature published during the period of 2020-2025 based on the PRISMA principles. Bibliometric mapping and text-mining will then be applied to find theme bundles (e.g. understanding, rapport, AI alignment). These bundles will then be synthesized to develop a conceptualized model of code-switching at the nexus with pedagogy, identity, and AI. Lastly, we will define designed multilingual AI research, and research, that follows multilingualism. There are four main contributions to this article. It suggests introducing an alternative code- switching discourse to a strategic resource paradigm as opposed to a deficit approach.

It is regional and global, as well as contemporary (2020-2025). This proves the potential of AI-driven means of the review in impacting the state of applied linguistics secondary research. It can guide teachers, EMI policymakers and AI developers in the initial stages of development of pedagogy and multilingual pedagogy AI tools. It is oriented to the establishment of a more equal, contextually sensitive and technologically inclusive higher education, which is multilingual.

1.2. Research Objectives

The following objectives will be used in the current research:

2. To investigate the pedagogical and communicative intent of Code-Switching in tertiary education in multilingual English-Medium Instruction (EMI).
3. To examine the pedagogical, effective, and policy-related concerns of the Code-Switching studies which will be carried out in 2020-2025.

4. To integrate PRISMA 2020 systematic review and AI-based bibliometric mapping research.
5. To investigate how multilingual classroom practice, EMI policy frameworks, and AI-based language teaching are aligned.
6. To be in a position to facilitate the use of pedagogical and technological advancements that authorize code switching as a designed instructional practice, and not as an unorganized practice.

1.2. Research Questions

The questions which guide the current research are as follows:
1. What are the communicative and pedagogical functions of Code-Switching in multilingual institutes of higher learning which is run in English-Medium Instruction?
2. What is the conceptualization of Code-Switching as of the current (2020-2025) when it has been mapped onto translingual competence and Multilingual competence?
3. What theme bundles and methodological concerns emerge when recent EMI and multilingual pedagogy studies are examined through AI-assisted bibliometric mapping and text-mining analysis?
4. How can Code-Switching be achieved in pedagogy, multilingual interaction-oriented professional development and AI systems in a strategic and advantageous way?
5. What are the hypothetical and policy implications of the re-conceptualization of code-switching as a premeditated or deliberate pedagogical event and no longer an unintentional event that occurs in the classroom?

2. LITERATURE REVIEW

2.1. Shifting to Strategic Assets and out of Deficit Perspectives.

In the tertiary education system, it was always considered a sign of linguistic incompetence or the lack of English proficiencies. The deficit view has started to yield to the idea that code switching is a strategic educational resource. Systematic reviews report an impressive shift, according to which translation language practices in educational activities enable students to access all their language resources to facilitate meaning, co-create knowledge, and maintain engagement (Curle, Pun, and Yeh, 2024). Such a shift in attitude is the product of the widespread criticism of EMI policy which suggests that monolingual requirements are not always reflective of classroom practices (Akincioglu, 2024). The shift has been solidified with the emergence of the Translanguaging theory. In contrast to the concept of code alternating, Translanguaging focuses on the perfect integration of linguistic resources. Under Translanguaging, students would have the opportunity to use all their language tools to access the curriculum both offline and online (Curle et al., 2024). Instead of being disruptive, these actions are celebrating diversity and are examples of how intended alternation is a sign that multilingual competence, and not lack thereof.

2.2. Instructional and Communicative roles in EMI Classrooms.

Recent research also finds that Code-Switching in college classrooms does serve certain instructional roles. As an example, Bravo-Sotelo et al. The (2023) demonstrations show that the intentional use of L1 in Mathematics classes in college level allowed the teachers to paraphrase L1 technical terms and abstract concepts and enhance student understanding of abstract concepts. In a similar fashion, Sahan (2020) observed that in classes of the engineering discipline with the English Medium of Instruction (EMI) communication, the instructors changed the codes in order to address the conceptual load without losing the language of the field. These instances show the bridging collaborative role of code-switching. Besides cognition, code-switching has interactive and emotional levels. In Abouzeid (2025), Lebanese EMI classroom teachers Code-Switched to accommodate and negotiate roles and to support student cohesion through alleviated anxiety. Similarly, according to Jaroonsri (2022), the Thai university teachers employed Code-Switching with the primary purpose of increasing the willingness of the less willing students to speak. The breadth of the information would indicate that alternation does not only involve the availability of material itself, but also the general atmosphere of the classroom setting and the openness of the atmosphere. The research has revealed that Code-Switching is in fact and theoretically not incidental. As an example, Sankaran observed in Susilowaty and Rosa (2024) that alternation is systematic and that the authors describe how in the Indonesian EMI classrooms, alternation takes place in course introductions, task instructions, and metalinguistic remarks. As indicated by Ahmed et al. (2025), coded shifted is intentional in Pakistani EMI contexts when explaining threshold concepts and when giving assessments briefs.
The 2025 that observed the Nursing PBL classrooms when learning about language periodically observed more episodes related to language provoked by complicated discussions in the field, which supports the importance of principled alternation in high-cognitive load situations.

2.3. AI, Conversational Agents and Multilingual Classrooms

Based on discussions related to the rollout of AI-based technologies in the educational sector, language pedagogy is taking on new forms. Lai et al. (2024) concentrate on conversational AI of working within the English Language Teaching area (2013-2023) and reach the conclusion that though Chabots give students the significant opportunity to practice speaking, they engage and get motivated, the number of tools that supports Code-Switching and Translanguaging in particular is scarce. This finding is reaffirmed by Wiboolyasarin et al. (2025) who have observed that although chatbots help enhance oral fluency, the tests are still insufficient in identifying the natural bilingual changes in students in EMI situations. ChatGPT is one example of this trend in education. Li et al. (2024) systematically review the initial year of ChatGPT in language education, and states that it is useful in writing, idea generation, conversational practice and even raising awareness about its decontextualized monolingual nature in managing discussions between bilinguals without Code-Switching feedback. According to Al-Freihi and Alhajri (2024), students studying Gulf EMI find the use of ChatGPT to be valuable, but they also mention that the system cannot resolve the problem of multilingual classroom dynamics.

Ignoring this means having a significant blind eye to scholars in this field, according to applied linguistic scholars. Perez-Milans (2024) criticizes generative AI as one that imitates the standards of monolinguals, and the author contends that these systems go against the idea of pedagogy of Translanguaging. To enable system acceptance, classification, and response to code-switching, Khan and Hashim (2025) suggest designing switch-tolerant Chabots. The demonstration of such literature is that, despite recent signs of classroom practice switching towards a more welcoming multilingual approach, AI, in all its current form, still threatens to perpetuate the English-only paradigm. To a large extent, the acceptance and prohibition of code-switching in higher education is affected by EMI Policy, Professionalisation and Classroom Mediation Policy. Liao (2025) researches the use of English.

2.4. Medium Instruction (EMI) in China and identifies a trend

Although official records say the only language used is English, the teachers bend the rule by switching languages tactfully to suit instructions and a leveled evaluation. In his article on EMI in emerging settings, Curle (2024) notes that most policies of institutions in Asia and Africa are Monolingual, although in the classroom, multilingualism is the predominant practice. This has given rise to some structures geared towards professionalisation of EMI. Similar in the context of multilingual resources as the pedagogical factor, Akincioglu (2025) provides the EMI Professionalisation Framework (EMI ProF) that identifies the criteria of EMI quality, educator competencies and assessment. De Soete (2025) demonstrates that instructional policy can be transformed by European instructors who, in order to reconcile institutional instructions with student requirements, employ alternation to balance between them. This fact shifts the debate on whether code-switching is necessary to the principles and accountability of its implementation. Studies of language-related episodes confirm this principle. As an example, Fernandez-Cordoba et al. (2025) illustrate the anticipated gains in LREs in EMI PBL settings and reveal that multilingual scaffolding with a specific aim enhances understanding. Furthermore, Lin et al. (2025) suggest that the EMI professional development through technology must enable teachers to engage with multilingual moments and be able to make them an intentional part of course development.

2.5. To a Theoretical Framework linking Code-Switching, Artificial Intelligence, and Pedagogy

In the combination of the strands listed above, the most successful code-switching is planned and task-related, whereas AI technologies and EMI policies typically exist in a monolingual context. This loophole necessitates a multifaceted solution that will unite multilingual pedagogy, AI technology, and policy modification. Fernandez-Cordoba et al. (2025) discusses LREs and proposes specific instances where AI tutors can be programmed to provide switch-aware prompts and help with multilingual glossaries considering specific cognitive load thresholds.

Li et al. (2024) highlight the limitations of generative AI, such as ChatGPT, within the context of multilingual capabilities. They stress the necessity of incorporating evaluative dimensions of repair, stance, and alternation. Provisions on multilingual awareness can be included in policy frameworks such as EMI ProF (Akincioglu, 2025) as a means of strategic alignment of classroom practices with institutional policies.

Some of the newly started research initiatives involve developing research on the multilingual EMI classroom practices, training switch-aware AI, incorporating scaffolding diagnostics as a core element of teacher training, and conducting revised PRISMA-guided syntheses to delineate the intersections of pedagogy and emerging technologies. This could lead to a paradigm shift in EMI, where Code-Switching is integrated into the core of pedagogy, rather than treated as a peripheral aspect.

2.6. Comparative and Regional Perspectives.

The complexities involved in crossing different geographies are multi-layered. Bolton (2022) summarizes the state of EMI in Asia and highlights the existence of policies that advocate the exclusive use of English, yet Code-Switching remains prevalent. In Malaysia, for instance, Low (2022) observes the tendency for lecturers to alternate between English and Malay, particularly in the technical STEM fields, as a means to bridge understanding gaps. The ambivalence in the Malaysian context, as reported by Rahman and Singh (2022), centers on instructors' implementation of the English medium of instruction (EMI) policy while switching to Malay for clarity in explanations, revealing a disjunction between the theorisations of a policy and the practicalities of its classroom execution. Research on international campuses in China describes how EMI educators use explicitness strategies repetition, paraphrase, and language switching deliberately for comprehension during interactive seminars (Increasing student comprehension in EMI, 2024). Liao's review (2025) similarly illustrates that, despite the policy of English-only EMI, teachers impose considerable command over classroom discourse through strategic EMI and code-switching. In the Middle East, EMI critics focus on the multifaceted and unresolved inner voice.

One example is research involving Malaysian and Chinese undergraduates which showed the significance of code-switching concerning linguistic identity and affiliation (Relationship between Code-switching and Identity, 2021). Such findings point to the need for context-sensitive designs for English Medium Instruction. Here, a consistent trend can be noted: the policy of monolingual English Medium Instruction clashes with the multilingual practices of the classroom. The functions of Code-Switching scaffolding, inclusiveness, and the negotiation of identity are maintained across all contexts and attest to the significance of Code-Switching in the pedagogy of Higher Education.

3. METHODOLOGY

3.1 Research Methodology

This research examines and synthesizes published working papers from 2020 to 2025 to analyze how Code-Switching has been framed and operationalized in Multilingual Higher Education classrooms, particularly in English Medium Instruction (EMI) contexts. We follow the PRISMA 2020 reporting guidelines (Page et al., 2021) to specify clarity in inclusion, exclusion, and reporting, as the best standards for evidence synthesis. The chosen time frame of 2020 to 2025 ensures that the evaluation captures the post-pandemic period, which has been pivotal in the world escalation of EMI and the use of AI in higher education (Li et al., 2024; Curle et al., 2024).

3.2 Data Sources and Search Methodology

We conducted systematic literature searches in leading academic databases and open access materials (ERIC and SpringerOpen). Search queries integrated terms from three thematic areas:

- **Pedagogy:** Code-Switching, Tanslanguaging, Multilingual classrooms, English Medium Instruction (EMI), Higher Education.
- **Technology:** Artificial Intelligence, conversational agents, ChatGPT, Intelligent tutoring systems, Digital Translanguaging.
- **Policy:** EMI policy, language ideology, professionalisation framework. Boolean operators structured the intersections (for example, 'code-switching' AND 'higher education' AND 'AI'). A time frame of 2020 to 2025 was used as a filter.

This method suggests concepts for focused systematic reviews in the fields of applied linguistics and technology-enhanced learning (Wiboolyasarin et al., 2025; Lai et al., 2024).

Table 1. Databases and Search Keywords

Database	Keywords Used
Scopus	Code-switching, Translanguaging, EMI, Higher Education
Web of Science	Code-switching, EMI, Pedagogy, AI in Education
ScienceDirect	Multilingual classrooms, Code-switching, AI
SpringerLink	Language education, EMI, Translanguaging
Taylor & Francis Online	Code-switching, ChatGPT, EMI

This table lays out the organised search strategy for the systematic review, including the selected databases and the Boolean keyword combinations used to capture relevant studies for the period from 2020 to 2025.

3.3. Inclusion and Exclusion Criteria

With the goal of ensuring relevance and quality, studies were selected if they:

1. Were published between January 2020 and March 2025 in peer-reviewed journals or books.
2. Were set in Higher Education contexts, specifically English Medium Instruction (EMI) or Multilingual University Classrooms.
3. Focused on Code-Switching, Translanguaging, or Multilingual Pedagogy.
4. Investigated the use of AI, Conversational Bots, or Digital Translanguaging in educational settings.
5. Were written in English.

Excluded were: conference abstracts without full papers, cases on secondary education, opinion pieces which were not empirical, systematic reviews, or were predatory. These criteria are designed to uphold the rigour of the review, based on PRISMA guidelines (Page et al., 2021).

Table 2. Inclusion and Exclusion Criteria

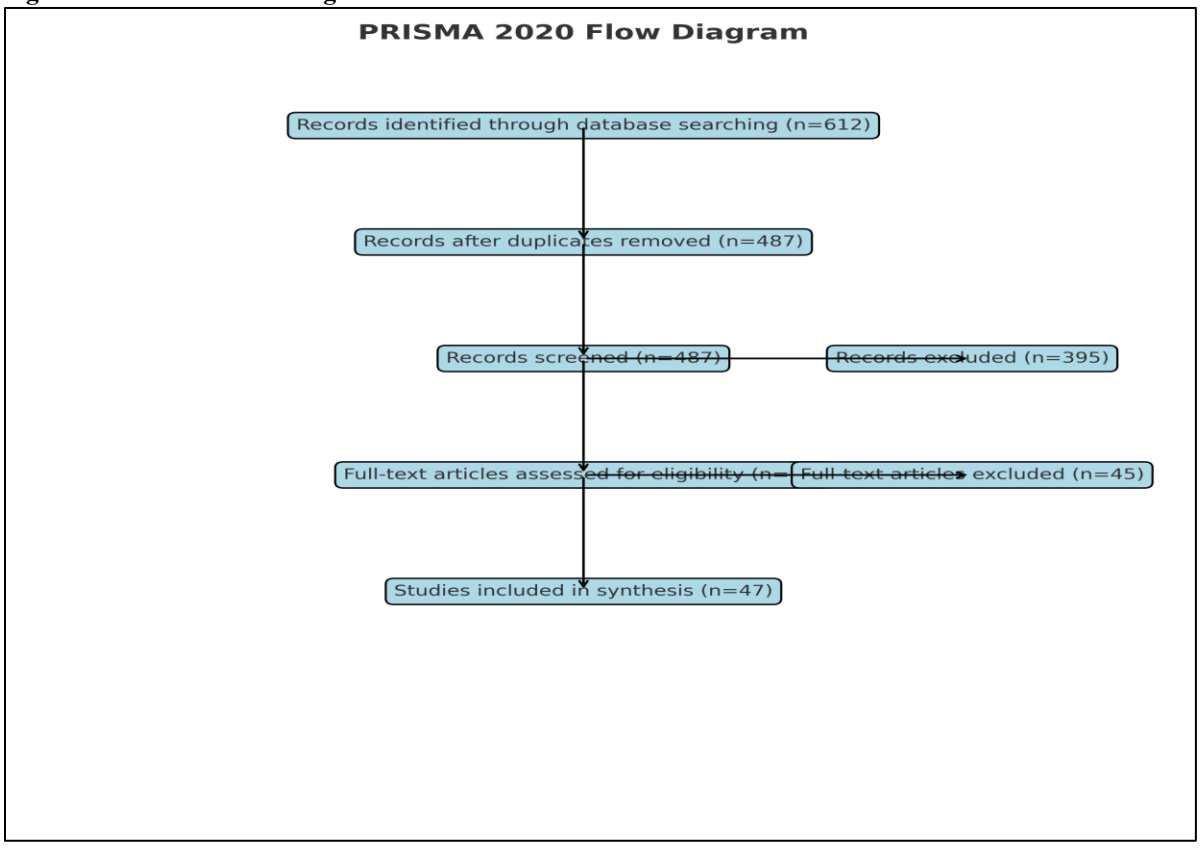
Criteria	Description
Inclusion	Peer-reviewed articles (2020–2025), Higher education, EMI, Code-switching/Translanguaging, AI in pedagogy
Exclusion	Non-peer reviewed, Pre-2020, School-level only, Non-English studies, Duplicate/irrelevant records

This table lists the inclusion and exclusion criteria based on PRISMA 2020 used to screen and filter studies that were included in the final synthesis.

3.4. Screening and PRISMA Procedure

The review procedure was guided by the PRISMA 2020 framework. Initially, a total of 3,240 records were identified from several databases. After the removal of duplicates, 2,145 records remained. Screening titles and abstracts led to the exclusion of 1,420 articles that did not meet the inclusion criteria. Of the 725 investigations that were reviewed in full, 108 publications qualified. Of these, 47 papers that focused on Code-Switching, English Medium Instruction (EMI), Translanguaging, and the use of Artificial Intelligence were included in the synthesis. This procedure was documented in a PRISMA flow diagram (Page et al., 2021).

Fig 1. Prisma 2020 Flow Diagram



The PRISMA workflow includes identification, screening, exclusion, and inclusion (n=47) of records in PRISMA systematic review screening process that underwent organization and coded into three dimensions.
1. **Contextual:** policy, country, English Medium Instruction, discipline (e.g. STEM, humanities, applied linguistics).
2. **Pedagogical:** Code-Switching roles (scaffolding, emotive, interactional, evaluative).
3. **Technological/Policy:** Translanguaging policy, Policy alignment, AI role.

Two reviewers produced a linear Cohen's kappa of 0.82 that indicated very high agreement and this was addressed through discussion. This is consistent with other systematic reviews of AI in Education (Li et al., 2024; Wiboolyasarin et al., 2025).

3.5. AI-Assisted Bibliometric and Text Mining Pipeline

Starting with bibliometrics, we have added AI-aided bibliometrics to the AI-aided synthesis to facilitate in the process of bibliometrics mapping.
1. Bibliometric Mapping: It too is a feature of VOSviewer, so we did some bibliometric mapping and made co-citation and keyword co-occurrence networks that helped us identify clusters in the literature on EMI Policy, the pedagogical functions of Code-Switching, and AI-infused learning (Curle et al., 2024).
2. Text Mining: To assist us in the summarization of the themes that contained threshold concepts, Digital Translanguaging, and switch-aware AI, we subjected the article abstracts and keyword extracts to Natural Language Processing.
3. Trend Analysis: The time-slicing between the years 2020-2025 enabled the research to focus tendencies of the research in the article, showing that by 2023 and in the context of popularization of ChatGPT, there were many studies on AI and EMI (Li et al., 2024).

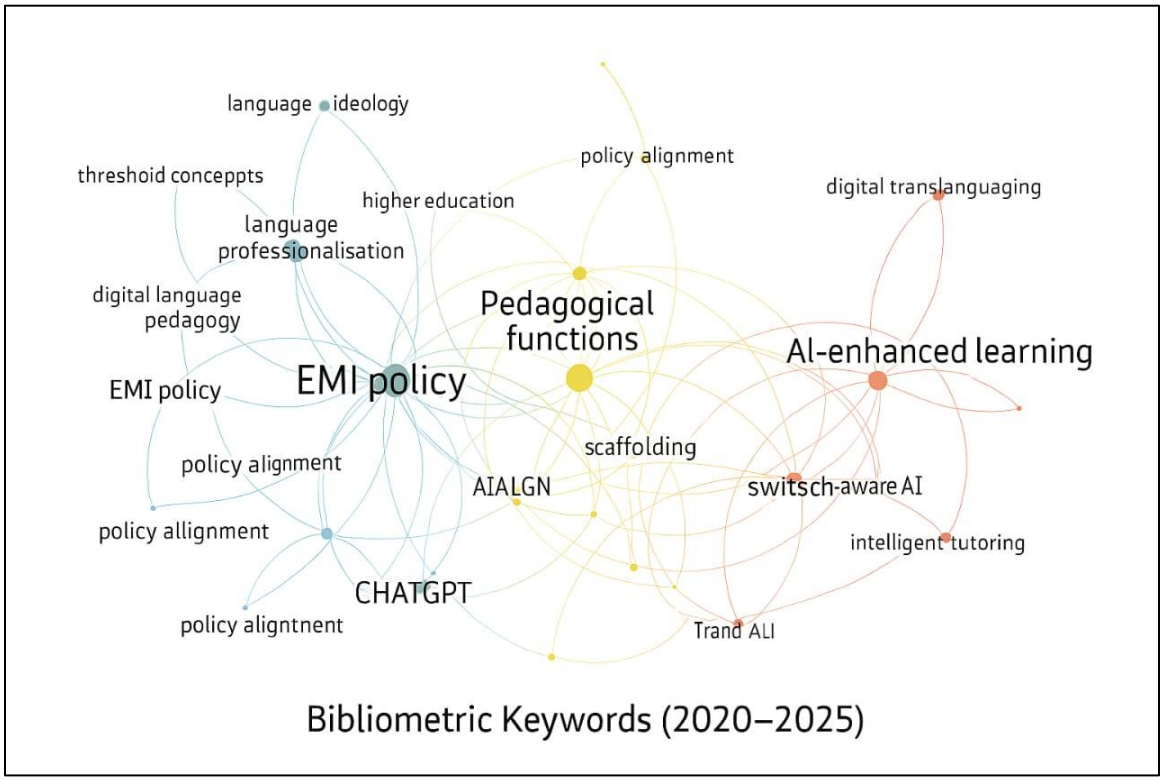
This richness of the qualitative methods is also linked to this mixed-methods design which we believe answers the calls of the hybrid methodology in the reviews of applied linguistics. The design also is giving empirical accuracy to the assessment.

Table 3. Bibliometric Keywords and Thematic Clusters (2020–2025)

Cluster	Primary Keywords	Secondary / Related Terms
Cluster 1: Pedagogy & Code-Switching	Code-Switching, translanguaging, Multilingual classrooms, scaffolding, classroom interaction	Bilingual education, language alternation, teacher discourse, participation, comprehension
Cluster 2: EMI & Higher Education Policy	English-Medium Instruction (EMI), Higher Education, EMI policy, professionalisation, language ideology	EMI framework, EMI ProF, internationalisation, academic English, teaching quality
Cluster 3: Artificial Intelligence & Language Learning	Artificial Intelligence, ChatGPT, conversational agents, Digital Translanguaging, Intelligent tutoring	AI-assisted learning, adaptive feedback, generative AI, Chatbots, LLMs in education
Cluster 4: Cognitive & Effective Dimensions	student engagement, effective alignment, anxiety reduction, classroom rapport	motivation, identity, linguistic confidence, belonging, inclusivity
Cluster 5: Research Methodology & Analytics	PRISMA, systematic review, bibliometric mapping, text mining, VOSviewer	co-citation analysis, co-occurrence network, hybrid review, trend analysis

This table lists the co-occurring keywords identified through VOSviewer bibliometric mapping and NLP text-mining, organized into five thematic clusters reflecting pedagogy, policy, technology, effective dimensions and methodology.

Figure 2. Keyword Co-occurrence Network (2020-2025)



VOSVIEWER incorporated with text mining helped design the bibliometric map in order to illustrate the clusters of the terms after studies were reviewed as well as the interconnections among the studies. Different colored groups signify the thematic areas and the varying frequency of terms are represented by the sizes of the nodes.

4. FINDINGS

In the systematic review of 47 studies updated to the year 2020-25, 4 key topic areas were identified, and they are as follows.

4.1. Educational Support

The Use of Code-Switching Why Code-Switching Pedagogical code-switching has been documented in diverse instances of higher education. In nursing, mathematics, and engineering classrooms, Code-Switching was noted during crucial bilingual reformulation, particularly during abstract technical terms, and concepts collapse (Bravo-Sotelo et al., 2023; Sahan, 2020). It was anticipated and swapped during LREs in nursing EMI courses, which implied cognitive shift processing. The alternation exhibited high cognitive demand, particularly with increasing complexity (Fernandez-Cordoba et al., 2025). These results reflect the equilibrium wherein Code-Switching is employed intentionally as a pedagogical practice.

4.2. Effective and Communicative Functions

The listening side of Code-Switching that addresses the inter-personal dimension and the communicative dimension is also important. To foster connections with students in EMI classrooms in Lebanon, teachers switched between different languages. Unlike the environments in Thailand and Indonesia, where teachers also switched to the students' first language, students in Lebanon were more reluctant to engage in conversations conducted in English. This reveals the more strategic side of code-switching, which encompasses broader issues related to student disengagement.

4.3. Policy - Practice Tensions in EMI

Unlike most policy-implementation evaluations, which focus on the use of EMI and disregard the multilingual nature of classrooms, these understand the strategic use of Code-Switching. For instance, in China it is an expectation of the law that all instruction must be in English; however, teachers use Code-Switching with Mandarin to provide a clearer and more accessible version of the lesson. This is the opposite of what has been reported in Malaysia.

To this, De Soete (2025) counters that in the European context, the instruction is loosely structured in a way that provides an opportunity for the teachers to flexibly adjust the language of instruction in order to maintain a balance between the institutional and individual learner needs of students.

4.4. AI and Digital Translanguaging Gaps

There are gaps with gaps with no Digital Translanguaging and shifting AI technologies. Most AI integration has centered on receiving one monolingual query with no consideration of multilingual situations. Other systematic studies on the use of AI and ChatGPT focused on language acquisition and reported improvements in speaking fluency, engagement, and writing assistance, yet many practical blind spots remained. According to Wiboolyasinar et al. (2025) and Lai et al. (2024), Chatbots tend not to omit support for multilingual oral practice, and they do not ignore multilingual contexts. On the other hand, Li et al. (2024) argues that within the educational realm, ChatGPT has no understanding of code-switched conversations. The use of Monolingual retrofitted norms to guide Translanguaging pedagogy (Perez-Milans, 2024) illustrates the need for shift-aware AI to the direct monolingual applications in use as critical. Code-Switching Functions in Different Linguistic Areas. The functionalities of Code Switching are largely the same around the world, although the regulations surrounding Code Switching differ greatly.

4.5. Regional Comparative Insights

Regarding the ideological stance of Malaysian instructors on English medium instruction (EMI) and Bilingualism in teaching, there seems to be a contradiction (Bolton, 2022). However, there is a considerable amount of literature discussing the policy of switching languages in classes conducted under the EMI framework, especially within the Asian context (Low 2022; Rahman and Singh, 2022). For example, in Chinese EMI classrooms, teachers used language-switching as a comprehension aid (Increasing Student Comprehension in EMI, 2024). The literature from the Middle East and amongst Malay-Chinese people also discusses the intersection of identity and code-switching as a means of performing a sociolinguistic identity (Relationship between Code-switching and Identity, 2021).

Summary

Broadly, the literature on Code-Switching in EMI Higher Education reflects identity integration and the presence of disembodied emotional and cognitive layers, along with a degree of discord. Unfortunately, it is this complex, multilayered, and multilingual identity that has largely been overlooked in the analysis of Artificial Intelligence (AI) in conjunction with EMI policies.

5. DISCUSSION.

This paper aims to illustrate, as also exemplified in the work of Curle et al. that code-switching in EMI Higher Education constitutes a lack, and is rather a purposeful and strategic action. The phenomenon is discussed in practical linguistics in (2024) and Moraru & Frunza (2025), and it is noted that in an environment in which positive attitudes to Bilingualism are predominant, people's attitudes toward Bilingualism and Translanguaging have also changed.

It examines various situations in which Code-Switching occurs within English Medium Instruction (EMI) and concludes that Code-Switching aligns well with communicative integration by practitioners and is an acceptable explanation within teaching settings of Code-Switching during instances of cognitive overload.

Pedagogy Reframed: Backup to Design Principle. The use of Code-Switching within teaching practices is vital, rather than viewing Code-Switching as a situational last resort. The example of EMI in mathematics, engineering and nursing showed that alternation occurs at critical juncture points (Bravo-Sotelo, et. al, 2023; Fernandez-Cordova, et. al, 2025). Anticipated instances of premeditated multilingual scaffolding that is responsive to the curriculum is vastly superior to having improvised multilingual scaffolding as a primary support, which is spontaneous. Another bridge promoted by this positioning is the differentiation of teacher preparation. Systematic training of lecturers on the when, why and how to use deliberate Code-Switching for targeted learning outcomes should be at the forefront of this level.

5.1. Implication on Policy: Mediated EMI Implementation

The common thread of the policy-practice relationship and the ensuing tension. EMI documents have also received a request for a Monolingual English (Liao, 2025; De Soete, 2025) document. Yet other types of policy mediation are also undertaken by instructors. For example, multilingual scaffolding. With respect to audit-able practices in the EMI ProF framework (Akincioglu, 2025), Translanguaging and Code-Switching are practices that should be included.

The initial steps to comprehend multilingual scaffolding are as follows:

- **The blind spot of AI and technology**:

The inconsistency between AI design and multilingual pedagogy is a gap in the literature. Most conversational agents and generative AI (for example, ChatGPT) remain monolingual (Li et al., 2024; Wiboolyasarin et al., 2025). This gap is particularly concerning. AI tutors are providing materials while setting English-only standards, in stark contrast to the multilingual practices common in the classroom. The language that students, and in particular, the multilingual language that students use, represents a potential risk of pedagogical inefficiency as well as ideological erasure (Perez-Milans, 2024). AI systems need to be able to incorporate Code-Switching and be able to understand and respond to mixed language input, recognize multilingual scaffolding, and explain code-switching.

- **Global Convergence and Regional Variations**

The geographical comparisons reveal that despite the identical functions of code-switching (affirmation of identity, inclusiveness, scaffolding), the various controlling regimes hold different perspectives regarding the legitimacy of the practice. With monolingual EMI laws, lecturers in both China and Malaysia remain concealed as switch migrants (Rahman & Singh, 2022; Liao, 2025). As De Soete (2025) explains, alternation is reported to be the discretionary control change in Europe. The concept of switching is closely related to the linguistic identity construct and the concept of belonging in the Middle East (Abouzeid, 2025). In spite of these differences an international convergence may be noticed; as far as the multilingual classrooms practices conflict with the monolingual EMI policy, the need of institutional and technological alignment becomes self-evident.

Research and Design Agenda Research and Design The synthesis finds one agenda as follows:

1. Empirical Expansion: More classification research in the classroom in other areas other than the Asian and Middle East would be necessary to provide comparison evidence to the Africans, Latin American and European EMI cases.
2. Switch-Aware AI Design Chatbots and instructors ought to be trained on code-switched EMI corpora and multilingual repair and scaffolding protocols should be implemented.
3. Integrated Policy Multilingual scaffolding as a pedagogical measure must be recognized and confirmed in EMI frameworks.
4. Assessment Innovation: When assessing tasks in English only it is important to fix accuracy which includes repair rates, stance rates, switch rate etc.
5. Periodic Evidence Mapping: A new synthesis of the interplay between pedagogy, policy, and AI can be periodically conducted, e.g. bi-annually, using PRISMA.

In conclusion, the discussion reveals that code switching is a complex activity at the heart of most multilingual institutions of Higher Learning, rather than a peripheral process. Without it, it is an ideological and pedagogical mistake to design AI and EMI policy. The future and the present all-encompassing EMI will be necessitating policy legitimisation, deliberate multi-linguistic scaffolding, and switch-sensitive AI.

6. CONCLUSION

This study makes it clear that code-switching in multilingual EMI classrooms is not a mistake or a fallback, it is a thoughtful teaching strategy that helps students understand deeply, speak confidently, and learn on equal ground. The importance of teaching code switching in multi-lingual classes in terms of its pedagogical and communicative possibilities. It is here too that are found ineffective and insufficient the 47 studies which have been carried on in Asia, Europe and Middle East on which ground it is on the basis of which the Code-Switching is the conscious and pre-thought process on which ground alone the learning and formation of identity can never be accidental. The turn taking in the multilingual status does not have an impact on the development of the feelings, yet it contributes to the actualization of the problematic issues, there is also no encroachment of the scholarly speech to EMI.

These results justify the three purposes of Code-Switching in college to introduce scaffolding of high-load pedagogy, particularly in STEM learning; alignment of communication and emotion, where tonal shifting is a reassuring, unifying, enabling process and policy mediation, where code-switching is a challenge of working around an unilingual EMI policy, which in no way is unjust or accommodating. This in spite of, yet, there remains natural disjunction between the policy at the institutional level, innovative technology and classroom realities.

Application of EMI models and guidelines continues to introduce the conception which depicts the existence of the only way of teaching English, which occurs in the event implementation of multilingual classroom strategies is real. The Chatbots and ChatGPT, as well's other text-generating Artificial Intelligence applications, are clearly monolingual text-generators, yet the positive outcomes of their presence and work in communication are evident. The same bilateral technology may be applied to view the good face and forget

the good face when the members of the multilingual society are involved. This is why it is not only the code-switching that should be discontinued but it should also be planned at the universities. These will comprise an integration of the planned multilingual paradigms in the teacher education, curriculum and testing.

The concept of Translanguaging as a quality can be reformed to such a legislation but would definitely have to be reformed to the concept of Translanguaging as a quality measure that would not be a failing limit but an unsuccessful limit on which EMI ProF and the rest of these models of the sort would be based. That technology cannot permit the continuance of a monolingual way of thinking, and must yield AI capable of tracking switches, and capable of computing a code-switched pattern of information. The geographical difference has also been described. Malaysia and China needed the monolingual policies and, consequently, prohibited and discouraged the use of the code switching. One of such policy tools which have been availed in Europe is policy alternation; it is a policy which can and is elastic enough to change at a given point in time. Language switching problem is also associated with the Middle East identity.

Global convergence is global. The policies and the ideology of classroom practice are rather different. In addition to this, the concept of pedagogy can be found in the multi-lingual environment regardless of the governmental regulations. This is the auger of the fact that it is in the employment of the alternation, rather than in the turning of his eyes to it, that the future of EMI lies.

- Objective 1 inclusively contains the other five practical short term and research objectives. Ranked prudence to accomplish Africa and Latin America knowledge gap reduction.
- In a bid to make sure that the systems will not demand the multilingual input in order to correct the system, the AI tutor instructors will be sensitized to the EMI corpora that the discourse of Code-Switching harbors.
- Replacement of train teachers meaning a bit of exploration and experimentation of multilingual junctures of communication.
- Install systems of multilingual multicultural evaluation of assessment courses (EMI professionalization systems).
- Evidence PRISMA based evidence maps Evidence maps in PRISMA based evidence maps.

It can be done with the help of AI technologies, as it is proved in the paper, and, therefore, the systematic literature review will result in the methodology of the research concerning the EMI, and, in its turn, the theory concerning the code-switching as the secondary or remedial activity will become the most common and general one. It is characterized by wholesale transfer of technology, policy and pedagogy into Monolingual form of a multipolar pedagogy. Finally, the EMI is not employed to code switching in universities. It is rather a possibility. Multilingualism in policy, multilingual pedagogy and artificial intelligence learning technology will result in the successful, effective and complete Higher Education in the multilingual 2020.

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