FACTORS INFLUENCING STUDENT SUCCESS AND CHALLENGES IN ENGLISH-MEDIUM INSTRUCTION ENVIRONMENTS: A SYSTEMATIC REVIEW

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Abstract: English-medium instruction (EMI) continues to expand across non-Anglophone higher education, yet student outcomes remain uneven. This systematic review synthesizes empirical evidence on factors shaping student success and challenges in EMI programs. Following the PRISMA 2020 statement (Page et al., 2021), we searched Scopus, Web of Science, ERIC, and Google Scholar for studies published between 2014 and 2025. From 2,111 records, 12 studies met the inclusion criteria. Data were appraised with CASP/MMAT and synthesized through inductive thematic analysis (Thomas & Harden, 2008), with subsequent abductive interpretation drawing on Self-Regulated Learning and Psychological Resilience frameworks. Four interrelated themes emerged. First, language competence is multidimensional: discipline-specific vocabulary predicts achievement more reliably than global proficiency scores, and transitional adaptation follows nonlinear trajectories. Second, disciplinary discourse patterns generate distinct demands. Social science courses require higher linguistic loads than STEM fields, challenging uniform admission standards. Third, students employ differentiated coping strategies. Problem-focused approaches include terminology management and feedback seeking; emotion-focused approaches include reframing and anxiety regulation. These strategies reflect identity positioning and prior EMI exposure. Fourth, institutional factors mediate integration. Language policy clarity, service accessibility, and structured peer networks shape both academic performance and social belonging. Findings redirect attention from student deficits to systemic design. EMI effectiveness depends less on raising entry thresholds than on providing discipline-sensitive language support, establishing transparent bilingual classroom norms, and ensuring responsive institutional services. Implications for policy, pedagogy, and future research are discussed.

Keywords: English-medium instruction (EMI), vocabulary knowledge, disciplinary variation, coping strategies, institutional support.

INTRODUCTION

English-medium instruction (EMI) has rapidly expanded in higher education worldwide over the past two decades, especially in non-Anglophone contexts. Universities increasingly adopt EMI as a strategy to internationalize their campuses, attract global talent, and enhance competitive standing. For example, institutions implement English-taught programs to recruit international students, improve global rankings, and produce graduates equipped for a global workforce (Björkman, 2011; Knight, 2004; Wächter & Maiworm, 2014). Reflecting this trend, English-medium programs have grown at a remarkable rate across Europe, Asia, and beyond (Bradford, 2021). By the mid-2010s, roughly 20% of all degree programs in some European countries (e.g., the Nordic region) were taught in English (Heisterkamp et al., 2025). This global surge underscores EMI's perceived importance, yet it also brings into focus substantial challenges. Moving entire curricula to a foreign language can strain students and faculty, raising concerns about educational quality and equity. Stakeholders have voiced serious reservations about EMI implementation even as they acknowledge it may be inevitable (Macaro et al., 2018). In other words, the push for EMI has outpaced clear evidence of its effectiveness, making a critical examination of its outcomes both urgent and important.

A defining feature of EMI in higher education is its dual goal: students must master advanced disciplinary content while simultaneously learning or improving their English. English-medium education is thus inherently a high-stakes double challenge (Dafouz & Smit, 2020). As Dafouz and Smit (2020) note, each EMI program is shaped

by unique global, national, and local forces, making implementation highly context-dependent. What counts as "successful" EMI can vary widely; indeed, it is *"very difficult to draw meaningful conclusions about what can be labelled 'good' or 'successful'"* EMI across different settings (Dafouz & Smit, 2020, p. 4). Students in EMI are expected to acquire specialized knowledge through English and improve their language proficiency at the same time—a demanding task that sets EMI apart from first-language instruction. Not surprisingly, this dual burden often presents significant linguistic, academic, and sociocultural hurdles for learners (Doiz et al., 2013). Early research and policy discourse on EMI tended to focus on linguistic challenges, such as students' limited English proficiency and its impact on comprehension. However, clearly, language barriers are only part of a more complex picture. EMI students face a nexus of interrelated difficulties spanning language, academic skills, and cultural adaptation.

Studies across diverse regions consistently show that EMI challenges extend beyond grammar and vocabulary. In Japan, for instance, university faculty and students have reported concerns not just about English proficiency, but also about students' academic skills and confidence in an English-taught environment (Bradford & Brown, 2018). Similar findings emerge in South Korea (Kim et al., 2014), Vietnam (Vu & Burns, 2014), and Turkey (Başıbek et al., 2014; Yıldız et al., 2017), underlining that academic and sociocultural factors intertwine with language issues. Even within the same classroom, students may experience markedly different realities. Cultural and linguistic gaps can leave some feeling like "insiders" and others like marginalized "outsiders," which in turn affects their participation and understanding of the material (Björkman, 2011; Kim et al., 2014). This insider–outsider dynamic relates to students' self-perceptions, peer interactions, and cross-cultural integration, as recent studies on EMI classrooms have observed (Volkova & Kolesov, 2022; Zhang & Lütge, 2024). In essence, sociocultural adjustment—such as fitting in with peers, negotiating identity in a second language, and understanding professors' expectations—emerges as a crucial component of the EMI student experience alongside mastering content. These findings reinforce that EMI success is not determined by language skills alone; it is co-shaped by the academic environment and the sociocultural context in which learning takes place.

Another important insight from the literature is that disciplinary context moderates EMI outcomes. Students in humanities or social sciences often confront different challenges than those in STEM fields (Airey & Linder, 2009; Soruç et al., 2021). In language-intensive disciplines like international relations or law, success may hinge on advanced English academic literacy—e.g., understanding nuanced arguments or writing essays. Whereas, in engineering or chemistry, the obstacles might lie in decoding technical terminology, symbols, and complex diagrams that accompany content learning. Soruç et al. (2021) provide quantitative evidence of this variation: at a Turkish university, English proficiency levels explained 36.8% of the variance in language-related difficulties reported by International Relations students, but only 11.4% for Electrical Engineering students. In other words, a student's major can significantly influence which aspects of EMI are most problematic. General English proficiency tests (e.g., IELTS) tend to be stronger predictors of academic performance in fields that require extensive reading, discussion, and writing, and less predictive in fields that rely on formulas or non-verbal content. This disciplinary divergence suggests that a one-size-fits-all approach to EMI is ineffective. It also indicates potential inequities: for example, science students might struggle less with language per se, but they could face other hurdles (e.g., heavy content load or unfamiliar pedagogy) that are obscured if we focus only on English test scores. Overall, the diverse challenges reported across different national and disciplinary contexts underscore the need to examine EMI through a broad, multidimensional lens rather than treating it as a uniform experience.

How has prior research approached EMI success and student challenges? Initially, many studies (and institutional policies) were grounded in a second language acquisition (SLA) perspective, often framing English proficiency as the key determinant of success and viewing motivation to learn English as a crucial facilitator (Macaro, 2018; Rose et al., 2020). Evidence supports the importance of these factors: Rose et al. (2020), for example, found that students' English test scores and academic English skills were significant predictors of their course grades in an EMI program. Interestingly, that study also revealed a more nuanced picture—motivation, which is typically beneficial in language learning contexts, did not correlate with higher academic grades in the EMI setting (Rose et al., 2020). This suggests that even well-motivated students may struggle if they lack the necessary language proficiency or academic skills, and it hints at possible differences between learning a language per se and learning *through* a language. More importantly, Rose et al.'s interviews showed that students themselves conceive "success in EMI" as multifaceted, encompassing not only final grades but also lecture comprehension, improvements in English proficiency, and long-term gains like career opportunities (Rose et al., 2020). Such findings broaden the

notion of success beyond exam results, aligning with a growing consensus that EMI outcomes should be evaluated on multiple dimensions. Indeed, for this review, *student success* is defined holistically: it includes academic performance (e.g., grades or GPA), academic adaptation (effective content comprehension, classroom participation, and the ability to learn in an L2 environment), and sustained engagement (continued enrollment and program completion). This multidimensional definition echoes recent perspectives in EMI research emphasizing that success extends beyond raw grades to students' functional capacity to navigate an English-mediated academic world (Aizawa, 2024; Rose et al., 2020; Szabó et al., 2021).

Notwithstanding these advances, there remain notable gaps and inconsistencies in the EMI literature. One issue is that much research has been compartmentalized: studies often focus on isolated factors (e.g., language test scores, teacher attitudes, or a single institutional case) rather than building an integrated understanding. Traditional conceptual frameworks have struggled to capture the full complexity of EMI. For instance, earlier research often assumed a straightforward linkage between English proficiency and academic success, implicitly adopting a "deficit model" where students' language limitations were seen as the primary problem. Yet recent evidence challenges this deficit view, revealing that many obstacles stem from systemic factors like curriculum design, pedagogy, and support infrastructure. In some universities, EMI programs have been introduced without sufficient preparation: instructors may not be trained in bilingual pedagogy, support services (writing centers, language tutoring, etc.) may be underdeveloped, and materials may not be adequately adapted for non-native speakers. Such institutional shortcomings can significantly hinder student success, regardless of individual language ability (Dearden & Macaro, 2016; Doiz et al., 2013). Similarly, teaching practices play a decisive role—for example, whether lecturers adjust their speech rate, clarify terminology, or allow code-switching when needed. These pedagogical choices can mitigate or exacerbate comprehension difficulties (Kim et al., 2014; Yıldız et al., 2017). Beyond language and pedagogy, scholars have begun highlighting additional factors in EMI outcomes. Digital literacy is one emerging consideration: in today's universities, students often rely on digital platforms and English-medium online resources, so their ability to navigate e-learning tools and online academic content in English can affect their performance. Another factor is psychological preparedness—including students' academic self-confidence, anxiety management, and resilience in the face of challenges. A few recent studies have directly explored these dimensions. For instance, Charoenpornsook and Thumvichit (2025) examined how engineering students in Thailand cope with EMI stressors, identifying distinct profiles of coping strategies (e.g., proactive problem-solving vs. emotion-focused coping). Nguyen et al. (2025b) found that resilience traits—such as viewing setbacks as opportunities to learn—distinguished successful international medical students in a Vietnamese EMI program. These works underline that personal agency and mental preparedness can significantly shape academic outcomes, yet such factors remain underrepresented in mainstream EMI research. In sum, while language proficiency and motivation are undoubtedly important, a comprehensive framework must also account for institutional support, teaching methodology, technology use, and student psychological traits (Lijie et al., 2025). No single study to date has woven all these threads into one model, and thus our understanding of EMI effectiveness remains fragmented.

Given the rapid proliferation of EMI and the multifaceted nature of the challenges described, there is a clear need for a systematic synthesis of the research to date. A widely cited review by Macaro et al. (2018) took an initial step in this direction, critically evaluating 83 studies. That review concluded that evidence was insufficient to assert that EMI reliably benefits students' English skills, nor that it definitively harms content learning (Macaro et al., 2018). Macaro and colleagues also noted that key stakeholders (students and faculty) often harbor serious concerns about EMI practice, ranging from fears of lower academic standards to feelings of linguistic insecurity. Crucially, they attributed the mixed findings partly to research design issues—many studies were small-scale, lacked robust comparison groups, or did not examine actual learning outcomes in depth. Since the publication of that 2018 review, the volume of EMI research has grown, especially in the 2020s, and new angles have been explored (e.g., resilience, as mentioned above). However, the field still lacks a unifying, evidence-based account of what makes EMI effective (or not) across various contexts. As Dafouz and Smit (2020) argue, a holistic but flexible approach is required to make sense of EMI's global spread. The present systematic literature review responds to this need by integrating findings across studies, regions, and disciplines in order to identify general patterns as well as context-specific nuances. By synthesizing recent empirical work, we aim to pinpoint the primary challenges students face, the key success factors beyond language proficiency, and the critical gaps in current knowledge that future research should address. The goal is to move toward a more comprehensive understanding

of EMI in higher education—one that can inform policy (e.g., program design, language support provision) and pedagogical practice (e.g., teacher training, classroom strategies) in internationalized universities.
To sharpen the focus of our review, we investigate the following research questions, which reflect the core concerns identified in the literature:

1. What are the primary linguistic, academic, and sociocultural challenges students face in English-taught programs across different national and disciplinary contexts?
2. What key factors beyond language proficiency—such as institutional support, teaching practices, digital literacy, and psychological preparedness—significantly affect student academic outcomes in EMI settings?
3. What major gaps exist in the current understanding of EMI effectiveness, and what directions should future research take to address these gaps?

In examining these questions, our review employs two theoretical lenses: Self-Regulated Learning (SRL) theory and Psychological Resilience theory. Self-Regulated Learning theory (Pintrich, 2004; Zimmerman, 2002) emphasizes learners' active role in managing their learning processes—setting goals, deploying strategies, and self-reflecting—which is highly pertinent for EMI students who must take charge of their learning in a second language. Meanwhile, resilience theory, e.g., by Masten (2001), highlights individuals' capacity to adapt and thrive in the face of adversity, offering a framework to understand how some students overcome EMI-related obstacles better than others. By applying these theories, the review recognizes students not just as passive recipients of English-medium education, but as active agents who regulate their learning and cope with challenges in varied ways. These perspectives help interpret the literature in a way that bridges individual-level factors (like study strategies or stress management) with broader institutional and sociocultural contexts. In the remainder of this paper, we systematically review empirical findings through the prism of these concepts, ultimately proposing an integrative model of EMI student success that accounts for the dynamic interplay between language, content, and context. Such an approach, we argue, is vital for advancing both scholarly understanding and practical support of English-medium instruction in higher education.

RESEARCH METHODOLOGY

This systematic review aims to comprehensively identify and evaluate empirical studies examining factors influencing international students' learning outcomes in English-taught environments. The search and screening process adhered to the PRISMA 2020 reporting guidelines (Page et al., 2021); the full procedure is depicted in the PRISMA flow diagram (Figure 1). The review was not pre-registered with PROSPERO; given the retrospective formulation of the protocol relative to the timeline of search and screening, prospective registration was not pursued. We document this as a methodological limitation (see Section 4.3). The search strings, inclusion criteria, and screening procedures were nonetheless recorded internally before full-text screening commenced.

Information Sources and Search Strategy

Scopus, Web of Science Core Collection (WoSCC), ERIC, and Google Scholar were searched as primary databases. Although our initial framing positioned Google Scholar as supplementary for citation tracing and gray literature identification, in practice it returned the great majority of retrieved records (see Section 2.2); we therefore treat all four as co-primary sources while acknowledging Google Scholar's known limitations in indexing consistency and replicability (see Section 4.3). Core search strings employed Boolean operators (AND, OR) and truncation symbols (*) to cover four key concepts: medium of instruction, research population, learning outcomes, and influencing factors. Example search string structure: ("English Medium Instruction" OR "EMI" ...) AND ("students" OR "international students*" OR "domestic students*" OR "local students*" ...) AND ("learning outcomes" OR "academic adaptation" ...) AND ("influencing factors" OR "challenges" ...). The population term was deliberately broadened beyond "international students" because EMI classrooms typically contain both international and domestic learners whose experiences are analytically distinguishable (e.g., Kim et al., 2014; Volkova & Kolesov, 2022).

Identification of Search Records

The database search encompassed Web of Science (WoS), Scopus, ERIC, and Google Scholar. Although Scopus, ERIC, and Google Scholar yielded a comparatively smaller number of records, these databases predominantly

index high-impact, peer-reviewed journals that maintain rigorous quality control. Notably, ERIC returned no relevant results, likely reflecting the database's limited coverage of the topic, as it primarily focuses on North American educational literature and may not capture international EMI research published in non-education journals. Employing a multi-database search strategy thus ensured broad coverage while maintaining quality through subsequent screening procedures. Google Scholar was used as a supplementary source, contributing 2,099 initial records prior to quality screening. The summary of the search results is provided below.

- Web of Science (WoS): Initial search yielded 9 records
- Scopus: Initial search yielded 3 records
- ERIC: Search returned 0 records
- Google Scholar: Total of 2,099 records retrieved
- Total: 2,111 initial records

Screening Criteria

Included studies must meet the following conditions: (a) Empirical primary research (quantitative, qualitative, or mixed methods); (b) Focus on student populations in English-medium programs within higher education; (c) Examine factors related to student challenges, adaptation, or academic achievement. Literature reviews, theoretical papers, or studies focusing on K-12 education were excluded.

The screening process comprised three steps: (1) duplicate removal, (2) title/abstract screening, and (3) full-text evaluation.

Web of Science screening: From 9 initial records, 1 was excluded as a non-peer-reviewed dissertation, retaining 8 records.

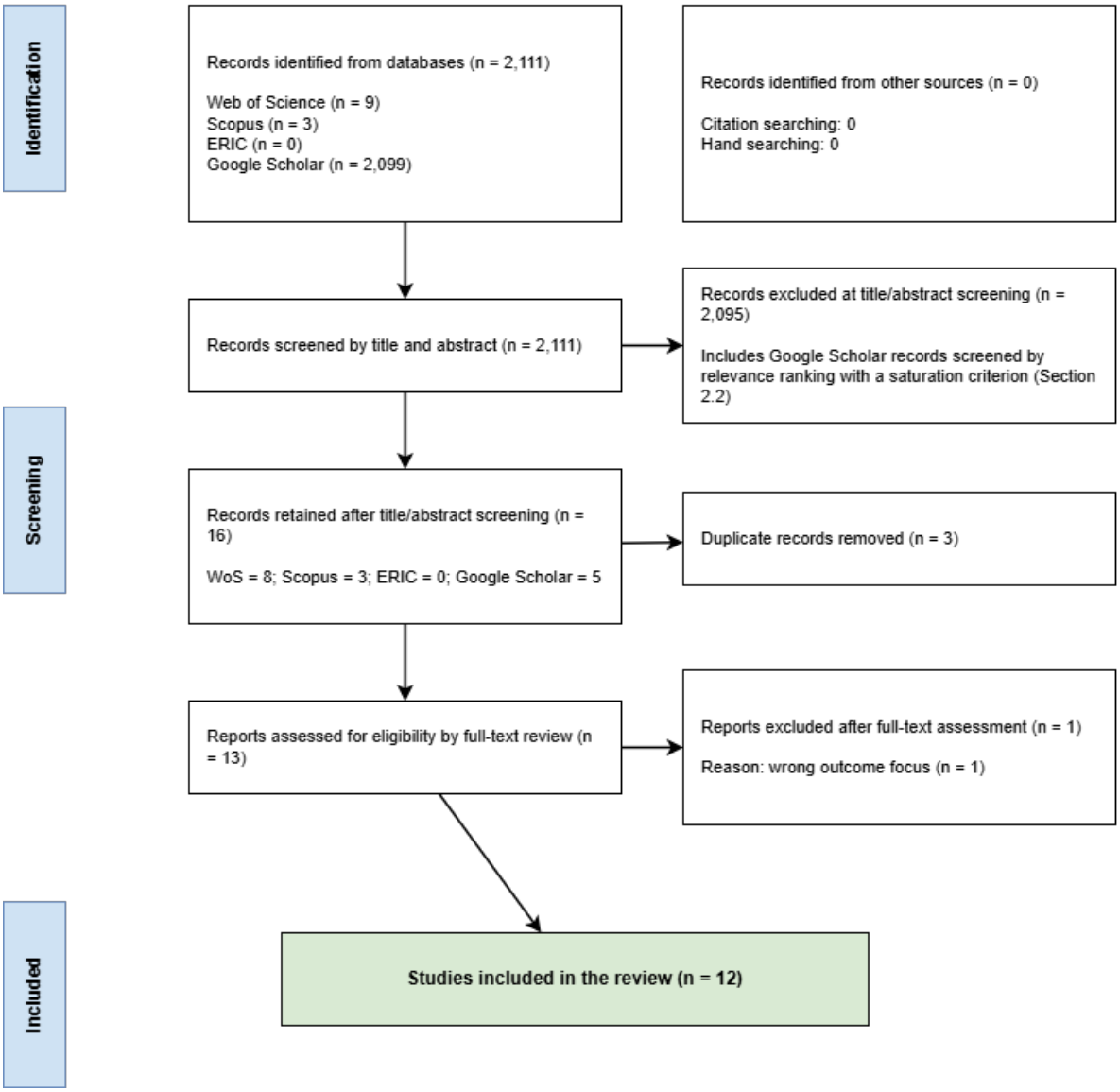
- Scopus screening: All 3 records were retained after initial screening.
- ERIC screening: No relevant records were identified (n=0).
- Google Scholar screening: Due to the large volume (n=2,099), records were screened in order of relevance ranking, with title and abstract review continuing until ten consecutive results returned no eligible studies (a saturation criterion); the first 200 ranked records were inspected at minimum. Exclusions were based on document type (e.g., monographs, book chapters, conceptual papers) and publication sources (e.g., institutional repositories, non-peer-reviewed working papers), retaining 5 records. We acknowledge that exhaustive screening of all 2,099 records was not feasible and that this screening depth constitutes a methodological limitation, partially mitigated by the comprehensive coverage of Scopus and Web of Science for peer-reviewed empirical studies.

After title/abstract screening: 8 records from WoS, 3 from Scopus, 0 from ERIC, and 5 from Google Scholar were retained, totaling 16 records. After removing 3 duplicate records, 13 unique records proceeded to full-text evaluation. Following full-text assessment, 1 record was excluded due to non-compliance with inclusion criteria (wrong outcome focus), resulting in 12 final included publications.

Data Elements

Extracted data included: (a) authors and year; (b) country and institutional background; (c) participant details; (d) research methodology; (e) research objectives; (f) key findings on challenges and success factors; (g) specific outcomes or metrics employed. As shown in Figure 1, this study strictly followed the PRISMA literature screening process. The initial search yielded 2,111 records from four databases (Web of Science, Scopus, ERIC, and Google Scholar). After deduplication, title/abstract screening, and full-text evaluation, 12 empirical studies were ultimately included. The complete screening process and specific reasons for excluding studies at each stage are detailed in the figure below.

Figure 1
PRISMA 2020 Flow Diagram



Quality Assessment

During data extraction, the research team conducted preliminary quality reviews of included studies, systematically documenting methodological strengths and potential limitations. The formal quality assessment was conducted using two validated frameworks: the Critical Appraisal Skills Programme (CASP) checklist for qualitative studies and the Mixed Methods Appraisal Tool (MMAT) for quantitative and mixed-methods research (CASP, 2018; Hong et al., 2018). Each study was independently evaluated by two reviewers, with discrepancies resolved through discussion.

Table 1 summarizes the quality assessment outcomes. Overall, the included studies demonstrated moderate to high methodological rigor. Strengths included clear research objectives (12/12 studies), appropriate sampling strategies (11/12 studies), and transparent data collection procedures (10/12 studies). Common limitations included small

sample sizes restricting generalizability (7/12 studies), limited discussion of researcher reflexivity in qualitative work (5/8 studies appraised on the qualitative dimension—i.e., the 2 purely qualitative studies plus the qualitative components of 6 of the 7 mixed-methods studies that produced standalone qualitative findings), and insufficient reporting of effect sizes in quantitative work (3/4 studies appraised on the quantitative dimension—i.e., the 3 purely quantitative studies plus 1 mixed-methods study with a primary quantitative phase). Mixed-methods studies were therefore appraised on both dimensions where applicable, which explains why the denominators differ from the overall n=12.

Quality assessment results served as critical contextual factors for evidence interpretation, not as criteria for literature exclusion (Gough et al., 2017). Lower-quality studies were retained, but their findings were interpreted with appropriate caution in the synthesis.

Table 1
Quality Assessment Summary of Included Studies

Study	Design	Tool	Key Strengths	Key Limitations
Aizawa (2024)	Longitudinal quantitative	MMAT	Large sample (n=381); pre-post design; systematic tracking	Single institution; limited control variables
Szabó et al. (2021)	Quantitative correlational	MMAT	Validated instruments; multiple regression; clear operationalization	Cross-sectional; self-reported grades
Rose et al. (2020)	Mixed methods	MMAT	Effective integration of qual/quant data; triangulation	Convenience sampling; small qual sample (n=20)
Kim et al. (2014)	Qualitative exploratory	CASP	Rich descriptions; member checking; sustained engagement	Single discipline focus; limited triangulation
Soruç et al. (2021)	Quantitative comparative	MMAT	Multi-disciplinary sample; validated scales; comparative design	Self-reported proficiency; cross-sectional design
Charoenpornsook & Thumvichit (2025)	Q methodology	CASP	Innovative viewpoint capture; systematic sorting; clear factor analysis	Small sample (n=47); single institution
Nguyen et al. (2025b)	Qualitative case study	CASP	In-depth interviews; thematic saturation; reflexivity discussed	Single institution and discipline; potential recall bias
Volkova & Kolesov (2022)	Qualitative ethnographic	CASP	Prolonged engagement (12 months); thick description; multiple sources	Language barriers in data collection noted
Zhang & Lütge (2024)	Qualitative narrative	CASP	Participant voices centered; researcher reflexivity explicit	Small sample (n=15); potential researcher bias
Yıldız et al. (2017)	Mixed methods sequential	MMAT	Sequential design; appropriate sampling; both phases well-executed	Small sample (n=78); limited integration discussion
Alanazi & Curle (2024)	Qualitative interview	CASP	Clear analytical framework; systematic coding; inter-coder reliability	Single discipline (medicine); recruitment challenges

Nguyen et al. (2025a)	Qualitative phenomenological	CASP	Appropriate phenomenological approach; bracketing discussed	Single program context; limited participant diversity

Note. MMAT = Mixed Methods Appraisal Tool; CASP = Critical Appraisal Skills Programme.

RESEARCH FINDINGS

Study Selection

Following the search and screening process, a total of 12 original research articles were ultimately included in this review.

Study Characteristics

The 12 included studies spanned diverse geographic regions, including Japan (Aizawa, 2024; Rose et al., 2020), Romania (Szabó et al., 2021), South Korea (Kim et al., 2014), Turkey (Soruç et al., 2021; Yıldız et al., 2017), Vietnam (Nguyen et al., 2025a, 2025b), Russia (Volkova & Kolesov, 2022), Germany (Zhang & Lütge, 2024), Saudi Arabia (Alanazi & Curle, 2024), and Thailand (Charoenpornsook & Thumvichit, 2025). Research methodologies varied, encompassing quantitative studies (n=3) (Nguyen et al., 2025a; Soruç et al., 2021; Szabó et al., 2021), qualitative studies (n=2) (Kim et al., 2014; Yıldız et al., 2017), and mixed-methods studies (n=7) (Aizawa, 2024; Alanazi & Curle, 2024; Charoenpornsook & Thumvichit, 2025; Nguyen et al., 2025b; Rose et al., 2020; Volkova & Kolesov, 2022; Zhang & Lütge, 2024). Sample sizes ranged from 15 participants in qualitative work (Alanazi & Curle, 2024) to 310 participants in survey-based research (Nguyen et al., 2025a).

Table 2

Characteristics of Included Studies

Author (Year)	Country	Sample Size	Method	Discipline	Focus
Aizawa (2024)	Japan	62	Mixed Methods	Chemistry	Transition Challenges, Disciplinary Discourse
Alanazi & Curle (2024)	Saudi Arabia	15	Mixed Methods	Medicine	Academic Reading and Listening Difficulties
Charoenpornsook & Thumvichit (2025)	Thailand	47	Mixed Methods (Q)	Engineering	Coping Strategy Types
Kim et al. (2014)	South Korea	25	Qualitative	Interdisciplinary	Code-Switching, Cultural Differences
Nguyen et al. (2025a)	Vietnam	310	Quantitative	Medicine	Student Satisfaction, Support Services
Nguyen et al. (2025b)	Vietnam	20	Mixed Methods	Interdisciplinary	Resilience, Self-Determination
Rose et al. (2020)	Japan	118	Mixed Methods	Interdisciplinary	Interaction Between Language Proficiency and Motivation
Soruç et al. (2021)	Turkey	171	Quantitative	Social Sciences Engineering	Disciplinary Differences, Academic

Szabó et al. (2021)	Romania	95	Quantitative	Interdisciplinary	Language Challenges Vocabulary Size Predicting Academic Performance
Volkova & Kolesov (2022)	Russia	237	Mixed Methods	Interdisciplinary	Adaptation Challenges, Peer Networks
Yıldız et al. (2017)	Turkey	176	Qualitative	Interdisciplinary	Terminology Anxiety, Teacher Practices
Zhang & Lütge (2024)	Germany	50	Mixed Methods	Interdisciplinary	Code-Switching, International Student Perspectives

Thematic Analysis Procedure

This study employed Thomas and Harden's (2008) inductive thematic analysis method to synthesize research findings, following a three-step process: First, all included studies' results sections were coded line by line; second, similar codes were organized into descriptive themes; finally, analytical themes capable of addressing the research questions were further extracted. The principal investigator conducted preliminary coding across all 12 studies, generating 87 coding items covering key factors influencing EMI students' learning outcomes, such as "vocabulary gap," "peer support networks," and "disciplinary terminology." A second reviewer independently coded four randomly selected studies (approximately one-third of the total) to assess consistency. Cohen's kappa coefficient was 0.78, indicating high inter-rater reliability (Landis & Koch, 1977).

After discussing and resolving discrepancies, the research team refined the final coding framework. Subsequently, the team grouped the codes into four core themes based on conceptual similarity and frequency of occurrence across studies. Themes were required to meet two criteria: (1) appearing in at least four studies (approximately 33%); and (2) representing distinct dimensions of EMI learning experiences not covered by other themes. The four finalized themes were (1) The Multiple Dimensions of Language Competence, (2) Disciplinary Variation and Instructional Design, (3) Differentiated Coping Strategies, and (4) Institutional Support and Social Integration—corresponding to Themes 1–4 in Section 3.4. These themes emerged naturally through systematic analysis rather than being predetermined. Finally, a third reviewer audited the thematic structure to ensure logical consistency and comprehensive coverage.

Synthesis of Findings

Synthesizing the findings of the 12 included studies yields four core themes that together describe an ecosystem of EMI effectiveness. Language proficiency remains central throughout, but it operates alongside academic, sociocultural, and pedagogical factors whose interactions are considerably more intricate than proficiency-centered accounts of EMI would suggest.

Theme 1: The Multiple Dimensions of Language Competence. General English proficiency accounts for only part of academic success in EMI: lexical competence, transitional adaptation, and discipline-specific discourse ability each prove critical in their own right.

Vocabulary as a Key Predictor. Compared with broad measures such as overall IELTS scores, vocabulary proficiency offers a more practical and more predictive metric. Using the Vocabulary Levels Test, Szabó et al. (2021) found English vocabulary size to be the strongest predictor of GPA among multilingual students, explaining more than 30% of grade variance and contributing more than any other predictor entered into their regression model. Two further studies point the same way: Yıldız et al. (2017) identified technical terminology as a major source of student anxiety across fields, and Alanazi and Curle (2024) found that medical students must acquire vocabulary rapidly if they are to manage demanding academic reading and lectures.

Nonlinear Characteristics of Transition Adaptation. Although standardized test scores such as IELTS correlate with academic performance, Aizawa's (2024) longitudinal study indicates that high English proficiency does not guarantee a smooth transition. Transition adaptation is instead a highly individualized and nonlinear process: students' prior content knowledge, previous exposure to English-medium instruction, learning strategies, and classroom ecology collectively shape both the trajectory and the duration of adjustment. Alanazi and Curle (2024) further revealed that students' adaptive capacity grows alongside their learning abilities over time, with language challenges for medical students peaking during the first and second years of university before gradually diminishing.

Discipline-Specificity and Discourse Load. Rose et al. (2020) found that language proficiency, academic skills, and motivation interact differently across disciplines, and the discourse load students carry varies accordingly. Chemistry students struggle with terminology, symbols, and diagrams (Aizawa, 2024), while medical students face intensive academic reading and demanding lecture comprehension (Alanazi & Curle, 2024). Differences of this magnitude imply that no single "generic English threshold" can adequately predict academic risk across majors.

EMI support must therefore move beyond general English tutoring toward discipline-specific, vocabulary-focused interventions. Institutions should implement continuous risk monitoring using low-cost vocabulary tests (Szabó et al., 2021). Combined with differentiated teaching strategies (Aizawa, 2024), these approaches help students overcome both transitional and sustained academic challenges.

Theme 2: Disciplinary Variation and Instructional Design. Students who enter EMI with comparable language proficiency nonetheless encounter markedly different difficulties, because disciplinary discourse structures and classroom teaching practices shape what proficiency is actually required of them.

Disciplinary Differences in Practice. Soruç et al. (2021) provide quantitative evidence of this variation: at a Turkish university, English proficiency explained 36.8% of language challenges for International Relations students but only 11.4% for Electrical Engineering students. Language-intensive social science disciplines rely heavily on linguistic skill for discourse tasks such as framing definitions, mounting arguments, and writing explanations. STEM fields make different demands, and measures like IELTS become correspondingly less predictive there, since what students must master is a repertoire of symbolic systems, diagrams, and formulas.

Chemistry students, for instance, must handle terminology, symbols, and diagrams simultaneously (Aizawa, 2024), whereas medical students contend with rapid lectures and dense specialized vocabulary (Alanazi & Curle, 2024). Challenges of this kind expose a substantial gap between general English preparation and the actual requirements of a major (Yıldız et al., 2017).

The Critical Role of Teacher Language Practices. Lecturers' English proficiency, accent, pace, and use of the L1 bear directly on both content comprehension and classroom equity, and international and local students read these practices very differently. In Germany and South Korea, international students typically resisted L1 use during instruction, seeing it as a source of barriers and inequality (Kim et al., 2014; Zhang & Lütge, 2024), though they accepted it for informal interaction or where instructors immediately restated the explanation in English (Zhang & Lütge, 2024).

Local students, who share the teacher's L1, tend by contrast to regard it as an efficient and even necessary "cognitive scaffold," and many request L1 summaries after class to reduce anxiety and check their grasp of complex concepts (Kim et al., 2014). Teacher-side attributes compound the picture: Yıldız et al. (2017) found that limited English proficiency, heavy accents, rapid delivery, and excessive L1 use together deepen vocabulary difficulties and impede comprehension.

The Necessity of Functional Language Policies. These tensions suggest that EMI policies work better when they specify norms by context than when they impose a blanket "English-only" rule. Equity requires English for core teaching, assessment, and formal discussion, while the L1 can reasonably serve administrative reminders or emotional support provided instructors paraphrase immediately in English (Kim et al., 2014; Zhang & Lütge, 2024). Implementation carries as much weight as design: institutions need to train teachers through EMI pedagogy

workshops and to state policies plainly in syllabi and grading criteria, so that uncertainty about permissible language use does not itself become an obstacle (Yıldız et al., 2017).

Theme 3: Differentiated Coping Strategies Among Students. Students facing EMI challenges employ diverse coping strategies shaped by their cognitive traits, emotional tendencies, identity positioning, and cultural backgrounds.

Problem-Focused vs. Emotion-Focused Coping. Charoenpornsook and Thumvichit (2025) identified distinct coping profiles among Thai engineering students using Q methodology. Some favor problem-focused strategies like preparing speech drafts, seeking instructor feedback, and creating terminology flashcards. Others prefer emotion-focused approaches—maintaining optimism, accepting language limitations as learning opportunities, and using self-talk to manage anxiety. Effective support systems should therefore address both dimensions: academic resources (language coaching, writing centers) and psychological resilience-building.

Research on international medical students in Vietnam supports these findings. Nguyen et al. (2025b) found that successful students demonstrate key resilience traits: they reframe challenges as growth opportunities, proactively seek resources, and adjust strategies quickly after setbacks. Beyond problem-solving techniques like self-directed learning and time management, these students actively build peer networks and leverage institutional resources.

Identity Positioning and Coping Differences. Local and international students differ markedly in how they respond. In Korea, Kim et al. (2014) found that domestic students regarded English as a foreign language over which they had no ownership; they relied on the L1 as a cognitive scaffold, or switched into it during group work to keep making progress. International students, including those who were themselves non-native speakers, treated English instead as a lingua franca and resisted L1 use in class because it left them feeling excluded (Kim et al., 2014; Zhang & Lütge, 2024). Such divergent orientations shape language preferences, participation patterns, and social integration alike: the low confidence of local students and international students' sensitivity to exclusion together produce the "insider-outsider" dynamic observed in EMI classrooms (Kim et al., 2014).

Language proficiency is not the only determinant of success. Aizawa's (2024) longitudinal study found that prior subject knowledge and previous EMI experience significantly shape adaptation: students with strong subject foundations can succeed despite weaker language skills, while high scorers may struggle where preparation is thin or where teaching methods do not suit them. Support provision therefore cannot be uniform. Task-oriented students need academic resources and strategy training, whereas emotion-oriented students require psychological support and resilience-building; institutions must in addition identify and close the gaps between local and international students if learning environments are to be genuinely inclusive.

Theme 4: Institutional Support and Social Integration. Individual ability is only one input into EMI learning outcomes; social networks and institutional support do much to shape how far students integrate both academically and socially. Where English-language services are inadequate, international students find themselves shut out of informal academic circles and campus activities, and the result can be strong academic integration coupled with weak social integration, a gap that accessible services and deliberate peer connection help to close.

Peer Networks as Primary Support. Students typically seek help from peers before approaching faculty or administrators (Volkova & Kolesov, 2022). They turn first to classmates who share their language or major for help with resources and procedures. International medical students view peer collaboration as crucial—through study groups, they share notes, review lectures, compile glossaries, and develop a sense of belonging (Nguyen et al., 2025b).

In Russia, Volkova and Kolesov (2022) found that international students integrate better when teams include bilingual "bridge" members. Universities should formalize these connections through buddy or mentorship programs rather than leaving them to chance.

Institutional Accessibility Matters. In this context, "accessibility" means English-language support for administration, counseling, visas, and housing, and the quality of that provision bears directly on international students' trust and satisfaction. In Vietnam, Nguyen et al. (2025a) found that support activities such as language

services, career guidance, and cultural programming predicted student satisfaction better than physical facilities such as laboratories or libraries, a result that sits awkwardly with strategies built primarily around infrastructure investment.

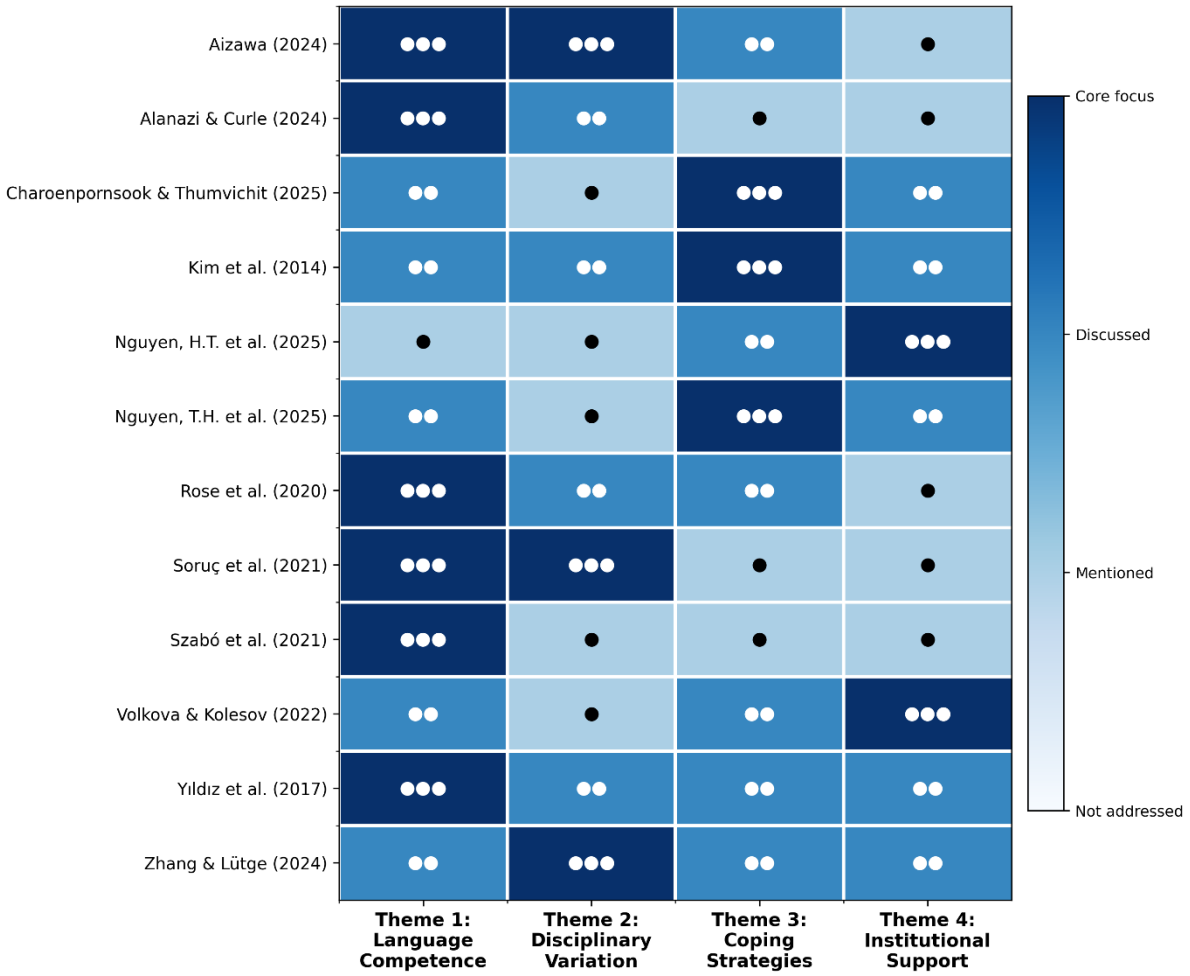
When institutions communicate mainly in the local language or respond slowly, students rely on informal channels like peer groups or social media. This increases misinformation risks and weakens institutional connections (Volkova & Kolesov, 2022). Students need clear, timely English guidance to reduce anxiety from information gaps (Yıldız et al., 2017).

Language Policy and Belonging. Classroom language practices affect not only what students understand but how far they feel they belong. Where policies fail to define which domains are English-only and which admit limited L1 use, and fail to require that L1 contributions be restated in English, group work tends to produce markedly unequal participation. In Germany, Zhang and Lütge (2024) found that frequent German use without English paraphrasing left international students feeling marginalized and disrespected, which reduced both their participation and their course satisfaction.

From Individual Coping to Institutional Support. Many effective student strategies, such as peer support, reviewing recordings, and creating glossaries, can only achieve meaningful scale through systematic institutional provision. To address this, institutions should implement comprehensive support across three key areas. First, academic support must be systematized through discipline-specific language training (ESAP/EAP), clear language policies stated in syllabi, and provision of recordings with captions (Yıldız et al., 2017). Second, administrative services require full English-language accessibility, including responsive support channels on learning management systems and websites, along with clear English guidance for course selection, visas, and housing procedures (Volkova & Kolesov, 2022). Third, social integration should be formalized through credit-bearing study groups or mentorship programs, complemented by intercultural activities and team projects that foster sustained cross-cultural interaction (Nguyen et al., 2025b). Together, these measures align social and academic integration, reduce collaboration barriers across cultural groups, and ensure that all students, regardless of linguistic background, can access resources, engage in academic discourse, and develop a sense of belonging within the institution.

Figure 2 presents a visual synthesis of the document-theme distribution across all 12 included studies.

Figure 2
Document-theme distribution



Theoretical Interpretation of Student Coping

This study uses two theoretical frameworks to explain how EMI students cope with challenges. The first is Self-Regulated Learning Theory (Zimmerman, 2002), which posits that successful EMI learners actively manage their own learning. They monitor their comprehension and deploy a range of strategies to address gaps when they arise. These include cognitive strategies (e.g., compiling vocabulary lists), behavioral strategies (e.g., help-seeking), and environmental strategies (e.g., joining study groups). Pintrich (2000, 2004) expanded this idea by identifying four areas where students need to manage themselves: thinking, motivation, behavior, and their surroundings. Pintrich emphasized that affective and motivational regulation are particularly consequential, as they directly shape persistence and academic performance.

The second framework is Psychological Resilience Theory (Masten, 2001), which highlights why building resilience matters in EMI settings. Students with strong resilience persist when facing adversity. They maintain confidence and reframe challenges as opportunities for growth rather than obstacles. They proactively seek solutions, mobilize support networks, and draw on prior experiences of success.

Taken together, these frameworks indicate that academic success in EMI programs depends on more than English proficiency. Students must also develop self-regulatory competencies and the capacity to recover from setbacks.

Institutions should therefore not only enhance students' English skills but also cultivate effective learning strategies and provide support for managing the stress associated with studying through a second language.

DISCUSSION

Key Findings: A Critical Synthesis

This review of 12 empirical studies reveals a more complex picture of EMI student success than prevailing deficit-oriented narratives suggest. While English language proficiency undeniably matters, framing EMI challenges solely as student language deficiencies obscures structural inequities and pedagogical inadequacies within EMI programs themselves.

The finding that English proficiency explains 36.8% of language challenges in International Relations but only 11.4% in Electrical Engineering (Soruç et al., 2021) challenges the widespread practice of uniform English proficiency requirements across disciplines. This suggests that current admissions policies may systematically disadvantage students in discourse-heavy fields while unnecessarily restricting access in fields where language plays a more limited role. These findings suggest that the relationship between standardized English proficiency measures and academic success may vary considerably across disciplines. While Soruç et al. (2021) found that English proficiency explained only 11.4% of the variance in Electrical Engineering compared to 36.8% in International Relations, further research with larger samples and longitudinal designs is needed to determine optimal admission requirements for different STEM fields. The emphasis on vocabulary size as a superior predictor of academic performance (Szabó et al., 2021) raises questions about the construct validity of high-stakes English tests. If vocabulary knowledge, which is highly teachable and context-specific, outperforms general proficiency measures, why do institutions continue to rely on TOEFL and IELTS as primary selection criteria? This disconnect suggests a misalignment between what we assess (general English proficiency) and what actually predicts success (discipline-specific vocabulary and discourse competencies). The implication is that EMI programs may be selecting students based on proxy measures rather than authentic predictors of EMI readiness.

The finding regarding teacher language practices exposes a fundamental tension in EMI pedagogy. Local students' preference for L1 use as a “cognitive scaffold” conflicts with international students' experiences of exclusion when L1 is employed (Kim et al., 2014; Zhang & Lütge, 2024). However, framing this purely as a "language policy problem" overlooks a deeper equity issue: if teachers lack the English proficiency to explain complex concepts clearly, should the burden of comprehension fall entirely on students? The data suggest that in many EMI contexts, English is used not because it enhances learning but because institutional policies mandate it—even when instructors and students share an L1. This raises critical questions about the pedagogical rationale for EMI in settings where English functions as neither instructors’ nor students' strongest language.

The heterogeneity in student coping strategies (Charoenpornsook & Thumvichit, 2025) is often interpreted as individual differences in self-regulation. However, a critical reading suggests that students' reliance on emotion-focused coping may reflect inadequate institutional support systems. When students must individually navigate ambiguous language policies, seek informal peer help because formal support is inaccessible, or manage anxiety caused by unclear communication, we are witnessing not personal coping but adaptive responses to institutional failure. The question becomes: why should students need "coping strategies" if EMI programs were adequately designed and supported?

Finally, the finding that students turn first to peers rather than institutional services (Volkova & Kolesov, 2022) is presented descriptively in most studies, but it warrants critical interpretation. Peer networks emerge not because they are optimal but because formal support systems are unavailable, non-responsive, or perceived as unwelcoming. International students' reliance on "bilingual bridge members" or co-national peers reflects institutions' failure to provide accessible English-language services. Rather than celebrating peer support as a grassroots solution, we should recognize it as evidence of institutional neglect. The normalization of informal support masks systemic under-resourcing of EMI student services.

In summary, while these findings collectively identify factors influencing EMI success, they also reveal how EMI programs often transfer responsibility for managing linguistic and structural barriers onto students themselves—framing systemic issues as individual deficits to be overcome through personal effort.

Theoretical Contributions

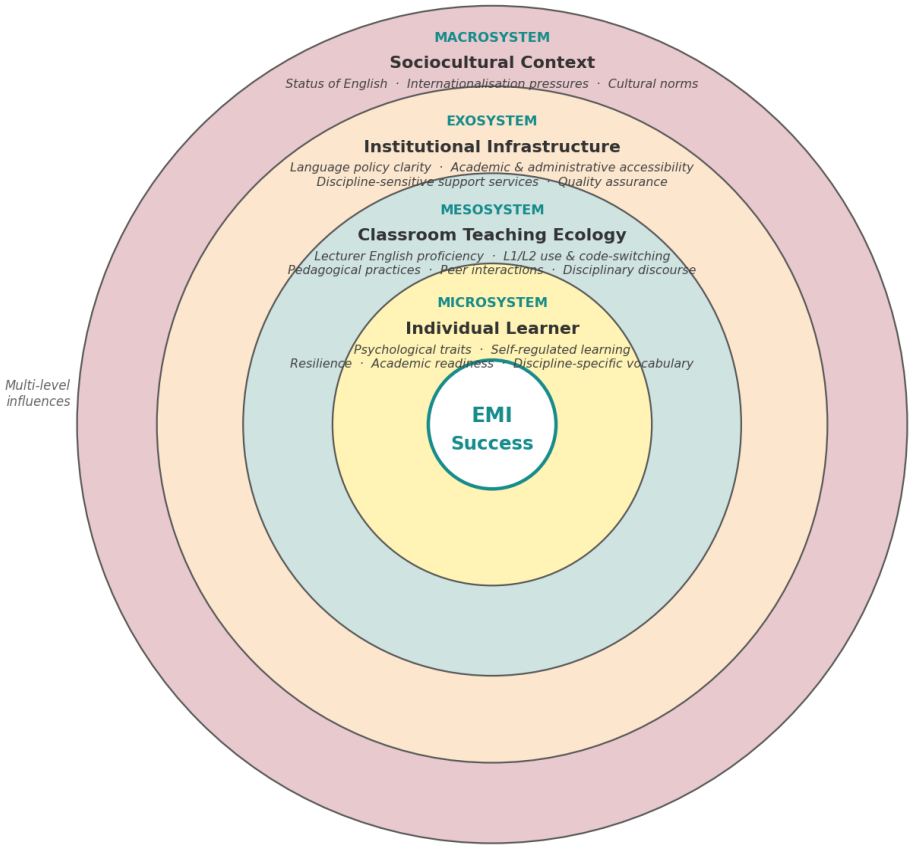
To address the systemic misalignments identified above, an ecological model of EMI success was developed through an abductive approach, moving iteratively between theory and data. Building on Self-Regulated Learning Theory (Zimmerman, 2002), Psychological Resilience Theory (Masten, 2001), and Bronfenbrenner's (1979) ecological systems theory, the analysis identified multi-level influences on EMI learning. Synthesis of the findings reported across the included studies (Sections 3.4–3.5) revealed patterns of systemic mismatches and adaptive strategies that operationalized these theoretical insights. The resulting model represents a theory-informed, data-grounded synthesis that explains the study's findings while advancing EMI theoretical frameworks.

This ecological model represents a theoretical contribution that synthesizes Self-Regulated Learning Theory and Psychological Resilience Theory (Section 3.5) with Bronfenbrenner's (1979) ecological systems perspective. Unlike earlier EMI frameworks, it positions individual agency within nested institutional and sociocultural contexts, thereby bridging micro-level coping strategies with macro-level systemic factors. Unlike Macaro (2018), it does not view the integration of language and content as a linear ultimate goal. Instead, it emphasizes that language, pedagogy, institutional structures, and sociocultural factors form an interwoven, collaboratively functioning system where no single element consistently holds primacy. Compared to Dafouz and Smit's (2020) ROAD-MAPPING framework, this model moves beyond institutional structural analysis to focus more intently on students' actual learning outcomes. It operationalizes the macro "management" dimension into specific indicators, such as whether students receive institutional support and whether language policies are clear and well-defined. The model emphasizes that these factors, particularly administrative transparency and communication efficiency, often exert a more significant influence on student satisfaction and sense of belonging than physical facilities. Simultaneously, it moves beyond the classroom-centered perspective of CLIL (Coyle et al., 2010), stressing that systemic policies must acknowledge the differing language demands across disciplines. For instance, social sciences prioritize reading and discussion, presenting greater linguistic challenges than STEM fields (dominated by symbols and charts); this gap is difficult to bridge through classroom-level improvements alone.

Furthermore, by integrating Self-Regulated Learning Theory (which emphasizes individual agency) and Psychological Resilience Theory (which highlights adaptive capacity) with Bronfenbrenner's (1979) ecological systems theory, the model analyzes influences across multiple levels: individual learner characteristics (microsystem), classroom interactions (mesosystem), institutional policies (exosystem), and broader sociocultural contexts (macrosystem). It highlights that difficulties students encounter in EMI learning often stem not from individual shortcomings but from "mismatches" between different levels of the system. For instance, research (e.g., Szabó et al.) indicates that proficiency in subject-specific vocabulary predicts academic performance more effectively than TOEFL or IELTS scores. Yet some institutions retain these standardized tests as primary admission criteria, reflecting systemic misalignment. Therefore, the model advocates addressing issues through multi-level collaboration rather than merely requiring students to adapt to the system. Its core shift lies from "fixing students" to "fixing the system," promoting educational equity and structural accountability. This does not negate frameworks like CLIL or ROAD-MAPPING but builds upon them to propose a more holistic and equity-oriented perspective.

The "EMI Success" at the center of the diagram represents the ultimate learning outcomes. The model illustrates that EMI success stems from the combined effects of multiple factors, including language proficiency, teaching environment, student characteristics, and institutional support. Therefore, if educational interventions focus solely on one aspect—such as improving language skills—while neglecting support in other areas, the final results will be highly limited.

Figure 3
An Ecological EMI Success Model



Note. Adapted from Bronfenbrenner (1979); integrates Self-Regulated Learning (Zimmerman, 2002) and Psychological Resilience (Masten, 2001) at the microsystem level.

Limitations

Several limitations should be acknowledged. First, despite an initial pool of 2,111 records, the final corpus comprised only 12 included studies. This reflects both the still-small body of empirical EMI studies that meet our inclusion criteria and the pragmatic relevance-ranking approach applied to the 2,099 Google Scholar records (Section 2.2). The modest final corpus constrains the generalizability of the thematic synthesis, particularly for under-represented regions (e.g., South Asia, the Middle East) and disciplines beyond those covered in the included studies. Cross-disciplinary and cross-regional comparisons should therefore be read as indicative rather than definitive, and future updates should expand coverage as more empirical EMI evidence accumulates.

Second, the search relied heavily on Google Scholar, which contributed 2,099 of 2,111 initial records. Google Scholar is known for inconsistent indexing, opaque ranking, and limited replicability relative to systematically indexed databases. Although a relevance-ranked screening with a saturation criterion was used to keep the workload tractable, this approach cannot guarantee that all eligible studies indexed by Google Scholar were identified. Future iterations of this review should extend coverage of systematically indexed databases (e.g., additional discipline-specific repositories) and complement database searching with hand-searching of key EMI journals.

PRACTICAL IMPLICATIONS

Based on the findings, this section outlines recommendations across policy, pedagogy, and student support.

Policy Recommendations

Before student enrollment, institutions should require basic English requirements for all majors, but a more reasonable approach is to set standards based on the specific needs of each major. For instance, humanities students should meet higher reading and writing requirements, while STEM students may be granted some flexibility in overall score thresholds. However, they must take additional subject-specific vocabulary tests to ensure they can grasp core classroom content.

Classroom language use cannot be entirely dependent on instructors' preferences. Universities must establish clear guidelines: all core concepts must be taught in English. If instructors use the local language (e.g., Chinese) to supplement instruction, they must immediately repeat the same content in English. The objective is clear: to ensure equity, enabling all students, especially international students, to keep pace.

Many students in English-taught programs rely on peers to get information and study support. Universities bear the responsibility to transform these individual efforts into formal institutional support. For example, peer tutoring programs could be institutionalized, offering credit or financial incentives.

Pedagogical Practices

Universities must increase investment in training faculty in English-language teaching techniques. Effective EMI instruction requires pre-class communication with students to understand their needs and provide preparatory materials. Instructors should integrate video resources and AI tools to visualize content, breaking down language barriers that may hinder comprehension. Post-class communication is equally important; instructors should actively reach out to students and offer assistance when difficulties arise. These pedagogical practices are often decisive for student satisfaction and academic performance.

Institutional Support Services

University websites and course registration systems should feature fully functional English versions. Institutions should also optimize administrative services and provide personalized language support. To reach students more effectively, universities should increase visibility on social media platforms familiar to students, posting important information through channels students regularly use. Institutions should proactively organize cross-cultural activities to prevent local and international students from operating in silos. Regular social events can facilitate cross-cultural exchange, helping students build support networks and develop a stronger sense of belonging.

CONCLUSION

This review highlights English medium instruction as an ecosystem where linguistic competence, disciplinary discourse, student coping, and institutional conditions interact to shape academic outcomes. Evidence across twelve empirical studies indicates that vocabulary knowledge offers a more direct predictor of achievement than global proficiency scores, that language demands vary substantially by field, and that student strategies are filtered through identity, prior exposure, and psychological resilience. Institutional accessibility, transparent language policies, and structured peer networks consistently emerge as decisive enablers of both academic and social integration. The proposed ecological perspective reframes student difficulties as symptoms of systemic misalignment rather than individual deficit, calling for discipline-sensitive admissions, curriculum-embedded language support, and capacity building for instructors in EMI pedagogy. Several limitations should be acknowledged. The evidence base remains concentrated in selected national contexts and relies heavily on small samples or self-report measures in some studies. Future inquiries would benefit from multi-site longitudinal designs, stronger measurement of discipline-specific vocabulary growth, and closer attention to digital literacies that increasingly mediate EMI learning. Ultimately, the effectiveness of EMI rests on alignment across policy, pedagogy, and support services rather than on language requirements alone.

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