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English Medium Instruction in Saudi Arabia: A Systematic Review

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Abstract

This systematic literature review investigates the adoption and impact of English Medium Instruction (EMI) in Saudi Arabian higher education. It synthesizes findings from 18 empirical studies, primarily in applied sciences such as engineering, medicine, and computer science, while noting a dearth of research in social sciences. The review reveals a uniformity in student perceptions of EMI across disciplines, highlighting its widespread acceptance and challenges in cultural and linguistic adaptation. It also emphasizes the diversity of research methodologies used, offering insights into both teacher and student perspectives. This comprehensive analysis not only maps the current landscape of EMI in Saudi Arabia but also identifies critical areas for future research, particularly in understanding its long-term educational and socio-cultural implications.

Keywords: *English Medium Instruction (EMI), Systematic Review, Perceptions, Higher Education, Saudi Arabia*

Introduction

Undoubtedly, English stands out as one of the most prevalent languages in the global context, particularly in higher education. While English has long served as the Medium of Instruction (MOI), its usage has recently experienced rapid growth worldwide, especially in international educational institutions, particularly those in expanding circle countries (Kachru, 1992). The adoption of English as the medium of instruction in higher education (EMI in HE) is expanding globally, often driven by the pursuit of internationalization. Teaching in English is often viewed as a symbol of internationalization, and the integration of EMI in HE is closely linked to a rise in international staff and students, as well as the implementation of transnational education programs (Macaro, 2018; Yuksel et al., 2022). Moreover, numerous perceived benefits of EMI

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include enhancing students' employability, increasing revenue from international students, boosting institutional rankings, improving students' English proficiency, and facilitating access to educational materials (Galloway, 2021).

Furthermore, Over the last two decades, there has been a significant global expansion in the utilization of English for teaching academic subjects. This growth can be attributed to a variety of factors that have been thoroughly documented in the literature. The first reason is centered around enhancing English language proficiency. The second motive is to establish English as a common medium of instruction in countries with diverse linguistic backgrounds. The third reason is the pursuit of economic competitiveness by fostering a workforce proficient in English (Coles & Swami, 2012). The fourth incentive for employing EMI is to produce graduates equipped with global literacy skills (Richards & Pun, 2021).

Despite the aforementioned advantages, the introduction of English as a Medium of Instruction (EMI) still poses certain difficulties for both students and educators. They have expressed concerns about the heightened workload associated with EMI, requiring more time for study, class preparation, and the development of teaching materials (Altay et al., 2022). Additionally, debates have arisen regarding the use of the native language in EMI classrooms, with research generally indicating that lecturers and students find their first language beneficial for grasping the teaching content (Curle, et al., 2020a). Moreover, studies have highlighted instances where the proficiency benchmarks set for students in English are either low or nonexistent. There is considerable variation among students in their readiness for EMI courses, prompting calls for a needs analysis and tailored support based on the specific context. Recommendations have also been made for increased support for teaching staff and enhanced collaboration between subject and language specialists (Galloway, 2021).

English Medium Instruction

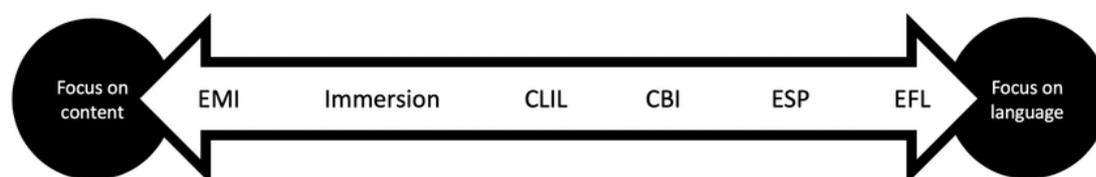
English medium instruction (EMI) refers to the use of the English language as the medium of instruction for academic subjects in educational settings where English is not the first language of the majority of the students. EMI is defined as "The use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language of the majority of the population is not English" (Macaro et al., 2018, p. 18). The primary aim of EMI programs often centers around content learning, with most students considering English as a second, foreign, or additional language (L2). While Macaro's (2018) definition of EMI encompasses various contexts, other definitions have been proposed, underscoring the intricacies of the term and the diverse perspectives on this instructional approach. However, Coyle et al. (2010) provide an alternative definition aligning more closely with Content and Language Integrated Learning (CLIL), characterizing it as a dual-focused educational approach where 'an additional language' is utilized for teaching both language and content. Additionally, in alignment with Coyle et al.'s (2010) characterization of EMI, Taguchi (2014, p.89) has proposed a definition emphasizing a specific language learning objective. In this regard, EMI programs are described as "curricula using English as a medium of instruction for basic and advanced courses to improve students' academic English proficiency."

The acknowledgment of context-based diversity and the notable distinctions between English as a Medium of Instruction (EMI) and English as a subject are common features found in various EMI definitions. In English language classes focused on English for Academic

Purposes (EAP) or English for Specific Purposes (ESP), the emphasis lies on the language itself rather than content. However, the prevalence of EMI has contributed to a rise in courses specifically centered on English as a subject, notably EAP and ESP. Generally, EMI does not explicitly aim for language learning but is considered incidental or implicit within the process of instruction in English (Galloway, 2021). This distinction, as shown in Figure 1, sets EMI apart from other educational approaches like CLIL (Content and Language Integrated Learning) and CBI (Content-Based Instruction). In CLIL and CBI courses, there is an explicit goal of enhancing students' English proficiency. Although English learning is not explicitly targeted in EMI, many still perceive this strategy as providing opportunities for students to improve both their English language skills and academic knowledge (Rose & Galloway, 2019; Rose et al., 2020; Yuksel et al., 2021).

Figure 1

Continuum of EMI in Practice (Thompson & McKinley, 2020)



Theoretical Underpinnings of EMI

The theoretical foundations of English Medium Instruction (EMI) are deeply rooted in bilingual education models, which have evolved significantly in response to the changing educational landscape (Macaro, 2018). EMI represents a major shift in language teaching approaches, moving away from traditional English Language Teaching (ELT) towards a more integrated method where English is used as the medium of instruction for various academic subjects. This transition is not merely a linguistic change but also reflects broader educational strategies, particularly in higher education. One of the key theoretical underpinnings of EMI is its alignment with the concept of Content and Language Integrated Learning (CLIL), which is more prevalent in secondary education (Andjelkov, 2022). Unlike CLIL, where the primary motivation is often to trial new language teaching approaches, EMI in higher education is frequently driven by institutional goals such as boosting international profiles and catering to global student mobility (Curle et al., 2020b). This distinction underscores the unique position of EMI in tertiary education, where it often becomes a necessary choice due to the diverse linguistic backgrounds of the student body, rather than an alternative to native language instruction. Furthermore, the implementation of EMI is influenced by the broader context of learning content through a second language, especially in relation to educational phases preceding higher education. The interactions between different educational stages and their medium of instruction approaches suggest that lessons learned in one setting can significantly impact others. This interconnectedness highlights the necessity of understanding EMI within a comprehensive educational framework, acknowledging the varied motivations and outcomes associated with its use in different educational phases. The theoretical foundations of EMI are therefore multifaceted, encompassing aspects of bilingual education models, institutional

strategies, and the broader educational context. Understanding these underpinnings is crucial for comprehending how EMI is implemented and its impact on the educational landscape.

EMI Systematic Reviews and Meta-analyses

Several systematic reviews and meta-analyses have been conducted to consolidate the relationships involving EMI and various factors. For instance, Williams (2015) analyzed EMI research predominantly carried out in the South Korean context. Likewise, Jablonkai and Hou (2023) evaluated empirical studies on EMI conducted within Chinese higher education. Furthermore, Lo and Lo (2014) conducted a meta-analysis comparing the effectiveness of using the first language (L1) as the Medium of Instruction (MOI) to EMI in the context of Hong Kong. Moreover, Macaro et al. (2018) systematically reviewed EMI literature, with a specific focus on the higher education context.

Research Questions

In recent years, the implementation of English Medium Instruction (EMI) has become a central element of educational reforms in Saudi Arabia, symbolizing a strategic initiative to enhance students' English language skills and align the nation's educational practices with international standards. This shift towards EMI, especially in technical and scientific disciplines such as engineering, medicine, and computer science, has seen a rapid adoption across numerous Saudi universities. While various studies have explored the implementation and implications of EMI within the Saudi context, a holistic and comprehensive review of this body of research has been lacking. This study, therefore, represents a significant contribution to the academic discourse by amalgamating and analyzing the existing literature on EMI in Saudi Arabia. It seeks to provide a nuanced understanding of the current state of EMI, its challenges, and its future prospects by addressing key research questions pertinent to the field. The research questions of this study therefore are:

RQ1: What is the current status of English Medium Instruction in Saudi Arabia?

RQ2: Is there any difference in students' perceptions towards EMI based on their academic subjects?

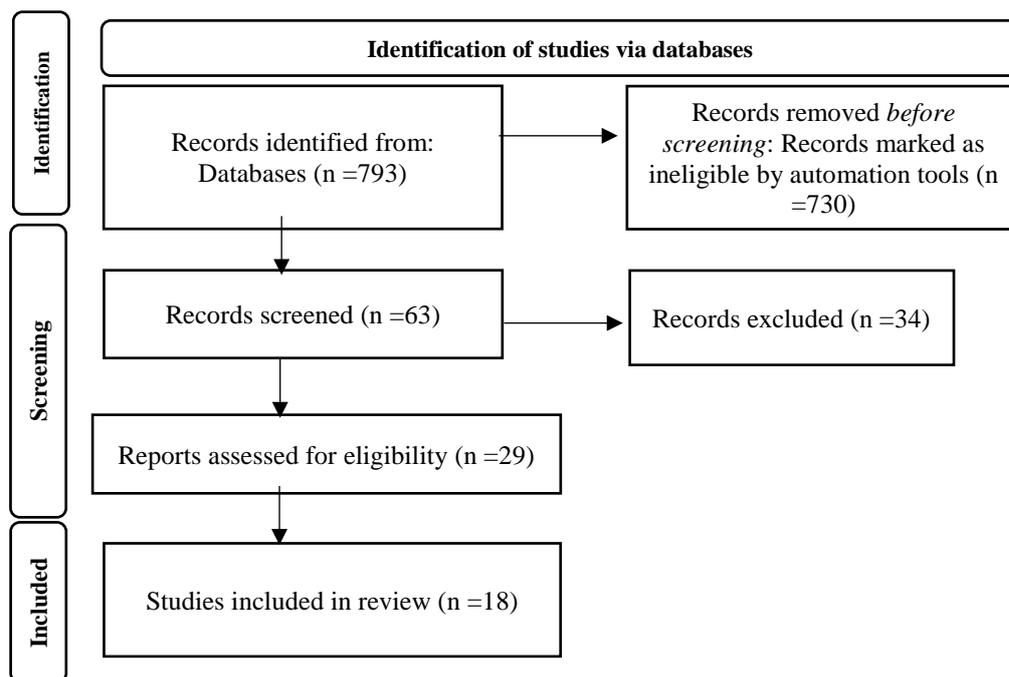
RQ3: What research approaches, methodologies and research instruments are applied in EMI studies in Saudi Arabia?

Methods

A systematic review follows a rigorous process involving predefined search criteria and screening techniques to ensure the inclusion of relevant studies. This meticulous approach ensures the consideration of a diverse range of research, minimizing the potential for bias and providing a comprehensive understanding of EMI in Saudi Arabia. Initially, research questions were formulated, and keywords were provided to align with these questions. The search was then conducted, and the results were filtered based on predetermined inclusion and exclusion criteria. Following this, the selected articles underwent analysis, and their findings were synthesized, culminating in the presentation and discussion of these findings. Throughout this systematic review, the PRISMA guidelines were used (Figure 2). The PRISMA is a widely utilized framework in educational research projects, facilitating the identification of inclusion and exclusion criteria for pertinent literature (Ramalingam, et al., 2022).

Figure 2

Flowchart of the Present Study



These steps are explained in detail as follows.

Search Process

To find the relevant studies, a search was performed across the following databases: SCOPUS, ERIC, and Google Scholar. The search query was crafted using the following keywords: (“English Medium Instruction” OR “EMI” AND “Saudi Arabia”). Initially, this search produced a combined total of 793 papers from all databases. We then applied filters according to predetermined inclusion and exclusion criteria, followed by a meticulous data extraction process, as elaborated below. The search was conducted on 2nd of December 2023.

Inclusion and Exclusion Criteria

The screening process occurred in two stages: initially, titles and abstracts were scrutinized, followed by the reading of full-text versions to ascertain whether studies satisfied the inclusion and exclusion criteria. Studies were deemed eligible for inclusion if they were conducted within Saudi Arabia and centered on courses across various disciplines (e.g., sciences, engineering, and social sciences). Conversely, studies were excluded if they were theoretical in nature, literature reviews, commentaries, or policy papers, or if they were conducted outside Saudi Arabia. The final selection comprised 18 studies focusing on EMI within Saudi Arabia, all of which are detailed in Appendix 1.

Results

Students' Perceptions towards EMI Based on their Academic Majors

The diverse range of studies conducted in Saudi Arabia encompasses various academic programs, shedding light on the implications of EMI across different disciplines. Table 1 shows the programmes and the studies conducted for each programme.

Table 1
Distribution of Studies among Academic Disciplines

Program	N of studies	Studies
Medicine	7	Al-Zumor, (2019); Al Makoshi, (2014); Alhamami, (2023); Alhamami & Almelhi (2021); Al-Kahtany, et al. (2016); Alshareef, et al. (2018); Alqarni (2023)
Engineering	5	Al-Zumor, (2019); Al-Kahtany, et al. (2016); Loubert, & Troudi, (2019); Alhamami, (2023); Alqarni (2023)
Computer Science	3	Al-Zumor, (2019); Alhamami, (2021); Alhamami, (2023)
Science	3	Alhamami, (2023); Alhamami, & Almelhi, (2021); Al-Kahtany, et al. (2016).
Preparatory Year Program	3	Al-Amri & Awaji, (2023); Alfehaid, (2018); Shamim, et al. (2016).
Business	1	Oraif & Alrashed, (2022)
Teachers	1	Aldawsari, (2022)
Primary schools	1	Al-Qahtani & Al Zumor (2016).

Table 1 presents the distribution of studies across various programs, indicating the number of studies for each category. The highest number of studies is observed in the field of medicine, with a total of 7 studies. Following closely is computer engineering, accounting for 5 studies, while computer science and the Preparatory Year Program each have 3 studies. There is a single study conducted for business. Also, one study was conducted for primary schools and one study was conducted to measure teachers' perceptions.

Some studies recruited students from computer science, engineering, and medicine disciplines. For example, Al-Zumor (2019) conducted his study for students from computer science, engineering, and medicine. Similarly, Al-Kahtany, and Al Zumor (2016) recruited students from medicine, engineering, and science. In addition, Loubert and Troudi's (2019) examined the implementation of EMI in engineering department. Al Makoshi's (2014) focused on medicine. However, Aldawsari (2022) selected participants from social sciences. Similarly, Alhamami and Almelhi (2021) recruited students from health and science. Alshareef et al. (2018) focused on decision-makers in medical instruction. Oraif and Alrashed (2022) selected participants from business and management department. Some studies (Alfehaid, (2018); Shamim, et al. 2016) selected their participants from the Preparatory Year Program. all the studies mentioned above were conducted at universities. Only Al-Qahtani and Al Zumor (2016) who investigated the parents' attitudes toward EMI in private primary schools.

Measurement

EMI studies employ diverse measurements, including comprehension, assessment, communication, proficiency scores, attitudes, and multicultural personality dimensions. The varied measurements contribute to a comprehensive understanding of EMI's impact on different aspects of education in Saudi Arabia. These measurements are summarised in Table 2.

Table 2*Distribution of Studies Based on Measurements Used in the EMI Studies*

Measurement	N of studies	Studies
Perceptions about EMI	6	Aldawsari, (2022); Al-Jarf, R. (2008); Gaffas (2019); Alshareef, et al. (2018); Shamim, et al. (2016); Alqarni (2023)
Attitude towards EMI	5	Alfehaid, (2018); Al-Kahtany, et al (2016); Al-Qahtani, & Al Zumor, (2016); Oraif & Alrashed, (2022); Alqarni (2023)
GPA and scores in Intensive English	2	Alhamami & Almelhi (2021); Alhamami (2023)
Use of English discourse markers	1	Al Makoshi, (2014)
Proficiency	1	Al-Amri & Awaji, (2023)
Comprehension	1	Al-Zumor, (2019).
Communication	1	Al-Zumor, (2019).
Multicultural personality	1	Alghizzi & Alshahrani (2022).
alumni records	1	Alhamami, (2021; 2023)
Test scores	1	Oraif & Alrashed, (2022)

Table 2 presents an overview of the various aspects investigated within the scope of the studies. The majority of studies focused on exploring perceptions about EMI, with a notable count of six studies dedicated to this dimension. Following closely are studies examining attitudes towards EMI (5 studies). Alumni records, GPA and scores in Intensive English were included with 2 studies for each aspect. Other aspects include comprehension, communication, and the use of English discourse markers, proficiency, multicultural personality, and test scores each represented by a single study.

The results across these studies employ diverse measurements to assess the impact of EMI in various academic contexts. For example, Al-Zumor's (2019) investigation measured comprehension, assessment, and communication in computer science, engineering, and medicine, revealing a negative impact of using English in these scientific disciplines. In addition, Al Makoshi (2014) focused on the use of English discourse markers in medical discourse as a communicative strategy. Al-Amri and Awaji (2023) utilized proficiency and achievement scores to establish a statistically significant correlation between English language proficiency and mathematics achievement in the Preparatory Year Program. Aldawsari (2022) evaluated perceptions about EMI among teachers and social sciences students. Alfehaid (2018) assessed attitudes towards EMI, revealing both favorable attitudes and challenges in the Preparatory Year Program. Alghizzi and Alshahrani (2022) explored the impact of EMI on multicultural personality dimensions. Alhamami and Almelhi (2021) studied health and science, utilizing GPA and scores in intensive English programs to predict academic achievement. Al-Jarf (2008) investigated college students' views on the status of English and Arabic and their attitudes towards using these languages as a medium of instruction. Al-Kahtany, et al. (2016) explored attitudes towards EMI in medicine, engineering, and science. Al-Qahtani and Al Zumor (2016) assessed Saudi parents' attitudes towards EMI in private primary schools using questionnaires. Alshareef et al. (2018) evaluated decision-makers' perspectives on the choice of English for medical instruction through interviews. Gaffas (2019)

examined students' perceptions of English courses for General and Specific Purposes. Louber and Troudi (2019) measured the challenges associated with EMI in engineering through questionnaires and interviews. Oraif and Alrashed (2022) assessed test scores and attitudes towards EMI in business courses. Shamim, et al. (2016) explored teachers' and students' preferences for EMI in the Primary Years Program through observation, interviews, and focus groups. These varied measurements provide a comprehensive understanding of the implications of EMI across different academic disciplines and shed light on attitudes, perceptions, and academic performance.

Research Methodologies and Research Instruments Used in the Studies

Research methodologies used in the studies are diverse, ranging from questionnaires and interviews to corpus analysis and alumni data analysis. These methods are summarized in Table 3.

Table 3

Distribution of Studies Based on Research Methods Used in the EMI Studies

Research method	N	Studies
questionnaire	6	Al-Zumor (2019); Aldawsari, M. (2022); Alfahaid, (2018); Al-Qahtani & Al Zumor (2016); Gaffas, (2019); Louber & Troudi (2019).
Interview	6	Alfahaid, (2018); Al-Jarf (2008); Alshareef, et al. (2018); Louber & Troudi (2019). Shamim, et al. (2016); Alqarni (2023)
Focus group	3	Shamim, et al. (2016). Al Makoshi, (2014); Alqarni (2023)
Observation	2	Alfahaid, (2018). Shamim, et al. (2016).
Document analysis	1	Alqarni (2023)
Scores	1	Al-Amri & Awaji (2023).

Table 3 presents the distribution of studies based on research methods employed across the studies. Questionnaires and interviews appear as the most frequently utilized research methods with six studies for each. Focus group discussions was used in three studies. Observational method appeared in two studies. A single study opted for the use of scores as a research method. Also, document analysis was used in one study.

The research methods employed in the studies offer a varied and comprehensive approach to understanding the impact of EMI in Saudi Arabia. Al-Zumor (2019) utilized a questionnaire to investigate the negative consequences of using English in teaching computer science, engineering, and medicine. Al Makoshi (2014) employed a corpus analysis to examine Code-Switching (CS) in medical discourse as a communicative strategy. Al-Amri and Awaji (2023) utilized scores to establish a statistically significant correlation between English proficiency and mathematics scores in the Preparatory Year Program. Aldawsari (2022) employed a questionnaire to gauge attitudes among teachers and social sciences students towards EMI. Alfahaid (2018) adopted a multi-method approach, including questionnaires, interviews, and observations, to explore attitudes towards EMI in the Preparatory Year Program, revealing both favorable attitudes and language-related challenges. Alghizzi and Alshahrani (2022) did not specify a particular research method but focused on multicultural personality dimensions and the impact of EMI. Alhamami and Almelhi's dual studies in health and science (2021) employed alumni data, questionnaires, and interviews to uncover the impact of EMI on academic achievement. Al-Jarf (2008) conducted interviews to understand college students'

views on the status of English and Arabic and their attitudes towards using these languages as a medium of instruction. Al-Kahtany, Faruk, and Al Zumor's study (2016) investigated attitudes towards EMI using unspecified research methods in medicine, engineering, and science. Al-Qahtani and Al Zumor (2016) used questionnaires to explore Saudi parents' attitudes towards EMI in private primary schools. Alshareef et al. (2018) employed interviews to explore decision-makers' perspectives on the choice of English for medical instruction. Gaffas (2019) utilized questionnaires to understand students' perceptions of English for General Purposes (EGP) and English for Specific Purposes (ESP) courses. Louber and Troudi (2019) used questionnaires and interviews to investigate the implementation of EMI in engineering. Oraif and Alrashed (2022) did not specify a research method, focusing on business students' attitudes towards EMI. Shamim, Abdelhalim, and Hamid (2016) employed observation, interviews, and focus groups to explore teachers' and students' preferences for EMI in the Primary Years Program (PYP). The variety of research methods demonstrates a holistic approach to examining the multifaceted aspects of EMI across different academic programs in Saudi Arabia.

Discussion

RQ1. What is the Current Status of EMI in Saudi Arabia?

In the last two decades, there has been a swift proliferation of EMI programs in various higher education institutions in Saudi Arabia (Alnasser, 2022; Al-Hoorie et al., 2021; Barnawi & Al-Hawsawi, 2017). Studies have identified various factors contributing to this rapid expansion of EMI within the Saudi context. One significant factor is the aspiration for internationalization, as highlighted by Phan and Barnawi (2015). Economic development also plays a crucial role in this process, with scholars such as Elyas and Picard (2013) and Elyas and Al-Ghamdi (2018) emphasizing its impact. Additionally, the imperative for educational policy reform contributes to the globalization trend (Allmnakrah & Evers, 2020). Another motivating factor is the ambition to enhance university rankings, as observed by Tsou et al. (2017). Together, these factors reflect the multifaceted nature of the forces driving higher education institutions toward global engagement, encompassing internationalization goals, economic considerations, educational policy dynamics, and the pursuit of improved institutional standing on a global scale.

These influential factors have spurred the extensive integration of English as a Medium of Instruction (EMI) throughout Saudi Arabian universities. Aligned with the objectives outlined in the Saudi government's Vision 2030, Saudi universities are under pressure to internationalize their educational offerings. While many Saudi students recognize English as a crucial language for examinations, its importance extends to higher education, commerce, and international business communication, as noted by Al-Thubaiti (2019). English has recently garnered increased prominence within higher education institutions in Saudi Arabia, marking a notable shift in its status within academia, as highlighted by Elyas and Picard (2013) and Barnawi (2022).

Saudi universities commonly house English departments and language institutes that cater to both English and non-English major students, as documented by Alnasser (2022) and Alsuhaibani (2015). While many institutions of higher learning boast English departments offering graduate and postgraduate programs, several Saudi scholars draw attention to

pedagogical challenges associated with English as a Medium of Instruction (EMI) within these academic settings, as evidenced by Alnasser (2022) and Barnawi (2021). Concerns surrounding the swift proliferation of EMI in Saudi Arabia encompass its potential impact on the Arabic language and cultural heritage. These apprehensions include the possibility of marginalizing Arabic, imposing greater cognitive burdens on students, and eroding their sense of cultural identity, as articulated by Hopkyns and Elyas (2022). The rapidly evolving policies and socio-political landscape, coupled with conflicting messages in media and policy documents, are likely to engender ideological tensions among students and educators.

Advocates against an English-only policy in education argue that such an approach could heighten learning pressures for English as a Foreign Language (EFL) or English as a Second Language (ESL) students and exacerbate inequities within the learning environment, as posited by HammRodriguez and Morales (2021). Some scholars contend that the EMI policy in Saudi Arabia lacks a robust foundation. For instance, Louber and Troudi (2019) contend that the language policy was implemented without thorough analysis or consultation with key stakeholders, such as teachers and parents. Similarly, Barnawi and Al-Hawsawi (2017) assert that significant policy shifts over the years were enacted without transparently communicated justifications. These changes include reducing the weekly English class hours, mandating all universities to incorporate a foundation year focused on English language proficiency, and adopting the Common European Framework Reference for Languages without addressing raised concerns.

Since 1960, English has been a mandatory subject in both the three-year intermediate and secondary levels, with four 45-minute sessions per week, as detailed by Al-Seghayer (2011). In 2004, English became compulsory in the sixth year of primary school, and by 2011, it was integrated into the curriculum for the fourth and fifth years of primary education, becoming a foundational subject throughout the intermediate and secondary levels, as outlined by Wedell & AlShumaimeri (2014). Despite Arabic remaining the primary language of instruction in schools nationwide, English predominantly serves as the medium of instruction at most Saudi universities, according to Macaro et al. (2018).

The proliferation of English as a Medium of Instruction (EMI) across Saudi Arabia commenced with the establishment of the first medical school in the country in 1967 at King Saud University in Riyadh, as highlighted by Al-Shreef et al. (2018). Since then, the interest in educating students through EMI at higher education institutions has been carefully considered, with many medical colleges considering secondary students' scores in science subjects and English during the admissions process. Despite the challenges stemming from students' inadequate English proficiency upon graduating from secondary school, as indicated by Wedell & Al-Shumaimeri (2014), several studies have shown positive attitudes among Saudi students towards EMI, including findings by AlMashheikhi et al. (2014) and Yousif et al. (2014). While some students associate English with the language of science and technology and view it as indispensable for learning these subjects through EMI, others highlight the suitability of Arabic for teaching certain subjects, as noted by Al-Masheikhi et al. (2014) and Al-Jarf (2008), respectively. It is recognized that despite nine years of English instruction, university entrants in Saudi Arabia frequently graduate from secondary school with insufficient English proficiency, posing challenges in meeting the demands of their major studies in universities where English serves as the medium of instruction, as highlighted by Wedell & Al-Shumaimeri

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(2014). Consequently, Saudi universities offer language courses to assist students in better coping with English-medium instruction.

Challenges of Implementing EMI in Saudi Arabia

Implementing EMI in Saudi Arabia faces several challenges. One significant obstacle lies in the recruitment of a qualified and proficient workforce capable of delivering content effectively in English. The transition to EMI also raises concerns regarding students' academic achievements, as they navigate a curriculum delivered in a language that may not be their first. Additionally, preserving cultural identity becomes a noteworthy challenge as EMI adoption may influence the use of the Arabic language in educational settings. Furthermore, the lack of comprehensive plans to assess EMI implementation at universities and schools signifies a potential barrier to effectively monitoring and refining the process to ensure its success. In addition, Louber and Troudi (2019) pointed out that there was a certain gap between policy and practice, as all participants were aware of the official guidelines with respect to implementing EMI, suggesting that the official policy ought to be negotiated, or at least discussed with policymakers and officials. However, there were no plans to examine its implementation at the university and also at the education in general.

RQ2. Is there any Difference in Students' Perceptions towards EMI Based on their Academic Subjects?

The aforementioned research studies indicated that both Saudi students and educators generally expressed favorable attitudes towards English as a Medium of Instruction (EMI). However, certain investigations, such as Al-Zumor (2019), identified significant negative consequences associated with using English to teach scientific subjects, notably impacting students' comprehension of scientific content and their performance in assessments. Moreover, employing EMI was found to induce feelings of anxiety, frustration, tension, fear, and embarrassment among learners, ultimately leading to subpar educational outcomes. The findings suggested that there was a lack of clear differentiation in how students across various academic disciplines perceived EMI. Regardless of whether students were studying science, engineering, business, or social sciences, their attitudes towards learning in English did not display substantial variations. Students from diverse fields tended to share similar perspectives or experiences concerning EMI. However, some studies noted variances in students' perceptions based on their chosen majors. For instance, Alqarni (2023) observed that engineering students showed a preference for intelligible learning and effective communication, whereas medical students leaned towards standard native English usage, albeit encountering contextual challenges linked to miscommunication and medical errors. Additionally, the findings illustrated instances of conflict, doubt, uncertainty, and deviations in participants' attitudes and perceptions regarding the use of English as a medium of instruction. Moreover, the focus was primarily on applied science departments, with particular attention given to computer science, engineering, and medicine. It is noteworthy that there were fewer studies conducted in the field of business and management. In addition, the results showed that the research conducted did not include studies specifically carried out in schools. Additionally, an interesting observation is that no studies were undertaken in the field of social science, particularly languages. This indicates a potential gap in research coverage, as social sciences

play a crucial role in understanding various aspects of human behavior and communication. The absence of studies in social science within the reported results may imply a need for further exploration and investigation in these areas to achieve a more comprehensive understanding across diverse academic disciplines.

RQ3. What Research Approaches, Methodologies and Research Instruments did EMI Study in Saudi Arabia Apply?

The investigation of research approaches, methodologies, and instruments employed in studies focusing on English Medium Instruction (EMI) in Saudi Arabia showcases a diverse and comprehensive effort to understand its multifaceted implications across various academic disciplines and programs. The methodologies, ranging from questionnaires and interviews to corpus analysis and observation, offer nuanced insights into different facets of EMI implementation and its effects. Several studies, including those by Al-Zumor (2019), Aldawsari (2022), and Alfehaid (2018), utilized questionnaires to probe the impact of EMI on language learning. This approach has been instrumental in gauging attitudes and perceptions towards EMI, providing quantitative data that can be analyzed for patterns and trends. Interviews, as employed in studies by Al-Amri & Awaji (2023) and Alqarni (2023), offer deeper qualitative insights, allowing researchers to explore the experiences and opinions of individuals in more depth. These interviews can uncover nuanced perspectives that are not always evident in survey data.

Alfehaid (2018) and Shamim et al. (2016) used a multi-method approach, combining various research techniques to provide a more comprehensive understanding of the subject matter. This approach is particularly useful in addressing the complex nature of EMI, as it allows for the collection of both qualitative and quantitative data, providing a more holistic view of its impact. The employment of analysis of scores, as done by Al-Amri & Awaji (2023), and document analysis, as in Alqarni (2023), further diversifies the research methodologies in the field. Analysis of scores can offer objective data on the academic outcomes associated with EMI, while document analysis can provide insights into policy and implementation strategies. Each of these methodologies contributes to a richer understanding of the impact of EMI in Saudi Arabia, highlighting the complexity and diversity of its application and effects in different educational contexts. This multifaceted approach to research underscores the need for varied methods to fully comprehend the implications of EMI in different academic and cultural settings.

Conclusion

The overall insights derived from the studies included in this systematic review provide a comprehensive understanding of the multifaceted impact of EMI in Saudi Arabian academic settings. The diverse findings illustrate both the potential advantages and notable challenges associated with EMI implementation across various disciplines. The studies collectively emphasize the complex relationship between English proficiency and academic performance, especially in subjects like mathematics and healthcare. The complexities of EMI are further underscored by concerns about its impact on students' native language, cultural identity, and the attitudinal differences among stakeholders. Despite the positive attitudes expressed by some towards EMI, the studies reveal challenges in course implementation, recognition of

unfamiliar terms, and coping strategies employed by students. In essence, these findings highlight the delicate balance required to navigate the implementation of EMI, considering the varied dynamics of disciplines, linguistic backgrounds, and educational contexts in Saudi Arabia.

Suggestions for Future Studies

The absence of studies in social science within the reported results suggests a potential gap in the current body of knowledge. This gap may indicate a need for further studies in these areas to enhance and broaden our understanding across diverse academic disciplines. Social science encompasses a wide range of subjects that delve into human behavior, societal structures, and cultural dynamics. The absence of studies in this discipline may limit our ability to comprehensively grasp the details of social phenomena, potentially hindering the development of well-informed policies and interventions. Moreover, the analysis reveals a deficiency in studies conducted at schools. This gap is significant as educational institutions serve as crucial environments for learning, development, and the shaping of societal norms. The lack of research in this context may hinder our understanding of various factors influencing the educational system, student outcomes, and the overall effectiveness of educational practices. Addressing this gap through further research is essential for identifying areas of improvement, implementing evidence-based educational strategies, and ultimately fostering a more effective and equitable learning environment.

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Ethics Declarations

Competing Interests

No, there are no conflicting interests.

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Appendix A

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