



Meta-Analysis of EMI in Kazakhstani Secondary Education: A Case of “Bilim-Innovation” Lyceums

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Abstract

This study examines the implementation of English Medium Instruction (EMI) in the secondary education system of Kazakhstan, with a particular focus on the unique experience of Bilim-Innovation Lyceums (BILs). The study aims to analyze how BIL integrates EMI within the framework of the national trilingual education policy and to link global EMI research trends with local practice. This study employed a bibliometric analysis with a systematic approach involving identification, screening, and selection stages to analyze 81 Scopus-indexed articles published between 2020 and 2024, followed by a descriptive analysis to contextualize the findings within the implementation of EMI at Bilim-Innovation Lyceums. The results show that BIL has become a leading platform for testing EMI-based teaching in mathematics, science, and other core subjects, reflecting broader global trends in internationalization and multilingual education. By linking bibliometric insights to real-world experiences of BILs, the study highlights successes and challenges, including teacher training, curriculum development, and policy alignment. Overall, this study contributes to understanding how EMI can be effectively implemented in the secondary education system of Kazakhstan and presents BIL as a model for integrating EMI into innovative learning environments.

INTRODUCTION

It is an interesting fact that, despite having various mediums of instruction depending on geographical location, context, and cultural and political background, the English language has shifted from its status as English as a Foreign Language (EFL) to English Medium Instruction (EMI). This transformation has been driven by globalisation, the rapid expansion of information in English across various domains, and the implementation of English-centered policies at national and international levels. However, the majority of attention on EMI has been concentrated in higher education, with relatively limited focus on secondary education. This tendency is evident in the findings of Gurney (2018); Sah & Li (2018), which show that EMI is more prevalent in tertiary education than in secondary schools, more common in secondary schools than in primary schools, and more dominant in private institutions than in public ones.

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The spread of EMI in educational settings has attracted considerable scholarly attention worldwide (Helm, 2020; Shen et al., 2020). EMI has emerged as a prominent strategy as countries seek to expand educational opportunities and internationalize their institutions. Over the past two decades, the demand for English-medium instruction in both higher and secondary education has increased rapidly, driven by globalization and the internationalization of schooling (Western Electric Co., 1985). Many non-English-speaking countries have adopted EMI to enhance their competitiveness in the global education landscape. Kassymova et al (2025); Rahman et al (2025) highlight that EMI has been rapidly adopted as a tool for strengthening institutional competitiveness and global engagement. Similarly, Ma et al (2021); Sun et al (2018) emphasizes that EMI policies contribute significantly to the internationalization of education and influence both students and faculty development.

Despite these global trends, EMI research in Kazakhstan remains relatively limited in scope and quantity, with most studies focusing on elite institutions. This indicates a gap in understanding how EMI operates across broader educational contexts, particularly in secondary education and inclusive settings.

The integration of EMI into education systems has raised pressing questions regarding inclusive education. Kazakhstan is actively internationalizing its education system through policies that promote EMI alongside inclusive practices to ensure equal access for all students. According to the World Bank Group (2025), inclusive education involves creating systems that allow all learners to access and benefit equally from education. UNICEF (2025) further emphasizes that inclusive education ensures that all children have equal opportunities to develop essential life skills. However, many marginalized learners continue to fall behind, particularly in developing countries (World Bank Group, 2025).

Policy ambitions, however, do not always translate into practice. Passeka & Somerton (2024) describe Kazakhstan’s inclusive education framework as largely aspirational, highlighting significant gaps in teacher training. Many teacher education institutions lack structured curricula, practical exposure, and specialized courses on inclusion, limiting teachers’ readiness to address diverse learner needs (Az-Zahra et al., 2025). As a result, questions remain regarding whether EMI opportunities are equally accessible to students from different socioeconomic and linguistic backgrounds.

As in many non-English-speaking countries, EMI in Kazakhstan is implemented at both school and tertiary levels. However, there is no universally agreed definition of EMI within the local context due to its relatively recent emergence in global education. The development of EMI in Kazakhstan began gradually in the early 1990s, with only a few universities offering English-medium programs. Significant growth occurred after Kazakhstan joined the Bologna Process in 2010, leading to an expansion of English-medium programs across higher education (Xu et al., 2021; Yessenbekova, 2023).

At the secondary level, Kazakh-Turkish Lyceums (now known as Bilim-Innovation Lyceums) have played a pioneering role since their establishment in 1992, implementing EMI in science, mathematics, and ICT subjects. This early adoption contributed to the development of graduates capable of continuing their studies in English-medium universities both domestically and internationally. The establishment of Nazarbayev Intellectual Schools in 2008 further strengthened EMI implementation through the promotion of trilingual education policies (Wang &

Caloz, 2021).

Research indicates that effective EMI implementation requires adaptive teaching strategies, particularly in multilingual and inclusive classrooms. Jiang (2017) emphasize the importance of aligning teaching methods with students' diverse needs. EMI also offers opportunities to promote multilingualism and global competence; however, it may also exacerbate inequalities if not implemented inclusively (Kasmani, 2015).

The introduction of EMI in Kazakhstan's secondary education system was further reinforced through institutional initiatives. Kazakh-Turkish schools were the first to introduce EMI long before the national trilingual policy was formally implemented (Lo Giudice et al., 2026). Later, Nazarbayev Intellectual Schools were designated as key agents for educational reform, responsible for piloting and disseminating EMI practices nationwide. Between 2016 and 2019, a significant number of teachers received EMI training, although the quality and consistency of such training varied (Wang & Caloz, 2021).

Despite initial progress, the expansion of EMI into mainstream schools faced several challenges, including insufficient planning and limited pedagogical readiness, leading to a temporary pause in implementation in 2019. Nevertheless, the continued growth of international schools and increasing demand for EMI highlight its ongoing relevance in Kazakhstan's education system (Beisenbayev & Almukhametov, 2024; Simonova, 2015).

In this context, this study aims to examine how Education-Innovation Lyceums (BILs) have adopted and implemented EMI within Kazakhstan's trilingual education policy. While previous studies have primarily focused on macro-level analyses, limited attention has been given to institutional practices such as those of BILs. These institutions play a significant role in pioneering innovative pedagogical approaches, particularly in the early introduction of EMI in science and mathematics.

Furthermore, this study employs a bibliometric analysis of 113 Scopus-indexed publications to explore global and regional trends in EMI research. By linking these findings with local practices, including policies, textbooks, and teaching strategies in BILs, this study aims to bridge the gap between theoretical research and practical implementation. The findings are expected to highlight both global trends and context-specific challenges, including issues related to teacher training, curriculum alignment, and the balance of multilingual education goals.

METHODS

Software and instruments used in the research analysis

The current study used the Scopus CSV database for analysis. A systematic review of the included articles was conducted using the Bibliometric Review and Meta-Analysis (PRISMA) approach and R Studio software. The analysis covered five years from 2020 to 2024, providing the latest author studies, keyword usage, and scholarly focus on EMI in secondary education (Belle & Zhao, 2023; Gutema et al., 2024; O'Dea et al., 2021; Page et al., 2021; Rahman et al., 2024). The data were retrieved from the Scopus database using the keywords: "English Medium Instruction" AND "Kazakhstan", combined with terms such as "trilingual education", "inclusive education", and "secondary schools". Search criteria required that documents: (a) were published in peer-reviewed journals; (b) were written in English; and (c) focused on Kazakhstan contexts. Non-academic sources

and publications not included in Scopus were excluded during the analysis.

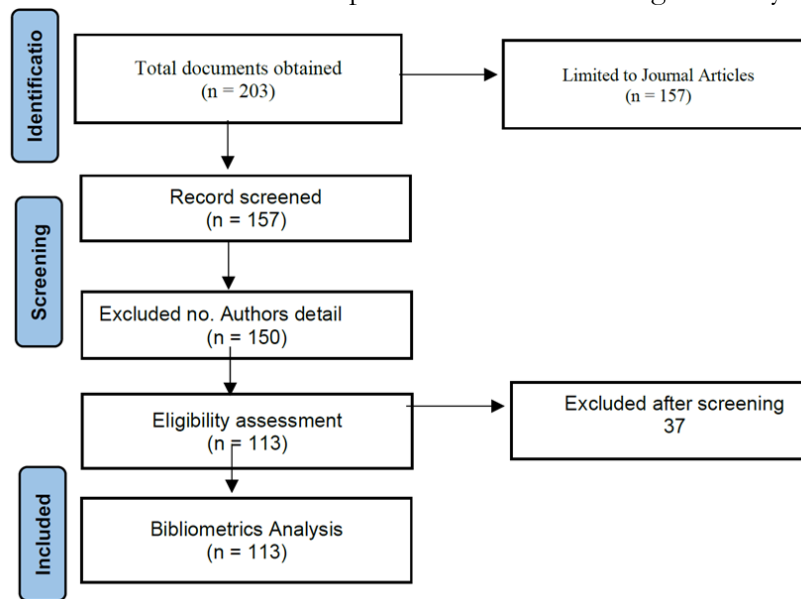


Fig 1. Flow diagram of PRISMA and Bibliometrics analysis

Employed bibliometric analysis to assess research trends and patterns in the implementation of English Intermediate Education (EMI) in secondary education, focusing on the experience of Bilim-Innovation lyceums (Asril et al., 2023; Engkizar et al., 2023; Engkizar et al., 2025).

RESULT AND DISCUSSION

The effectiveness of EMI and inclusive education is strongly influenced by the policy frameworks in place in a country. Al-Jaghoub et al (2025) examined educational inequality in the Australian context; despite inclusive legislative support, marginalized groups continue to face significant challenges. This highlights the need for comprehensive strategies that integrate the principles of inclusive education within EMI, ensuring that all students are supported. The need for inclusive assessment practices in higher education has also been addressed by (Harris & de Bruin, 2018). From a socio-political perspective, inclusive education advocates fair assessment that takes diversity into account as a goal. Such approaches are essential to ensuring that all students, particularly those in EMI contexts, are able to effectively demonstrate their learning (Gurney, 2018; Sah & Li, 2018; Xu et al., 2021).

Kazakhstan’s education reforms are placing a strong emphasis on modernization, internationalization, and inclusion. Policymakers are working to balance the expansion of EMI with the need for inclusive practices, while ensuring that marginalized groups are not left behind when the language of instruction changes. Let’s take a look at the bibliometric analysis of English Medium Education (EMI) in secondary education, based on Scopus, from 2020 to 2024. It includes 113 documents from 81 sources, with a significant annual growth rate of 28.78%. 5 books, 18 book chapters, 1 conference article, and 3 reviews indicate a growing global interest in EMI (Sun et al., 2018; Xu et al., 2021).

For figure axis labels, use words rather than symbols. Do not label axes only with units. Do not label axes with a ratio of quantities and units.

Table 1. Main information about the EMI Scopus Sources

Description	Results
Timespan	2020:2024
Sources (Journals, Books, etc)	81
Documents	113
Annual Growth Rate %	28,78
Document Average Age	2,73
Average citations per doc	6,531
References	5813
Document Contents	
Keywords Plus (ID)	87
Author's Keywords (DE)	384
Authors	
Authors	212
Authors of single-authored docs	33
Authors Collaboration	
Single-authored docs	35
Co-Authors per Doc	2,08
International co-authorships %	24,78
Document Types	
article	86
book	5
book chapter	18
conference paper	1
review	3

The average age of the papers is 2.73 years, and there are an average of 6.53 citations per paper, citing a total of 5813 sources. In the analysis, 87 Keywords Plus and 384 Author Keywords representing different research topics are distinguished. 212 researchers participate in authorship, and 24.78% of publications are covered by international co-authorship. The types of documents include 86 articles.

Annual scientific product

The data shows annual scientific production for the period 2020-2024. It reflects fluctuations in research output due to the impact of the COVID-19 pandemic, recovery efforts, and strategic publishing initiatives. The peak production was in 2024, after the decline in 2023.

Table 2. Published articles by year

Year	Articles Published
2020	12
2021	26
2022	27
2023	15
2024	33

- 2020 (12 articles): Low output due to the COVID-19 pandemic, which has halted research and publication activities.
- 2021 (26 articles): Increase, reflecting recovery from the pandemic.
- 2022 (27 articles): Steady increase in research output, reflecting continued focus on EMI.
- 2023 (15 articles): Possible decline due to changing research priorities or external factors.

- 2024 (33 articles): Highest output, reflecting increased research activity, with a focus on EMI.

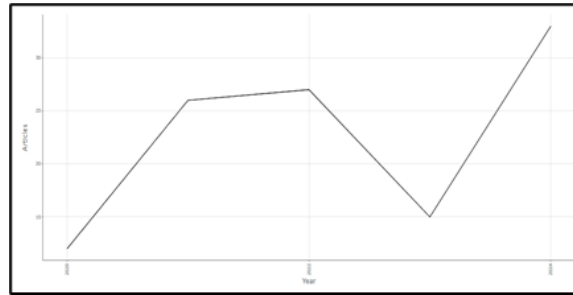


Fig 2. Annual Scientific Production

The annual scientific output from 2020 to 2024 reflects the impact of the COVID-19 pandemic, followed by recovery and a subsequent increase in research output. Despite a decline in 2023, the overall trend shows a rebound in 2024, with the highest number of published articles. It reflects a refocused and strategic effort in the field of English Medium Instruction (EMI) in secondary education, which has led to a peak in scientific activity and solid results in recent years (Gurney, 2018; Helm, 2020; Mekki-Berrada et al., 2021).

Sources of production over time

It examines data over time on trends in academic research publications related to language planning, English language teaching and learning, multilingual education, and current issues in education over the five years from 2020 to 2024. The table below provides an overview of the number of articles published each year in major academic journals and research journals.

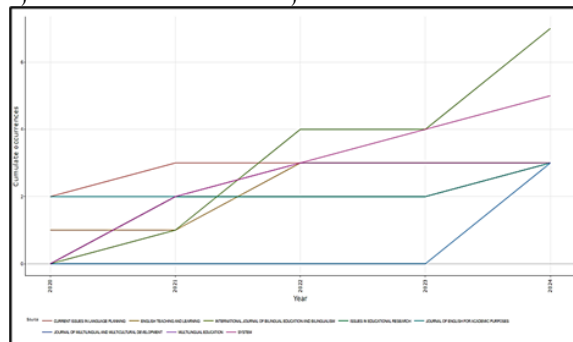


Fig 3. Sources of production over time

International scientific research, language teaching planning issues, as well as English language teaching, multilingual education, and academic journals such as the Journal of English for Academic Purposes and the Journal of Multilingual and Multicultural Development have been extensively studied. The aim is to identify patterns, changes in research, and emerging trends in these areas of study by analyzing the output of scholarly articles (Yessenbekova, 2023).

Table 3. Publication activity

Year	Inter National	System	Current issues in language planning	English teaching and learning	Issues in educational research	Journal of English for Academic Purposes	Journal of Multilingual and multi Cultural develop Ment	Multi Lingual education
2020	0	0	2	1	0	2	0	0
2021	1	2	3	1	2	2	0	2

2022	4	3	3	3	2	2	0	3
2023	4	4	3	3	2	2	0	3
2024	7	5	3	3	3	3	3	3

In 2020, publication activity was relatively low across most categories, with only a limited number of articles published, particularly in fields like English teaching and multilingual education. This period marks the beginning of a trend where scholarly output in these areas was still developing.

From 2021 to 2022, there was a noticeable increase in the number of publications across multiple fields. Research in current issues in language planning and English teaching and learning saw significant growth, suggesting an emerging scholarly interest in these areas. This period likely reflects a response to the evolving needs of education systems in addressing language planning challenges and the adaptation of English teaching methodologies.

In 2023, the trend of increased publications continued, with a marked shift towards a greater emphasis on multilingual education and language planning issues. The growing body of research in these areas reflects the increasing global recognition of the importance of multilingualism in education, as well as the need for strategic planning in language policy (Hassan et al., 2022).

2024 saw the highest number of publications across most categories, with a particularly strong focus on multilingual education, language planning, and related topics. This surge in academic output signals a continued and intensified scholarly interest in addressing the complexities of language acquisition, education policies, and global multilingual challenges, highlighting the significance of these fields in contemporary educational research.

Corresponding Author Countries examine the distribution of research articles published by various countries, categorised into two types of contributions: SCP (empirical/content-based) and MCP (methodological/theoretical). It is shown in Table 4.

Table 4. Corresponding Authors' Countries

Country	Articles	Articles %	SCP	MCP	MCP %
Hong Kong	19	16.8	12	7	36.8
United Kingdom	9	8	6	3	33.3
China	6	5.3	2	4	66.7
Canada	4	3.5	4	0	0
Morocco	3	2.7	3	0	0
USA	3	2.7	1	2	66.7
Indonesia	2	1.8	2	0	0
Korea	2	1.8	1	1	50
Netherlands	2	1.8	2	0	0
Singapore	2	1.8	2	0	0

The findings reveal that Hong Kong leads with the highest number of articles (19), with a balanced focus on both SCP and MCP. China, with a significant 66.7% of articles in MCP, emphasizes methodological contributions. Conversely, countries such as Canada, Morocco, Indonesia, the Netherlands, and Singapore concentrate exclusively on SCP. The USA and Korea demonstrate a balanced approach, distributing their articles evenly between SCP and MCP.

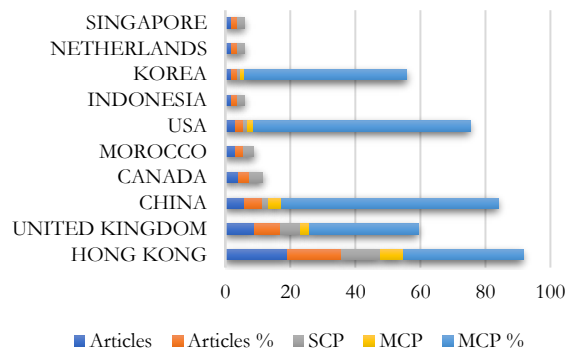


Fig 4. Distribution of Research Articles by Country and Contribution Type (SCP vs. MCP)

These patterns indicate differing research priorities across countries, with some focusing on empirical findings and others on advancing theoretical or methodological frameworks. The analysis of the authors in this study showed that Kazakhstani-based authors are underrepresented in Scopus-indexed EMI research. Possible reasons include limited access to international journals, lack of publication funds, publication in local languages, and capacity gaps in academic writing in English. Addressing these barriers is essential for strengthening Kazakhstan’s voice in the global EMI discourse.

The co-citation network figure represents the centrality of academic authors in a citation network using three key measures: Betweenness, Closeness, and PageRank.

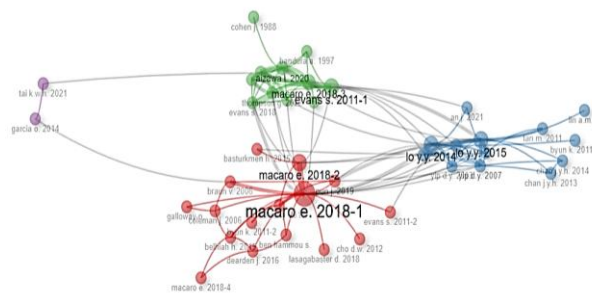


Fig 5. The co-citation networks

The figure shows how authors are positioned in the network based on their influence and connectivity. Some authors serve as central figures, while others are peripheral. High scores on these dimensions indicate the importance of the author in connecting to, accessing, or influencing the network.

Distance: Authors with high distance (e.g., makaro, 2018-1 with a score of 532,044) are key intermediaries in the network, connecting groups of authors. A high score on connectivity indicates that the author plays a significant role in the flow of information in the network.

Proximity: These measures how close an author is to all other authors in the network. High values (e.g., 2015, 0.006) indicate that the author can reach others more quickly, indicating that they are well connected in terms of proximity.

PageRank: Measures the importance of an author based on their connections. Authors with high PageRank (e.g., 0.06 in 2015) are likely to have influential connections, suggesting that their work is central to the network.

The spread of EMI in educational settings has attracted considerable scholarly attention worldwide (Shen et al., 2020). EMI has emerged as a prominent strategy as countries seek to expand their educational opportunities for the internationalisation of their institutions. Macaro et al (2018) conducted a systematic review of EMI, finding that it has been rapidly adopted as a tool for enhancing the global competitiveness of educational institutions. Compared to global EMI research trends that focus on higher education, language policy, and teacher identity Engkizar et al (2023); Gautam & Bhalla, (2023); Macaro et al (2018), EMI research in Kazakhstan remains relatively limited in scope and quantity, having been conducted primarily in elite schools.

Similarly, Zhang (2022) examined EMI policies in China, highlighting the internationalisation of education and its implications for students and faculty. Over the past two decades, the demand for English-medium instruction (EMI) in both higher and secondary education has increased rapidly worldwide, driven by globalisation and the internationalisation of schooling (Western Electric Co., 1985). Many non-English-speaking countries have begun to implement EMI to increase their competitiveness. The findings of the study indicate a trend toward EMI being viewed as a pathway to academic and professional opportunities, as it enables the development of students' intercultural and pragmatic self-efficacy skills from an early age (Payne et al., 2018).

CONCLUSION

Overall, recent policy directions and practical initiatives in Kazakhstan support the goals of EMI and internationalization through the creation of inclusive educational environments. Therefore, it is crucial to adopt policies and practices that prioritize equity and access, ensuring that all learners benefit from opportunities in an increasingly globalized educational landscape. The integration of EMI represents a significant change in inclusive education that provides new opportunities and emerging challenges for schools, teachers, and students.

The results of this study indicate a steady expansion of EMI in the secondary education system of Kazakhstan, driven by national policies on multilingualism and the growing demand for English language proficiency. A bibliometric analysis revealed an increase in EMI-focused publications, reflecting the growing international and local interest in language policy, educational reforms, and pedagogical innovations. In this context, the experience of the Bilim-Innovation Lyceums offers a practical example of EMI implementation. Their early integration of EMI into math, science, and other core subjects demonstrates how targeted institutional strategies can impact student outcomes, curriculum design, and even university pathways.

While this study establishes links between global EMI research and the Kazakhstani context, further research is needed to assess the pedagogical impact of EMI in BIL, focusing on teacher training, resource allocation, curriculum adaptation, and student achievement. Future research should also examine the long-term outcomes of EMI adoption and identify sustainable patterns for scaling up these practices in other secondary schools. By linking global trends to BIL's localized experience, this study contributes to a deeper understanding of EMI implementation and offers practical insights for shaping Kazakhstan's education modernization strategy.

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DECLARATIONS

Author contribution

Ye. Abduldjayev: Writing-Preparation of original manuscript, **Yerkhan Abduldjayev:** Conceptualization, Methodology, **G.A. Begimbetova:** Visualization, Investigation, Improve Content, **Zh.K.Markhmadova:** Data accuracy and analysis, Improve Language.

AI Statement

The data and the grammatical structure in this article have been validated and verified by English language experts and no AI-generated sentences are included in this article.

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Conflict of interest

The authors declare that this research was conducted without any conflict of interest in the research.

Ethical clearance

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