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THE RELATIONSHIP BETWEEN LANGUAGE OF INSTRUCTION AT SECONDARY SCHOOL AND ACADEMIC ACHIEVEMENT IN EMI HIGHER EDUCATION

EMI became an educational policy in Kazakhstan and its benefits are not arguable. Although EMI state is in action challenges emerge on the way. Therefore, continuous research in this field is needed for educated decisions on all levels of education. Considering higher education level interrelated with others, schooling as a previous step might have an impact on it. This article investigates the correlation between the academic performance of undergraduate students in English as a Medium of Instruction (EMI) programs and their language of instruction during secondary school. The primary objective is to determine whether studying in English during secondary education confers an advantage to EMI undergraduates. By utilizing administrative data obtained from a selective private EMI university in Kazakhstan (n=6.980) and conducting t-test analyses, the study reveals that students who studied in EMI secondary schools perform better academically in their EMI university studies. The implications of these findings on policy are discussed.

Keywords: English-medium instruction, higher education, academic achievement, EMI, trilingual education.

Introduction

The rapid growth of English as a medium of instruction on all levels of education is documented worldwide [1]. Regarding the specific factors driving this recent surge in popularity in Kazakhstan, experts point to the implementation of a comprehensive trilingual policy and the country's participation in the Bologna Declaration as noteworthy contributors [2, 3]. The ministry of Education reports

that the number of undergraduate students enrolled English-mediated educational programs grew from 31125 in 2021 to 39935 in 2022 [4]. As the recommendation to the government Higher Education Development Center suggests increasing the format of English-mediated educational programs both in quantity and quality [4]. Contrary to the fast pace of the adoption English as the medium of instruction, little comprehensive research is done in this field [3].

According to Tajik et al. [3] students who lacked consistent English learning at their secondary school struggled to understand the content of the courses taught in English. This issue results in GPA which is significant evidence of a student's academic success. Nurshatayeva estimates in her quantitative study that undergraduate students' academic achievement decreases after shifting to English-only instruction, although it gradually recovers thereafter [4]. Nurshatayeva and Page the scholars analyzing the same dataset highlight that this recovery in estimation proves that students adapt to English as a language of instruction [5].

One important area that is lacking rigorous evidence is the relationship between language of instruction at the secondary school level and academic success in EMI higher education. This paper aims to contribute to the literature by providing such evidence. Specifically, I study whether studying in English at secondary school level is an advantage when it comes to achievement in EMI university studies.

The following research question guides the study: Do students who studied in English at secondary school perform better academically in EMI higher education?

The findings reveal that undergraduate students who finished EMI school perform better at the university. It contributes to the literature quantifying and validating perceptions of the beneficial position of English-instructed secondary education over education mediated in the local language when it comes to academic achievement at the university with the same language of instruction. The results of this study may have practical implications in the form of targeted enrolment to the language preparation program for the undergraduate students who did not have opportunity to study at EMI secondary school.

Literature Review

Several studies explored the connection between the language of instruction at the secondary school level and students' academic outcomes in English-medium instruction (EMI) higher education.

Macaro emphasized the need to systematize EMI research in various educational contexts and levels [1]. He called for recognizing the interplay between secondary and higher education in shaping EMI outcomes. In a subsequent study, Macaro delved into the transition from Content and Language Integrated Learning

(CLIL) classrooms to EMI universities in Italy, finding that students in higher education faced fewer language-related challenges, suggesting that early exposure to EMI might confer advantages [7].

In Spain, Dafouz and Camacho's study revealed similar performance levels for both EMI and non-EMI student groups, with a slight advantage for EMI students that did not reach statistical significance [8]. This suggests that the language of secondary instruction may not be an important determinant of EMI success, at least in some contexts.

Research on EMI in Asia presents mixed evidence on the role of the language of instruction in secondary schooling. The literature consistently indicates that irrespective of the language of instruction prior to entering an EMI university, the English language proficiency of undergraduate EMI students remains one of the challenges for effective EMI implementation in the region [9, 10]. Yet there is evidence that the language of instruction during secondary education plays a crucial role in EMI outcomes, as English instruction may rely heavily on prior knowledge [11].

In summary, the connection between the language of instruction at the secondary school level and outcomes in EMI higher education is a multifaceted issue, with evidence suggesting that it can significantly influence student performance in EMI programs. However, other factors, such as cultural and contextual variables, may also play a role in determining success in EMI higher education.

This review suggests that the role of the language of instruction at the secondary school level in determining the academic outcomes of EMI undergraduate students should be empirically tested in every context where EMI is implemented. This is particularly important in Kazakhstan, where EMI instruction at the secondary level is often offered in private schools or selective schools for gifted children. Further, the education policy context in Kazakhstan differs significantly from that of other countries implementing EMI. Specifically, EMI in Kazakhstan is implemented within broader country-level policies and frameworks such as trilingualism [2].

Materials and methods

Data

This study uses administrative data from a selective private EMI university in Kazakhstan. We focus on undergraduate students that are studying in the 2022–2023 academic year (n=6,980). That is, our findings generalize to the entire population of students who are enrolled in undergraduate programs in this selective EMI university as of spring semester 2023.

The rich dataset includes detailed information on students' secondary schooling and academic achievement in their EMI studies. I use the following two variables for my t-test analyses:

1 GPA: Grade point average at the university. The GPA variable ranges from 0 to 4 and is unweighted.

2 ENG_SCHOOL: An indicator variable equal to 1 if English was language of instruction at student's secondary school. The ENG_SCHOOL variable is equal to 0 if the student's secondary schooling was in Kazakh, Russian, Turkish, Uzbek or other language.

I use the following two variables to generate descriptive statistics for the study:

3 KAZ_SCHOOL: An indicator variable equal to 1 if Kazakh was language of instruction at student's secondary school. The KAZ_SCHOOL variable is equal to 0 if the student's secondary schooling was in any other language.

4 RUS_SCHOOL: An indicator variable equal to 1 if Russian was language of instruction at student's secondary school. The RUS_SCHOOL variable is equal to 0 if the student's secondary schooling was in any other language.

Method

To compare the academic achievement operationalized as university GPA across students' language of instruction at secondary school, I use two-sided paired t-test analysis. Two-sided paired t-test analysis is a commonly used method for analyzing and comparing means of two groups [12]. It allows researchers to determine if there is a statistically significant difference between the means of the two groups, without specifying the direction of the difference (i.e., whether one group is higher or lower than the other).

My analysis follows equation 1 for the two-sided t-test

$$t = \frac{(\overline{GPA_{English}} - \overline{GPA_{Other\ languages}})}{\sqrt{(s^2_{English}/n_{English}) + (s^2_{Other\ languages}/n_{Other\ languages})}} \tag{1}$$

where t represents the t-value, $\overline{GPA_{English}}$ and $\overline{GPA_{Other\ languages}}$ are the means of GPA in the two groups being compared, $s^2_{English}$ and $s^2_{Other\ languages}$ are the standard deviations of the two groups, and $n_{English}$ and $n_{Other\ languages}$ are the sample sizes of the two groups. I calculate the t-value using equation 1 and compare it to the critical value associated with the 0.05 level of significance. If the calculated t-value exceeds the critical value, it indicates a significant difference between the groups. I perform all analyses using Stata statistical software (version 17).

Results and discussion
Descriptive statistics
Table 1 presents basic descriptive statistics for the data. The GPA reported in row 1 averages 2.65 suggesting that the students of this EMI university perform considerably well. The GPA standard deviation of 0.82 suggests that there is considerable variation in students' GPAs.

Statistics reported in rows 2-4 of Table 1 show the proportions of students according to their secondary school language of instruction. Perhaps not surprisingly, those who studied in EMI schools (see row 2) are the second largest group comprising 16 % of the total student body. It makes sense that a leading EMI university in Kazakhstan would attract a considerable number of students with EMI secondary schooling backgrounds. Yet the largest group comprises students who studied in Kazakh-language secondary schools. About 71 % of students at this EMI university studied in Kazakh at school, likely reflecting the overall trend in the rise of Kazakh language schooling in Kazakhstan more broadly rather than idiosyncrasies of this particular university's admission and enrollment. Finally, at about 11 %, students who studied in Russian language secondary schools represent the smaller share of the three core languages of secondary instruction represented in the sample (Table 1).

Table 1 – Descriptive statistics

#	Variable	Obs.	Mean	SD	Min	Max
1	GPA	6,974	2.65	.82	0	4
2	ENG_SCHOOL	6,980	.16	.37	0	1
3	KAZ_SCHOOL	6,980	.71	.45	0	1
4	RUS_SCHOOL	6,980	.11	.31	0	1

Table 2 presents means and standard deviations of GPA across language of instruction at secondary school. The statistics suggest that the GPA of students who studied in EMI secondary schools is highest at 2.72. The GPA of students who studied in Kazakh schools (2.65) is slightly higher but similar to the GPA of students who studied in Russian language schools.

Table 2 – Means and SDs of GPA across languages of instruction at secondary school

	ENG_SCHOOL	KAZ_SCHOOL	RUS_SCHOOL
GPA	2.72 (0.84)	2.65 (0.81)	2.60 (0.85)

T-test analysis results: Is studying at an EMI secondary school an advantage in EMI higher education?

T-test results presented in Table 3 showthat the average GPA of students from EMI secondary schools is .08 points higher compared to the GPA of students who studied in schools with other languages of instructions. The t-statistic 3.1429 and the associated p-value 0.0017 suggest that this difference in GPAs is statistically significant at the 0.05 alpha level.

In other words, studying at an EMI secondary school does provide students with an advantage when it comes to EMI higher education.

Table 3 – T-test results comparing GPA of students who studied in English versus other languages at secondary school

	N	Sample mean	Standard error
ENG_SCHOOL=1	1,147	2.72	.02
ENG_SCHOOL=0	5,834	2.64	.01
Difference		.08	
t-statistic		3.1429	
p-value		0.0017	

Conclusion

The quantitative analyses conducted in this paper suggest several implications for the research on EMI higher education. First, the language of instruction at secondary school matters for students' academic achievement. Specifically, students who studied in EMI secondary schools tend to perform better academically in EMI higher education and this difference is statistically significant. Clearly, my analysis is limited to one university in Kazakhstan. Nevertheless, this is a leading EMI university in the country and the findings pertain to a substantial proportion of the EMI higher education sector in the country.

The findings also suggest that students' secondary school language should be considered as an important factor related to students' academic performance in EMI higher education. EMI universities should provide sufficient supports to students who didn't have the luxury of studying in English at secondary level.

Next, while the practical significance of a difference in GPAs of .08 points may be arguably on the smaller side, one should keep in mind that students tend to retake courses in order to proceed in their studies. That there remains a statistically significant difference in GPAs even after students likely retook failed courses

suggests that the relationship between secondary school language of instruction and EMI university academic achievement should be taken seriously by EMI policies.

This study is among the first quantitative studies rigorously exploring EMI higher education in Kazakhstan. Future studies making use of administrative data like in this paper should focus on examining the determinants of EMI academic outcomes in order to provide policy guidance to higher education leaders.

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МЕКТЕПТЕГІ САБАҚ БЕРУ ТІЛІ ЖӘНЕ АҒЫЛШЫН ТІЛДІ ЖОҒАРЫ МЕКТЕПТЕГІ АКАДЕМИЯЛЫҚ ҮЛГЕРІМ АРАСЫНДАҒЫ БАЙЛАНЫС

Қазақстанда ағылшын тілін оқыту тілі (EMI) ретінде білім саласындағы саясатқа айналды, осы орайда оның артықшылықтары күмәнсіз. EMI іске асырылып жатса да, бұл жолда мәселелер туындап жатыр. Сол себепті ғылымға негізделген шешімдерді қабылдау үшін білім берудің барлық деңгейлерінде үзілмейтін зерттеу қажет. Жоғары мектеп қалған деңгейлермен байланысқан деп қарастырса, орта мектеп алдыңғы деңгей ретінде оған әсер етеді. Бұл мақала ағылшын тілді (EMI) бағдарламаларда оқып жүрген бакалавр студенттердің академиялық үлгерімі мен олардың орта мектепте оқыту тілімен байланысты зерттейді. Негізгі мақсат ағылшын тілін оқыту тілі (EMI) ретінде қолданған орта мектепте білім алу EMI жоғары оқу орынның студенттеріне артықшылық бере ме екенін анықтау. Қазақстандағы таңдаулы EMI университетінің әкімшілік деректерді (n=6980) t-тест сараптамадан өткізіп, EMI ортамектепте оқыған студенттер EMI университетінде

академиялық тұрғыдан үлгерімі жоқарырақ екнін анықтадық. Бұл нәтижелерді саясатта қолдану талқыланады.

Кілтті сөздер: ағылшын тілін оқыту тілі ретінде қолдану, жоғары білім беру саласы, академиялық үлгерім, EMI, үштілділік

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ВЗАИМОСВЯЗЬ МЕЖДУ ЯЗЫКОМ ОБУЧЕНИЯ В СРЕДНЕЙ ШКОЛЕ И АКАДЕМИЧЕСКОЙ УСПЕВАЕМОСТЬЮ В EMI ВЫСШЕМ ОБАЗОВАНИИ

Обучение на английском языке (EMI) в Казахстане стало образовательной политикой и его преимущества неоспоримы. Хотя EMI уже в действии, на пути возникают сложности. Следовательно, непрерывное исследование этой области необходимо для принятия осведомленных решений на всех уровнях системы образования. Рассматривая высшее образование во взаимосвязи с остальными уровнями, средняя школа как предыдущая ступень может воздействовать на него. Данная статья изучает корреляцию между академической успеваемостью студентов бакалавров обучающихся на программах язык обучения которых английский (EMI) и языком обучения их средней школы. Главная задача – определить является ли обучение на английском в средней школе преимуществом для студентов EMI ВУЗа. Применив t-тест анализ для административных данных выборочного университета в Казахстане (n=6.980) исследование показало, что студенты, обучавшиеся на английском в средней школе, показывают более высокую академическую успеваемость в EMI университете. Рассматривается применение данных результатов в политике.

Ключевые слова: обучение на английском, высшее образование, академическая успеваемость, EMI, трехъязычное образование