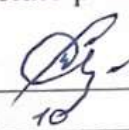


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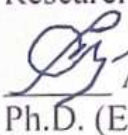
GRADUATE QUALIFICATION WORK OF MASTER'S DEGREE STUDENT
(MASTER'S THESIS)

**English Medium Instruction in Teaching Chemistry in Higher Education:
Opportunities for Improving Learner Instruction**

on the basis of the educational program for preparing master's degree students
45.04.02 – Linguistics

Zazybin Alexey Georgievich

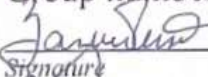
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THE TASK
of completing the final qualification work of a master to a student
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Last name First name Patronymic of the student
in the direction of training 45.04.02, main educational program (profile) "Linguistics"

1 Topic of the thesis

English Medium Instruction in Teaching Chemistry in Higher Education: Opportunities for
Improving Learner Instruction

2 The deadline for student to complete the thesis:

a) to the academic office /
dean's office - _____

b) to State Examination
Commission - _____

3 Initial data for work:

The object of the study – opportunities for improving learner instruction in teaching Chemistry through EMI

The subject of the study – the influence of external factors – teacher's language proficiency, the speed of speaking/lecture delivery, availability of glossary, - and internal factors – student's language proficiency, attending an introductory language courses, - on the quality of educational process

The aim of the study - to give practical recommendations on improving the comprehension of content in teaching Chemistry through EMI in Higher Education

Tasks:

1. To make a research on how students assess the delivery of lectures in English for Chemistry – related courses.

2. To investigate the students' reflection on the use of L2 in EMI classroom

3. To investigate the students' reflection on the use of visual aids in EMI classroom

4. To find out the students' opinion on multiple-choice questions vs open-ended questions in content assessment process

Research methods:

quantitative and qualitative methods, analysis of survey and interviews.

The organization or industry on which the work is being carried out –

Department of Chemical Engineering, Kazakh-British Technical University

4 Summary of the work:

Both learners' and teachers' English proficiency levels influence how well the students can understand course material and may ultimately affect how well they absorb the material and will use it in the future. EMI implementation in the classroom may be problematic if students have inadequate English ability, therefore institutional support may be required for long-term success. It is crucial that schools improve the standard of English language instruction in order to address the problem. This could be accomplished by introducing new courses, like "English for Chemical Engineers" or other ESP courses, increasing the credits for teaching English in the classroom, and creating an environment for communication with native speakers - supervisors and foreign students.

Supervisor of the final qualification work
Associate Prof., Ph.D. in Education,
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АННОТАЦИЯ

Данная магистерская диссертация исследует, как улучшить образовательный процесс на английском языке как средстве обучения (EMI). Она состоит из введения, обзора литературы, методологии, результатов, обсуждения, заключения, списка литературы и приложений. Введение посвящено теоретическим вопросам внедрения EMI; оно освещает наиболее известные точки зрения на EMI. Обзор литературы охватывает наиболее распространенные модели EMI и некоторые недостатки и проблемы EMI. В главе методологии приводится описание общего исследовательского дизайна, выборки и используемых инструментов. Результаты представляют данные, полученные в рамках опроса и интервью среди студентов кафедры химической инженерии Казахско-Британского технического университета о их опыте получения инженерного образования через EMI и о том, как они видят развитие образовательного процесса на EMI. Обсуждение состоит из анализа данных, охваченных в результате исследования, с обозначением современных концепций, принятых и обсуждаемых среди специалистов по EMI. Заключение подводит итоги исследования и содержит практические рекомендации по тому, как сделать инструкции на EMI более понятными.

ABSTRACT

This master's dissertation examines how to improve the educational process in EMI. It consists of an introduction, literature review, methodology, findings, discussion, conclusion, a list of references, and appendices. The introduction is devoted to theoretical issues of EMI implementation; it highlights the most well-known points of view on EMI. The literature review covers the most commonly accepted EMI models and certain drawbacks and challenges of EMI. In the methodology chapter a description of the overall research design, the population, sample, and instruments used is given. Findings present the data obtained within the survey and interviews among the students of the Department of Chemical Engineering, Kazakh-British technical university, on their experience in getting engineering education through EMI and how they see the development of the EMI educational process. The discussion consists of an analysis of data covered in the findings with a reflection on the modern concepts accepted and under discussion among EMI professionals. The conclusion sums up the research and contains practical recommendations on how to make instructions in EMI clearer.

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1.INTRODUCTION

English Medium Instruction (EMI), or English as a Medium of Instruction, is generally construed as “the use of the English language to teach academic subjects (other than English itself) in countries or jurisdictions in which the majority of the population’s first language is not English” (Macaro, 2022, p. 534). English is regarded here as a foreign language setting, but not as the object of instruction. The classroom learner in EMI is consequently faced with the dual problem of learning both the content and the language that encodes the material, and instruction consists of scaffolding both content comprehension and English language ability. Despite without mentioning English-taught university programs, this interpretation does utilize the term "EMI" in this dissertation to refer to a higher education setting.

EMI is spreading throughout higher education and has increased in areas where English has historically been considered a foreign language. Since 2000, there have been more than ten times as many EMI programs taught exclusively in English across Europe (Wächter, 2014). The use of EMI in higher education is a reflection of its internationalization, the spread of English as an academic lingua franca, the need to draw in foreign students by offering graduate programs in English (for example, in Denmark), and the need to better prepare graduates with the communication skills necessary in a globalized economy (for instance, in South Korea). According to a survey of 55 nations, English is presently the language of teaching at over 90% of private institutions and over 89% of public universities (Dearden, 2015).

Many questions have been raised by this phenomenon, the majority of which have not yet been fully answered (Dafouz, 2016). As EMI focuses mostly on content learning and not language learning, its impact on content understanding and learning is a crucially important topic (Cots, 2013; Greere, 2008). For example, one could speculate that EMI might result in lower subject competence because English as the medium of instruction may be less familiar to students than

their first language (L1), either because of poor comprehension skills or because teachers anticipate this problem and simplify content.

With this in mind, the importance of facilitating the educational process taking place through EMI goes without a doubt. In this work, I would like to draw attention to and find approaches how to make instructions in EMI clearer. To do so, it is, first, important to consider EMI models, predictable challenges, and, second, to research how the stakeholders see the ways of improving the process of acquiring new knowledge in EMI courses. Accepting students as the main stakeholders, it is worth noticing their beliefs when taking science degree programs through EMI (Jiang, 2019): getting a degree/diploma, passing exams, earning credits, reading specialized literature and seeking information, engaging in academic activities, presenting research at domestic and international conferences, engaging in research activities, writing papers, participating in international research projects, communicating with international scholars/researchers.

As a Chemistry teacher at the Kazakh-British technical university, I will use the opportunity to interview both the students and the professors of my university in order to clarify their vision on how to make instructions in EMI clearer.

2. LITERATURE REVIEW

In this review, the main models of EMI implementation are presented along with the certain drawbacks and challenges of EMI.

2.1 EMI models

The EMI models are considered here since the preparatory model acquired by the university authorities can play a vital role in the quality of the educational process. According to Macaro (2018) and Sahan (2021), there are four most popular models of EMI:

1) Preparatory Year Model.

Prior to permitting the students to enrol in an EMI course or program, they must complete a year or more of intense English language instruction. According to this concept, English language proficiency is a must for EMI. “Proficiency” here can be described as studying English for broad academic purposes (EAP) or directing English toward a particular subject area. This methodology can call for cooperation between English language professors and subject matter experts. This model is typical in Turkey, Oman or UAE where the intended audience is primarily domestic students. Benefits of using a Preparatory Year Model:

- This model prepares students effectively to use English as an academic lingua franca.
- It makes students more aware of using language as a medium of instruction
- It boosts their self-esteem as multilingual English users.

2) Pre-institutional Selection Model

Here students are pre-selected on the basis of their English proficiency to be enrolled in an EMI program or course. The basic premise of the model is that students will not require a lot of linguistic assistance while learning in the EMI and that teachers will not need to adjust their teaching to different proficiency levels.

This model is similar to what is accepted in the universities in Anglophone countries and common in mature EMI contexts (in the Netherlands and Northern European universities). For example, in order to be accepted into the Chemical Engineering program at Kazakh-British technical university, potential students must achieve a level of 5.0 on IELTS or 80 on TOEFL.

3) Institutional Concurrent Support Model

This model is predicated on the idea that pupils who have finished secondary school must have achieved a particular level of English proficiency and are thus prepared for EMI. Therefore, EMI is available to everybody who has finished their secondary education. Contrary to the Pre-institutional Selection Model, however, students may receive remedial EAP instruction here, necessitating an understanding of the students' linguistic needs on the part of the content teacher and, likewise, an understanding of how to meet the needs such as the need to learn the specific academic genre and the corresponding language, on the part of the English language teacher.

Students may enroll on ESP or EAP course designed by a language teacher who is familiar with the language requirements of content subjects and with academic genres. This model is in use in institutions with high proficiency in EMI but with many students who need language support (USA and GB universities with a high load of Asian students).

4) Multilingual Model

This model provides essential freedom in how English is used to teach a subject's content. It can be considered as a compromise: it is permitted to switch up the language of instruction, whether it be English or another language, both within and between sessions. It is possible to organize teaching in a bilingual way initially to force students to transit to EMI (this approach is only possible if all the students speak the same L1, e.g., in Chinese universities). This alternative model of EMI was offered in Dafouz's (2018) EMEMUS (English-Medium Education in

Multilingual University Settings). The approach was defined by Richards and Pun (2022) as translanguaging or code-switching. Translanguaging "is now a household name in international conferences, symposia, summer schools, and the central topic of highly cited publications" (Jaspers, 2018). When a speaker moves between two different linguistic codes, this is referred to as "code-switching." According to the theory of translanguaging, the speaker uses a single linguistic code that combines elements of two or more languages. Two opposing perspectives on the use of code-switching in language schools as it has traditionally been regarded are described by Chen (2015). Supporters view it as a legitimate tactic to employ in a bilingual setting and one that fosters a positive learning environment in the classroom. However, critics claim that it prevents people from learning a second language.

In his other paper, Macaro (2020) presents an alternative way of classifying EMI models making a decent distinction between "hard-core EMI" and "soft EMI." The 'hard-core' EMI refers to 'policy-driven' choices on the subjects that can be taught in L1 - physics, math, engineering, geology, etc. On the other hand, soft-EMI is "language led." For example, Applied Linguistics, TESOL, International Business, and Translation Studies are language-led academic subjects. It is logical that soft-EMIs should be simpler to implement than hard-EMIs. Hard-EMIs, which are usually mandated by national or institutional guidelines, would necessitate a stronger connection between content and foreign language teaching or a stronger partnership between content providers and language teachers.

Sahan (2021) has collected data using 85 classroom observations and interviewing 21 engineering lecturers at 7 Turkish universities. As a result, she made an insight into the interconnection between language use and classroom interaction. Sahan identifies four variations of EMI implementation (Figure 1):

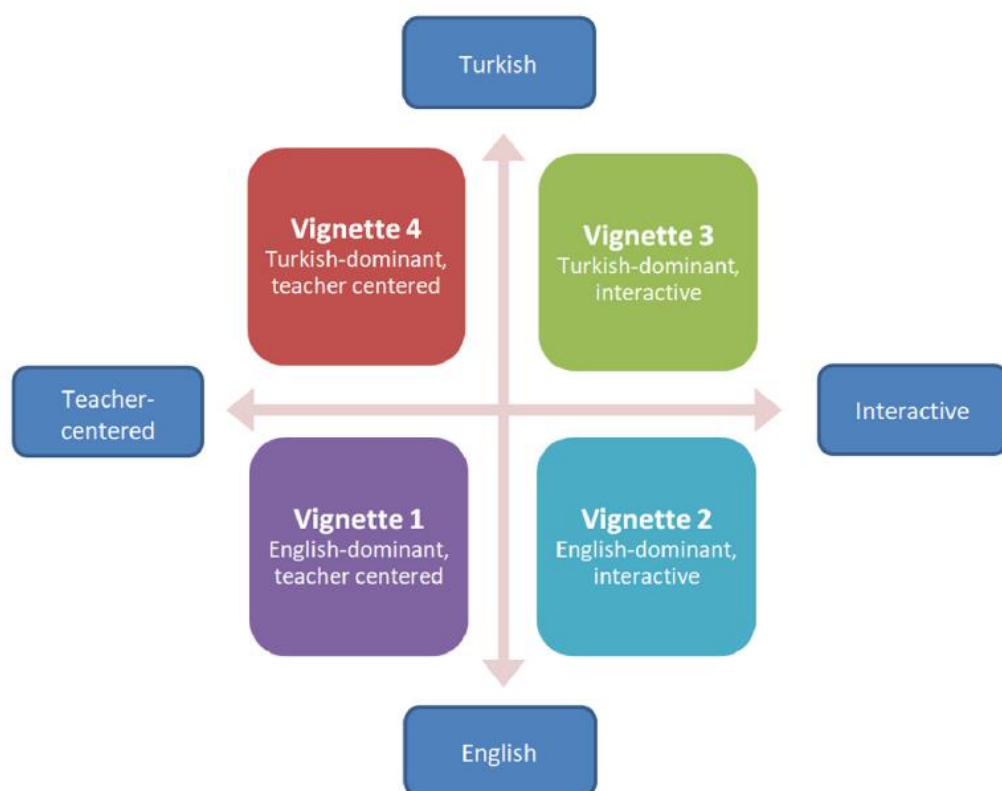


Figure 1. Variations of EMI implementation (retrieved from Sahan (2021))

1) Vignette 1: English-dominant, teacher-centered.

Most of the EMI lessons that were observed were English-dominant teacher-centered lectures. In other words, the majority of the lecture in these classes was in English, with teacher talk making up the majority of speaker time. They were distinguished by comparatively little L1 use and teacher-student interaction. At six of the seven universities, this kind of methodology was used to teach EMI classes. These classrooms used an average of 78.8% English and an average of 5.80% Turkish, including occasional codeswitching, compared to an overall average of 56.4% English and 23.5% Turkish, respectively. Student participation came about in both the L1 and the L2, but, during these classes, teachers typically responded in the L2.

2) Vignette 2: English-dominant, interactive.

This category contains language classes that were mostly conducted in English and where there was a sizable amount of teacher-student interaction

(30.2%, compared to an overall average of 11.7% in Vignette 1). Average class time was 50.1% taken up by teacher-talk, which was almost entirely in English (97.9%). An average of 68.0% of people spoke English, which was slightly less than in Vignette 1. However, compared to 49.0% of interaction and 25.0% of student discourse for Vignette 1, 70.7% of teacher-student interaction and 38.2% of student talk took place in the L2. In interviews, the teachers described how they tried to scaffold language and material in order to promote student engagement in the lessons. With this strategy, they were able to manage the students' limited English skills while ensuring that they were paying attention to the class. Practically, that meant that lecturers employed strategies to create opportunities for the students to participate in class in English.

3) Vignette 3: L1-dominant, interactive.

EMI classes that were moderately interactive and predominantly taught in Turkish fell into a third type. The majority of the time, the language practices in the classroom were characterized by higher levels of teacher-student interaction (36.5%, compared to an overall average of 20.7%) and higher average proportions of L1 use, particularly Turkish with English technical terminology (71.9%, compared to an overall average of 23.5%). The instructors in this group stated in interviews that they were departing from established university policy and that their lectures belong to EMI courses just on paper. However, they claimed that they were lecturing (mainly) in Turkish for the students' benefit because they were unable to participate in the course material in English due to their limited English skills. In these classes, students rarely asked complex question chains or requested content clarification both in L1 and L2. While limiting the level of complexity in student work, this pedagogical strategy promoted student engagement and gave the teacher a way to check that they were learning the material while maintaining English as the medium of instruction.

4) Vignette 4: L1-dominant, teacher-centered

The fourth EMI lecture type was L1-dominant and teacher-centered. L1 was used on average 66.2% of the class time, while the overall average was 15.4%. The students did not record any English expressions as complete sentences or extended sentences. Teacher-student interaction accounted for an average of 15.5% of the class time, which is less than the average (20.66%) and the average of other classes with Turkish language (36.5%). Students rarely answered complex questions in these classes. Instead, the students listened to the lecture mainly in Turkish and briefly answered the questions asked by the lecturer.

In conclusion, it should be mentioned that pedagogical awareness of various ways of conducting EMI lessons should be further studied and raised through professional development programs.

2.2 Certain drawbacks and challenges of EMI

The drawbacks and challenges of EMI implementation are considered here to emphasize the main points of improving an educational process to succeed in reaching its main goals.

The following are listed by Smith (2004) as reasons against EMI implementation:

- 1) poor language proficiency and the necessity for local staff and students to receive training
- 2) local staff's resistance to teaching in English
- 3) insufficient proficiency of incoming international students in the host language
- 4) problems with organization and administrative infrastructure
- 5) consistency and availability of teaching materials

Belhiah (2015) also points out that the spread of English is sometimes seen as a threat not only to local mother languages but also to local religions, values, principles and centuries-old traditions.

However, the importance of English in science and business is widely recognized. Similarly, Breidbach (2003) rhetorically questions whether English in higher education is really “the academic lingua franca” or “the lingua franca trap”. The absence of general homogeneity is also a drawback in EMI implementation as if the system were still under experimental development and did not acquire the requisite national and international backup policies and quality monitoring.

Translanguaging among students with the same L1 may be practised in international EMI classes where the majority of the students, but not all, speak the same language as the teacher, excluding foreign students who are not proficient in the local tongue, as is the case with some Swedish EMI programs (Kuteeva, 2020). According to Chen (2015), instructors generally use a bilingual method of communication for explanatory objectives, but they also perform socializing and management tasks. For instance: establish rapport with students, improve classroom management, fill in vocabulary knowledge gaps, explain and clarify instructions, reinforce new information by repeating it in the L1, summarize parts of the lesson, explain new concepts and terms, and increase learner motivation.

Doiz (2013) lists several obstacles to EMI adoption, including carefully developing postsecondary English-taught courses, professors who are qualified both in language and content, and enrolling students who have the necessary English ability. There is also very little data on how effective content learning is and whether the breadth and depth of this information would be the same if the course were provided in the learners' native language (L1), even in settings where the aforementioned challenges are appropriately addressed.

There is a discussion among EMI experts about students' English ability with regard to learning and understanding content. Wächter (2014) describes critical views towards EMI programs in higher education, claiming they lower the quality of the education provided, and even suggesting that students who did not understand English were taught by staff who were unable to speak & write the language properly. The intensity of these conversations contrasted strikingly with the extremely limited quantity of empirical data that was available on the subject.

Offering EMI programs and courses in non-English environments results in the low quality of the instruction offered by faculty members whose knowledge of English may be just rudimentary or whose ability to teach in the language is restricted. This low-quality instruction, combined with restricted English comprehension on the part of many non-Anglophone international and local students, creates an environment where a lack of actual learning is taking place (Altbach, 2019).

But it seems reasonable to elucidate whether students with poor English actually struggle to understand important concepts in class and whether this will cause them to only partially absorb the course material. The difficulties students may face are often underestimated, assuming that the general English skills they acquire in high school will be sufficient for them to learn through the IME or for them to easily solve problems arising in the context of several proficiency courses. Sert (2008), researching the efficiency of EMI at Turkish universities, argued that EMI is helpful for the development of language skills but ineffective for the learning of content. In a detailed study of EMI implementation at Al-Farabi Kazakh National University, Seitzhanova (2015) makes the following observation: “most students, though their understanding of lectures was not high, agreed that instruction in English helped them to improve their English proficiency.”

Research performed by Airey (2011) emphasizes that inadequate reading skills lead to a more superficial understanding of the text. Problems with taking notes while listening and difficulties with understanding the meaning of terms are also noted. On the other hand, Shaw (2008) suggests that Swedish students read biology textbooks in English as well as English students do if they have more time.

Evans (2011) indicates the lack of interaction inside EMI classes. Students take notes but ask very few questions and prefer to do it after class or during the break. The reason could be their lack of confidence in English skills, students afraid to speak English in front of their friends, or they can experience a lack of knowledge about the subject. Painting a more optimistic picture, Belhiah (2015) suggests that more than 50% of EMI students feel comfortable interacting in

English. However, the same study found that only a third of professors agreed that students felt comfortable asking and answering questions in class.

Another relevant factor to consider is class size: the reduced number of students will improve communication and interaction. Byun et al. (2011) state that a large class makes it impossible for teachers to meet the learning needs of their students, limits their ability to give individual feedback, and limits student participation, thereby causing them to lose out ability to improve both English and content.

In conclusion, it should be stated that understanding and internalizing the concepts, schemata, and knowledge that serve as the conceptual underpinning of various academic subjects in the university curriculum is essential to learning through EMI. It is also important to learn how to apply English to scaffold the literacy and thinking processes that a discipline requires.

3. METHODOLOGY

This chapter focuses on the methodology of the study. It describes the methodology used to conduct the study and explains why each research design is used in the study. This chapter begins by describing the overall research design, the population and the sample, and introduces the instruments. Finally, it describes how the data are collected and gives an analysis of the collected data.

3.1 Research methodology

This study uses both quantitative and qualitative methods, also known as the mixed methods approach. Quantitative data relies on structured, closed-ended questionnaires to find answers to research questions, whereas qualitative data relies on open-ended, semi-structured questionnaires to conduct interviews. To obtain reliable data, these data collection techniques were used to answer our research questions with sufficient evidence and confidence.

3.2 Population and sample

The participants in this study were the students at the Kazakh-British Technical University in Almaty, Kazakhstan. The sample for this study consisted of 81 people. Students are selected from the general undergraduate population and are mixed gender. The students were from the Department of Chemical Engineering, who took classes in Organic chemistry and Physical chemistry in English. The sampling technique used in this study was simple random sampling. In simple random sampling, each sample has the same probability of being selected. According to Horton (2019), a randomly selected sample helps reduce potential bias in data collection.

3.3 Instrumentation: survey questionnaire

The questionnaire survey was elaborated by the author of this dissertation for the students of the Department of Chemical Engineering studying through EMI

and includes 10 items that were adapted into this study. The questionnaire consists of 2 parts: background information about the student, and their reflection on the statements using a scale ranging from 1-4 to measure the extent they agree/disagree according to the following variants: (1) strongly disagree, (2) disagree, (3) agree, (4) strongly agree.

3.4 Instrumentation: semi-structured interview

To get in-depth responses from the participants, a secondary tool was a semi-structured interview with open-ended questions. Utilizing this strategy has the significant benefit of lowering the subjectivity and bias of the research. The interview questions were created to delve into the difficulties that the students had when using EMI in the classroom. The interview also includes a few generic questions, but only for the sake of explanation and clarification. In order to perform this research, a semi-structured interview with open-ended questions was employed.

3.5 Data collection: survey

A survey research design is used in quantitative research to collect data. Ten questions in all were addressed to the students. The poll was broken into two sections and contained open-ended questions. The participants' demographic data were included in the first section. The questions about EMI in the classroom made up the second section. A Likert scale was employed to provide respondents with a variety of options and to give the researcher a more precise indication of how liberal the responses were. The researcher would also get an opportunity to view the data they had gathered from various angles. The survey's four response options, which ranged from 1 (strongly disagree) to 4 (strongly agree), were presented to the participants. The 81 participants were provided with the survey questionnaire through Google Forms, and they were invited to complete it. Their participation was optional, and it was made clear that the only reason for which their responses

would be used was educational. Out of respect for the participants' privacy, the background information has been kept private.

3.6 Data collection: interview

To comprehend the students' problems in relation to the research problem, a semi-structured interview was used for the qualitative research. The interviewee must provide direct answers to the questions that are provided in a systematic manner in this form of interview. The study's interview questions demand a thorough answer from the students regarding the difficulties associated with implementing EMI in the classroom. Three students were chosen at random from the study population to be interviewed. The interview took place in person. Each student was given identical questions in order to ensure the consistency of the research's findings. Although the interviewee is permitted to talk and negotiate during the interview, the interviewer does have some control over the process. This makes it possible to glean more detailed information from the interview's discourse. The researcher paid close attention to the participant's comments throughout the interview. The interview sessions were taped with the participants' permission in order to support the data the researchers had collected.

3.7 Quantitative data analysis

The quantitative data were analyzed by the researcher using descriptive analysis. The overall trends in the data are summarized by descriptive statistics, which also explains the range of scores and sheds light on the score that seems to be the highest. Statistics and calculations of numerical values, such as frequencies, mean values, and standard deviations, were used to analyze the data. The researcher in this study took a few actions to get the data from the questionnaire that the participants answered: the researcher first creates the questionnaire, the responders are then given the questionnaires, and the responses are then gathered in a third step. The replies' outcomes are then computed. The data are then examined and summarized.

3.8 Qualitative data analysis

To collect qualitative data, interview transcripts were analyzed using a six-step thematic analysis proposed by Braun (2016). To become familiar with the data, first, transcripts were carefully read (that were first transcribed from the audio). Initial code was then generated to develop the theme using Vivo coding. Patterns and themes in codes across the different interviews were then identified by noting similarities between participants' responses. Next, previously identified themes were considered. Each topic was then named and defined accordingly. Finally, the results are developed and presented in a study.

4. FINDINGS

This chapter introduces the main research findings of the dissertation as demographic information (age, gender, mother tongue, year of education, IELTS score), answers to the survey and interview questions.

4.1 Demographic information

Part 1 of the survey is devoted to demographic information of the participants, it includes gender, age, mother tongue, year of getting a degree course, IELTS score, and covers 128 participants. The survey was distributed among the students of the Department of Chemical Engineering, Kazakh-British technical university (KBTU), 32% of them were from the first year of education, 22% - from the second, 22% - from the third, and 24% - from the fourth year. The student's age was mostly between 17 and 21 years old (96%), 62% of them - female participants. 69% of the participants stated Kazakh as their mother tongue, 9% - Russian, 21% denoted themselves as bilingual, Kazakh and Russian (nearly 100% of the students are actually bilingual, they know Russian at a very high level, but in term of belonging to the mother tongue only 21% could not choose which of these two languages they know better), less than 2% stated that their mother tongue is other than Kazakh or Russian. The IELTS score threshold to enter the degree course is 5.5, but within the entrance process, students also could take KBTU's test on English proficiency. 11% reported they have that level of English, 31% reported their score is 6.0-6.5, 14% reported their score is 7.0 or higher, and 44% passed the KBTU's entrance examination test.

4.2 The survey regarding EMI

Part 2 of the survey is devoted to the difficulties the students experience in EMI. It consists of 10 questions addressed to the students of the Department of Chemical Engineering KBTU and uses a scale (questions 1-8) to measure the extent they agree/disagree with a statement regarding EMI ranging from 1-4

(Likert 4-point scale), question 9 required to make a choice between 4 answers (which do not belong to Likert scale). The last 10th question is open-ended and let the students explain their opinion about difficulties with EMI in their own words.

Question 1: “Do you agree with the statement: the teacher’s English language proficiency influences the level of my understanding of lectures/tutorials/labs?” (Figure 2).

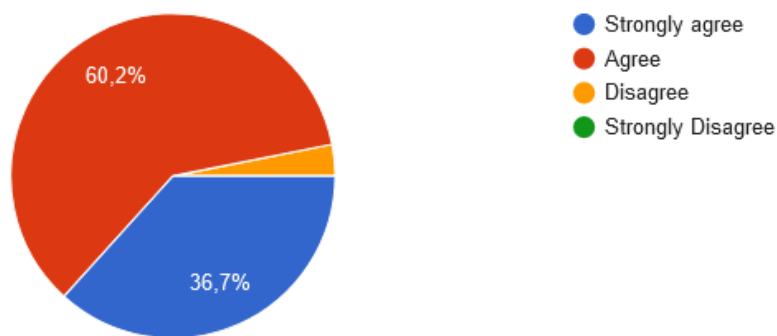


Figure 2. The diagram of the distribution of answers to Question 1 of the survey.

Answering this question 60% of participants mentioned: “agree” and 37%: “strongly agree”.

Question 2: “Do you agree with the statement: my own English language proficiency influences the level of my understanding of lectures/tutorials/labs?” (Figure 3).

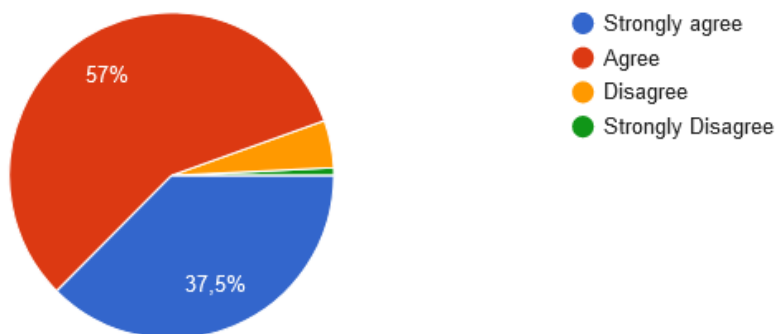


Figure 3. The diagram of the distribution of answers to Question 2 of the survey.

Answering this question 57% of participants mentioned: “agree” and 38%: “strongly agree”.

Question 3: “Do you agree with the statement: if the teacher speaks slower, I would understand lectures/tutorials/labs much better?” (Figure 4).

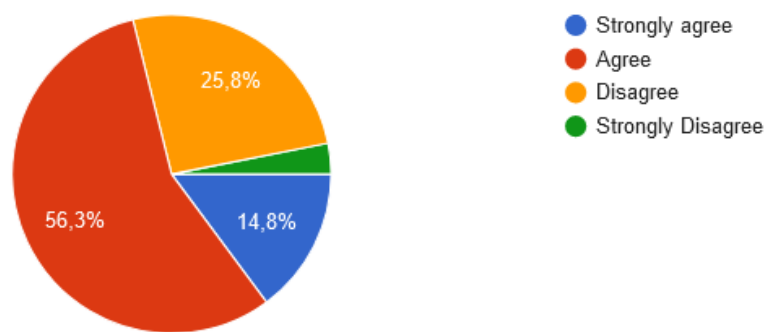


Figure 4. The diagram of the distribution of answers to Question 3 of the survey.

Answering this question 56% of participants mentioned: “agree” and 26%: “strongly agree”. Compared to answers to the other questions, the fraction of negative answers here was higher: 26% answered “disagree” and 3% - “strongly disagree”

Question 4: “Do you agree with the statement: if the teacher introduces the specific vocabulary before starting the course I would understand lectures/tutorials/labs much better?” (Figure 5).

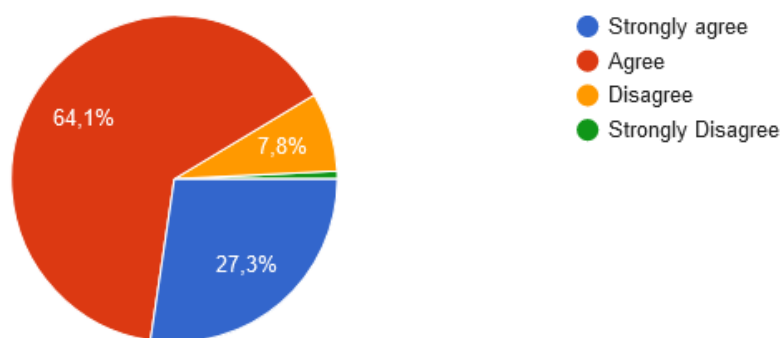


Figure 5. The diagram of the distribution of answers to Question 4 of the survey.

More than 91% of the participants answered “agree” and “strongly agree”.

Question 5: "Do you agree with the statement: I would definitely benefit from taking an introductory language course "English for chemical engineers" in the first year of education?" (Figure 6).

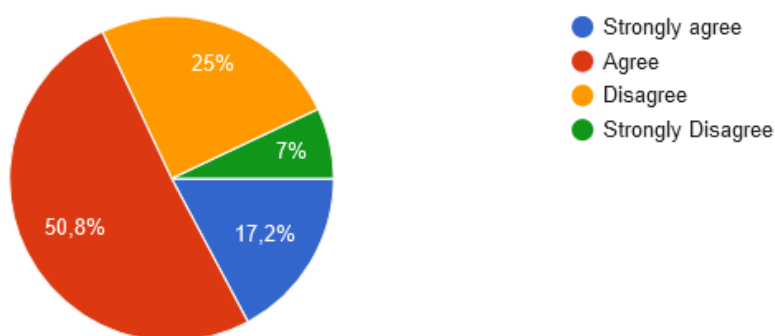


Figure 6. The diagram of the distribution of answers to Question 5 of the survey.

Two-thirds (51% - “agree” and 17% - “strongly agree”) of the participants think they would benefit from such kind of EAP course, even so, about one-third of the participants were against this idea (25% - “disagree” and 7% - “strongly disagree”)

Question 6: “Do you agree with the statement: I would definitely benefit if the teacher uses Kazakh/Russian language along with English to explain some specific concepts related to the course?” (Figure 7).

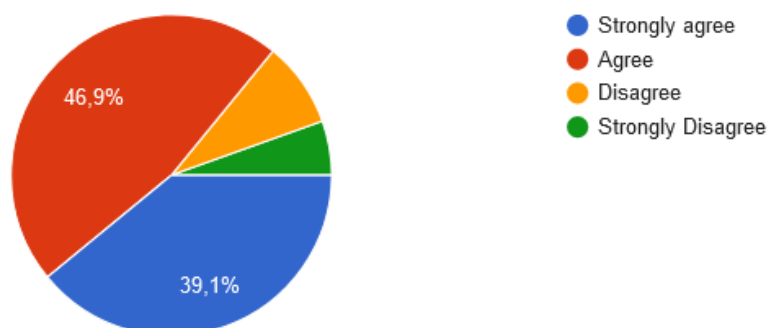


Figure 7. The diagram of the distribution of answers to Question 6 of the survey.

86% of the participants prefer their teacher to use L1 for the explanation of some complex issues (39% - “strongly agree” and 47% - “agree”).

Question 7: “Do you agree with the statement: I would definitely benefit if the teacher used visual aids like short YouTube videos with native speakers explaining some concepts from the lecture/tutorial?” (Figure 8).

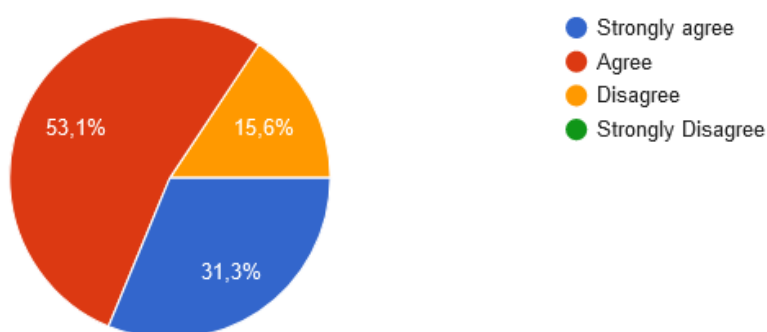


Figure 8. The diagram of the distribution of answers to Question 7 of the survey.

31% strongly agreed that the inclusion of short YouTube videos with native speakers explaining some concepts is beneficial for understanding lectures/tutorials.

Question 8: "Do you agree with the statement: within the tests, a teacher should use only multiple-choice questions (without open-ended questions) so that I can better show my knowledge?" (Figure 9).

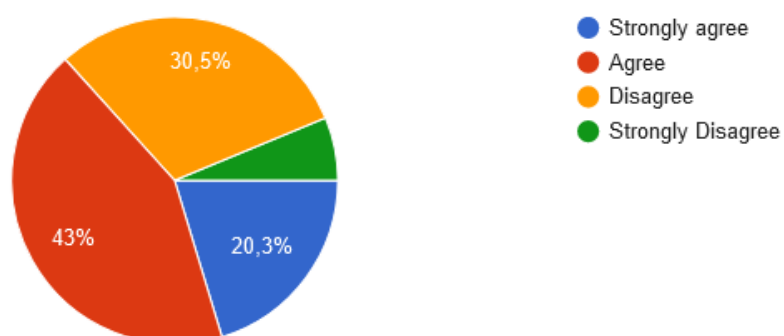


Figure 9. The diagram of the distribution of answers to Question 8 of the survey.

63% of participants agreed and strongly agreed with limiting the tests to only multiple-choice questions, even so, the number of those who disagreed was higher than in the other answers (31% - “disagree” and 6% - “strongly disagree”).

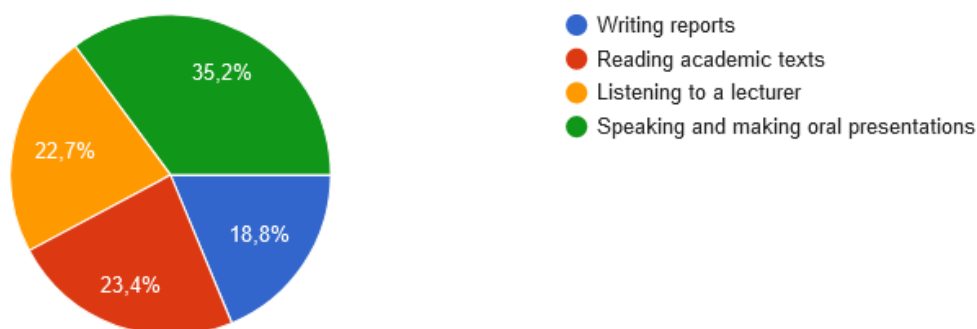
Table 1. The students' opinions on how to make instructions in EMI clearer based on the survey (statements/questions 1-8) among 128 students.

| N | Statement/question | SA | A | DA | SDA | Mean | SD |
|---|---|-------------|-------------|-------------|----------------------|------|-----|
| 1 | The teacher's English language proficiency influences the level of my understanding lectures/tutorials/labs | 47 (37%) | 77 (60%) | 4 (3%) | 0 (0%) | 3.3 | 0.3 |
| 2 | My own English language proficiency influences the level of my understanding lectures/tutorials/labs | 48 (38%) | 73 (57%) | 6 (5%) | 1 (less than 1 %) | 3.3 | 0.4 |
| 3 | If the teacher speaks slower I would | 19 (15%) | 73 (56%) | 33 (26%) | 4 (3%) | 2.9 | 0.5 |

| | | | | | | | |
|---|--|-------------|-------------|-------------|----------------------|-----|-----|
| | understand lectures/tutorials/labs much better | | | | | | |
| 4 | If the teacher introduces the specific vocabulary before starting the course I would understand lectures/tutorials/labs much better | 35 (27%) | 82 (64%) | 10 (8%) | 1 (less than 1 %) | 3.2 | 0.4 |
| 5 | I would definitely benefit from taking an introductory language course “English for chemical engineers” in the first year of education | 22 (17%) | 65 (51%) | 32 (25%) | 9 (7%) | 2.8 | 0.7 |
| 6 | I would definitely benefit if the teacher uses Kazakh/Russian language along with English to explain some specific concepts related to the course | 50 (39%) | 60 (47%) | 11 (9%) | 7 (5%) | 3.2 | 0.7 |
| 7 | I would definitely benefit if the teacher used visual aids like short YouTube videos with native speakers explaining some concepts from the lecture/tutorial | 40 (31%) | 68 (53%) | 20 (16%) | 0 (0%) | 3.2 | 0.5 |
| 8 | Within the tests, a teacher should use only multiple-choice questions (without open-ended questions) so that I can better show my knowledge | 26 (20%) | 55 (43%) | 39 (31%) | 8 (6%) | 2.8 | 0.7 |

Question 9: “Within the English medium instruction the most difficulties I experience in... writing reports; reading academic tests; listening to a teacher; speaking and making oral presentations” (Figure 10).

Figure 10. The diagram of the distribution of answers to Question 9 of the survey.



35% mentioned Speaking as the most difficult skill.

Table 2. The students' opinions, based on the survey (statement/question 9), about the English language skill they experience the most difficulty with.

| Statement/question | writing reports | reading academic tests | listening to a teacher | speaking and making oral presentations |
|--|-----------------|------------------------|------------------------|--|
| Within the English medium instruction the most difficulties I experience in... writing reports; reading academic tests; listening to a teacher; speaking and making oral presentations | 19% | 23% | 23% | 35% |

Question 10: “What can be helpful in getting better results when studying engineering courses in English? Give your advice on the improvement of the educational process. What would you like to change?”

Table 3. The most frequent students’ answers to the open-ended question (question 10 of the survey): “What can be helpful in getting better results when studying engineering courses in English? Give your advice on the improvement of the educational process. What would you like to change? (spelling preserved)”.

| N | Answer |
|---|---|
| 1 | Noting/I don’t know/no ideas/everything is OK |
| 2 | I would like teachers to explain the meaning of specific key words or terms which describe topics. |
| 3 | Kinda, some teachers has really strong accent, when u are hearing it, u would miss 50% of information, bcs u don't understand accent, |

| | |
|---|---|
| | especially some midasian accent |
| 4 | More additional information in video type or to make recordings of the lessons |
| 5 | So, I recommend you to exclude basic english course for freshmen from the curriculum and add english for chemical engineering instead |
| 6 | Teachers should give specific vocabulary list at the beginning of the course, tests should be multiple choice |

4.3 Interviews

Within the interviews, all the 3 participants reported problems that arose while listening to the lectures. Based on the survey results, the participants interviewed found it difficult to understand the lectures, mainly because they had never done academic listening before. The reason may be that the students learned English mostly for the purpose of passing exams, so their English knowledge and skills were not sufficient to cope with the use of EMI in the classroom. “In many schools, chemistry was not studied in English”, “Many of us did not graduate from English schools, so it is unusual for us to study specialized subjects in English, since we are not familiar with many terms, which makes it more difficult to understand this or that discipline.”

Furthermore, the interviewees added that some improvements could be made in the use of EMI to address the challenges. These improvements include the use of visual aids and code-switching to facilitate the teaching and learning process for students, especially those with lower English proficiency: “I think teachers can also use code-switching using both English and L1 to help students understand more difficult concepts, or to create visual aids that students can look at. That would help to understand the topic more deeply” and “When teachers use EMI in the classroom, I think they need the opportunity to integrate the lesson with some visual elements or graphic presentations they want to show”.

5. DISCUSSION

In this chapter, the analysis of data presented in Findings is done to get practical recommendations on how to improve the situation with the educational process in EMI.

Research question: How to make instructions in EMI clearer?

The participants who were surveyed criticized EMI for its difficulty and challenges, which was predictable. Floris (2014) asserted that those students who come from non-English medium institutions are most likely to feel unfamiliar with the concepts learned, as they have to experience the sudden change of the medium of instruction in learning. To facilitate an understanding of how to improve the situation, the survey and interviews described above were created.

Questions 1 and 2, as well as the open-ended question 10 of the survey, were about how the teacher's and student's English language proficiency influences the level of understanding lectures/tutorials/labs. The participants stated that they had trouble comprehending the lesson, mainly because of the teacher and their own low English proficiency. In the sum ("strongly agree" plus "agree") the students marked that the teacher's language proficiency (97%) and their own language proficiency (95%) influence the comprehension in class.

According to assessments like the IELTS or in light of the levels outlined in the Common European Framework of Reference, EMI teachers may be required in some institutions to demonstrate an upper intermediate or advanced level of English. The CEFR is a six-point scale used internationally to describe language proficiency. It ranges from A1 for language beginners to C2 for language mastery at the advanced level. Students are also often asked to provide an IELTS certificate before entering a university (Brown, 2017) or any other evidence to refer to a level on the CEFR.

The argument against relying only on IELTS or CEFR is that EMI calls for specialized language abilities that differ from those included in the CEFR, such as command of subject-specific and metalinguistic terminology and the discourse competence necessary for efficient disciplinary material delivery in the classroom. The term "Cognitive Academic Language Proficiency" (CALP), coined by Cummins (1991), refers to the cognitive and linguistic abilities that serve as the foundation for competence in the academic subject and tasks of a discipline. Learning to comprehend and speak the specialized forms of English that are used in EMI classes is necessary for developing CALP.

To enhance CALP, students may need some introductory language support. Before students start making the shift to EMI, it makes sense to offer language support to help them get ready. Prior starting EMI, students may be needed to take a bridging course to advance their English proficiency from the level they would have attained in secondary school to one that will allow them to enrol in EMI courses at the university level. As an alternative, a brief, intensive pre-university course that serves as a pre-sessional "booster" and strengthens the learners' mastery of academic terminology and skills may be necessary before students begin EMI tertiary courses. Pre-sessional EAP makes the supposition that a minimum level of English ability is required in order to facilitate learning through EMI.

Stressing the importance of a bridging program, Baker (1998) noted that "the more demanding the curriculum area, the higher level of learning expected, and the later switch to learning through a second language, the more important it is to provide bridging programs". But what exactly does this degree of competence entail? According to Aizawa (2020), "Little to no research has established whether there are linguistic thresholds after which English language proficiency stops being a substantial barrier to their academic performance and perceptions of ease towards EMI study". The specifics of this barrier rely on the students' prior understanding of the subject, their motivation, the language requirements of the discipline, and other elements.

In terms of teachers' language proficiency, the main problem is that subject teachers using EMI usually have a strong background in their major subjects but no additional training in teaching through EMI. The experience of teaching using EMI may encourage the instructor to reconsider the nature of their professional identity as a teacher and to emphasize different aspects of it in the EMI environment than they would in a class that does not use EMI. More "identity work" may be required to help the teacher realize the sense of academic authority they have when teaching in their mother tongue, and to be accepted by their students as accomplished university lecturers due to the unique nature and dynamics of an EMI class, particularly an international class. As an example, when teaching in their first language, a sustainability specialist may be able to explain the principles of a complicated adaptive system using L1; yet, he/she may feel constrained when attempting to do so in English due to the lack of English language proficiency.

The teachers' proficiency in using EMI can be enhanced through the yearly-performed workshops where it would be possible to accept some approaches from experienced colleagues. The other solution is regular sabbatical leaves (even so, not very popular practice in former Soviet Union countries) during which employees been still employed have an opportunity to teach and to do research in anglophone universities.

Question 3 was about the teacher's temp of speech. 71% of the participants answered "strongly agree" and "agree". Taking into account that most of the teachers in KBTU have Kazakh or Russian as L1, it is hard to suppose their temp of speech is too high and influences comprehension (their accent can influence comprehension, and it was mentioned in some of the answers to the open-ended question 10). Probably, the students experienced problems when were exposed to the native speakers' lectures or YouTube short explanatory videos.

Even so, it is not possible to exclude the individual features of the teacher-talk mode of speaking: some of the teachers speak fast with few pauses, while others generally have a much slower speaking rate. Often lectures are not even aware of their typical speaking features (temp of speech, hesitations, plenty of

ongoing self-corrections, incomplete sentences) which might make the students disorganized. Watching a video or listening to an audio recording of a typical lesson can be an asset in improving the situation.

Question 4 supposes an introduction of a specific vocabulary before the course. This idea was warmly welcomed by the survey participants, 91% of them answered “agree” or “strongly agree” and the comments to the open-ended question 10 as well as the results of interviews support it.

Academic language is saturated with specialized terms and words. The situation looks harder for the first-year students (among them, 100% supported the idea of introducing a glossary before the course). The difficulty that students in the UAE faced with Maths and IT texts was discussed by Bielenberg (2004). The simplified English texts used in schools were the only ones that students were familiar with. The language they studied at school or that they encountered in an EMI preparatory course is often recognized by EMI students themselves as significantly different from academic English. The presence of Latin and Greek words and the more complex syntax in the texts caused students to face challenges since the demands of academic language were not met by their previous experience of English.

The situation with some words becomes more complex when the word moves from general English to EAP. For example, in scientific discourse, the word "concentration" has a distinct meaning than when it is used in a more general register. In this context, it refers to the quantity of a specific material, whereas in a more common language, it denotes the capacity for focusing on something.

Vocabulary knowledge in tertiary studies is often not sufficient for even English majors. According to a study of college students' vocabulary development in Chinese universities (Yi, 2007), English majors' vocabulary increased by 3000 words during their first two years of study, in the opposite, in the last two years of study, student's vocabulary increased by only 500 words, so that newcomers should accept a quite huge number of new terms and words.

This problem was partially solved for the Chemistry-related courses at the Department of Chemical Engineering, KBTU, by publishing an illustrated English-Russian glossary (Zazybin, 2019) which we are going to expand to English-Russian-Kazakh glossary in the future (Figure 11).

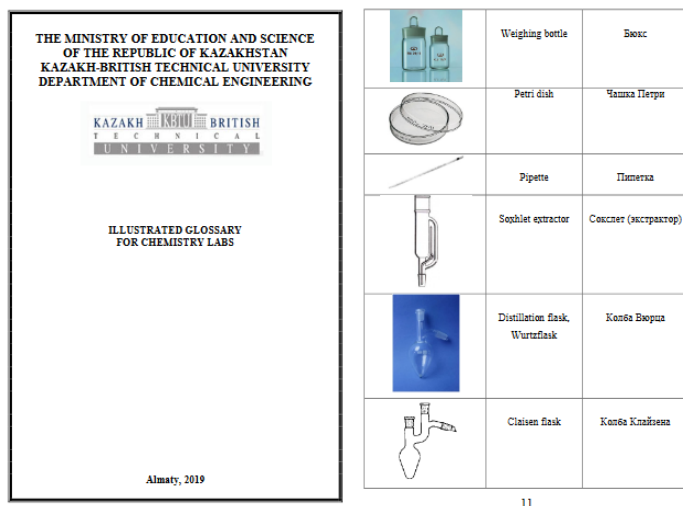


Figure 11. Illustrated glossary for chemistry labs.

Question 5 was about taking an introductory language course “English for chemical engineers” in the first year of education. This idea was welcomed by 68% of respondents (those, who have chosen “agree” plus those, who have chosen “strongly agree”). This course is supposed to be a combination of a preparatory course, intended to prepare learners for EMI by enhancing the reading skills they need to comprehend course materials and academic texts in English, listening skills for understanding explanatory videos and lectures, writing skills used for essay writing and note-taking, and speaking skills for asking questions and making presentations, and some version of ESP course, to introduce students to chemistry-related academic vocabulary and abstract concepts they may come across in textbooks and research papers. Some specific features typical for academic English grammar and syntax can also be introduced: nominalization, use of subordinate clauses, passive verbs, etc.

In 2023 the course “English for chemical engineers” was introduced at the Department of Chemical Engineering, KBTU, taught by a native speaker, so the productivity of this approach will be assessed later on.

Question 6 was about using L1 by the teacher along with English to explain some specific concepts related to the course. 86% of the participants marked they “agree” and “strongly agree” that adding such a course to the educational program for chemical engineer majors would be beneficial for increasing comprehension in EMI, even so, when answering the open-ended question 10, some of the participants stated they would prefer L1 not to be used within the classes (mostly, it derived from the third- and fourth-year students). Soruc (2018) advises using L1 as strategic support, not only orally within the lectures to explain the most complex concepts, but also at home by using L1 reference book to support lectures’ comprehension and to fill in the gaps in understanding.

Supporters of translanguaging and code-switching believe that when used strategically, it can be considered both a teaching strategy and a pedagogical resource, clarifying academic content and initiating greater levels of students’ involvement in the educational process. It is capable of facilitating the dialogic mode of instruction and allowing students to plan and think in their L1 before answering in English. However, critics of L1 application in EMI point out that it is frequently used arbitrarily, without any sound pedagogical justification, and while it may offer an effective shortcut to comprehension, there is no conclusive proof that it aids EMI learners in achieving the second goal of EMI - learning English.

Different EMI professors give different accounts of how they use L1 when teaching EMI. Simbolon (2017) discovered that teachers mostly employed Indonesian (L1) to enhance subject learning in EMI lessons in Indonesia, but English was used more frequently for other components of a lesson such as lesson summaries. Similar findings were made by Paulsrud (2014) in a study of the usage of L1 and L2 in secondary schools in Sweden, where Swedish was more frequently used for individual instruction and English for whole-class instruction.

In regard to this question of the survey, the author of this **dissertation** can add the information obtained from the online MOOC course “English for teaching purposes” provided by Coursera, which he passed in 2016, where professors Silvia Solá Viñals (2016) and Jose Ygoa-Bayer from the Universitat Autònoma de Barcelona insists on using L1 in EMI classes if it facilitates comprehension.

Question 7 was about supporting lectures with visual aids like short YouTube videos. Most of the participants positively reacted to this statement – in sum, 84% marked “agree” and “strongly agree”. Tran (2022) conducted research on using short YouTube videos in class and stated that videos appeared to be a conduit that inspired students' engagement. Therefore, the findings on using short videos should be made available to the EMI lecturers in order for them to utilize the advantages of this technology instrument to create the most engaging and effective courses. Additionally, Bajrami (2016) found that when choosing video content for the classroom, topics must be chosen based on students' interests, their level of English proficiency, as well as cultural aspects. If the video clip does not contain any amusing features, the novelty of the topic is crucial for students' engagement and attention.

In chemical engineering classes the advantage of using short explanatory videos with native speakers from the forefront technical universities helps both to acknowledge students with the correct pronunciation of engineering terms and concepts and to focus their attention on the material studied just before together with the EMI lecturer.

Question 8 was the most provocative one and suggested getting rid of open-ended questions within the tests and using only multiple-choice questions. It was the lowest amount of the participants who answered "agree" and "strongly agree" (63% in sum) among all the questions surveyed. Interestingly, the percentage of respondents among students in the third and fourth years of education who answered positively was even lower, 42%. The author of this dissertation uses in his EMI practice both multiple-choice and open-ended questions since the first requires less time to check (which is important for large-scale classes) and to give

feedback, while the second helps to check students' knowledge better and provides students with an opportunity to show their erudition.

In support of the student's opinion, Pun (2022) points out that in EMI teachers might need to modify the linguistic requirements of assignments. For instance, they might decide to use multiple-choice questions in tests rather than open-ended or essay-style ones, or they might want to provide a dictionary of key terms.

Question 9 was out of the Likert scale and was introduced to the survey to find out which of the language skills within the EMI is the most difficult for students: writing reports, reading academic tests, listening to a teacher, or speaking and making oral presentations. The majority (35%) of respondents noted Speaking as the skill that causes the greatest difficulties. The reason can be that within EMI classes with a large amount of students, it is hard to give an opportunity to each student to ask his own question or to make even a short talk/presentation.

Participating in various spoken activities, such as lectures, seminars, presentations, conversations, workshops, and tutorials, is a key component of EMI learning. The EMI learner converses in spoken English with the institution's staff, other students, and the lecturers. They could be required to participate in asking questions and giving answers during lectures as well as other comprehension tests. When participating in group discussions, seminars, and tutorials, they could be required to give presentations and communicate in English with the instructors and other students. Speaking abilities are essential for assisting students in developing their comprehension of disciplinary material.

To help students develop their speaking abilities through EMI classes it is suggested by Jiang (2019) to reduce anxiety by using code-switching, providing students with a written outline for the presentation of lectures, engaging local students with international students or staff to practice spoken English, getting acquainted with native speaker's accents through watching YouTube videos, making use of imitating lecturers' pronunciation and asking/answering questions in English in class.

During the interviews, the participants stated they would strongly like to develop English language ability through EMI classes. Some EMI content teachers could believe that it is not their obligation to assist learners in developing their English language skills. Costa (2012) discovered that EMI professors in the Italian higher education system prioritized teaching their academic subjects over their students' language development.

Helping with language skills should probably lead to including academic language ability as a component of content assessment. The linguistic components of academic assignments that will be evaluated as a part of students' performance should be noted by the EMI teacher. These could be linguistic, grammatical, conversation, or textual characteristics. So, for instance, the instructor would allot a specific amount of marks to a category like "language use," and when instructing the EMI course, the lecturer would be sure to make it clear to the students exactly what this would entail.

To develop students' speaking skills at the Department of Chemical Engineering, KBTU, lecturers are trying to involve all the students in different contests. The author of this dissertation teaches "Technology of Ecologically Friendly Fuels" devoted mostly to the production and use of three main biofuels: biomethanol, bioethanol and biodiesel. At one of the tutorial classes, students participate in Biobattle. To do so, all the students are divided a week before into 3 teams and prepare a presentation for 15-20 minutes in which they defend the project of production of one type of biofuel in Kazakhstan. While one team makes a presentation, the others listen and prepare questions on the technology of production, sustainability etc. The jury (3 judges) selected also from the students assesses the presentation and answers to the questions. Among the criteria (see: Appendix 1) is the use of language resources (all slides and reporter's speech should be in English; the team loses 2% for the use of Russian or Kazakh). Such kind of activity allows each student to prepare a short (2-3 min) speech as a participant of the team, listen to other participants, and ask and answer questions

At the end of the Discussion section, the author would like to mention that the survey results presented in this dissertation do not cover completely the needs of students studying through EMI, surveys and interviews performed by other researchers of EMI can make the picture more complete and help to answer the question: how to make instructions in EMI clearer? To mention one (Bocanegra-Valle, 2016), some additional advice may be found:

Focusing on skill-based learning

Encouraging learners' autonomy through learner-centered approach

Relying more on academic discourse and genres

Using the findings of surveys and interviews to re-evaluate the course content.

Expansion of survey questions and conduction of the study with larger samples is important for future investigation in this field to get more reliable data and an objective description of the situation with EMI implementation.

6. CONCLUSION

This master's dissertation aimed to shed light on the difficulties students experience in studying through EMI. It involves mixed method research to answer the research question: how to make instructions in EMI clearer? As content acquisition in EMI takes precedence over language learning, one of the study's strengths is that it provides a qualitative research approach to weak points in perception through EMI which is accompanied with quantitative research to assess students' view on improving the situation.

One of the key findings of this study is that both learners' and teachers' English proficiency levels influence how well the students can understand course material and may ultimately affect how well they absorb the material and will use it in the future. EMI implementation in the classroom may be problematic if students have inadequate English ability, therefore institutional support may be required for long-term success. It is crucial that schools improve the standard of English language instruction in order to address the problem. This could be accomplished by introducing new courses, like "English for Chemical Engineers" or other ESP courses, increasing the credits for teaching English in the classroom, and creating an environment for communication with native speakers - supervisors and foreign students. In terms of teachers' low English proficiency, universities should make sure that the professors they hire not only possess a degree in the Chemistry or another subject area but also the pedagogical skills necessary to instruct students at the tertiary level, acquainted with the basic principles and techniques in EMI implementation, for example, by taking MOOC courses or even getting a second degree. Institutional support for the EMI lecturers may be in motivating instructors to enroll in the international EMI-workshops and travel to conferences abroad.

A second conclusion of this dissertation is that lecturers should use a variety of instructional techniques to enhance students' comprehension of the lectures' content. Using code-switching is one of the options: anytime problems with

comprehension develop, lecturers and students may turn to their L1 to ensure topic understanding. Even so, critics claim that code-switching prevents students from learning a second or additional language, advocates of code-switching now argue that learning of L2 occurs naturally in bilingual classrooms and offers an alternative education concept to the previously supported monolingual paradigm. The second option is an extensive work with an engineering vocabulary, especially when introducing a new course. At first glance, it may seem that all that is needed of an EMI student is the development of the ability to comprehend and employ a large number of new words that they have never come across before. However, as vocabulary is a tool and not an end in itself, focusing solely on the vocabulary aspect of academic language might result in a misunderstanding of the nature of academic discourse. The EMI teacher can assist students in developing the lexical aspects of academic literacy in a variety of methods: include learning vocabulary as a goal of topic courses, keep track of the difficulties students have learning core academic vocabulary, and gradually create a subject-specific glossary of frequently used academic words with context. Introduction of glossary at the beginning of each course is marked very positively by the survey respondents, especially, if this glossary contains illustrations and some additional information. The third option is the inclusions of short explanatory YouTube videos in lectures. Students have positive reflections towards the inclusion of YouTube video clips in the lectures. Research on the inclusion of YouTube videos in lectures made by Tran (2022) also shows that students had major improvement in the post-test results. Short explanatory YouTube videos correct students' pronunciation and focus their attention on the topic of the lecture and, by repeating the main issues, facilitate the absorption of new information.

The third conclusion regards some issues of assessment in EMI. Most of the EMI teachers and students when choosing what should be assessed in EMI – content or language – select content with no doubt. English is regarded as a mean to comprehend content, but, since this comprehension is impossible without language, we should accept that some fraction of the grades should be assigned to

the progress in ESP as well. Assessment in EMI classes takes into account the mastery of academic skills, genres, registers, and appropriate use of academic vocabulary and grammar forms. Collaboration between content EMI teachers and EAP/ESP teachers can be an asset. The other aspect is an assessment of content. The survey showed that 63% of respondents prefer assessment through multiple-choice tests, which is understandable, especially for the new-coming students with a lack of background in academic English. At the same time, after graduation, the former student will need to meet the challenges of their profession by writing reports, compiling technical documentation in English, and writing research papers – all this will be impossible if to restrict the assessment process only with multiple-choice tests. Hence, to deal with the issue, it is essential at the first assessments to start with multiple-choice questions and to gradually add open-ended/essay type tasks.

After conducting this study, the author feels compelled to make some recommendations that would help other researchers working in the same field of inquiry. First, it is proposed that the study be conducted with larger samples using a combination of techniques such questionnaires, interviews, and observations. This is so that the researcher can obtain more insightful study data as well as a better grasp of the data. Additionally, more studies can be done on how teachers feel about using EMI and how to use it efficiently. Such studies may be able to help teachers with the EMI teaching process and contribute to the effective use of EMI in the education process.

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APPENDIX A

Questionnaire form

- 1) Do you agree with the statement: the teacher's English language proficiency influences the level of my understanding of lectures/tutorials/labs?
- 2) Do you agree with the statement: my own English language proficiency influences the level of my understanding of lectures/tutorials/labs?
- 3) Do you agree with the statement: if the teacher speaks slower, I would understand lectures/tutorials/labs much better?
- 4) Do you agree with the statement: if the teacher introduces the specific vocabulary before starting the course I would understand lectures/tutorials/labs much better?
- 5) Do you agree with the statement: I would definitely benefit from taking an introductory language course "English for chemical engineers" in the first year of education?
- 6) Do you agree with the statement: I would definitely benefit if the teacher uses Kazakh/Russian language along with English to explain some specific concepts related to the course??
- 7) Do you agree with the statement: I would definitely benefit if the teacher used visual aids like short YouTube videos with native speakers explaining some concepts from the lecture/tutorial?
- 8) Do you agree with the statement: within the tests, a teacher should use only multiple-choice questions (without open-ended questions) so that I can better show my knowledge?
- 9) Within the English medium instruction the most difficulties I experience in...? writing reports; reading academic tests; listening to a teacher; speaking and making oral presentations

10) What can be helpful in getting better results when studying engineering courses in English? Give your advice on the improvement of the educational process. What would you like to change?

Semi-structured interview schedule

- 1) What was your previous experience in getting knowledge through EMI?
- 2) Do you experience any discomfort when studying engineering courses in the group with a mixed English language ability (higher or lower than yours)?
- 3) Do you think it is better to increase the entering threshold for the degree program from IELTS 5.5 to 6.5? Or to push those students with IELTS lower than 6.5 to spend 1 preparatory year studying general English and EAP?
- 4) Do you think EMI classes should help you to develop English language ability?

At what extent, do you think, the EMI teacher should focus on the content and on the language?
- 5) How would you prefer your content and language knowledge be evaluated?
- 6) Which part(s) of the lesson cause(s) for you the main troubles with comprehension?
- 7) What kind of vocabulary support you need for EMI classes?
- 8) Do you readily take part in spoken activities (debates, contests, exhibitions) on the engineering content?
- 9) What do you think the teacher can improve to make EMI classes clearer?
- 10) What do you think you can improve to make EMI classes more effective?

APPENDIX B

Biobattle

All three biofuels are claimed as renewable and green alternatives to conventional fossil fuels. There is no need to say about the disadvantages of fossil fuels (depletion, CO₂ emission, diversification of energy resources, etc.) or demands for a “green sustainable alternative” (all of these are considered as current status quo). Instead, teams must argue their teams' fuel based on criteria in the scheme.

The presentation takes 20 minutes. Language of presentation and speech – English.

Question obligations: all team members must be ready to answer questions from a judging panel/other teams. Judges will choose members of opposing teams to ask questions and a person from the defending team to answer them.

Assessment scheme.

Feedstock's choice (5%) – propose a feedstock source, which would be used in the process and provide statistics about feedstock availability and how it can be applied in Kazakhstan (in which area, briefly describe the potential of this area) (5%)

Product distribution model (10%) – describe the target product form (neat fuel or blend) and argue why you choose it.

Technology of production (20%) – estimate the complexity of the technological scheme (10%) and the possibility to install a biofuel plant in KZ (10%).

Process profitability (20%) – what would be the costs per mass/energy/carbon units? Would be fuel/blend competitive with conventional fuel or as food application in the case of edible feedstock (10%)?

Energy balance (10%) – how much energy can we utilize from 1 ton of feedstock? What would be an energy potential of your product?

Environmental and social aspects (10%) – how your fuel/blend will affect harmful gas (CO₂, NO_x, SO₂) emissions? (5%) - how your fuel/blend will affect the social situation in the chosen area? (5%)

Objectivity (5%) – the main disadvantages and ways of overcoming them must be mentioned in the presentation/

Presentation format (10%) – well organized slides, coherence of ideas/information, language resources (all slides and reporter's speech should be in English; team loses 2% for the use of Russian or Kazakh), relevant and clear diagrams (preferably, but not necessary, diagrams should be drawn by team's members), relevant sources of information.

Contribution (5%) – all team members show good general knowledge of research material and the ability to answer the questions.

Time-management: students are given 8 minutes for their presentation and 7 minutes for a question-answer part session (from the judges/teams).

Presenters will be notified when one minute and 10 seconds remain.

Judge Sheets

| Criteria | | Team Bioethanol | Team Biomethanol | Team Biobutanol |
|--|--------------------------------------|-----------------|------------------|-----------------|
| Feedstock's choice (5%) | | | | |
| Product distribution model (10%) | | | | |
| Technology of production (20%) | | | | |
| Process profitability (20%). | | | | |
| Environmental and social aspects (10%) | | | | |
| Energy balance (10%) | | | | |
| Objectivity (5%) | | | | |
| Presentation format (10%) | Slide organization (2%) | | | |
| | Coherence of ideas/information (2%) | | | |
| | Language resources (2%) | | | |
| | Relevant and clear diagrams (2%) | | | |
| | Relevant sources of information (2%) | | | |
| Time-management (5%) | | | | |
| Contribution (Total: 5%) | Answers | | | |
| | | | | |
| | | | | |
| | Questions | | | |
| | | | | |

Отчет о проверке на заимствования №1



Автор: Крайдер Анастасия Вадимовна
Проверяющий: Крайдер Анастасия Вадимовна
Организация: Томский Государственный Университет
Отчет предоставлен сервисом «Антиплагиат» - <http://tsu.antiplagiat.ru>

ИНФОРМАЦИЯ О ДОКУМЕНТЕ

№ документа: 13
Начало загрузки: 13.10.2023 07:00:43
Длительность загрузки: 00:00:11
Имя исходного файла: ВКР_Зазыбин_без отчета.pdf
Название документа: ВКР_Зазыбин_без отчета
Размер текста: 81 кБ
Символов в тексте: 83318
Слов в тексте: 11920
Число предложений: 608

ИНФОРМАЦИЯ ОБ ОТЧЕТЕ

Последний готовый отчет (ред.)
Начало проверки: 13.10.2023 07:00:54
Длительность проверки: 00:05:34
Комментарии: не указано
Поиск с учетом редактирования: да
Проверенные разделы: приложение с. 0-52, библиография с. 0-47, титульный лист с. 0-2, содержание с. 0-6, основная часть с. 0-1,0-5,0-13,0-17,0-21,0-30,0-43
Модули поиска: Патенты СССР, РФ, СНГ, Шаблонные фразы, ИПС Адилет, Перефразирования по Интернету (EN), Переводные заимствования по Интернету (EnRu), Переводные заимствования по коллекции Интернет в русском сегменте, Модуль поиска "tsu", Перефразирования по eLIBRARY.RU, Перефразированные заимствования по коллекции Интернет в русском сегменте, Переводные заимствования по коллекции Интернет в английском сегменте, Переводные заимствования, СПС ГАРАНТ: аналитика, Библиография, Перефразирования по СПС ГАРАНТ: аналитика, Кольцо вузов, СПС ГАРАНТ: нормативно-правовая документация, Переводные заимствования издательства Wiley, Цитирование, Сводная коллекция РГБ, Диссертации НББ, Коллекция НБУ, Издательство Wiley, eLIBRARY.RU, Переводные заимствования (RuEn), СМИ России и СНГ, Перефразирования по Интернету, Перефразирования по коллекции издательства Wiley, Сводная коллекция ЭБС, Переводные заимствования по eLIBRARY.RU (EnRu), Медицина, Переводные заимствования по коллекции Гарант: аналитика, Перефразированные заимствования по коллекции Интернет в английском сегменте, Интернет Плюс*



| СОВПАДЕНИЯ | САМОЦИТИРОВАНИЯ | ЦИТИРОВАНИЯ | ОРИГИНАЛЬНОСТЬ |
|------------|-----------------|-------------|----------------|
| 12,06% | 0% | 12,58% | 75,36% |

Совпадения — фрагменты проверяемого текста, полностью или частично сходные с найденными источниками, за исключением фрагментов, которые система отнесла к цитированию или самоцитированию. Показатель «Совпадения» — это доля фрагментов проверяемого текста, отнесенных к совпадениям, в общем объеме текста.

Самоцитирования — фрагменты проверяемого текста, совпадающие или почти совпадающие с фрагментом текста источника, автором или соавтором которого является автор проверяемого документа. Показатель «Самоцитирования» — это доля фрагментов текста, отнесенных к самоцитированию, в общем объеме текста.

Цитирования — фрагменты проверяемого текста, которые не являются авторскими, но которые система отнесла к корректно оформленным. К цитированиям относятся также шаблонные фразы; библиография; фрагменты текста, найденные модулем поиска «СПС Гарант: нормативно-правовая документация». Показатель «Цитирования» — это доля фрагментов проверяемого текста, отнесенных к цитированию, в общем объеме текста.

Текстовое пересечение — фрагмент текста проверяемого документа, совпадающий или почти совпадающий с фрагментом текста источника.

Источник — документ, проиндексированный в системе и содержащийся в модуле поиска, по которому проводится проверка.

Оригинальный текст — фрагменты проверяемого текста, не обнаруженные ни в одном источнике и не отмеченные ни одним из модулей поиска. Показатель «Оригинальность» — это доля фрагментов проверяемого текста, отнесенных к оригинальному тексту, в общем объеме текста.

«Совпадения», «Цитирования», «Самоцитирования», «Оригинальность» являются отдельными показателями, отображаются в процентах и в сумме дают 100%, что соответствует полному тексту проверяемого документа.

Обращаем Ваше внимание, что система находит текстовые совпадения проверяемого документа с проиндексированными в системе источниками. При этом система является вспомогательным инструментом, определение корректности и правомерности совпадений или цитирований, а также авторства текстовых фрагментов проверяемого документа остается в компетенции проверяющего.

| № | Доля в тексте | Доля в отчете | Источник | Актуален на | Модуль поиска | Блоков в отчете | Блоков в тексте |
|------|---------------|---------------|--|-------------|---|-----------------|-----------------|
| [01] | 10,45% | 10,45% | не указано | 29 Сен 2022 | Библиография | 1 | 1 |
| [02] | 7,01% | 0,93% | https://repositori.udl.cat/bitstream/handle/10459.1/71393/Content%20C... https://repositori.udl.cat | 02 Янв 2023 | Интернет Плюс* | 30 | 100 |
| [03] | 6,02% | 4,43% | https://repositori.udl.cat/bitstream/handle/10459.1/71393/Content%20C... https://repositori.udl.cat | 02 Янв 2023 | Перефразированные заимствования по коллекции Интернет в английском сегменте | 8 | 12 |
| [04] | 4,77% | 0,8% | https://eprints.soton.ac.uk/435919/1/LIBRARY_COPY_FINAL_THESIS_2019... https://eprints.soton.ac.uk | 13 Окт 2023 | Интернет Плюс* | 24 | 87 |
| [05] | 4,7% | 0,34% | https://purehost.bath.ac.uk/ws/portalfiles/portal/211894382/English_in_... https://purehost.bath.ac.uk | 31 Янв 2023 | Интернет Плюс* | 10 | 69 |
| [06] | 3,62% | 0,29% | http://oro.open.ac.uk/87004/1/Zuaro_Dissertation.pdf http://oro.open.ac.uk | 25 Мар 2023 | Интернет Плюс* | 10 | 57 |
| [07] | 2,75% | 0,04% | https://ora.ox.ac.uk/objects/uuid:0a5d19d7-28af-473d-8c0e-c2f1ead5f8ca/... https://ora.ox.ac.uk | 13 Окт 2023 | Интернет Плюс* | 1 | 46 |
| [08] | 2,13% | 2,13% | не указано | 13 Янв 2022 | Цитирование | 11 | 11 |

| | | | | | | | |
|------|-------|-------|--|-------------|--|----|----|
| [09] | 2,11% | 0% | https://library.oapen.org/bitstream/handle/20.500.12657/49449/9781000... https://library.oapen.org | 31 Мая 2022 | Интернет Плюс* | 0 | 16 |
| [10] | 2,03% | 0% | At the Crossroads of TESOL and English Medium Instruction https://doi.org | 30 Сен 2018 | Издательство Wiley | 0 | 11 |
| [11] | 1,86% | 0,65% | https://hh.diva-portal.org/smash/get/diva2%3A1376055/FULLTEXT01.pdf https://hh.diva-portal.org | 14 Мар 2020 | Интернет Плюс* | 21 | 56 |
| [12] | 1,82% | 0% | https://eprints.whiterose.ac.uk/179469/1/Englishization_of_Higehr_Educa... https://eprints.whiterose.ac.uk | 12 Апр 2022 | Интернет Плюс* | 0 | 16 |
| [13] | 1,56% | 0,04% | https://www.esptodayjournal.org/pdf/current_issue/december_2017/Guz... https://esptodayjournal.org | 22 Окт 2020 | Интернет Плюс* | 2 | 25 |
| [14] | 1,53% | 1,33% | Использование проектного метода в изучении профессионального а... http://ivo.garant.ru | 21 Мар 2020 | Переводные заимствования по коллекции Гарант: аналитика | 6 | 7 |
| [15] | 1,3% | 0% | Full article: Professional learning for educators teaching in English-medium... https://tandfonline.com | 14 Мая 2022 | Интернет Плюс* | 0 | 10 |
| [16] | 1,26% | 0% | Speaking Anxiety and Strategy Use for Learning English as a Foreign Lang... https://doi.org | 30 Сен 2018 | Издательство Wiley | 0 | 9 |
| [17] | 1,26% | 0% | https://files.eric.ed.gov/fulltext/EJ1134377.pdf https://files.eric.ed.gov | 14 Мая 2022 | Интернет Плюс* | 0 | 13 |
| [18] | 1,25% | 0,13% | "We are not the language police": Comparing multilingual EMI programm... https://doi.org | 31 Мар 2019 | Издательство Wiley | 1 | 8 |
| [19] | 1,2% | 0% | A systematic review of English medium instruction in higher education L... https://cambridge.org | 29 Апр 2022 | Интернет Плюс* | 0 | 9 |
| [20] | 1,09% | 0% | IMPLEMENTING EMI AT A RUSSIAN UNIVERSITY: A STUDY OF CONTENT LE... http://espeap.junis.ni.ac.rs | 15 Окт 2020 | Интернет Плюс* | 0 | 17 |
| [21] | 1,04% | 0% | English medium instruction in higher education: Teacher perspectives on ... https://doi.org | 28 Янв 2022 | Издательство Wiley | 0 | 7 |
| [22] | 0,95% | 0% | A systematic review of English medium instruction in higher education https://cambridge.org | 26 Ноя 2020 | Интернет Плюс* | 0 | 7 |
| [23] | 0,93% | 0% | https://www.iier.org.au/iier30/ozet.pdf https://iier.org.au | 28 Фев 2022 | Интернет Плюс* | 0 | 6 |
| [24] | 0,92% | 0% | Roles of Vocabulary Knowledge for Success in English-Medium Instructio... https://doi.org | 30 Сен 2018 | Издательство Wiley | 0 | 5 |
| [25] | 0,81% | 0% | English in the multilingual classroom: implications for research, policy and... https://emerald.com | 03 Мар 2020 | Интернет Плюс* | 0 | 18 |
| [26] | 0,71% | 0,16% | Eastern Mediterranean University http://i-rep.emu.edu.tr:8080 | 06 Янв 2018 | Перефразирования по Интернету (EN) | 2 | 3 |
| [27] | 0,67% | 0% | English in Hong Kong higher education https://doi.org | 31 Дек 2017 | Издательство Wiley | 0 | 5 |
| [28] | 0,67% | 0% | Ernesto Macaro — https://education.ox.ac.uk | 06 Ноя 2022 | Интернет Плюс* | 0 | 6 |
| [29] | 0,65% | 0% | International Graduate Students' Experiences of English as a Medium of I... https://ijlter.org | 13 Окт 2023 | Интернет Плюс* | 0 | 5 |
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| [32] | 0,6% | 0,05% | http://www.academypublication.com/issues3/tpls/vol12/tpls1203.pdf http://academypublication.com | 25 Мар 2022 | Интернет Плюс* | 1 | 5 |
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| [40] | 0,4% | 0% | https://www.philol.msu.ru/~ruslang/docs/%D0%A1%D0%B8%D0%B4%D0... https://philol.msu.ru | 30 Янв 2020 | Интернет Плюс* | 0 | 9 |
| [41] | 0,39% | 0% | "We are not the language police": Comparing multilingual EMI programm... https://onlinelibrary.wiley.com | 15 Янв 2021 | Интернет Плюс* | 0 | 7 |
| [42] | 0,36% | 0,36% | https://www.tdx.cat/bitstream/handle/10803/687255/Tgsr1de1.pdf?isAllo... https://tdx.cat | 31 Дек 2022 | Перефразированные заимствования по коллекции Интернет в английском сегменте | 1 | 1 |
| [43] | 0,35% | 0% | Шестая Международная научно-практическая конференция студенто... https://book.ru | 03 Июл 2017 | Сводная коллекция ЭБС | 0 | 2 |
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| [45] | 0,32% | 0% | http://eprints.maynoothuniversity.ie/5495/1/EprintsCliveEarlsStrikingthe... http://eprints.maynoothuniversity.ie | 07 Янв 2018 | Перефразирования по Интернету (EN) | 0 | 1 |

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| [50] | 0,25% | 0% | English Medium Instruction and the potential of translanguaging practice... https://benjamins.com | 13 Окт 2023 | Интернет Плюс* | 0 | 2 |
| [51] | 0,24% | 0,05% | Абрамова Ольга Александровна; [Место защиты: Национальный иссл... http://dlib.rsl.ru | 01 Янв 2022 | Сводная коллекция РГБ | 1 | 2 |
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| [58] | 0,23% | 0,23% | Пахман С. В. История кодификации гражданского права. Тома I-II. - С.-... http://ivo.garant.ru | 17 Сен 2005 | Переводные заимствования по коллекции Гарант: аналитика | 1 | 1 |
| [59] | 0,23% | 0,23% | https://englishnursery.ru/wp-content/uploads/2020/05/osnovy-bilingval... https://englishnursery.ru | 17 Окт 2022 | Интернет Плюс* | 3 | 3 |
| [60] | 0,22% | 0,22% | %D0%AF%D0%B7%D1%8B%D0%BA%D0%B8%D0%BA%D1%83%... http://vital.lib.tsu.ru | 25 Мая 2021 | Переводные заимствования по коллекции Интернет в русском сегменте | 1 | 1 |
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| [66] | 0,18% | 0,18% | Английский язык как язык межкультурного профессионального общ... http://ivo.garant.ru | 09 Мар 2019 | Переводные заимствования по коллекции Гарант: аналитика | 1 | 1 |
| [67] | 0,18% | 0% | https://www.sefi.be/wp-content/uploads/2021/12/SEFI49th-Proceedings-f... https://sefi.be | 28 Сен 2022 | Интернет Плюс* | 0 | 2 |
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| [74] | 0,12% | 0% | http://papers.iafor.org/wp-content/uploads/conference-proceedings/ECL... http://papers.iafor.org | 13 Фев 2022 | Интернет Плюс* | 0 | 1 |
| [75] | 0,12% | 0% | https://files.eric.ed.gov/fulltext/ED607570.pdf https://files.eric.ed.gov | 26 Мая 2023 | Интернет Плюс* | 0 | 1 |
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| [80] | 0,12% | 0% | Инноватика-2014: сб. материалов X Всероссийской школы-конферен... https://e.lanbook.com | 22 Янв 2020 | Сводная коллекция ЭБС | 0 | 1 |
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| [82] | 0,09% | 0,09% | http://philosociology.com/UPLOADS/_PHILOSOCIOLOGY.ir_Blackwell%20... http://philosociology.com | 01 Мар 2022 | Интернет Плюс* | 1 | 1 |
| [83] | 0,09% | 0% | http://philosociology.com/UPLOADS/_PHILOSOCIOLOGY.ir_Blackwell%20... http://philosociology.com | 18 Окт 2022 | Интернет Плюс* | 0 | 1 |
| [84] | 0,09% | 0% | Мозг освобожденный. Как предотвратить перегрузки и использоват... http://bibliorossica.com | 22 Янв 2020 | Сводная коллекция ЭБС | 0 | 1 |

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| [88] | 0,08% | 0% | https://saarj.com/wp-content/uploads/ACADEMICIA-DECEMBER-2020-FU... https://saarj.com | 20 Дек 2022 | Интернет Плюс* | 0 | 1 |
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| [95] | 0,06% | 0,06% | https://istina.msu.ru/media/publications/articles/d69/a27/4468101/ESP_C... https://istina.msu.ru | 28 Дек 2021 | Интернет Плюс* | 1 | 1 |
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