

**STEM teachers' perceptions about pre-service training and their challenges
in CLIL classrooms in Kazakhstan**

Gaukhar Maximova

Submitted in partial fulfillment of the requirements for the degree of

Master of Arts

in

Multilingual Education

Nazarbayev University Graduate School of Education

May, 2020

Word count: 12482

AUTHOR AGREEMENT

By signing and submitting this license, I, Gaukhar Maximova, grant to Nazarbayev University (NU) the non-exclusive right to reproduce, convert (as defined below), and/or distribute my submission (including the abstract) worldwide in print and electronic format and in any medium, including but not limited to audio or video.

I agree that NU may, without changing the content, convert the submission to any medium or format for the purpose of preservation.

I also agree that NU may keep more than one copy of this submission for purposes of security, back-up and preservation.

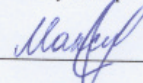
I confirm that the submission is my original work, and that I have the right to grant the rights contained in this license. I also confirm that my submission does not, to the best of my knowledge, infringe upon anyone's copyright.

If the submission contains material for which I do not hold copyright, I confirm that I have obtained the unrestricted permission of the copyright owner to grant NU the rights required by this license, and that such third-party owned material is clearly identified and acknowledged within the text or content of the submission.

IF THE SUBMISSION IS BASED UPON WORK THAT HAS BEEN SPONSORED OR SUPPORTED BY AN AGENCY OR ORGANIZATION OTHER THAN NU, I CONFIRM THAT I HAVE FULFILLED ANY RIGHT OF REVIEW OR OTHER OBLIGATIONS REQUIRED BY SUCH CONTRACTOR AGREEMENT.

NU will clearly identify my name(s) as the author(s) or owner(s) of the submission, and will not make any alteration, other than as allowed by this license, to your submission.

I hereby accept the terms of the above Author Agreement.



Author's signature:

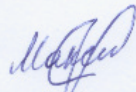
29.05.2020

Date:

Declaration

I hereby declare that this submission is my own work and to the best of my knowledge it contains no materials previously published or written by another person, or substantial proportions of material which have been submitted for the award of any other course or degree at NU or any other educational institution, except where due acknowledgement is made in the thesis. This thesis is the result of my own independent work, except where otherwise stated, and the views expressed here are my own.

Signed:



Date:

29.05.2020



Nazarbayev University
Graduate School of Education
www.nu.edu.kz

53 Kabanbay Batyr Ave.
010000 Astana,
Republic of Kazakhstan

October 2019

Dear *Gaukhar,*

This letter now confirms that your research project entitled:

STEM teachers' perceptions about pre-service training and their challenges in CLIL classrooms in Kazakhstan

has been approved by the Graduate School of Education Ethics Committee of Nazarbayev University.

You may proceed with contacting your preferred research site and commencing your participant recruitment strategy.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Xabier San Isidro'.

Xabier San Isidro

On behalf of Elaine Sharplin
Chair of the GSE Research Committee
Professor
Graduate School of Education
Nazarbayev University

Block C3, Room 5006
Office: +7 (7172) 70 9371
Mobile: +7 777 1929961
email: elaine.sharplin@nu.edu.kz

CITI Training Certificate

		Completion Date 08-Sep-2019 Expiration Date 07-Sep-2023 Record ID 32824572
This is to certify that		
Gaukhar Maximova		
Has completed the following CITI Program course:		
Responsible Research Training	(Curriculum Group)	 Collaborative Institutional Training Initiative
Social, Behav, Edu, Etc	(Course Learner Group)	
1 - Basic Course	(Stage)	
Under requirements set by:		
Nazarbayev University		
Verify at www.citiprogram.org/verify/?w10de0d2a-6b35-4bec-92f2-4eee00a6b438-32824572		

Acknowledgements

I would first like to express my sincere gratitude to Professor Xabier San Isidro, my thesis supervisor, for his professional guidance, valuable feedback, and encouragement throughout the thesis writing journey. His supervision and insights in the field have played a significant role in my becoming a researcher.

Special thanks to all professors of the Nazarbayev University Graduate School of Education for their professional guidance and support during the years of studying there, Bridget Goodman, our academic mum, for her support and assistance, Sulushash Kerimkulova, Miriam Sciala, Elka Todeva, Stephen Bahry, Anas Hajar and Janet Helmer for their input throughout this MA programme. I would also like to pay my special regards to Laura Karabassova and Aisara Yessenova for their considerate guidance in my research.

I wish to express my sincere appreciation to my parents and my husband, Nauryzbek, for always believing in me and encouraging me to pursue my dreams. Special thanks for their patience and helping in whatever way you could during this challenging period. I am also grateful to Assel, my dear roommate, for her help and support in this two-year academic journey.

Abstract

STEM teachers' perceptions about pre-service training and their challenges in CLIL classrooms in Kazakhstan

Since the beginning of the 21st century a global shift from English as a Foreign Language (EFL) to English as a Medium of Instruction (EMI) alongside Content and Language Integrated Language (CLIL) has been taking place in non-anglophone countries.

Kazakhstan introduced a CLIL-oriented trilingual policy in 2007 by which STEM subjects must be taught through English. The State Programme for Education Development of the Republic of Kazakhstan for 2011-2020 aims to increase the proportion of teachers lecturing science subjects in English to 15% by 2020. This is the reason why, in the 2019-2020 academic year, this Trilingual Policy became mainstream in secondary education, triggering a need for pre-service teacher training in English. As a result, this need has brought about higher educational institutions putting in place pre-service teacher training programmes with a multilingual track with a view to endowing the educational system with qualified professionals. With this context in mind, this qualitative study aims to explore, on the one hand, the perceptions that graduates from pedagogical institutions with a multilingual track have about pre-service training; and, on the other hand, the challenges they face in CLIL classrooms. Data was collected through semi-structured interviews that were conducted with six participants. The findings revealed that the teachers generally have a positive attitude toward their pre-service training. They tend to associate the pre-service preparation in a multilingual track with English language development, along with better internship and career opportunities. The challenging areas for the teachers included assessment, the language proficiency of their students, a lack of methodological support and the need for regular language practice. This study might be beneficial for researchers, educators and teachers in multilingual education, programme administrators and

policymakers who develop the courses of action to successfully implement the Trilingual Policy in Kazakhstan.

Аңдатпа

Қазақстандағы жаратылыстану бағыты бойынша пәндер (STEM) мұғалімдерінің кәсіби даярлық бағдарламасына деген көзқарастары және олардың пән мен тілді кіріктіріп оқытудағы қиыншылықтары

XXI ғасырдың басынан бастап жаһанданудың ықпалымен әлемдегі көптеген елдерде ағылшын тілін шет тілі ретінде оқытудан (EFL) ағылшын тілінде оқыту (EMI) және пән мен тілді кіріктіріп оқыту тәсіліне (CLIL) ауысу орын алуда. 2007 жылы Қазақстанда пән мен тілді кіріктіріп оқыту тәсіліне (CLIL) негізделген үштілділік саясаты енгізілді, осыған байланысты жаратылыстану бағыты бойынша пәндер (биология, химия, физика және информатика) ағылшын тілінде оқытылуы тиіс. Қазақстан Республикасында білім беруді дамытудың 2011 – 2020 жылдарға арналған мемлекеттік бағдарламасында жаратылыстану бағыты пәндерін ағылшын тілінде оқытатын мұғалімдердің үлесін 2020 жылға қарай 15% дейін арттыру бағытталған. Сондықтан, 2019-2020 оқу жылында үштілділік саясаты орта білім беру ұйымдарының негізгі бағытына айналып, мұғалімдерді ағылшын тілінде дайындауға қажеттілік тудырды. Нәтижесінде, бұл қажеттілік жоғары оқу орындарында білім беру жүйесін білікті мамандармен қамтамасыз ету мақсатында көптілді топтардағы кәсіптік даярлық бағдарламаларын енгізуге алып келді. Осы контекстті ескере отырып, бұл сапалы зерттеу жұмысы, бір жағынан, мұғалімдердің көптілді топтардағы кәсіби даярлық бағдарламаларына деген көзқарастарын; және екінші жағынан, олардың пән мен тілді кіріктіріп оқытудағы қиыншылықтарын зерттеуді мақсат етеді. Деректер алты қатысушымен жүргізілген жартылай құрылымды сұхбаттар негізінде жиналды. Зерттеу нәтижелері мұғалімдердің көптілді топтардағы кәсіби даярлық бағдарламаларына оң көзқарастарын көрсетті. Олар кәсіби даярлықты ағылшын тілін жетілдірумен қатар, тәжірибеден өту және болашақта

жұмысқа орналасуға дайындауға тамаша мүмкіндіктермен байланыстырады.

Бағалау, студенттердің ағылшын тілін жеткілікті білмеуі, әдістемелік қолдаудың және күнделікті тілдік практиканың болмауы мұғалімдерге қиындық тудыратын тұстары болып табылады. Осылайша, бұл зерттеу үштілді білім беру саласындағы зерттеушілер мен мұғалімдерге, сондай-ақ Қазақстанда үштілділік саясатын сәтті жүзеге асыру үшін іс-шаралар жоспарына жауапты көптілді топтардың бағдарлама ұйымдастырушылары мен реформаторлар үшін пайдалы.

Аннотация

Особенности восприятия учителей предметов естественно-научного направления (STEM) о предпрофессиональной подготовке и их трудности в предметно-языковом интегрированном обучении (CLIL) в Казахстане

С начала XXI века в неанглоязычных странах происходит глобальный переход от обучения английского языка как иностранного (EFL) к обучению предметов на английском языке (EMI) и предметно-языковому интегрированному обучению (CLIL). В 2007 году Казахстан ввел трехязычную политику, ориентированную на подходе CLIL, согласно которой предметы естественно-научного направления (биология, химия, физика и информатика) должны преподаваться на английском языке. Государственная программа развития образования Республики Казахстан на 2011-2020 годы направлена на увеличение доли преподавателей, преподающих научные дисциплины на английском языке, до 15% к 2020 году. Именно поэтому в 2019-2020 учебном году трехязычная политика стала основным направлением в среднем образовании, что вызвало необходимость подготовки преподавателей на английском языке. В результате эта необходимость привела к тому, что высшие учебные заведения внедрили программы предпрофессиональной подготовки учителей в полиязычных группах с целью обеспечения системы образования квалифицированными специалистами. С учетом этого контекста, данное качественное исследование направлено на изучение, с одной стороны, особенностей восприятий выпускников педагогических учреждений о предпрофессиональной подготовке в полиязычных группах; и, с другой стороны, трудностей, с которыми они сталкиваются в преподавании через предметно-языковой интегрированный подход (CLIL). Данные были собраны с помощью полуструктурированных интервью, которые были проведены с шестью участниками. Результаты показали,

что учителя, в целом, положительно относятся к своей предпрофессиональной подготовке в полиязычных группах. Они склонны связывать предпрофессиональную подготовку с совершенствованием навыков владения английским языком, а также с лучшей стажировкой и карьерными возможностями. Трудностями для учителей являются оценивание, слабое владение английским языком их учениками, отсутствие методологической поддержки и необходимость регулярной языковой практики. Таким образом, данное исследование может быть полезным для исследователей и преподавателей в области трехязычного образования, а также для администраторов программ и реформаторов, которые разрабатывают план действий для успешного осуществления трехязычной политики в Казахстане.

Table of contents

AUTHOR AGREEMENT	ii
Declaration.....	iii
Ethical Approval.....	iv
CITI Training Certificate.....	v
Acknowledgements	vi
Abstract.....	vii
Chapter 1: Introduction.....	1
Problem statement	2
Purpose of the study	4
Research questions	4
Significance of the study	4
Thesis outline.....	5
Chapter 2: Literature Review	6
Defining terms	6
Perceptions.....	6
Pre-service teacher training	6
STEM.....	6
Content and Language Integrated Learning (CLIL).....	6
English as a medium of instruction (EMI) and Content-Based instruction (CBI)	7
CLIL components	9
Teacher qualifications for CLIL	11
The Trilingual policy in Kazakhstan	12

Pre-service teacher training	13
Pre-service teacher training in Kazakhstan	14
Chapter 3: Methodology	16
Research design	16
Research site	17
Research sample	17
Data collection instruments	19
Ethical considerations.....	20
Chapter 4: Findings	22
Benefits of pre-service training	22
English proficiency.....	23
Career prospects	24
Internship opportunities.....	24
The main drawbacks of pre-service training	26
Shortage of teachers proficient in English.....	26
Language barrier.....	27
Lack of materials and resources	28
Recommendations for pre-service teacher training programmes	29
Challenges in CLIL classrooms.....	30
Assessment	30
Language proficiency of students.....	31
Lack of methodological support and language practice for teachers	32
Chapter 5: Discussion.....	34
RQ1. What are STEM teachers' perceptions about pre-service training?.....	34
RQ2: What challenges in terms of methodology and languages do STEM teachers face in CLIL classrooms?.....	36

Chapter 6: Conclusion	39
Recommendations	40
Limitations	41
Implications for further research	41
References	43
Appendices	48

List of Tables

Table 1: Participant Chart.....19

Chapter 1: Introduction

A global shift from English as a foreign language to English as a medium of instruction for science subjects is occurring in non-anglophone countries (Dearden, 2014). Coleman (2010) believes that the English language is fundamental for employability, international mobility, and cooperation, development, access to research and information. Irsaliyev, Karabassova, Mukhametzhanova, Adil, Bekova & Nurlanov (2017) emphasize that the English language proficiency positively affects the country's human development index, development of technology export, research funding, and youth employment. In this way, it is no wonder that many countries worldwide are trying to implement English in their educational systems, as this sector may serve as the main one in fostering the English language competence of the population. Over the last two decades, the CLIL approach has been actively used as an umbrella term to describe foreign medium instruction. Pérez-Cañado (2018) mentions that CLIL is increasingly welcomed not only in the European continent but also in Latin America and Asian countries. Frequently, for many practitioners, CLIL is entirely associated with teaching content in English (Fortanet-Gomez, 2013).

One of the most significant reforms in Kazakhstan is the introduction of the Trilingual Policy, which aims to train future generation of the country fluent in Kazakh, Russian and English languages. Initially, the first president of the country, Nursultan Nazarbayev, suggested the idea of the project "Trinity of languages" in 2007 when he highlighted the importance of knowledge of at least three languages in our society as a crucial factor to succeed as a country (Nazarbayev, 2012). Within the Trilingual Policy, the functional proficiency of the population in three languages is one of the aims to be addressed. In the field of education, the Trilingual Policy implies teaching science subjects, namely Physics, Biology, Chemistry and Computer Science in the English language, the

History of Kazakhstan in the Kazakh language, and World History in Russian language (Roadmap 2015-2020).

Kazakhstan introduced a CLIL-oriented Trilingual Policy by which STEM subjects are meant to be taught through English. In accordance with the State Programme for Education Development of the Republic of Kazakhstan for 2011-2020, the English language needs to be taught not only as a foreign language but also used as a medium of instruction for content subjects. This procedure requires special attention, since English as opposed to Kazakh and Russian languages, is not frequently used in everyday communication of the majority of the population. With this in mind, there has been an urgent need for qualified teachers who are able to lecture content in the English language. As declared in the State Programme for Education Development of the Republic of Kazakhstan for 2011-2020, Kazakhstan aims to increase the share of teachers lecturing science subjects in English from 0,6% in 2010 to 15% by 2020. This is the reason why, in the 2019-2020 academic year, this Trilingual Policy has become mainstream in secondary education, triggering an urgent need for pre-service teacher training in the English language. This need has, as a result, brought about higher education institutions putting in place pre-service teacher training programmes with a multilingual track with a view to endowing the educational system with qualified professionals. What is more, the State Program for Education Development in Kazakhstan for 2011-2020 indicates the importance of pre-service teacher training programmes with a multilingual track in higher educational institutions. Subsequently, the standard curriculum was amended and updated in order to train pedagogical cadres for teaching in CLIL.

Problem statement

As Pérez-Cañado (2016) mentions, “the implementation of the approach is outpacing teacher education provision” (p.267). This means that the majority of teachers

are not prepared to teach in CLIL, and there are many potential barriers that impede the successful implementation of the policy. The majority of CLIL practitioners are subject-specialists, which involves additional challenges to improve the language skills of the students, along with content acquisition. Teachers are undoubtedly the main actors in implementing the policy. However, they have been forced to teach according to the CLIL approach without proper training, and this situation should be taken into account and put as the primary issue in the CLIL agenda (Pérez-Cañado, 2018).

In Kazakhstan, teacher preparation for trilingual education at universities includes the aspects of learning languages, teaching subjects, and training in teaching methods, where CLIL is the foundation for teaching English and for teaching methodologies (Irsaliyev et al. (2017). In addition to that, CLIL should be “a compulsory component in the assessment of teaching practice” (p.171). Despite the recommendations given, the pre-service teacher training programmes appear not to be effective in preparing qualified pedagogical cadres for the Trilingual Policy. According to Kambatyrova & Iyldyz (2015), the universities lack the selection requirements for entering a multilingual track, which means that students with different English language level study in one group. This causes difficulties for teachers to study content in English. In addition to this, there are many aspects of pre-service teacher training programmes to pay attention to, which raises the question that the pre-service teacher preparation might be insufficient in terms of methodological and language training. In-service teachers are trained throughout their careers. However, quality training of pre-service teachers should not be undervalued. Despite the number of students in multilingual groups (1773 students in 2017) (Irsaliyev et al., 2017), there is still a lack of teachers who can teach content in English in the year when CLIL should become mainstream in secondary schools. Moreover, there is a scarce of

research on CLIL implementation in the Kazakhstani context, namely on the perceptions of CLIL teachers, their challenges, and how they address these challenges.

Therefore, it is necessary to investigate the pre-service teacher education for CLIL teachers, their perceptions, and challenges. There is a dearth of both empirical studies on pre-service training in the context of Kazakhstan, and the study might reveal the essential existing issues in the field regarding the recommendations to improve the programmes.

Purpose of the study

The primary goal of this qualitative study is to explore the perceptions of graduates from pedagogical institutions with a multilingual track about pre-service training along with the challenges they face in CLIL classrooms. Specifically, the study focuses on Biology, Chemistry, Physics and Computer Science teachers' perceptions, the desired changes they would like to propose for pre-service training courses, and the challenges they face in CLIL teaching practice. Moreover, the exploration of both pre-service training needs and experience, along with the in-service CLIL practice, brings in a full picture of the CLIL teacher training. In this light, the study addresses the issues of the existing discrepancies between pre-service training and in-service needs for CLIL teachers in Kazakhstan.

Research questions

After the review of the existing literature in the field, two main research questions were crafted and guided the study:

- 1) What are the perceptions of Biology, Chemistry, Physics, and Computer Science teachers about pre-service training?
- 2) What challenges in terms of methodology and language do STEM teachers face in CLIL classrooms?

Significance of the study

As mentioned earlier, the pre-service teacher training in the Kazakhstani context lacks attention, and the results of the study might be valuable for policymakers and educators to get some voices from teachers who have already started to apply their knowledge in the CLIL classrooms in Kazakhstan. Teachers who took part in the interviews had an opportunity to reflect back on their professional development training at universities, which provide administrators of pre-service teacher training programmes with several recommendations on what can be done to improve them. Moreover, the government is putting more effort to professional pre-service training courses starting this year, which means that this professional development area should be adequately ready to train future CLIL practitioners.

Thesis outline

The current thesis consists of six chapters. The introduction chapter gives background information about the study and context, followed by the problem statement and the research purpose, research questions, and significance of the study. The following chapter addresses the literature review, ranging from defining the key terms and concepts, to then delving into CLIL conceptualization, its differences from EMI and CBI, CLIL fundamentals, CLIL teacher qualifications and the analysis of previous research. The methodology chapter presents the information about the research design, research site and sampling, and data collection instruments along with the ethical considerations of the study. Then, findings are presented considering the identified categories, followed by a discussion and interpretation chapter. Finally, the conclusion chapter summarizes the key findings, provides recommendations for policymakers and CLIL practitioners, describes the limitations of the study, and delineates the implications for further research.

Chapter 2: Literature Review

The chapter presents the key terms and concepts of the paper commencing from CLIL conceptualization, its fundamentals, and development, further moving to the Trilingual Policy in the Kazakhstani context, both referring to the breakthroughs and challenges. Following this is the review of previous studies on the pre-service teacher education, CLIL teacher qualifications, and challenges of teachers in CLIL classrooms.

Defining terms

Perceptions – a mode of perceiving reality and experience through senses, which "influences an individual's opinion, judgment, understanding a person or situation, the meaning of an experience and how one responds to a situation" (Munkhall, 2012).

Pre-service teacher training – according to the UNESCO glossary (2019), pre-service teacher training programmes are developed to prepare future teachers for their profession at a specified level of education in public and private educational institutions where graduates receive an official teaching qualification. In the paper, pre-service teacher training and pre-service teacher education will be used equivalently.

STEM (Science, Technology, Engineering, and Mathematics) will refer to science subjects Biology, Chemistry, Computer Science, and Physics in Kazakhstani secondary schools. STEM teachers are teachers who teach those subjects. STEM teachers and science teachers will be used in the paper interchangeably.

Content and Language Integrated Learning (CLIL)

Content and Language Integrated Learning (CLIL) is "a dual-focused educational approach in which an additional language is used for the learning and teaching of both content and language" (Coyle, Hood, & Marsh, 2010, p. 1). Following the definition, CLIL involves the use of additional language in the classroom and teaching/learning content and language at a balanced level (Fortanet-Gomez, 2013). Some scholars (Ball & Lindsay

2010; Huttner & Rieder-Bunemann, 2010) characterize CLIL as “the actual instructional techniques and practices used in classrooms to promote L2/foreign language learning” (as cited in Cenoz, Genesee, & Gorter, 2014, p. 245). Garcia (2009) views CLIL as “an umbrella term that embraces any type of program where a second language is used to teach non-linguistic subject matter” but where the previously used language is excluded, and the whole curriculum is delivered in that additional language (as cited in Fortanet-Gomez, 2013, p.40). In addition to that, for many practitioners, CLIL is entirely associated with teaching content in English (Fortanet-Gomez, 2013). The same association with CLIL might be examined with educators in the Kazakhstani context. However, in the context of this research, English is not the only medium of instruction as Kazakh and Russian are also used as languages for instruction for some subjects such as History of Kazakhstan in Kazakh language and World History in the Russian language. Regarding this, Coyle, Hood, & Marsh (2010, p.1) interpret additional language as “learner’s foreign language,” but it sometimes might be the second or some form of heritage language, which can probably be observed in Kazakhstan.

English as a medium of instruction (EMI) and Content-Based instruction (CBI)

It is necessary to recognize the differences between CLIL and many other languages in education programmes, namely English, as a medium of instruction (EMI) or content-based instruction programmes (CBI).

A common concept used for delivering content in the English language is EMI. Dearden (2014, p.4) defines EMI as “the use of the English language to teach academic subjects in countries or jurisdictions where the first language (L1) of the majority of the population is not English”. The definition of EMI tells the difference between CLIL and EMI, which is critical to distinguish as the current paper, and the approach applied in the Kazakhstani context is CLIL. CLIL does not imply “which second, additional or foreign

language (L2) academic subjects are to be studied in”, whereas EMI “makes it quite clear that the language of education is English” that might bring about some “geopolitical and socio-cultural implications” (Dearden, 2014, p. 4). In addition to that, CLIL aims to encourage both content and language, while EMI does not set that target.

Earlier definitions of CBI refer to “concurrent study of language and subject matter, with the form and sequence of language presentation dictated by content material” (Brinton, Snow & Wesche, 1989, as cited in Cenoz, 2015, p.10). Lyster & Ballinger (2011, p.279) characterize CBI or CBLT (Content-based Language Teaching) as “an instructional approach in which non-linguistic curricular content such as geography or science is taught to students through the medium of a language that they are concurrently learning as an additional language”. The additional languages here include the spectrum of languages from second to indigenous and heritage languages. Bradford & Brown (2016) claim that CBI acts as an instrument for language learning, and its outcome is language and performance-oriented, whereas CLIL focuses both on language and content. Furthermore, language acquisition is more important than language learning in CLIL because language is used in real-life cases. That is why CLIL fundamentals are: “(a) fluency is more important than accuracy and (b) learners develop fluency through use, through communicating for a variety of purposes” (San Isidro, 2018, p.186).

In addition to that, Tarnopolsky (2013) considers that CLIL involves a broader range of various approaches in comparison with CBI that is targeted at English for Specific purposes and adult education. On the other hand, Cenoz (2015) argues that CLIL and CBI do not differ much concerning their key characteristics. An essential common characteristic includes the combination of both content and language, where the languages are not acquired first but learned being used in content classes (Genesee & Lindholm-Leary, 2013, as cited in Cenoz, 2015). Another shared feature between CBI and CLIL, as

reported by Cenoz (2015), is the challenge of having multilingual students with diverse languages in their linguistic repertoire in one class. The latter point can be observed in the Kazakhstani context, where the CLIL approach is to be introduced for students with different L1 (Kazakh/Russian and ethnic minority languages).

CLIL components

Due to the impact of globalization in the period of a massive migration wave to Europe, an urgent need for better language teaching and learning approaches was highlighted at the end of the twentieth century. As a result, the term CLIL was adopted in 1994. Coyle, Hood & Marsh (2010) believe that CLIL was developed as a modern tool in education in reply to the challenges of globalization and has proven to be a practical approach. They also argue that there are four main forces behind CLIL. First, parents, who want their children to be proficient in at least one foreign language. Then, governments and policymakers, who seek to make the state improve, both economically and socially. Another force is the European Commission in their pursuit of more significant inclusion in education. Last but not least, education practitioners and language experts, who view this approach as a possibility for integrating languages with other subjects.

The definition of CLIL has been provided earlier as “a dual-focused educational approach in which an additional language is used for the learning and teaching of both content and language” (Coyle, Hood, & Marsh, 2010, p. 1). It has been mentioned that CLIL is based on language acquisition as opposed to language learning. However, it should be mentioned that CLIL is not about learning a language, but using an additional language to learn the subject, language is determined by the content to be learned. This, in turn, has led to developing students’ language proficiency from basic interpersonal communication skills (BICS) to cognitive academic language proficiency (CALP) (San Isidro, 2018). Cummins (1984) characterizes BICS as the enhancement of basic

communication fluency in the additional language whilst CALP as the language necessary in an academic environment (as cited in San Isidro, 2018). While BICS is used in CLIL classrooms, there should also be a focus on the acquisition of subject-specific language.

The 4Cs framework (Coyle, 2007) constitutes another essential CLIL component. According to San Isidro & Lasagabaster (2020), the 4Cs framework serves as a methodological basis for CLIL curriculum planning and incorporates four building blocks by which content learning and language learning integrated within a context: “content (subject matter), communication (language learning and using), cognition (learning and thinking process) and culture (developing intercultural understanding and global citizenship)” (Coyle et al., 2010, p.41). Following this, CLIL implies the appropriate use of a language along with learning effectively through the language. Coyle et al. (2010, p.42) provide seven principles that guide the 4C framework:

1. Content is not only about obtaining new knowledge and skills, but also about the learners generating their own knowledge, understanding, and developing their skills.
2. Content needs to be connected to cognition (learning and thinking). In order to enable the learners to build their own understanding, content must be analyzed for its linguistic demands.
3. Cognition should be analyzed in terms of its linguistic demands.
4. Language should be accessible and transparent and related to the learning context
5. Interaction is crucial in the learning process, particularly in contexts where the medium of instruction is a foreign language.
6. In CLIL, language and culture are interrelated; therefore, intercultural awareness is essential.
7. Context variables should be taken into account to implement the CLIL approach effectively”.

These principles of the CLIL approach have brought about the additional requirements for the teachers; thus, the following section considers the CLIL teacher qualifications.

Teacher qualifications for CLIL

Teachers are considered the main actors, and key agents in any education reform and highly qualified cadres are essential for the successful implementation of the reform. Undoubtedly, successful CLIL implementation and practice are likely to require teachers to acquire several competencies that are highly applicable to the CLIL classroom.

Within the studies on CLIL, the European Framework for CLIL teacher education (Marsh, Mehisto, Wolff and Frigols-Martin, 2010, pp.17-27) proposes a number of professional competencies that CLIL teacher is expected to acquire throughout the teacher preparation programmes:

- “1) Personal reflection – an ability to recognize and self-reflect on the level of language proficiency, as well as pedagogical and content competences. This means that CLIL teachers are able to: a) recognize and clearly speak their understanding of and attitudes towards general teaching principles and the subject; b) define their competences in content and language and articulate the needs to develop these competencies; c) explore and express the ways of student-teacher collaboration as well as mechanisms of cooperation with colleagues; d) work in accordance with grounded professional confidence and regularly update professional development; e) explore the multiple roles of CLIL teacher and their own attitude towards the learning process
- 2) CLIL fundamentals – understanding the core CLIL features, that is being able to a) describe core CLIL features such as definition, models, outcomes, methodology, and driving principles and common CLIL misconceptions; b) contextualize CLIL and discuss it with different stakeholders;
- 3) Content and language awareness – the ability to “scaffold language learning during

content learning” (Marsh et al., 2010, p. 19) because language enhancement and cognitive development are interdependent and facilitate the learning process;

4) Methodology and assessment which consists of support to build learner capacity, cooperation with colleagues, the establishment of a meaningful learning experience, use of didactic strategies and use of appropriate assessment tools;

5) Research and evaluation includes action research in cooperation with colleagues and critical analysis of the existing research on CLIL as well as using self, peer and student evaluation to improve the practice;

6) Learning resources and environments imply specific resources for CLIL and enriched environments to help students to form a sense of security to explore content and manage their learning process;

7) Classroom management - ability to motivate and deal with the anxiety of students.

8) CLIL management – ability to manage the programme with different internal and external stakeholders and recognize each stakeholder’s role in its success.

The Trilingual policy in Kazakhstan

The Trilingual policy in education is being implemented within the framework of the project “Trinity of languages” declared in 2007 on the Assembly of the People of the Republic of Kazakhstan. The State Programme on the Development and Functioning of the languages in the Republic of Kazakhstan for 2011-2019 (2010) sets the development of the Trilingual model of education as one of its main objectives. In this light, the Trilingual model implies the use of three languages, Kazakh, Russian and English, in primary and secondary education. The term trilingual education is interchangeably used with the term multilingual education in the Kazakhstani context. The Trilingual policy is defined as “the use of three languages as languages of instruction” (Cenoz, 2001, p.3).

To foster the implementation of the Trilingual policy, the government has introduced several initiatives, including the implementation of the policy in Nazarbayev Intellectual schools (NIS), Bilim Innovation lyceums (BIL), and 33 specialized schools for gifted children Daryn. Mathematics and science subjects are taught in the English language in these schools in 11th and 12th grades, whereas History of Kazakhstan, Geography and Fundamentals of Law in Kazakh and World History in Russian (Kambatyrova & Iyldyz, 2015). These schools were pilot schools, and the main aim was the further transition of their experience of a trilingual education model to other mainstream schools all over the country. At the tertiary level, two universities – Buketov Karaganda State University and the University of International Relations and World Languages named after Abylai Khan – were the first higher education institutions to implement multilingual education by order of the Ministry of Education and Science (Goodman & Karabassova, 2018). Irsaliyev et al. (2017) reported that there were 17 teacher training universities to prepare pedagogical cadres to teach science in English in the academic year 2016-2017, and the teachers were being trained in CLIL.

Pre-service teacher training

With the increase in the number of diverse students, there is a growing demand for pre-service and in-service teacher preparation programmes. Probably, everyone would agree that teachers play a significant role in the educational set-up. Kumaravadivelu (2001) emphasizes this role “in any educational reform, teachers and teacher educators constitute pivotal change agents” (as cited in Pérez-Cañado, 2016, p. 217). Furthermore, Pérez-Cañado (2018) states that teachers have often been thrown to teach using the CLIL approach without being sufficiently trained. She then claims that teacher training should be prominent in the CLIL agenda as CLIL's success largely depends on teacher education and preparation.

Some research has been done on pre-service teacher education in the European context. Pérez-Cañado (2016) identified the major areas: ongoing professional development, availability of materials and resources for teaching, adequate methodological training, collaborative teaching as well as ICT availability which are in need to thoroughly worked out within teacher education for CLIL teachers to be sufficiently ready for the potential challenges in CLIL classrooms.

Pre-service teacher training in Kazakhstan

Since the implementation of the Trilingual policy in Kazakhstan, there has been an urgent demand for teachers who are qualified to teach science subjects in English. As a result, a number of in-service teacher training centers and programmes — such as Orleu and Ustaz— along with some pre-service training programmes —with a multilingual track in different universities have been set up. However, while the teacher provision for in-service training programmes seems to have been given quite careful attention, pre-service teacher preparation courses might lack that attention. Moreover, there is a lack of investigation on pre-service teachers' perceptions and challenges in Kazakhstan. Yessenova's (2016) study on the perceptions of Science and Mathematics pre-service teachers regarding their preparation at pedagogical institutions reported on three subcategories that help to generate a holistic view of the availability of training in higher education: attitudes to the reform, challenges, and satisfaction with the quality of the education. The attitudes were mainly positive, although the participants mentioned ill-planned reform initiatives. The positive attitude toward the programme was interpreted by their motivation to get a training in a multilingual track as “English language is perceived as a key to better employability and upward mobility” (Yessenova, 2016, p. 47). Briggs, Dearden, and Macaro (2018, p.688) observed the same result in their study where secondary school teachers positively perceived EMI programmes, which “provide home

country students with a high-quality education and particularly about its potential to improve their English”.

Nevertheless, the eagerness of the pre-service teachers in Yessenova’s research was followed by unanticipated challenges throughout the university preparation. The challenges included the language barrier, the lack of professors proficient in English, and the shortage of resources in the English language (2016). Interestingly, however, in-service teachers find planning the lessons and preparing materials as one of the most challenging aspects of delivering science subjects in the English language (Briggs et al., 2018).

A study on EMI perceptions has also revealed that “both teachers and students participating in an EMI experience have positive perceptions, but also acknowledge that it has challenges” (Corrales, Paba Rey & Santiago Escamilla, 2016, pp. 334-335). The research highlights the importance of language proficiency of both teachers and students and, therefore, states that “institutions should make decisions about language level requirements needed to participate in EMI programs” (Corrales et al., 2016, p.335). A similar conclusion is also made in Yessenova’s study (2016), where the research participants expressed concern about the shortage of teacher educators proficient enough in English as one of the main disadvantages of the EMI programme.

To sum up, the chapter presented the definitions of the key terms in the study, then delved into the CLIL approach, its components, CLIL teacher qualifications, and further moved to the context of Kazakhstan, the Trilingual policy and the previous studies on the pre-service teacher training.

Chapter 3: Methodology

The chapter provides information about the methodology applied in the study. It describes and justifies the choice of an interview-based qualitative study, the sampling strategy, and data collection instruments. The study aims to explore the science teachers' perceptions about pre-service training and their challenges in lecturing subjects in CLIL. Two main research questions were crafted in order to guide the present study:

What are the perceptions of Biology, Chemistry, Physics, and Computer Science teachers about pre-service training?

What challenges in terms of methodology and language do STEM teachers face in CLIL classrooms?

The first section of the chapter is devoted to explaining and justifying the qualitative interview-based research design of the study. In the second section, the research site and sample are described. The third part addresses the data collection instruments and process, followed by the data analysis and the ethical considerations of the investigation.

Research design

In order to investigate perceptions of STEM teachers about pre-service training and their challenges in CLIL classrooms, a qualitative interview-based research design was used. A qualitative interview-based approach where “problems are explored to obtain a deeper understanding and where interviewer maintains a ‘feeling of openness’ to the participants’ responses” (Creswell, 2014, pp. 32-33) made it possible to explore teachers' perceptions about pre-service training programmes, and identification of challenges.

According to Merriam&Tisdell (2016), collecting data through interviewing the participants is an essential tool when behavior, feelings, or interpretations about the actions in the past cannot be observed. In other words, interviewing respondents allowed them to reflect back on their experience at pre-service training programmes. The qualitative

approach brought about the understanding of the phenomena by exploring the experiences of participants. Furthermore, research aims could be achieved by exploring teachers' views and opinions through interviews. The implementation of the Trilingual policy through the CLIL approach is a relatively new phenomenon in the Kazakhstani educational system. Moreover, not much is known about the pre-service teacher training in groups with a multilingual track, and this was the reason therefore to adopt a qualitative research design, which made it possible to analyze the issue thoroughly as well as relate it to the experience of in-service teachers.

Research site

The present study took place among teachers from different types of schools throughout the country. The study focused on the schools who have already implemented CLIL approach. Initially, CLIL pedagogy started at Nazarbayev Intellectual Schools (NIS), which pioneered CLIL implementation in the country. These pilot schools were supposed to translate their experience to mainstream schools (Karabassova, 2018). Some mainstream schools have fully transferred to the Trilingual model; thus a number of research sites were selected to be able to generate a holistic picture of pre-service training and CLIL challenges. The Strategic plan of the Ministry of Education and Science for 2017-2021 (2016) reports that, from the academic year 2019-2020, it is planned for high school students to study 2 subjects out of 4 (Computer Science, Biology, Physics, Chemistry) in English depending on the opportunities of schools regarding the teachers and materials. The research sites were Nazarbayev Intellectual school (NIS), Bilim Innovation lyceum (BIL), Daryn, pilot and mainstream schools.

Research sample

Non-probabilistic purposeful sampling was used as the individuals were intentionally selected with a view to both understanding the problem deeply and eliciting information-

rich data from the interviews (Merriam&Tisdell, 2016). Patton (2015) pointed out that the logic and power of purposeful sampling is the emphasis on “information-rich cases, from which one can learn a great deal about issues of central purpose of the inquiry” (as cited in Merriam&Tisdell, 2016, p.96). Therefore, basic criteria were established to reflect the purpose of the study and this led to identify information-rich cases. Specifically, snowball sampling was applied, which involves finding a few key participants who easily meet the criteria for the study (Merriam&Tisdell, 2016). The participants were chosen according to two criteria: 1) they must have finished pre-service training with a multilingual track at universities; and 2) they were working as science teachers at the time of the interviews. The possibility that one school has all those STEM teachers who teach in English was very low, and, therefore, therefore the participants were also representatives of different schools all over Kazakhstan. These different characteristics of the participants provided a general overview of pre-service teacher training and their experiences that vary on their workplaces and length of experience in the CLIL classrooms. What is more, challenges may differ from school to school as low English language proficiency of students might bring about additional difficulties for the CLIL teachers. Thus, the characteristics mentioned above of the interview respondents were crucial to be able to investigate the topic more deeply.

Determining the number of participants was a bit challenging as there is no common standard for this (Mears, 2012). At the beginning, 6-8 interviews were planned to be conducted to make sure to collect sufficient data to represent and answer the research questions. However, the interviews were taken with six teachers: one Chemistry, two Physics, two Computer science and one Biology.

Interviews were conducted with the participants at an agreed location as well as online upon a scheduled appointment suggested by each participant at his/her convenience.

The participant also had a chance to choose a language for both the interview and consent form.

After acquiring permission from the Ethics Committee to conduct the research, several possible participants were contacted. They were informed about the study, its purpose and methods. The reason for contacting (an offer to conduct an interview) and a consent form outlining major features of the study were provided as well. The researcher also contacted and visited several schools as they were referred by other participants to have teachers who exemplified the characteristics of the sampling of the study.

Before the interview, the participants were given a consent form to sign outlining the purpose and procedures of the study again. The participants that had their interviews online were sent the consent form by email, which they signed and sent back the signed scanned version. They were also informed about the ethical considerations and a chance to withdraw from the study at any time. The interview was recorded with the permission of the interviewee. Each interview lasted from 12 to 45 minutes. Table 1 shows the information about the participants.

Table 1. Participant Chart

№	Pseudonym	Subject	Teaching experience	Grades teaching	Workplace
1	Serzhan	Computer Science	4 years	8-9-10-11	Private school
2	Aidana	Physics	5 years	9-10-11	Mainstream school
3	Nurzhan	Physics	5 years	11-12	NIS
4	Tomiris	Chemistry	1 year	7	Daryn
5	Aziza	Biology	3 years	9-10	BIL
6	Aisha	Computer Science	3 years	8	Mainstream school

Data collection instruments

Semi-structured interviews with open-ended questions were used in the study. This allowed the participants “to create the options for responding and share their views relatively unconstrained by the researcher’s perspective” (Creswell, 2014, p.234). An advantage of using semi-structured interviewing is that it can facilitate answering the main research questions and explore the participants’ opinions in greater depth. (Creswell, 2014). As reported by Mears (2012), in-depth interviews offer a way for a researcher to look at the event or experience from another person’s perspective, and, thus provide a greater understanding of the issue which is a purpose of the study. In light of this, in-depth interviews with CLIL teachers with pre-service experience in a multilingual group made it possible to better understand the link between the university preparation and challenges in CLIL classrooms.

Six semi-structured interviews were conducted with CLIL teachers. The interview protocol comprised 10 questions and some follow up questions specific to the responses. The focus of the questions was on the teachers’ rationale to study in a multilingual group, benefits of pre-service training, challenges during the training and in the implementation of the CLIL-oriented Trilingual Policy.

Ethical considerations

Before the data collection procedures, the research study was approved by NUGSE Research Committee and signed by the Thesis Supervisor. The consent forms were developed beforehand and signed by school principals and teachers. The research purpose, the data collection process, possible risks and benefits for the participants and their rights were articulated in the consent form. All efforts to ensure the confidentiality of the study were made:

- All identifiers such as real names, the universities where the participants received pre-service training and schools, they work were removed

- All print out documents were kept in a secure place, and all notes, and audiotapes were kept in a password protected personal computer and secured in separate password protected folder

To conclude, this chapter explained and justified the research design, sampling strategy, research site, data collection tools and procedures, along with the ethical issues.

The next section will focus on the findings emerged from the data analysis.

Chapter 4: Findings

The chapter presents findings that emerged from the analysis of 6 semi-structured interviews collected from science teachers in order to address the two main research questions of the study. They are exploring Chemistry, Physics, Biology, and Computer Science teachers' perceptions about pre-service training and identifying their methodological and linguistic challenges in CLIL classrooms in the Kazakhstani context.

The following major categories were identified after thoroughly reading and analyzing the interview transcripts: benefits of multilingual groups in pre-service training programmes, its drawbacks, recommendations from the teachers to improve the pre-service teacher training courses, and challenges in CLIL classrooms. This chapter provides insights into the attitudes towards the programme regarding their rationale to study in this programme and its benefits. Then, it reports on the major drawbacks of pre-service teacher preparation programmes and provides some recommendations and desired changes. The last category focuses on the methodological and linguistic challenges the teachers face in their CLIL classrooms, thus covering the second research question. Moreover, the challenges also include assessment issues and training needs for in-service teachers. The participants expressed different views in regard to their pre-service preparation. While the majority of the respondents agreed on the enhancement of their English language knowledge and specific vocabulary for their science subject, methodological preparedness to teach in English remains insufficient. The following categories were revealed after data analysis, which helped to develop a holistic vision of the pre-service training: rationale to be enrolled in the programme and its benefits, drawbacks of the training, and recommendations for quality programme development.

Benefits of pre-service training

English proficiency

The first theme that emerged from the responses about the rationale to be enrolled in a multilingual track in pre-service training is the opportunity to enhance English language skills. For example, when the teachers were asked about their motivation to study in a multilingual group, as compared to Kazakh or Russian groups, the responses revealed the following:

Extract 1

I entered university in 2012; it was the first year of pilot programs in multilingual groups. I wanted to study in a multilingual group because it would create more opportunities for me to improve my English, and I would also be able to teach my subject in English (Serzhan, December 9, 2019).

Extract 2

Teaching Physics in English seemed more interesting to me. Moreover, in 4 years, I would have more chances to improve my English language skills in multilingual groups compared to Kazakh or Russian (Aidana, December 11, 2019).

Another respondent also stated that studying in a multilingual group at university significantly improved her English language proficiency. The participants mentioned that they could obtain information from the primary source, which was also a result of English language enhancement.

Extract 3

An essential thing to note is that now I can read and get all the necessary information from primary sources, which provide a lot of useful materials. I could notice the improvement in my English language level during university years (Nurzhan, December 16, 2019).

As reported by the participants, regular involvement in English classes and science lectures at university significantly increases the possibility of upgrading language skills.

This might be helpful not only in lecturing in English but also in receiving the original information directly from primary sources.

Career prospects

According to the participants, the chances of being employed by more prestigious schools increase if the teachers have a diploma which shows their qualifications in teaching in English. As the participants mentioned, the teacher training programmes prepare teachers in two directions, Kazakh or Russian groups, and a multilingual one where they had an opportunity to teach in English right after graduation. Thus, English was perceived as a key factor in better employability. The respondents highlighted the importance of the English language, especially in the era of globalization, saying that it is a requirement for everyone to be able to have excellent career opportunities in the future.

Extract 4

I think there must be multilingual groups because that is what the 21st century requires from us. You can get a job anywhere, and you can teach your subject in Kazakh, Russian, and English. English is a language that every citizen must know and speak fluently (Tomiris, December 10, 2019).

Extract 5

... it is a requirement of these times. For example, I was hired based on the certificate that I studied in English at university (Aziza, December 13, 2019).

Internship opportunities

In addition to good career opportunities, the teachers also mentioned better internship programmes during the last two years at university. Intellectual schools, such as Nazarbayev Intellectual Schools (NIS) or specialized schools for gifted children Daryn and Bilim Innovation Lyceums (BIL) have already implemented the Trilingual Policy and teaching science subjects in English which means that they would most likely recruit students from multilingual groups because they are assumed to be more proficient in

English. Besides that, these schools have a mentorship programme for interns, which is extra support for novice teachers, as reported by the respondents.

Extract 6

I was among the lucky ones because I was sent to NIS for my internship at the end of the fourth course. Only those students who were active in social life at the university had this opportunity. Some of my groupmates had their internship at mainstream schools where it was not as strict as in NIS; for example, they just went to school in the morning for a couple of hours. I learned a lot during this internship about the curriculum update and observed myself how teaching in English occurs in classrooms. My mentor was already teaching in English at that time, and I think she was applying the CLIL approach. She was amazing and taught me a lot in terms of combining language and content in a classroom (Aisha, December 8, 2019).

Extract 7

I had my internship at Daryn. At that time, chemistry was taught only once a week; at the beginning, I just attended the lessons as an observer, but after several weeks started to practice teaching in English. It was a beneficial experience for me. I had a chance to apply all the knowledge from the pre-service training programme in practice (Tomiris, December 10, 2019).

Two of the respondents graduated before the full implementation of the Trilingual Policy; thus, during their internship, only a few schools offered to teach science subjects in English. Nevertheless, the teachers considered this experience very helpful for their future teaching career.

Extract 8

During the senior year, I did two months of teaching practice at NIS. At that time, there were not any governmental regulations on teaching Physics in English. However, at a certain level, the lessons were conducted in English by providing some general phrases and definitions. My thesis work was about online lessons in English, so I tested those lessons during the internship. Overall, these two months' experience as an intern helped me a lot because soon after graduation, I was hired by the school and immediately started implementing the CLIL approach in 7th and 8th grades (Nurzhan, December 16, 2019).

Extract 9

At that period, most schools were conducting Physics lessons in Kazakh or Russian only. The university had an agreement with particular schools to send interns there, NIS or BIL were not among them, so I went to a mainstream school and taught in Russian. This experience was completely different from the theoretical practice we were having at university. I learned a lot about how to prepare for each topic and how to behave in front of students. It would have been much better if the university had sent us to specialized schools; however, we understand that at that time, there was a small number of schools teaching science subjects in English in Kazakhstan (Aidana, December 11, 2019).

The latter response highlighted the importance of internships. However, we see that not all the students had the opportunity to do their teaching practice at trilingual schools. Nevertheless, the majority of respondents agreed that studying in a multilingual track offers excellent internship opportunities since the students are believed to have a higher level of English proficiency.

The main drawbacks of pre-service training

Since the implementation of the Trilingual policy in Kazakhstan, both pre-service and in-service training programmes have been preparing pedagogical staff to lecture science subjects in English. Most of the participants mentioned that multilingual groups of pre-service teacher training programmes have many benefits for teachers to be able to deliver their subjects in the English language. Despite having many advantages, some teachers also point out the drawbacks of the pre-service teacher preparation.

Shortage of teachers proficient in English

The respondents brought up the extreme shortage of English-speaking faculty as one of the main issues. As teaching in English was a novelty for university teachers themselves, most of them were forced to teach in English because of the lack of teachers, and these teachers constantly struggled with language issues due to the limited knowledge of English.

There are no specialists, and there are no professors; there is a shortage of teachers. There have been many situations when the teacher enters the classroom and says: 'Excuse me, I am just starting to learn English, or I do not know English so that the lectures would be in Russian or Kazakh'. So, the disadvantage, I think, is the lack of qualified staff at the universities (Aisha, December 8, 2019).

Extract 11

The drawback is mainly with the language proficiency of teachers. Sometimes the lectures were so confusing because the teachers spoke both English and Kazakh, and neither of them was proficient (Tomiris, December 10, 2019).

Language barrier

One of the most apparent drawbacks, according to the teachers, was the language barrier issues. The participants all graduated from Kazakh and Russian medium classes, and at the beginning, it was hard for them to adapt to an English medium track. The interviewees indicated the problems with spoken English, its insufficiency during university years. This led the teachers to seek extra courses outside the university or their own practice online via some social network websites. What made this situation worse is the different level of English among students in one group. All the respondents reported that there were no selection criteria for multilingual groups; only the students' desire to study in English was taken into account.

Extract 12

The university administration gathered all first-year students and asked if there were students who would like to study in a multilingual group. There were a few only because the majority of them studied French or German at school, not English. Then the administration decided that all state grant holders and those who agreed would study in a multilingual track (Aidana, December 11, 2019).

Extract 13

... of course, it was difficult for all of us. I remember there were 26 students at the beginning of the first year in our group, but at the end of the first semester, we had only ten students left. There were people who had language problems, and they transferred to Kazakh and Russian groups (Serzhan, December 9, 2019).

Extract 14

It was spoken English; I would like students in pre-service training to speak in English more in the classroom. This was the main minus because, for example, I rarely spoke English during the training, it was a rare case when we were given a speaking assignment, we used mostly very simple phrases and word constructions. I wish we had to prepare a lesson plan and practise teaching Physics in English among groupmates (Nurzhan, December 16, 2019).

In general, language difficulties caused extra complexity to content comprehension because a student should understand a foreign language and the content at the same time. This led to the students seeking extra English language courses outside the university, which might not be affordable for everyone.

Lack of materials and resources

The respondents also complained about the dearth of books and materials in English. Even if some books were available, they were not appropriate or had very little information. In regard to the internet sources, few appropriate materials could be found online, and they were using resources in other languages.

Extract 15

We did not have any materials or resources at university. Most of the time, we searched on the internet and took the materials and lectures from different sources. However, the lectures taken from the internet were challenging to understand because the language was for advanced English speakers. We were pre-intermediate level students then, and it was very difficult for us to find material that would suit our level (Aziza, December 13, 2019).

Extract 16

I remember that I used to find materials in Kazakh or Russian and translate them. Of course, the university provided us with some books and lectures, but the information there was not enough to fully cover the topics (Aidana, December 11, 2019).

Another drawback mentioned was the lack of courses and research on bilingual education. Most secondary school students are bilingual in Kazakhstan. Moreover, with the introduction of the Trilingual Policy, the government aims to have trilingual school graduates in the near future. Due to this situation, some teachers highlighted the importance of teachers' preparation to manage a bilingual class.

Extract 17

... Moreover, we were not prepared to manage a bilingual class. I think, reading and critically analyzing some research articles or maybe even conducting research ourselves about bilingual schools might have been beneficial (Nurzhan, December 16, 2019).

Recommendations for pre-service teacher training programmes

Based on their own experiences, the respondents in the study provided some recommendations on how the pre-service teacher training programmes could be improved. Mainly, the teachers mentioned the need for quality teaching staff in multilingual groups, the compulsory internship during the junior and senior years of study at the universities, and the development of books and resources. Some respondents said the NIS internship, where the Trilingual Policy has already been implemented, was beneficial for immediate start to teach their subject in the English language after graduation. This might be compared with the internship in mainstream schools, where science subjects are still being taught in Kazakh or Russian.

Extract 18

It is necessary to improve the quality of teachers at the university. I think that if the universities themselves are interested in improving the quality of education, then the demand for graduates of those universities will increase because they will produce competent quality cadres (Serzhan, December 9, 2019).

Extract 19

The NIS internship was beneficial; it was easier to start teaching after graduating. The mentorship was outstanding. I cannot say that the teacher used the CLIL approach, but she taught in English. I understood that if I am proficient enough in language and know the subject, then the teaching is not hard; I felt more qualified after that internship (Aziza, December 13, 2019).

Challenges in CLIL classrooms

The question about the most challenging aspects of teaching using the CLIL approach elicited a range of difficulties. These challenges include assessment in CLIL, the language proficiency of students, lack of methodological support, and the need for regular language practice for teachers. The following subsections will describe each of these challenges in detail.

Assessment

The most remarkable challenge the participants mentioned was the assessment in CLIL. Teachers' responses show that they are not aware of the primary assessment criteria in CLIL. They also report the challenge of keeping the balance between language and content during the lectures.

Extract 20

A challenge for me personally is assessment. I assess only the content without regarding the grammar and sentence structure. I do not usually pay attention to the language; thus, I do not take language mistakes while assessing the student (Nurzhan, December 16, 2019).

Extract 21

There are students who are proficient in English; however, they are not good at the subject or vice versa; students are very good at the subject but weak at the language. In such cases, I do not know how to access the language or the content (Aidana, December 11, 2019).

It seems that the university did not cover the assessment in CLIL lectures. The teachers tended to pay more attention to content, saying that it was not a language lesson.

Extract 22

In such cases, I think we should mostly consider the content because we are content teachers. For example, a child who is good at physics and bad at language does not understand the general meaning of the task when it comes to calculations but correctly calculates the problem by connecting the units of measurement, the logical meaning. Often the problem with such children can arise when giving definitions. However, the most important thing is that he solves the task. I often pay more attention to physics when assessing the student (Aidana, December 11, 2019).

Language proficiency of students

Another major challenge among the respondents in CLIL classrooms was the language proficiency of students. Many teachers agreed that different levels of students cause inconveniences in delivering the subject in English. Moreover, they lost their precious time constantly translating the lecture from English to Kazakh or Russian so that students could comprehend the content.

Extract 23

The English proficiency of the students in one class may vary significantly. There might be some students whose English level is advanced whereas some others are beginners. When trying to find a compromise in this situation, the teachers lose much time. There are also some students who are proficient in the language; however, they are not good at the subject. This also causes problems in assessing and lecturing (Aziza, December 13, 2019).

Extract 24

The challenge for me is the students' level of English. I often switch to Kazakh when I notice that my students do not understand the material (Tomiris, December 10, 2019).

Extract 25

The issue arises when students do not understand the content in English. In such cases, I explain the same material in Kazakh or Russian so that the student understands. Thus, the problem is in the language proficiency of the students. There are English language classes three times a week in school and some students attend extra language courses, but even with all of this effort, they find it hard to comprehend the science content in English (Serzhan, December 9, 2019)

The teachers tend to switch to Kazakh or Russian when they see students struggling with the English language. This reveals the pattern of focus on content rather than on language skills, which, according to the respondents, might hinder content comprehension. Moreover, there is a mismatch between subject delivery in English and exams in Kazakh or Russian languages, which 11th grade teachers find challenging in their classrooms.

Extract 26

Even though the lessons are in English, the students pass the Unified National Test in Kazakh or Russian, which makes the teaching process complicated and confusing. I am very often confused with it and struggle between delivering the content in English or providing the students with the terms in Kazakh and Russian. I understand that I should put more effort into students' graduation exams, which are in Kazakh or Russian (Aidana, December 11, 2019).

Lack of methodological support and language practice for teachers

Some other challenges include the need for continuous professional training and communicative-oriented language training for in-service teachers. The teachers showed the desire to continually update their knowledge, especially in the CLIL approach. What is more, additional language training and methodological awareness will definitely help to eliminate the low confidence in teaching in English. During the interviews, all the participants admitted that they did not have any courses on methods of teaching content subjects in a foreign language. Even some of the respondents were familiar with CLIL, and they did not thoroughly study this approach at pre-service training.

Extract 27

The newly introduced CLIL approach is an approach that every CLIL teacher should be aware of, especially in terms of assessment and lesson planning. Therefore, I think that the Ministry of Education and Science in Kazakhstan should organize regular training courses for science teachers (Serzhan, December 9, 2019).

Extract 28

I cannot say that I was taught to use precisely this or that method. We only worked with different texts in English (Aidana, December 11, 2019).

Extract 29

We were not taught anything like that; I do not remember. There was a methodology course, for example, on how to explain to young children, but it was in Kazakh. Moreover, we did not have any such courses on how to teach science subjects in a foreign language (Aisha, December 8, 2019).

Extract 30

Honestly speaking, I do not remember any specialized CLIL courses. We did the same as in lessons in Kazakh or Russian, groups, just the language was English. Nothing changed, the same tasks and lectures, but the content was in English (Nurzhan, December 16, 2019).

On the whole, all the participants agreed that the methodological preparation should be reconsidered in pre-service teacher training programmes and the methodological awareness of using a foreign language in a science classroom should be increased.

To sum up, this chapter focused on the findings on the science teachers' perceptions about pre-service professional training and their challenges in CLIL classrooms. The findings revealed that teachers, in general, perceive their training positively. The rationales to join a multilingual track include the English language enhancement, career and internship opportunities. However, the participants were anxious about the lack of university staff who are proficient in English and lack of materials. Regarding the challenges in CLIL classrooms, the participants mentioned poor language proficiency of the students, assessment and lack of support and regular language practice. The following chapter will discuss, interpret and link the findings to the previous literature in the field of CLIL and pre-service training.

Chapter 5: Discussion

While the previous chapter focused on the findings of the study, this chapter aims to discuss these findings in order to gain a deep insight into the pre-service teacher training and implementation of the CLIL approach in Kazakhstan. The research questions aimed to explore Chemistry, Physics, Biology, and Computer Science teachers' perceptions about pre-service training and determine their methodological and linguistic challenges in CLIL classrooms. The perceptions were revealed, and challenges described through face-to-face and online interviews. The chapter discusses the findings of the study, interpretations, possible implications of the findings and links them to the existing literature in the field.

RQ1. What are STEM teachers' perceptions about pre-service training?

With regard to the first research question, the results revealed mainly positive attitudes toward the pre-service programmes and the participants perceived a multilingual track in pre-service teacher preparation as an essential step for successful Trilingual Policy implementation. STEM teachers' perceptions are presented regarding three categories - rationale to be enrolled in the programme, its benefits, and drawbacks, as well as recommendations for the reform – that could help to generate a holistic picture of the pre-service training in the Kazakhstani context. Undoubtedly, teachers would greatly benefit from the CLIL-specific training that focuses on language and culture targeting at both BICS and CALPS (Pérez-Cañado, 2016). In this light, the participants mentioned an opportunity to enhance their language skills being regularly involved in science classes in English. This finding coincides with Aguilar and Rodriguez (2012), who claim that students notice improvement of their skills resulting in increased self-confidence while being exposed to a certain number of hours in English.

Furthermore, the English language is seen as a great chance to work in prestigious educational institutions. The teachers perceived English proficiency as a key factor for

success in a career. This perception could be explained by the strong promotion of the Trilingual Policy in the country. For example, the state programmes and policies advocate the introduction and promotion of the reform, highlighting the need for English proficiency to succeed as an individual and as a whole country. Moreover, the salary of teachers who are qualified to teach content subjects in English is higher in comparison to the teachers who teach in Kazakh or Russian languages, and this serves as a great motivation for teachers. In addition to career opportunities after graduation, the internship during the pre-service training was also indicated. The majority of the respondents recognized the importance of internship before going to in-service teaching, although not all of them had an opportunity for professional practice in trilingual schools. This tallies with Kambatyrova & Iyldyz's (2015) study, where she discussed that not all the pre-service teacher preparation programmes were able to provide their students with professional practice. The matter here is that the universities should have negotiated on the issue before the students get enrolled in the programme.

Concerning the challenges of the programme and further recommendations, despite having a positive attitude toward the pre-service training, the participants honestly shared their challenges during the university preparation. One of the main challenges that teachers face is the low English language proficiency of the pedagogical staff in pre-service training programmes. Many scholars have pointed out the issue in Kazakhstani higher education institutions (Kambatyrova&Iyldyz, 2015; Yessenova, 2016; Irsaliyev et al., 2017), and the problem is still present. Teaching in the English language is a novelty for the policy stakeholders in Kazakhstan; thus, educators in pre-service programmes themselves struggle with the language issues. It is noteworthy that the measures are being taken to solve the issue, as the respondents mentioned the increase in the number of English-speaking staff at universities. Irsaliyev et al. (2017) reported (based on the research

findings from 17 universities) that one third of the faculty members have a beginner level in English, which is insufficient to train future CLIL teachers. In addition to the low proficiency of the staff, the participants were anxious about their own English language proficiency. They reported that language difficulties caused complexity to comprehend content. Pérez-Cañado (2018, p.215) points out that “foreign language proficiency was a notable lacuna for CLIL teachers that needed to be urgently addressed before providing other types of training”. In other words, the priority should be given to linguistic proficiency before the teachers start training for CLIL.

Interestingly, Fernandez & Halbach (2011) presented that CLIL practitioners, who were former linguistic area teachers, also challenged content comprehension despite having adequate language competence (as cited in Pérez-Cañado, 2016).

The lack of materials and resources in English was another challenge for CLIL teachers during pre-service training. Similar findings were reported by Kambatyrova&Iyldyz, 2015; Yessenova, 2016; Irsaliyev et al., 2017; in the Kazakhstani context as well as by Aguilar and Rodriguez, 2012; Pérez-Cañado, 2016. The European Framework lists the availability of CLIL specific resources and the environment for CLIL teacher education (Marsh, Mehisto, Wolff, and Frigols-Martin, 2010) as it enables teachers to explore content and manage their learning process. However, many Kazakhstani universities were unable to provide the students with books and materials. One of the solutions to the problem was purchasing the books that are used on an international level, but not all of them were appropriate for the context; thus, the policymakers are required to supply the universities with CLIL materials and resources.

RQ2: What challenges in terms of methodology and languages do STEM teachers face in CLIL classrooms?

Vis-à-vis the second research question, the results of the study disclosed various challenges that teachers face when lecturing content subjects in English. The most challenging part of the CLIL lesson for teachers was assessment. The teachers do not know how to assess both content and language. Moreover, they do not consider that language learning should also take place in CLIL classrooms. This might be explained by the factor that the pre-service training programmes do not prepare future CLIL teachers for assessment. Obviously, CLIL assessment is different from traditional assessment the Kazakhstani education system used to apply. Additionally, the inadequate assessment might affect the students' learning and motivation to study since the teachers mentioned that there are some students who are proficient in the language used as a medium of instruction but find content comprehension challenging. Therefore, the teachers should be adequately trained to assess in pre-service teacher training courses or supported during in-service teaching practice.

Another common challenge among CLIL teachers is language difficulties. In-service teachers are experiencing difficulties with students' low language proficiency, which causes extra problems when making meaning out of science content in English. What is more, the level of English proficiency varies from student to student. Although the English language is taught from primary school, most students find it insufficient to acquire the language during two or three hours a week. The absence of an English-speaking environment outside the classroom complicates the problem. Therefore, it is recommended for schools to organize extra-curricular activities for students where they will have an opportunity to practice their language production skills. This might help the students to overcome the language barrier, which facilitates learning the science content.

Another finding concerning the challenges deals with the lack of methodological support for CLIL practitioners and regular language practice. The teachers mentioned the

need for continuous professional development, especially in regard to the CLIL approach. The challenges mentioned by the interviewees indicated that they are insufficiently prepared for instructing in English. Obviously, teaching in the CLIL approach is completely different from the traditional teaching methods, and it requires an intensive self-study from teachers. Therefore, support in terms of the methodology and constant language practice could be expected from the school administration.

To conclude, this chapter has addressed the interpretation and analysis of the findings regarding the perceived benefits and challenges in pre-service teacher education, along with science teachers' challenges in CLIL classrooms. The findings mainly support the existing literature in the field. On the whole, the results pinpoint that it is crucial to pay attention to the CLIL practitioners' voices and support them throughout the CLIL practice. Furthermore, the findings revealed that pre-service teacher preparation programmes have to align with the CLIL teaching practice at secondary schools.

Chapter 6: Conclusion

The concluding chapter of the study summarizes the key findings, provides recommendations for the improvement of pre-service teacher training programmes, points out the limitations of the study, and presents possible implications for further research. The purpose of this study was to explore the perceptions that graduates from pedagogical institutions with a multilingual track have about pre-service training and the challenges they face in CLIL classrooms.

The current study revealed that teachers mainly perceive their pre-service preparation in a multilingual track positively. Their motivation to get enrolled in a multilingual track, their achievements, and current practice as a CLIL teacher might rationalize their perception. Along with the perceived benefits, the teachers mentioned the challenges and main drawbacks of the programmes. The major weaknesses include insufficient English language proficiency of pedagogical staff, lack of materials, and language difficulties of the students themselves. Based on the experiences, the interviewees provided several recommendations on how pre-service training can be improved. The recommendations include the need for competent pedagogical staff at universities, obligatory internship in trilingual schools, and the development of books and materials in English.

The study revealed numerous challenges for CLIL teachers. The challenging areas for the teachers included assessment, the language proficiency of their students, a lack of methodological support, and the need for regular language practice. The findings of the study highlight the necessity for pre-service teacher training institutions to pay closer attention to language preparation and communicative practice to overcome the anxiety and language barrier. Additionally, teachers should be trained in CLIL and become aware of the core CLIL features and components. Moreover, the European Framework for CLIL

teacher education (Marsh, Mehisto, Wolff, and Frigols-Martin, 2010) proposes a number of major professional competences that CLIL teachers are expected to acquire during the teacher training programmes. The interviewees mentioned the majority of these competencies. Therefore, the reform administrators should take them into account when designing statutory curricula.

Recommendations

The results of the study have several essential implications for the policymakers and programme administrators in the pre-service teacher preparation in Kazakhstan. It is noteworthy to mention that there has to be a link between pre-service training and in-service teaching practice as the fundamental aim of pre-service programmes is to endow the educational institutions with highly qualified cadres. The current research covered both the perceptions on and the challenges in pre-service training, along with the challenges in CLIL teaching practice. Therefore, the findings of the study might contribute to the successful implementation of the Trilingual Policy as they provide some relevant insights for policymakers and CLIL practitioners.

First, as one of the main challenges during university preparation was low language proficiency, it is recommended to organize language courses before the students start learning content in English. The courses might be organized as a foundation programme with a view to enabling first-year students to improve their English language level and overcome the language barrier. Besides this, the students should have the opportunity to practice the language in BICS and CALPS regularly. Moreover, it is important to establish clear selection criteria for a multilingual track as students may have different language levels depending on their school and background. Another side of this issue refers to the lack of pedagogical staff at universities who are proficient in English. Setting up

mandatory language courses, attracting foreign staff and young graduates from foreign universities might solve the issue.

Second, along with language and content, future CLIL teachers should have sufficient methodological preparation (Marsh et al., 2010). This means that teachers should be aware of the CLIL approach, its main features as well as how to assess both content and language. The framework for trilingual education implementation at the tertiary level highlights that training at pre-service programmes should be based on CLIL (Irsaliyev et al., 2017) so that pre-service teachers observe how teaching and learning in CLIL occur so that they can use this approach in the future.

Third, since Kazakhstan has taken major steps to implement the trilingual education model, it is essential for the teachers to read academic articles on bilingual and multilingual education and be able to investigate the main topics in the field. The pre-service teachers should be encouraged to research and publish their work.

The final recommendation, as highlighted by the participants, the internship at a trilingual school during pre-service training is an essential aspect of success for future CLIL teacher. Therefore, professional practice at school, where trilingual education has already been implemented, should be organized for every student of pre-service teacher training programme. Moreover, student teachers would greatly benefit from a professional guidance and assistance of a more experienced teacher throughout the internship.

Limitations

The main limitation of the study might be the small size of the sample. The results of the study cannot be generalized as they are based on the interviews with six respondents, and there is a maximum of two representatives of each science subject.

Implications for further research

Since trilingual education became mainstream from the 2019-2020 academic year in secondary education, the research topic is highly relevant for research. Large-scale studies with a variety of instruments should be conducted to maximize the lens through which the topic can be analyzed. Another possible way to look at the situation in pre-service teacher preparation programmes is to investigate the perceptions and challenges of the university management and teaching staff. It might also be beneficial to compare pre-service and in-service teacher training courses and see whether both of them face the same challenges and how they might be integrated to succeed in effective teacher training for the Trilingual Policy implementation in Kazakhstan.

References

- Aguilar, M., & Rodriguez, R. (2012). Lecturer and student perceptions on CLIL at a Spanish university. *International Journal of Bilingual Education and Bilingualism*, 15(2), 183-197. doi: 10.1080/13670050.2011.615906
- Ball, P., & Lindsay, D. (2010). Teacher training for CLIL in the Basque Country: The case of the Ikastolas-An expediency model. In D. Lasagabaster and L.Y. de Zarobe (Eds.), *CLIL in Spain: Implementation, results and teacher training* (pp. 162-187). Cambridge Scholars Publishing.
- Briggs, J., Dearden, J., & Macaro, E. (2018). English medium instruction: Comparing teacher beliefs in secondary and tertiary education. *Studies in Second Language Learning and Teaching*, 8(3), 673-696.
- Brown, H., & Bradford, A. (2017). EMI, CLIL, & CBI: Differing approaches and goals. In P. Clements, A. Krause, & H. Brown (Eds.), *Transformation in language education*. Tokyo: JALT.
- Cenoz, J. (2015). Content-Based instruction and content and language integrated learning: the same or different? *Language, Culture and Curriculum*, 28(1), 8-24.
- Cenoz, J., Genesee, F., & Gorter, D. (2014). Critical analysis of CLIL: Taking stock and looking forward. *Applied Linguistics*, 35(3), 243-262.
- Coleman, H. (2010). The English Language in Development. A paper commissioned by the British Council. British Council.
- Corrales, K.A., Paba Rey, L.A. & Santiago Escamilla, N. (2016). Is EMI enough? Perceptions from university professors and students. *Latin American Journal of Content and Language Integrated Learning*, 9(2), 318-344.
doi:10.5294/laclil.2016.9.2.4

- Coyle, D. (2007). Content and language integrated learning: Towards a connected research agenda for CLIL pedagogies. *International Journal of Bilingual Education and Bilingualism*, 10(5), 543-562.
- Coyle, D., Hood, P., & Marsh, D. (2010). *Content and Language Integrated Learning*. Cambridge: Cambridge University Press.
- Creswell, J. (2014). *Educational research: Planning, conducting and evaluating quantitative and qualitative research*. London, UK: Pearson Education Limited.
- Dearden, J. (2014). *English as a medium of instruction – a growing global phenomenon*. Oxford: British Council.
- Doiz, A., & Lasagabaster, D. (2017). Management teams and teaching staff: Do they share the same beliefs about obligatory CLIL programmes and the use of the L1? *Language and Education*, 31(2). 93-109. doi: [10.1080/09500782.2017.1290102](https://doi.org/10.1080/09500782.2017.1290102)
- Fortanet-Gómez, I. (2013). *CLIL in higher education: Towards a multilingual language policy*. Bristol, UK: Multilingual matters.
- Given, L. M. (2008). *The Sage Encyclopedia of qualitative research methods*. Los Angeles: SAGE publications
- Goodman, B. A., & Karabassova, L. (2018). Bottom up and top down: Comparing language-in-education policy in Ukraine and Kazakhstan. In I. Silova & M. Chankseliani (eds.), *Comparing post-socialist transformations: Education in Eastern Europe and Former Soviet Union* (pp. 147-166). Oxford: Symposium Books.
- Irssaliyev, S. E., Karabassova, L. Ch., Mukhametzhanova, A. Z., Adil, A. B., Bekova, M. A., & Nurlanova, Y. B. (2017). *Teaching in three languages: International experience and recommendations for Kazakhstan*, Astana: Information-Analytic center.

- Kambatyrova, A., & Iyldyz, L. (2015). The implementation of trilingual education in secondary schools in Kazakhstan: Pre-service teacher training in English. *KazNU Bulletin*, 2(45), 49-59.
- Karabassova, L. (2017). *Content and Language Integrated Learning (CLIL) as Trilingual Education Pedagogy in Kazakhstan*. Astana: Study Innovations.
- Karabassova, L. (2018). Teachers' conceptualization of content and language integrated learning (CLIL): Evidence from a trilingual context. *International Journal of Bilingual Education and Bilingualism*, 21(7), 1-13.
- Lyster, R., & Ballinger, S. (2011). Content-based language teaching: Convergent concerns across divergent contexts. *Language Teaching Research*, 15(3), 279-288.
doi:10.1177/1362168811401150
- Marsh, D., Mehisto, P., Wolff, D., & Frigols-Martin, M. J. (2010). *European Framework for CLIL Teacher Education: A framework for the professional development of CLIL teachers*. Graz: European Centre for Modern Languages.
- Mears, C. L. (2012). In-depth interviews. In Arthur, J., Waring, M., Coe, R. & Hedges, L. (Ed.), *Research Methods & Methodologies in Education* (pp.170-176). London, UK: SAGE Publications Ltd.
- Merriam, S. & Tisdell, E. (2016). *Qualitative research: A guide to design and implementation*. San Francisco, USA: Jossey-Bass.
- MoES (Ministry of Education and Science of the Republic of Kazakhstan). (2010). State Programme of Education Development in the Republic of Kazakhstan for 2011-2020. Astana: Ministry of Education and Science of the Republic of Kazakhstan.
- MoES (Ministry of Education and Science of the Republic of Kazakhstan). (2016). Strategic plan of Ministry of Education and Science for 2017-2021. Astana: Ministry of Education and Science of the Republic of Kazakhstan.

- MoES (Ministry of Education and Science of the Republic of Kazakhstan). (2015). Roadmap of Trilingual Education Development for 2015-2020. Retrieved from <http://umckrg.gov.kz>
- Munhall, P.L. (2012). Perception. *SAGE encyclopedia of qualitative research methods*. Thousand Oaks: SAGE Publications.
- Nazarbayev, N. (2012). The Address of the President of the Republic of Kazakhstan N. Nazarbayev “Strategy-2050: The new political course of the established state”. Retrieved from <https://strategy2050.kz>
- Nikula, T., Dalton-Puffer, C., & Llinares, A. (2013). CLIL classroom discourse: Research from Europe. *Journal of Immersion and Content-based Language Education*, 1(1), 70-100.
- Pérez-Cañado, M.L. (2016). Are teachers ready for CLIL? Evidence from a European study. *European Journal of Teacher Education*, 39(2), 202-221. doi: 10.1080/02619768.2016.1138104
- Pérez-Cañado, M.L. (2016). Teacher training needs for bilingual education: In-service teacher perceptions. *International Journal of Bilingual Education and Bilingualism*, 19(3), 266-295. doi: 10.1080/13670050.2014.980778
- Pérez-Cañado, M.L. (2018). Innovations and challenges in CLIL teacher training. *Theory into Practice*, 57, 212-221. doi: [10.1080/00405841.2018.1492238](https://doi.org/10.1080/00405841.2018.1492238)
- San Isidro, X. (2017). *CLIL in a multilingual setting: A longitudinal study on Galician students, teachers and families*. (PhD dissertation). University of the Basque country. Vitoria-Gasteiz, Spain.
- San Isidro, X. (2018). Innovations and challenges in CLIL implementation in Europe. *Theory into Practice*, 57, 185-195. doi: 10.1080/00405841.2018.1484038

- San Isidro, X., & Lasagabaster, D. (2019). Monitoring of teachers' views on both CLIL and the development of pluriliteracies: A Longitudinal qualitative study. *English Language Teaching*, 12(2), 1-16.
- San Isidro, X. & Lasagabaster, D. (2020). Lessons to be learned: a professional development approach to curriculum planning in a multilingual school in Galicia. In K. Bower, G. Chambers, D. Coyle, & R. Cross (Eds.), *Cross-curricular language learning: Putting CLIL into practice*. Cambridge University Press.
- Sylvén, L. (2013). CLIL in Sweden – why does it not work? A meta-perspective on CLIL across contexts in Europe. *International Journal of Bilingual Education and Bilingualism*, 16(3), 301-320.
- Tarnopolsky, O. (2013). Content-based instruction, CLIL, and immersion in teaching ESP at tertiary schools in non-English countries. *Journal of ELT and Applied Linguistics (JELTAL)*, 1(1), 1-11.
- Urmeneta, C. (2013). Learning to become a CLIL teacher: Teaching, reflection and professional development. *International Journal of Bilingual Education and Bilingualism*, 16(3), 334-353.
- Yessenova, A. (2016). *Teacher education for teaching content in English: perceptions of Science and Mathematics pre-service teachers*. (Master's thesis). Nazarbayev University. Astana, Kazakhstan.

Appendices

Appendix A: Informed Consent Form

INFORMED CONSENT FORM

(to teachers)

STEM teachers' perceptions about pre-service training and their challenges in CLIL classrooms in Kazakhstan

DESCRIPTION: You are invited to participate in a research study on exploring the effectiveness of pre-service teacher training programs. The purpose of the study is to explore the perceptions of graduates from pedagogical institutions with multilingual approach about pre-service training and their challenges in CLIL classrooms in Kazakhstan. You will be asked a number of open-ended questions that you can answer in your own way and as long as you will be willing to. The interview will be audio-recorded with your permission and some written notes might be taken during the interview. If the recording is not available, interviews will be manually note-taken. Confidentiality of all your data is guaranteed. All the notes and audio tapes will be transcribed and then they all will be kept safe in a password protected personal computer and secured in separate password protected files for three years. Only I and the supervisor will have access to the data. After three years, the data will be destroyed. The findings of the research might be used in educational conferences and articles; however, all the names will be replaced with pseudonyms to minimize the possible risks associated with the study.

TIME INVOLVEMENT: Your participation in the interview will take approximately 30-45 minutes.

RISKS AND BENEFITS: The risks associated with this study are considered to be minimal. First of all, we would like to remind you that your participation in the interview is totally voluntary and if you feel discomfort in answering a certain question you may skip it. Moreover, taking into account your working schedule and possible work overload, we offer you to decide yourself on the most convenient time and place for the interview. You also choose the language of the interview which you are most comfortable with. The benefits, which may reasonably be expected to result from this study, are that you will be able to reflect on your training at university which in its turn will provide developers of pre-service teacher preparation programs with some recommendations on what can be done to improve the programs. Your decision whether or not to participate in this research will not affect your employment.

PARTICIPANT'S RIGHTS: If you have read this form and have decided to participate in this project, please understand your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time. The alternative is not to participate. You have the right to refuse to answer particular questions. The results of this research study may be presented at scientific or professional meetings or published in scientific journals.

CONTACT INFORMATION:

Questions: If you have any questions, concerns or complaints about this research, its procedures, risks and benefits, contact the Master's Thesis Supervisor for this student work,

Xabier San Isidro, xabier.sanisidro@nu.edu.kz

Independent Contact: If you are not satisfied with how this study is being conducted, or if you have any concerns, complaints, or general questions about the research or your rights as a participant, please contact the NUGSE Research Committee at gse_researchcommittee@nu.edu.kz

Please sign this consent form if you agree to participate in this study.

- I have carefully read the information provided;
- I have been given full information regarding the purpose and procedures of the study;
- I understand how the data collected will be used, and that any confidential information will be seen only by the researchers and will not be revealed to anyone else;
- I understand that I am free to withdraw from the study at any time without giving a reason;
- With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

Signature: _____

Date: _____

The extra copy of this signed and dated consent form is for you to keep.

ЗЕРТТЕУ ЖҰМЫСЫ КЕЛІСІМІНІҢ АҚПАРАТТЫҚ ФОРМАСЫ (мұғалімдер үшін)

Қазақстандағы жаратылыстану бағыты бойынша пәндер (STEM) мұғалімдерінің кәсіби даярлық бағдарламасына деген көзқарастары және олардың пән мен тілді кіріктіріп оқытудағы қиыншылықтары

СИПАТТАМА: Сіз мұғалімдерге арналған кәсіби даярлық бағдарламасының тиімділігі туралы зерттеуге қатысуға шақырылып отырсыз. Бұл зерттеудің мақсаты - Қазақстандағы жоғары оқу орындарының көптілді топтардан бітіруші мұғалімдердің қызметке дейінгі дайындық туралы көзқарастарын және CLIL сыныптарындағы қиындықтары туралы зерттеу. Сізден сұхбатқа қатысуға және бірнеше сұраққа жауап беру сұралады. Сұхбат сіздің келесіміңізбен жазу құрылғысына жазылады, әңгіме барысында кейбір жазбалар жасалуы мүмкін. Егер жазу құрылғысына жазуға қарсы болсаңыз, сұхбат барысында зерттеуші жауаптарыңызды жазбаша түрде жазып алады. Барлық дыбыстық файлдар мен жазбалар үш жыл бойына құпия сөзбен қорғалған жеке компьютерде, оның ішінде құпия сөзбен қорғалған файлда сақталады. Содан кейін олар толығымен жойылады. Деректерге тек мен және жетекші қол жеткізе аламыз. Зерттеудің нәтижелері кейін білім беру конференцияларында және ғылыми мақалаларда қолданылуы мүмкін. Барлық атаулар және басқа ықтимал сәйкестендіргіштер өзгертіледі немесе жойылады.

ӨТКІЗІЛЕТІН УАҚЫТЫ: Сіздің қатысуыңыз шамамен 30-45 минут уақытыңызды алады.

ЗЕРТТЕУ ЖҰМЫСЫНА ҚАТЫСУДЫҢ ҚАУІПТЕРІ МЕН

АРТЫҚШЫЛЫҚТАРЫ: Зерттеуге байланысты қауіптер - минималды: біріншіден, Сіздің қатысуыңыз ерікті болып саналады және қандай да бір сұраққа жауап беру қиын деп ойласаңыз, ол сұрақты өткізіп жіберуіңізге болады. Сонымен қатар, жұмыс кестесін және жұмыстағы ықтимал жұмыс жүктемесін ескере отырып, Сізге қолайлы сұхбат жүргізу уақытын және орнын анықтауды ұсынамыз. Онымен қатар өзіңізге ыңғайлы тілді таңдай аласыз. Зерттеудің нәтижесінен күтілетін артықшылықтар ретінде университеттегі оқу туралы ой жүргізуіңіз болып табылады, бұл өз кезегінде мұғалімдерді даярлау бағдарламаларын жақсартуға бірнеше кеңестер ұсынуға мүмкіндік береді. Сіздің зерттеуге қатысуға келісу немесе бас тарту туралы шешіміңіз Сіздің жұмысыңызға әсер етпейді.

ҚАТЫСУШЫ ҚҰҚЫҚТАРЫ: Егер Сіз берілген формамен танысып, зерттеу жұмысына қатысуға шешім қабылдасаңыз, Сіздің қатысуыңыз ерікті түрде екенін хабарлаймыз. Сонымен қатар, қалаған уақытта айыппұл төлемей және Сіздің әлеуметтік жеңілдіктеріңізге еш кесірін тигізбей зерттеу жұмысына қатысу туралы келісіміңізді кері қайтаруға немесе тоқтатуға құқығыңыз бар. Зерттеу жұмысына мүлдем қатыспауыңызға да толық құқығыңыз бар. Сондай-ақ, қандай да бір сұрақтарға жауап бермеуіңізге де әбден болады. Бұл зерттеу жұмысының нәтижелері академиялық немесе кәсіби мақсаттарда баспаға ұсынылуы немесе шығарылуы мүмкін.

БАЙЛАНЫС АҚПАРАТЫ:

Сұрақтарыңыз: Егер жүргізіліп отырған зерттеу жұмысының процесі, қауіптері мен артықшылықтары туралы сұрағыңыз немесе шағымыңыз болса, келесі байланыс құралдары арқылы дипломдық жұмыс жетекшісімен хабарласуыңызға болады, Шабьер Сан Исидро, xabier.sanisidro@nu.edu.kz

Дербес байланыс ақпараттары: Егер берілген зерттеу жұмысының жүргізілуімен қанағаттанбасаңыз немесе сұрақтарыңыз бен шағымдарыңыз болса, Назарбаев Университеті Жоғары Білім беру мектебінің Зерттеу Комитетімен көрсетілген

байланыс құралдары арқылы хабарласуыңызға болады:

gse_researchcommittee@nu.edu.kz

Зерттеу жұмысына қатысуға келісіміңізді берсеңіз, берілген формаға қол қоюыңызды сұраймыз.

- Мен берілген формамен мұқият таныстым;
- Маған зерттеу жұмысының мақсаты мен оның процедурасы жайында толық ақпарат берілді;
- Жинақталған ақпарат пен құпия мәліметтерге тек зерттеушінің өзіне қолжетімді және мәлім болатынын толық түсінемін;
- Мен кез келген уақытта ешқандай түсініктемесіз зерттеу жұмысына қатысудан бас тартуыма болатынын түсінемін;
- Мен жоғарыда аталып өткен ақпаратты саналы түрде қабылдап, осы зерттеу жұмысына қатысуға өз келісімімді беремін.

Қолы: _____

Күні: _____

Осы қол қойылған және бекітілген келісім формасының қосымша көшірмесі сізде сақталады.

ФОРМА ИНФОРМАЦИОННОГО СОГЛАСИЯ (для учителей)

Особенности восприятия учителей предметов естественно-научного направления (STEM) о предпрофессиональной подготовке и их трудности в предметно-языковом интегрированном обучении (CLIL) в Казахстане

ОПИСАНИЕ: Вы приглашены принять участие в исследовании по изучению эффективности предпрофессиональной программы подготовки учителей. Целью данного исследования является изучение особенностей восприятия учителей-выпускников высших учебных заведений в полиязычных группах и их проблемы в CLIL классах. Вам будет предложено принять участие в интервью и ответить на ряд вопросов в свободной для Вас форме. Интервью будет записываться на диктофон, с вашего разрешения, и некоторые письменные заметки могут делаться во время разговора. В случае отказа от аудио записи, заметки будут делаться исследователем письменно. Конфиденциальность материала интервью гарантируется. Все аудио файлы и письменные записи будут транскрибированы и затем будут храниться в защищенном паролем компьютере и в отдельных защищенном паролем файлах в течении трех лет. После этого, они будут полностью уничтожены. Только я и мой супервайзер будем иметь доступ к собранным материалам исследования. Результаты данного исследования могут быть в последующем использованы на образовательных конференциях, в научных статьях и работах, однако ваши имена будут заменены на псевдонимы, чтобы минимизировать возможные риски, связанные с участием в данном исследовании.

ВРЕМЯ УЧАСТИЯ: Ваше участие потребует около 30-45 минут.

РИСКИ И ПРЕИМУЩЕСТВА: Риски, связанные с исследованием минимальны: во-первых, напоминаем Вам, что Ваше участие – добровольное и если Вы почувствуете, что Вам трудно или тяжело отвечать на какой-либо вопрос, Вы можете пропустить его. Более того, учитывая Ваш рабочий график и возможную загруженность на работе, мы предлагаем Вам самим определить удобное для Вас время и место проведения интервью. Вы также можете выбрать наиболее удобный для вас язык для проведения интервью. В качестве ожидаемых преимуществ в результате исследования можно рассматривать возможность провести само рефлексии над университетской программой подготовки учителей и проблемах в классах, связанных с применением предметно-языкового интегрированного подхода. Наряду с этим, Вы сможете внести значительный вклад в образовательную сферу нашей страны, предоставив рекомендации по улучшению программы подготовки учителей в полиязычных группах. Ваше решение о согласии либо отказе в участии никаким образом не повлияет на Вашу работу.

ПРАВА УЧАСТНИКОВ: Если Вы прочли данную форму и решили принять участие в данном исследовании, Вы должны понимать, что Ваше участие является добровольным и что у Вас есть право отозвать свое согласие или прекратить участие в любое время. В качестве альтернативы можно не участвовать в исследовании. Также Вы имеете право не отвечать на какие-либо вопросы. Результаты данного исследования могут быть представлены или опубликованы в научных или профессиональных целях.

КОНТАКТНАЯ ИНФОРМАЦИЯ:

Вопросы: Если у Вас есть вопросы, замечания или жалобы по поводу данного исследования, процедуры его проведения, рисков и преимуществ, Вы можете связаться с дипломным руководителем данной работы с, используя следующие данные: Шабьер Сан Исидро, xabier.sanisidro@nu.edu.kz

Независимые контакты: Если Вы не удовлетворены проведением данного исследования, либо если у Вас возникли какие-либо проблемы, жалобы или вопросы, Вы можете связаться с Комитетом Исследований Высшей Школы Образования Назарбаев Университета, отправив письмо на электронный адрес gse_researchcommittee@nu.edu.kz

Пожалуйста, подпишите данную форму, если Вы согласны участвовать в исследовании.

- Я внимательно изучил представленную информацию;
- Мне предоставили полную информацию о целях и процедуре исследования;
- Я понимаю, как будут использованы собранные данные, и что доступ к любой конфиденциальной информации будет иметь только исследователь;
- Я понимаю, что вправе в любой момент отказаться от участия в данном исследовании без объяснения причин;
- С полным осознанием всего вышеизложенного я согласен принять участие в исследовании по собственной воле.

Подпись: _____

Дата: _____

Вам необходимо сохранить дополнительную копию этой подписанной и датированной формы согласия.

INFORMED CONSENT FORM
(to Head teachers)

STEM teachers' perceptions about pre-service training and their challenges in CLIL classrooms in Kazakhstan

DESCRIPTION: You are invited to participate in a research study on exploring the effectiveness of pre-service teacher training programs. The purpose of the study is to explore the perceptions of graduates from pedagogical institutions with multilingual approach about pre-service training and their challenges in CLIL classrooms in Kazakhstan. STEM teachers (Biology, Chemistry, Physics and Computer Science) will be asked to participate in an interview with permission to record it and some written notes might be taken during the interview. If the recording is not available, interviews will be manually note-taken. All possible identifiers of the participant as well the workplace will be removed and replaced with pseudonyms in any kind of the presentation of the data to ensure the confidentiality. The audio tapes will be kept safe in a password protected personal computer and secured in separate password protected files for three years and then completely destroyed. Only I and the supervisor will have access to the data. The findings of the research might be used in educational conferences and articles; however, all the names will be replaced with pseudonyms to minimize the possible risks associated with the study.

TIME INVOLVEMENT: The data collection will be conducted in between December 2, 2019 - December 13, 2019. The interview will last approximately 30-45 minutes.

RISKS AND BENEFITS: The risks associated with this study are considered to be minimal. First of all, the participation of the teachers in the interview is totally voluntary and they may skip the questions they find hard to answer. The study is not conducted to make judgments about teachers or schools, but to have a general understanding of the perceptions of STEM teachers about pre-service training and their challenges in CLIL classrooms. The benefits, which may reasonably be expected to result from this study, are that teachers will be able to reflect on your training at university which in its turn will provide developers of pre-service teacher preparation programs with some recommendations on what can be done to improve the programs. This will make a valuable contribution to the development of pre-service teacher trainings.

PARTICIPANT'S RIGHTS: If you have read this form and have decided to allow a teacher to participate in this project, please understand that the teacher's participation is voluntary, and he/she has the right to withdraw his/her consent or discontinue participation at any time. The alternative is not to participate. The teacher has the right to refuse to answer particular questions. The results of this research study may be presented at scientific or professional meetings or published in scientific journals.

CONTACT INFORMATION:

Questions: If you have any questions, concerns or complaints about this research, its procedures, risks and benefits, contact the Master's Thesis Supervisor for this student work,

Xabier San Isidro, xabier.sanisidro@nu.edu.kz

Independent Contact: If you are not satisfied with how this study is being conducted, or if you have any concerns, complaints, or general questions about the research or your rights as a participant, please contact the NUGSE Research Committee at gse_researchcommittee@nu.edu.kz

Please sign this consent form if you agree to participate in this study.

- I have carefully read the information provided;
- I have been given full information regarding the purpose and procedures of the study;

- I understand how the data collected will be used, and that any confidential information will be seen only by the researchers and will not be revealed to anyone else;
- I understand that I am free to withdraw from the study at any time without giving a reason;
- With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

Signature: _____

Date: _____

The extra copy of this signed and dated consent form is for you to keep.

ЗЕРТТЕУ ЖҰМЫСЫ КЕЛІСІМІНІҢ АҚПАРАТТЫҚ ФОРМАСЫ (мектеп директорлары үшін)

Қазақстандағы жаратылыстану бағыты бойынша пәндер (STEM) мұғалімдерінің кәсіби даярлық бағдарламасына деген көзқарастары және олардың пән мен тілді кіріктіріп оқытудағы қиыншылықтары

СИПАТТАМА: Сіз мұғалімдерге арналған кәсіби даярлық бағдарламасының тиімділігі туралы зерттеуге қатысуға шақырылып отырсыз. Бұл зерттеудің мақсаты - Қазақстандағы жоғары оқу орындарының көптілді топтардан бітіруші мұғалімдердің қызметке дейінгі дайындық туралы көзқарастарын және CLIL сыныптарындағы қиындықтары туралы зерттеу.

Сіздің басшылығыңыздағы жаратылыстану-математика бағытындағы пәндердің мұғалімдері (Биология, Химия, Физика, Информатика) сұхбатқа қатысуына шақырылады. Сұхбат қатысушының келесімімен жазу құрылғысына жазылады, әңгіме барысында кейбір жазбалар жасалуы мүмкін. Зерттеуге қатысушының құпиялығын қамтамасыз ету үшін, қатысушыны немесе жұмыс орнын айқындайтын барлық деректер жобаның барлық мәтінінен, сонымен қатар дипломдық жұмыстың мәтінінен жойылатын болады. Барлық дыбыстық файлдар мен жазбалар үш жыл бойына құпия сөзбен қорғалған компьютерде, оның ішінде құпия сөзбен қорғалған файлда сақталады. Содан кейін олар толығымен жойылады. Деректерге тек мен және жетекші қол жеткізе аламыз. Зерттеудің нәтижелері кейін білім беру конференцияларында және ғылыми мақалаларда қолданылуы мүмкін. Барлық атаулар және басқа ықтимал сәйкестендіргіштер өзгертіледі немесе жойылады.

ӨТКІЗІЛЕТІН УАҚЫТЫ: Зерттеу 2 және 13 Желтоқсан 2019 аралығында өтеді. Сұхбатқа қатысу шамамен 30-45 минут.

ЗЕРТТЕУ ЖҰМЫСЫНА ҚАТЫСУДЫҢ ҚАУІПТЕРІ МЕН

АРТЫҚШЫЛЫҚТАРЫ: Зерттеуге байланысты қауіптер - минималды: біріншіден, сұхбатқа қатысу ерікті болып саналады және қатысушылар қандай да бір сұраққа жауап беру қиын деп ойласа, ол сұрақты өткізіп жіберулеріне болады. Зерттеу оқытушыларды немесе мектепті сынау

мақсатында өткізілмейді, тек жаратылыстану-математика бағытындағы пәндердің мұғалімдерінің кәсіби даярлық бағдарламасына деген көзқарастары және олардың CLIL сыныптарындағы проблемалары туралы жалпылама түсінік қалыптастыруға бағытталған. Зерттеудің нәтижесінен күтілетін артықшылықтар ретінде мұғалімдердің университеттегі оқу туралы ой жүргізулері болып табылады, бұл өз кезегінде мұғалімдерді даярлау бағдарламаларын жақсартуға бірнеше кеңестер ұсынуға мүмкіндік береді. Бұл Қазақстандағы мұғалімдердің кәсіби даярлық бағдарламаларын жақсартуға және қарай дамытуда құнды болуы мүмкін.

ҚАТЫСУШЫ ҚҰҚЫҚТАРЫ: Егер Сіз берілген формамен танысып және мұғалімге зерттеу жұмысына қатысуға шешім қабылдасаңыз, мұғалімнің қатысуы ерікті түрде екенін хабарлаймыз. Сонымен қатар, мұғалім кез келген уақытта зерттеу жұмысына қатысу туралы келісін кері қайтаруға немесе тоқтатуға құқығы бар. Мұғалім зерттеу жұмысына мүлдем қатыспауына да толық құқығы бар. Сондай-ақ, мұғалім қандай да бір сұрақтарға жауап бермеуіне де құқығы бар. Зерттеудің нәтижелері ғылыми және әріптестік кездесулерде немесе ғылыми журналдарда жариялануы мүмкін.

БАЙЛАНЫС АҚПАРАТЫ:

Сұрақтарыңыз: Егер жүргізіліп отырған зерттеу жұмысының процесі, қауіптері мен артықшылықтары туралы сұрағыңыз немесе шағымыңыз болса, келесі байланыс құралдары арқылы дипломдық жұмыс жетекшісімен хабарласуыңызға болады, Шабьер Сан Исидро, xabier.sanisidro@nu.edu.kz

Дербес байланыс ақпараттары: Егер берілген зерттеу жұмысының жүргізілуімен қанағаттанбасаңыз немесе сұрақтарыңыз бен шағымдарыңыз болса, Назарбаев Университеті Жоғары Білім беру мектебінің Зерттеу Комитетімен көрсетілген байланыс құралдары арқылы хабарласуыңызға болады:

gse_researchcommittee@nu.edu.kz

Зерттеу жұмысына қатысуға келісіміңізді берсеңіз, берілген формаға қол қоюыңызды сұраймыз.

- Мен берілген формамен мұқият таныстым;
- Маған зерттеу жұмысының мақсаты мен оның процедурасы жайында толық ақпарат берілді;
- Жинақталған ақпарат пен құпия мәліметтерге тек зерттеушінің өзіне қолжетімді және мәлім болатынын толық түсінемін;
- Мен кез келген уақытта ешқандай түсініктемесіз зерттеу жұмысына қатысудан бас тартуыма болатынын түсінемін;
- Мен жоғарыда аталып өткен ақпаратты саналы түрде қабылдап, осы зерттеу жұмысына қатысуға өз келісімімді беремін.

Қолы: _____

Күні: _____

Осы қол қойылған және бекітілген келісім формасының қосымша көшірмесі сізде сақталады.

ФОРМА ИНФОРМАЦИОННОГО СОГЛАСИЯ (для директоров школ)

Особенности восприятия учителей предметов естественно-научного направления (STEM) о предпрофессиональной подготовке и их трудности в предметно-языковом интегрированном обучении (CLIL) в Казахстане

ОПИСАНИЕ: Вы приглашены принять участие в исследовании по изучению эффективности предпрофессиональной программы подготовки учителей. Целью данного исследования является изучение особенностей восприятия учителей-выпускников высших учебных заведений в полиязычных группах и их проблемы в CLIL классах. Преподавателям STEM предметов (Биология, Химия, Физика, Информатика) будет предложено принять участие в интервью и ответить на ряд вопросов. Интервью будет записываться на диктофон, с разрешения участников, и некоторые письменные заметки могут делаться во время разговора. В случае отказа от аудио записи, исследователь будет записывать ответы участников интервью письменно. Все возможные идентификаторы участника либо места работы при представлении данных и написании всего проекта будут удалены в целях обеспечения конфиденциальности. Все аудио файлы и письменные записи будут храниться в защищенном паролем компьютере и в отдельных защищенном паролем файлах в течение трех лет. После этого, они будут полностью уничтожены. Только я и мой супервайзер будем иметь доступ к собранным материалам исследования. Результаты данного исследования могут быть в последующем использованы на образовательных конференциях, в научных статьях и работах, однако имена участников интервью будут заменены на псевдонимы, чтобы минимизировать возможные риски, связанные с участием в данном исследовании.

ВРЕМЯ УЧАСТИЯ: Исследование будет проведено в период с 2 декабря 2019 по 13 декабря 2019. Интервью займет примерно 30-45 минут.

РИСКИ И ПРЕИМУЩЕСТВА: Риски, связанные с исследованием минимальны: во-первых, участие учителей добровольное и они могут не отвечать на вопрос если посчитают его трудным. Исследование проводится не для того, чтобы оценить либо осудить учителя или школу, а для того, чтобы составить общее представление об особенностях восприятия учителей STEM предметов о предпрофессиональном обучении и их проблем в CLIL классах. В качестве ожидаемых преимуществ в результате исследования можно рассматривать возможность для учителей провести само рефлексия над университетской программой подготовки учителей и проблемах в классах, связанных с применением предметно-языкового интегрированного подхода. Наряду с этим, приняв участие в данном исследовании, учителя смогут внести значительный вклад в образовательную сферу нашей страны, предоставив рекомендации по улучшению программы подготовки учителей в полиязычных группах.

ПРАВА УЧАСТНИКОВ: Если Вы прочитали данную форму и разрешили учителю принять участие в данном исследовании, Вы должны понимать, что участие является добровольным и что у учителя есть право отозвать свое согласие или прекратить участие в любое время без ущерба учителю и без потери социального пакета, который предоставлялся. В качестве альтернативы можно не участвовать в исследовании. Также учитель имеет право не отвечать на какие-либо вопросы. Результаты данного исследования могут быть представлены или опубликованы в научных или профессиональных кругах.

КОНТАКТНАЯ ИНФОРМАЦИЯ:

Вопросы: Если у Вас есть вопросы, замечания или жалобы по поводу данного исследования, процедуры его проведения, рисков и преимуществ, Вы можете

связаться с дипломным руководителем данной работы с, используя следующие данные: Шабьер Сан Исидро, xabier.sanisidro@nu.edu.kz

Независимые контакты: Если Вы не удовлетворены проведением данного исследования, либо если у Вас возникли какие-либо проблемы, жалобы или вопросы, Вы можете связаться с Комитетом Исследований Высшей Школы Образования Назарбаев Университета, отправив письмо на электронный адрес gse_researchcommittee@nu.edu.kz

Пожалуйста, подпишите данную форму, если Вы согласны участвовать в исследовании.

- Я внимательно изучил представленную информацию;
- Мне предоставили полную информацию о целях и процедуре исследования;
- Я понимаю, как будут использованы собранные данные, и что доступ к любой конфиденциальной информации будет иметь только исследователь;
- Я понимаю, что вправе в любой момент отказаться от участия в данном исследовании без объяснения причин;
- С полным осознанием всего вышеизложенного я согласен принять участие в исследовании по собственной воле.

Подпись: _____

Дата: _____

Вам необходимо сохранить дополнительную копию этой подписанной и датированной формы согласия.

Appendix B: Interview protocol

Project: STEM teachers' perceptions about pre-service training and their challenges in CLIL classrooms in Kazakhstan

Date:

Time of interview:

Length of interview: 30-45 minutes

Place:

Interviewee:

Position of interviewee: a science subject teacher

Interviewer: Gaukhar Maximova

My name is Gaukhar Maximova and I am a second-year master student at Nazarbayev University. Thank you for the agreement to take part in the interview.

The topic of my research is "STEM teachers' perceptions about pre-service training and their challenges in CLIL classrooms in Kazakhstan". I would like to hear your opinion about the pre-service training, your experience as a student teacher and the challenges you face in CLIL classrooms. Specifically, I am interested in your motivation to join a multilingual track at pre-service preparation programme, the benefits and challenges of the programme along with the challenges in teaching science subject in English.

Let me mention some essential moments regarding the interview:

- The confidentiality will be provided
- You can choose between Kazakh, Russian and English languages to conduct the interview
- The interview will be audiotaped with your permission
- The interview is on a voluntary basis and you can withdraw from it any time or skip the question

If you agree to participate in the study, please read the consent form and sign it.

Interview questions:

№	Questions	Probes
1	Can you tell me about your pre-service training experience at university?	How was the programme organized? When did you graduate from university? What is the general perception about the pre-service training? What was the rationale for entering a multilingual track?
2	Do you think you had enough language training covered during pre-service training?	How did the language training occur? What language courses did you have?
3	What were the main methodological approaches you were trained in for teaching your subject in English?	Was the CLIL approach applied during the pre-service preparation?

4	Can you tell me about the internship? What training (internship) did you have during your final year at university?	Did you have an internship in a trilingual school? Was this practice useful for your future career?
5	What challenges are you facing teaching in CLIL classroom?	How do you cope with the challenges? Does the school administration help in solving the issues?
6	What is the most challenging thing for you in teaching your subject in English?	How do you solve these issues?
7	Are you taking any language courses to improve your language skills? Why?	How the courses help to improve the language skills particularly to teach your subject in English? Are there any courses organized by school administration to support science teachers?
8	Do you think there is a discrepancy between theoretical and practical experience of teachers who graduate from multilingual groups?	Does the university fully prepare for teaching in English right after graduation or the teachers need to work on themselves to improve their skills?
9	In your opinion, what are the main drawbacks of preparing students of pedagogical universities to teach subjects in English?	How could these disadvantages be solved? How do these drawbacks affect their current teaching practice?
10	What can be done to improve pre-service training of STEM teachers?	What recommendations can you give to improve the pre-service teacher training; challenges you are facing now might be the gaps you missed/ were not provided with during university preparation

Appendix C: Interview transcript

Interviewer: What subject do you teach?

Interviewee: I am Computer Science teacher.

Interviewer: Can you tell me about your pre-service training experience at university?

Interviewee: I entered the university in 2012 and it was the first year when pre-service teacher training in a multilingual track was introduced. I wanted to study in the group, because we were told that the instruction would be in English and, therefore, there would be more opportunities after graduation. Some core subjects were taught in English such as programming course and ethnopedagogy. whereas some others such as pedagogy and philosophy were taught in Russian and History of Kazakhstan in Kazakh.

Interviewer: What was the percentage of courses to be delivered in English, is there any official information on it?

Interviewee: The core subjects were mainly taught in Russian, some, like programming course, was in English throughout the four years at university. The problem was with the lack of teachers who are proficient in English, because of this, some courses were just cancelled or taught in Kazakh or Russian.

Interviewer: Do you think you had enough language training covered during pre-service training?

Interviewee: We had General English course and our teachers also had this course. I do not think that was enough for acquiring the language because we had it only first two years.

Interviewer: Do you think you improved your language skills during the course?

Interviewee: I cannot say that for sure, because I also attended extra courses outside the university which I paid myself for.

Interviewer: What were the main methodological approaches you were trained in for teaching your subject in English?

Interviewee: We were not taught anything like that, I do not remember. There was a methodology course, for example on how to explain to young children, but it was in Kazakh. And we did not have any such courses on how to teach the science subjects in a foreign language

Interviewer: Can you tell me about the internship? What training (internship) did you have during your final year at university?

Interviewee: I was among the lucky ones because I was sent to NIS for my internship at the end of the fourth course. Only those students who were active in social life at the university had this opportunity. Some of my groupmates had their internship at mainstream schools where it was not as strict as in NIS, for example, they just went to school in the morning for a couple of hours. I learned a lot during this internship about the curriculum update and observed myself how teaching in English occurs in classrooms. My mentor was already teaching in English at that time, I think she was applying the CLIL approach. She was amazing and taught me a lot in terms of combining language and content in a classroom.

Interviewer: Can you tell more about the internship at NIS, how it was organized?

Interviewee: The internship lasted for 15 weeks, the half of it, as far as I remember, was passive, when I just got acquainted with the mentor and her teaching methodologies. Then after two weeks, I attended the lessons in the mornings and we learned about what the updated curriculum was and the new approaches and methodologies in the afternoons, which was very useful. Then there was an active internship, where I worked just the mentor I was attached to. I taught Computer science for four weeks then, but at that time the subject was taught in Russian or English, I taught to Russian group.

Interviewer: Were you obliged to teach your subject in English during the internship?

Interviewee: No, there was no such requirement.

Interviewer: You told you were lucky to be sent to NIS for internship. Can you tell me more about the luck?

Interviewee: At that time only students who were active in social life of the university had this chance to go to NIS for internship. There were many cases when students were afraid to go to NIS because of their personal life, families, and little children, and they could not devote their full attention to the internship, so they went to mainstream schools. These schools did not require the interns to come every day to the school.

Interviewer: What challenges are you facing teaching in CLIL classroom?

Interviewee: I teach CS to 8th grade students. I started to use the pure CLIL approach only this year, because before that I was not properly aware of what CLIL is. The challenge is probably my laziness, you have to prepare for the CLIL lesson and not only for one lesson, it is a complex preparation so that students learn as much as possible from it. But for now, unfortunately, I have a calendar thematic plan, approved by the Ministry of Education and science or by the regional department of education and there are topics for lesson for one week, but in CLIL there have to be one topic for the whole term. This is a challenge for me.

Interviewer: Do you think one hour per week is not enough?

Interviewee: Yes, one lesson a week, that lasts for 40 minutes, is definitely not enough.

Interviewer: What is the most challenging thing for you in teaching your subject in English?

Interviewee: As I mentioned before, I had some difficulties with lesson planning before, but now I know how to organize a CLIL lesson. I am studying for my master's degree now; there I am being trained how to conduct a CLIL lesson and it facilitates my work. Another challenge might be assessment, but it is flexible, I took an exam in Russian.

Interviewer: Are you taking any language courses to improve your language skills? Why?

Interviewee: I attended before Master's programme, now my studies are in English and I find this sufficient language training.

Interviewer: Do you think there is a discrepancy between theoretical and practical experience of teachers who graduate from multilingual groups?

Interviewee: I think yes. For example, we studied programming theory at university, but we were not trained on how to teach it to students or even to teach in English. I am speaking about my experience, maybe it has changed now.

Interviewer: In your opinion, what are the main drawbacks of preparing students of pedagogical universities to teach subjects in English?

Interviewee: There are no specialists, there are no professors, there is a shortage of teachers. There have been a lot of situations, when teacher enters the classroom and says: 'Excuse me, I'm just starting to learn English, or I don't know English, so the lectures would be in Russian or Kazakh'. So, the disadvantage, I think, is the lack of qualified staff at the universities.

Interviewer: What can be done to improve pre-service training of STEM teachers? In other words, what can you recommend?

Interviewee: The quality of the staff at universities should be improved. If the universities show desire to get an autonomy, the government should give them the academic freedom. The latest law on the status of the teachers could increase the number of school graduates who want to enter pedagogical universities; therefore, the universities should work on the quality of the university staff and programmes. If to speak about the methodology, the teaching staff at universities should be trained first. Moreover, the NIS internship was very useful, it was easier to start teaching after graduating. If I did not have an internship at

NIS, I would not have learned what updated curriculum was and how to assess in CLIL. I understood that if I am proficient enough in language and know the subject, then the teaching is not hard, I felt more qualified after that internship

Interviewer: What was the selection criteria for a multilingual track in pre-service training programmes?

Interviewee: On a voluntary basis. Anybody who wanted to join a multilingual track was accepted. It was the first year when we entered the university, so the university administration created a group with those who wanted to study in a multilingual group.

Interviewer: What are the benefits of studying in a multilingual group?

Interviewee: The benefits in regard to my personal life, not career. I understood that there might be a lot of challenges, I learned to believe in myself and cope with the difficulties. I do not think I benefitted much from multilingual group, probably I would have the same perception if I had studied in Kazakh group. We were told that the diploma would signify that we studied in multilingual, but there was nothing about that in the diploma.