

Experience of CLIL in the natural science disciplines in Kazakhstan's schools

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Abstract

Science, technology, engineering, and mathematics (STEM) subjects are taught in English through the use of the CLIL approach following trilingual education that has been implemented in several pilot schools since 2007. In the Kazakhstani background, however, the CLIL approach is still in its infancy, and little is known about the views of stakeholders that can be useful for understanding its current condition and for effective adoption. The present study aimed to explore the attitudes and perceptions of the students of the CLIL approach in one of the trilingual schools. The study used a mixed approach to the design of case studies and semi-structured interviews and questionnaires as tools for data collection. Nine teachers participated in one-on-one interviews and a total of 53 school teachers (39 women and 14 men aged 20-60) participated in the survey. The study showed that students are primarily positive about the CLIL approach.

Keywords: CLIL technology; English; integrated learning; natural sciences; teachers.

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1. Introduction

Although one of the long-term priorities of Kazakhstan is to create people with knowledge of Kazakh, Russian, and English (Nazarbayev, 2012), trilingual education has been introduced through pilot schools throughout the country since 2006. The English language is not only taught as a subject within the trilingual education curriculum, but also as a part of the Material and Language Integrated Learning (CLIL) approach, which facilitates both subject content and language instruction (Coyle, Hood, & Marsh, 2010).

Although this strategy is commonly used and studied in European countries (Marsh, 2002), it is still in its infancy in the sense of Kazakhstan and thus “needs to develop and determine methods of implementation” (Oskolkova, 2014, p. 1). In addition, nothing is understood about the introduction of CLIL in pilot schools (Smagulova, 2012), although their perspectives could be communicated to other conventional schools. Therefore, to clarify and promote CLIL practice in Kazakhstan, this analysis aims to shed light on CLIL implementation. The principle of the Trinity of Languages, proclaimed by President Nazarbayev in 2006 at the XII Convention of the Assembly of Citizens of Kazakhstan, began to encourage trilingualism in an already bilingual community (Zhetpisbayeva & Arinova, 2012).

Since then, this concept has grown into a trilingual strategy that has changed our culture. Kazakh language should be a consolidating force among all ethnicities according to the policy, while Russian is the nation's historical advantage, and English is a tool that would open up new limitless opportunities for any person (Nazarbayev, 2012). This is strengthened by the fact that today's school teacher must work in search of innovation, developing his method of education worthy of the stream of time. To the question of what the nature of such a teacher should be, we decided to look for the answer, taking a step back in history. After all, such thoughts have long been expressed in the ancient ideas of the Kazakh people, and the works of great scholars.

The issue of professional development of teachers based on national education was identified by Kazakhstani scientists (Atemova et al., 2018) in their research, formulated their views on the heritage of great scholars, and defined the professional qualities of teachers. These qualities still have not lost their relevance. Besides, leadership skills also play a significant role for people with pedagogical specialties. As innovations and technologies are introduced, professional leadership skills will help prepare future professionals to be globally competitive (Atemova et al., 2018). According to the research and conclusions outlined above, the views of great thinkers and modern scientists complement each other. The main policy of the modern education system in the Republic of Kazakhstan is to train specialists who will be competitive in a multilingual global environment.

Significant reforms in the education system were implemented following the trilingual strategy. President Nursultan Nazarbayev (2012) claimed in his annual address to the nation that education was one of independent Kazakhstan's key goals and that learning English was very important for successfully entering the global arena. The possibilities presented by any of the three languages are deemed to contribute to the purpose. Trilingual education has thus become one of Kazakhstan's “major trends in the education system” (MoES, 2013).

1.1. Related Research

Content and Language Integrated Learning (CLIL) is the focused approach to be used in schools for trilingual instruction (Irsaliev, Karabassova, Mukhametzhanova, Adil, Bekova & Nurlanov, 2017). This technique makes "learning content via an additional language" (British Council, 2016). In other words, through this approach, students learn both the additional vocabulary and the subject. As most children in Kazakhstan grow up learning Kazakh and Russian, as opposed to English, they feel less strain when researching subjects through these languages. Since English is a foreign language and is often taught in the classroom setting, it is considered to be the most demanding aspect of the trilingual education curriculum. The state target, therefore, is set; our further concern, therefore, is to ensure its successful realization.

While trilingual education was introduced in 2007, it is still in its infancy, as the tasks and key metrics proposed in the main policy papers are still being enforced. There was a large reaction in culture to trilingual schooling, both positive and negative. The most influential debates are around teaching by English ICT, Physics, Chemistry, and Biology (IPCB). Some see it as a gain, some as a challenge to the language of Kazakh and the general acquisition of these subjects. The newly published State Education and Science Growth Policy in the Republic of Kazakhstan (SPED) (MoES, 2016) specifies that trilingual education will be introduced from 2017 to 2023 by converting the experiences of piloting schools into conventional secondary schools. A careful and detailed investigation of the experiences of pilot schools is required to ensure that this translation is successful.

According to Idrissova, Smagulova & Tussupbekova (2015), there is "a lack of clear idea of how content topics are taught in classrooms through English and a lack of educational research". Therefore, inadequate experience and lack of educational study among key stakeholders, along with a lot of controversies and debates (Baitukenov, 2016), may impede the realization of trilingual education. The need to seek stakeholder viewpoints if their views are to be incorporated into the extension of the software has been corroborated by Mehisto and Asser (2007). The value and necessity of researching the viewpoints of learners are acknowledged by many international studies because they are one of the key players in the education sector (Dalton-Puffer, Hüttner, Schindelegger & Smit, 2009).

It is uncertain, however, how Kazakhstani students view the approach to CLIL, and what their challenges and accomplishments are. For scholars, politicians, clinicians, and CLIL students, prior studies may extract useful knowledge. In reality, "student perspectives inform and illuminate the very circumstances of learning and teaching" (Schocker, Ditfurth, 2001, as cited in Massler, 2012). Due to the lack of research on the views of stakeholders in the Kazakhstani context, significant factors in the adoption of CLIL may be ignored. Massler (2012) believes that "the lack of student research can distort how the implementation of CLIL can be understood and formulated". While the extensive foreign study has been carried out, no studies have been found in the context of Kazakhstan that deals with understanding how IPCB subjects are taught in English from the viewpoint of students as one of the key stakeholders.

1.2. Purpose of study

Taken together, the research challenge is made up of a lack of awareness of how teaching in English takes place in the schools, a lack of research on this topic, and ultimately little time left for the national introduction of trilingual education. The present research aims to examine the behaviors and expectations of Content and Language Integrated Learning (CLIL) of students to clarify the current state of adoption of CLIL in a pilot school (PS) that is charged with transferring its experience to regional mainstream schools.

Three research questions were designed to achieve the research goal

1. What are the attitudes and opinions of students towards CLIL in a pilot school?
2. What advantages and obstacles do students see in CLIL?

The first research question aims to define the attitudes and expectations of the teachers towards learning subject topics through English. The second research question tries to identify how the CLIL approach is helpful to the Kazakhstani education context and what kind of difficulties they encounter while learning English topics. This question helps one to gain insights into the planned phased introduction of the trilingual curriculum, where various programs are accessible to students of different grades.

1.3. Literature review

1.3.1. Concept Of CLIL

CLIL is typically an umbrella word "which covers all the various types of core subjects of teaching through a foreign language" (Marsh, as quoted in Roiha, 2014), and precisely "it is a dual-focused educational approach in which an additional language is used for both content and language learning and teaching" (Coyle, Hood, & Marsh, 2010).

A foreign language or a language other than the mother tongue is referred to by the word additional language. It may be Russian and English, for instance, in Kazakh high school. The justification for combining content and language is "to achieve a high level of language awareness, to accommodate various learning styles, to provide greater exposure to L2, to enhance language and communication skills, and to increase learner motivation through greater authenticity". Furthermore, it is intended to improve both material awareness and language management.

CLIL has been widely used as an introduction to multilingual education as a creative approach to teaching and studying foreign languages and has been considered one of the popular approaches in European contexts. As reported by Coyle (2007), however, "there is no single blueprint that can be applied in different countries in the same way". In the field of trilingual education, Kazakhstan strives to use this approach (Irsaliyev et al., 2017).

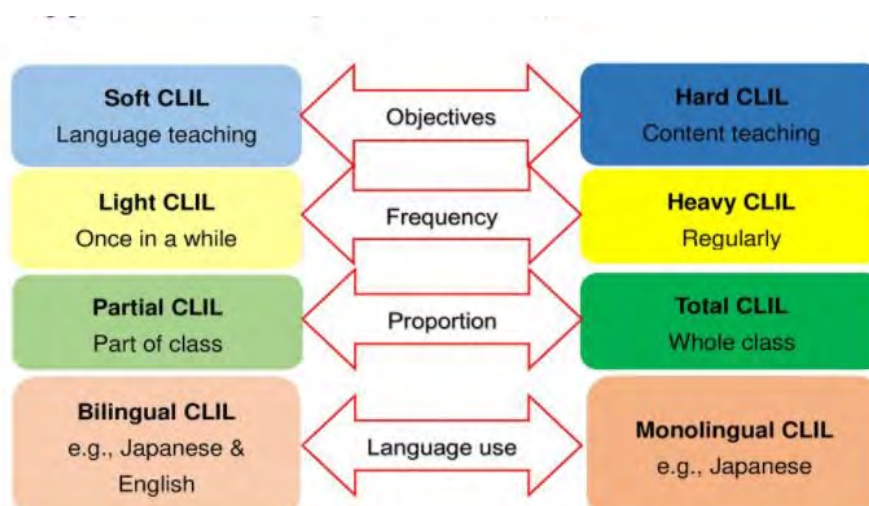
These working meanings, which derived from the discussion of four main principles, influenced the present research in terms of the organization of the chapter of the examination of literature, the creation of the interview and questionnaire, and were, therefore, central to the interpretation and discussion of the outcomes. The entire set of main principles, in other words, determines the present analysis. The concentration on the voices of CLIL students is key to various research, including primary (Massler, 2012), secondary (Lasagabaster & Doiz, 2016), vocational (Dalton-Puffer, Hüttner, Schindelegger & Smit, 2009), or student institutions of higher education (Tsuchiya, Perez Murillo, 2015). These surveys have either centered independently on exploring student expectations or together with other audiences, such as students, parents, and administrators. In both cases, to explain and improve teaching and learning, the viewpoints of students were considered invaluable.

Some researchers recognized the importance of perspectives that students can provide; for example, in the Pladevall-Ballester (2015) report, the insights into the success of the CLIL program in Catalonia; and on teaching approaches used in CLIL classrooms in the Vázquez, Molina & Ávila López study (2014). Other researchers (Massler, 2012) identified the state of adoption and CLIL conditions in schools along with the problems and accomplishments of students, while others checked the viability of different CLIL models in some contexts (Ikeda, 2013).

In the implementation of CLIL technology, it adapts to the types of CLIL depending on the class's academic performance (Ikeda, 2013) (Figure 1)

Figure 1

Types of CLIL



As this chart shows there are eight different types of CLIL. This categorization is based on objectives, Frequency, Proportion, and language use. There are two kinds of CLIL objectives: the so-called hard CLIL and soft CLIL methods. Hard CLIL means that the subject or subject curriculum is taught in a foreign language. However, the main lesson objective is the content objective, not the language, while in the so-called soft CLIL form; the content of the subject is subordinate to the language goal.

The viewpoints of various stakeholders were contrasted by some researchers and thus the areas of convergence and divergence of their views could be established. Wegner (2012), for instance, revealed that their opinions vary on learning the language and content and the distribution of CLIL classes by contrasting the experiences of students and teachers. As a result, these researchers provide students, parents, and administrators with realistic guidance and add to the current body of study. One clear example is the research by Massler (2012), where he proposed that CLIL should be introduced by modules in the first stages to ensure painless learning.

It can be inferred that researchers' sincere interest in investigating students' experiences shows the significance of the voices of students. It is worth noting that the vast majority of experiments have been performed during the past decade. The recent appearance of this phenomenon and, most significantly, the region for further study may suggest this. In addition, the findings of their studies indicate important ideas in their contexts that are appropriate for the improvement of CLIL. In the next chapter, their efforts will be discussed in more depth.

This is the chapter's central section since it reviews the very subject of the chapter, the international observational research on CLIL attitudes and opinions of secondary school students. Five main themes are given below for the study of international studies. These are behaviors and expectations of CLIL by students; perceptions of students learning the content in CLIL classes; perceptions of students learning the language in CLIL classes; perceptions of CLIL pedagogy by students; perceived advantages of CLIL; and perceived CLIL obstacles. The review of current literature on the experiences of CLIL by students has revealed multiple separate variables influencing their positive or negative perceptions. They are concerned with methods of language and instruction unique to the CLIL approach. Several research on CLIL associate the experiences of learners with the language element (Yassin, 2009).

Some students see CLIL as an "opportunity for better future careers and education," as Denman et al. (2013) suggest, largely because CLIL offers an opportunity to improve their language skills. In addition, a methodological analysis by Yassin (2009) correlated the experiences of students with their standard of English. They report that learners with strong English command appear to be optimistic about CLIL and vice versa. However, other scholars who have researched the link between language proficiency and cognition have found that, because of their poor level of English, students do not have negative impressions (Vázquez, 2014).

Furthermore, the literature review showed an agreement among academics that the interpretations of CLIL by students are mainly related to teaching strategies that are typical of CLIL. For example, Czura & Papaja (2013) note that as they are more student-centered, students view CLIL classes positively; students love becoming active learners and gaining more support from their teachers. In addition, due to "intense visibility and genuine circumstances" (Lasagabaster & Sierra, 2009), and better organization of lessons, students find CLIL "more fun" and "meaningful" (Hunt, 2011). These observations have been supported by other research (Vázquez, 2014). Given these positive outcomes of CLIL, there were still several negative aspects revealed by many reports. "CLIL was found "too complicated", "boring" and "no use" by a smaller number of learners (Coyle, 2013), "confusing", "unpleasant" and "more difficult" (Finardi, 2016). The involvement of English in studying the material induced some negative impressions in these tests.

Another research (Herrera, 2015) shows how the impressions of CLIL by students could shift over time. Before and after taking CLIL courses, Herrera explored students' impressions of CLIL."In

particular, the study highlights that the initial perceptions of learners of upcoming CLIL classes and perceptions were completely different after being taught in CLIL classes: their perceptions changed from "difficult, awkward, and illogical" to "a nice way to practice English, more fascinating. The author (Herrera, 2015) concludes that such a transition takes place when students build their learning methods to cope with challenges, and during the classes, their teachers should also create a collaborative environment. These results show that considering the unfavorable image of CLIL classes due to language problems, they can be alleviated over time by good teaching methods. Another research (Lasagabaster, 2014) correlated one and three years of familiarity with the experiences of students. They find that the more students are introduced to CLIL, the more beneficial they believe CLIL is. As such, it can be inferred that derogatory attitudes derive more from the inexperience of students rather than the lack of ability or expertise to participate in CLIL schools.

Given all this evidence, it seems that CLIL's positive views dominate over negative ones. The writers have put forward three key reasons that underpin students' expectations. There are influences linked to grammar, the essence of CLIL embodied in the creative teaching approaches in which teaching is student-centered with exercises that make students engaged learners, and finally time. More significantly, however, these studies demonstrate that the teaching and learning strategies used in CLIL classes can be important for building one's expectations and can, in turn, provide useful input on their effective execution.

2. Materials and Methods

2.1. Data collection instrument

According to the above methodology, among the teachers of the natural science cycle, special questionnaires were obtained to test the skills of integrated teaching of the English language. Over the past three years, "Ustaz" Professional learning Center LLP has attended English courses for about 8500 teachers. The mentoring project has been running for a year as part of this course. The questionnaire was taken from teachers of natural sciences in Turkestan, Kazakhstan: chemistry, physics, biology, and computer science. It describes and includes the joint work of mentors, i.e. subject teachers under the supervision of language teachers for 2018-2019.

2.2. Participants

A total of 53 school teachers (39 women and 14 men aged 20-60) participated in the survey. It allowed determining the extent to which CLIL technology penetrates the classroom.

2.3. Procedure

The survey was created at docs.google.com, obtained through WhatsApp, and conducted anonymously.

The questionnaire consists of three stages:

In the first stage, we identified the general basic information about the participants.

Here we determined such information as age, gender, subject of teaching, pedagogical experience, living in rural and urban areas, basic knowledge of English, or studying other foreign languages at school or university.

We tried to draw attention to the fact that if earlier English was studied at school or University, they are more familiar with English than those who studied French or German and assumed that this would make it easier to learn English.

Secondly, taking into account the age characteristics of students is important in teaching language. We believe that intensive integrated teaching of the English language is facilitated by the psychological perception of both young and adult professionals.

Thirdly, the environment, the presence of a multilingual environment in rural and urban areas, the availability of information sources in different languages, and the good functioning of the Internet increase interest in learning English.

Fourth, there is an even distribution of forces for mastering knowledge and language.

And if inexperienced professionals, first of all, make an effort to master both science and language, then an experienced teacher does not make much effort to master science but to master the language.

We considered that this is also one of the factors creating the conditions for integrated learning. We placed the questionnaire form for determining these data in the following table 2.

Table 2

Participants' information

Participants Information	
Age	20 to 60 years old
Gender	male, female
Work experience	1-31 years or above
Science subjects	Biology, Chemistry, Physics, Computer Science
Basic foreign languages	English, German, French
School area	Village, city

In the second stage of the questionnaire, we wanted to find out whether participants support the introduction of CLIL technology in the education system of Kazakhstan, and whether it is difficult or easy to apply.

Next, we offer a table that shows the views of teachers to CLIL. Because we are convinced that teacher interest and positive feedback about CLIL will have an effective impact on mastering this technology.

Table 3

Teachers' attitude scores towards using CLIL on Likert's scale

Scale	Strongly agree (highest)	Agree (high)	Neutral (moderate)	Disagree (low)	Strongly disagree (lowest)
Score	5	4	3	2	1

In the third stage of the questionnaire, we sought to show the development of the skills of using the CLIL method in the educational process and the level of knowledge of a foreign language of teachers of the natural science cycle.

Following the tasks set in the third part of the questionnaire, we surveyed science teachers to determine the level of formation of integrated English language teaching skills.

The questionnaire included the following questions:

How would you describe your level of English?

What motivates you to learn/develop English?

Which aspect was easier for you in teaching the integrated English language?

Which of the following can you do?

Analyzing the answers to these questions, we noticed that the CLIL technology had a positive impact on the integrated teaching of the English language, but there were some difficulties.

3. Results

As noted in the first stage, the collected data on the survey of school teachers trained in integrated English language learning in chemistry, biology, computer science, and physics were analyzed. According to the results of a survey of 53 school teachers, 38 women and 15 men between the ages of 20 and 60 were enrolled. This information is shown in table 4:

Table 4
Participants' Age and Gender

Gender		Frequency	%	Valid percent	Cumulativepercent
Valid	Female	38	71,7	71,7	71,7
	Male	15	28,3		28,3 100,0
	Total	53	100,0	100,0	
Age		Frequency	%	Valid percent	Cumulativepercent
Valid	20-30	4	7,5	7,5	7,5
	31-40	26	49,1	49,1	56,6
	41-50	17	32,1	32,1	88,7
	51-60	6	11,3	11,3	100,0
	Total	53	100,0	100,0	

When determining the age characteristics of participants: between the ages of 20 and 30 years were 7.5%, from 31 to 40 years- 49.1%, from 41 to 50 years-32.1%, from 51 to 60 years-11.3%. The purpose of determining the work experience of teachers in the school was to identify the percentage of teachers who have sufficient experience in teaching a given subject. According to the diagram below, young specialists with work experience from 1 to 10 years accounted for 22.6%, teachers with 11-20 years of experience - 49.1%, that is, most of the percentage, specialists with 21-31 years of experience - 22.6 %, teachers with more than 31 years of experience - 5.7%.

Thus, the percentage of teachers with more than 10 years of experience in this subject is 71.7%. From these statistics, it is clear that the specialists are prepared from a methodological point of view. Therefore, we concluded that the process of integrated learning should be aimed, first of all, at the formation of their language skills. For that reason, the use of the CLIL technique will give an effective result. The percentage of teacher experience is shown in the following table 5.

Table 5
Work experience

		Frequency	%	Valid percent	Cumulative percent
Valid	1-10	12	22,6	22,6	22,6
	11-20	26	49,1	49,1	71,7
	21-31	12	22,6	22,6	94,3
	31 in above	3	5,7	5,7	100,0
	Total	53	100,0	100,0	

Teaching chemistry, physics, biology, and computer science in integrated teaching of the English language aroused great interest and contributed to the activation of science teachers. In particular, biology teachers - 43.4% mainly attended the English language course. This showed that, unlike other science teachers, biologists took an active interest in innovative technologies. According to the results of the questionnaire, it turned out that the vast majority of teachers were "Elementary" level accounting for 47.8%, and a computer science teacher's attendance consist of

20.8%, while 36.4% mastered the pre-intermediate level. This shows that computer science teachers who work with electronic systems are good at the English language.

Figure 2

Teachers' activity indicator

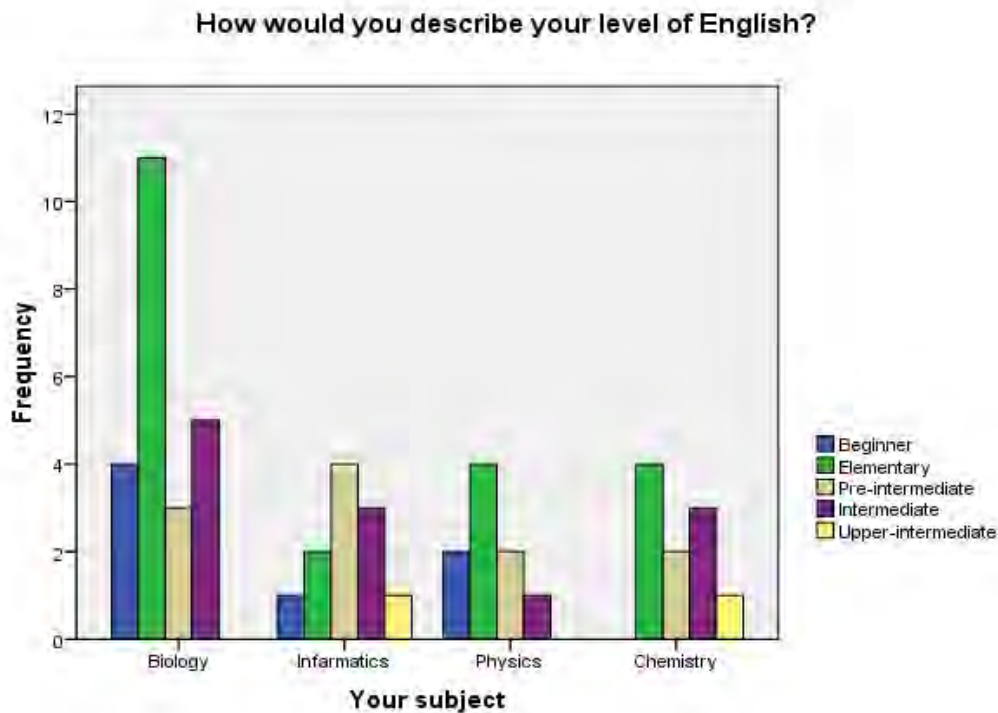


Table 6

The basic foreign language of participants

		What foreign language did you learn at school?			
		English	German	French	Итого
Age	20-30	Frequency 3	1	0	4
		% в Age	75,0%	25,0%	,0%
31-40	Frequency 12	5	9	26	
	% в Age	46,2%	19,2%	34,6%	100,0%
41-50	Frequency 11	5	1	17	
	% в Age	64,7%	29,4%	5,9%	100,0%
51-60	Frequency 3	3	0	6	
	% в Age	50,0%	50,0%	,0%	100,0%
Total	Frequency 29	14	10	53	
	% в Age	54,7%	26,4%	18,9%	100,0%

As a result of the survey, it was found that 54.7% of respondents studied English at school. The rest of the teachers noted that they studied German and French at school. From this data, it follows that when integrating the English language into natural science subjects, different levels of complexity must be taken into account and the methodology should be applied depending on the level of training of teachers. The given data above determines the necessary information and the

selection of appropriate material to enable course participants to learn CLIL and then apply it in the classroom.

In conclusion, according to the first stage of the survey, it turned out that 49.1% of teachers who participated in English courses were middle-aged (31-40 years) teachers, 49.1% had more than 10 years of experience, and 54.7% had a base in English. In turn, these indicators show the predominance of qualified, flexible, and capable teachers of subject-language integration.

However, despite their extensive experience, it is important that teachers are interested in learning English, their attitude to the language, and understanding its needs. As a result of the survey, we identified the attitudes of teachers toward mastering CLIL technology in the five points listed below. (Table 7)

Table 7

Teacher's attitude to CLIL

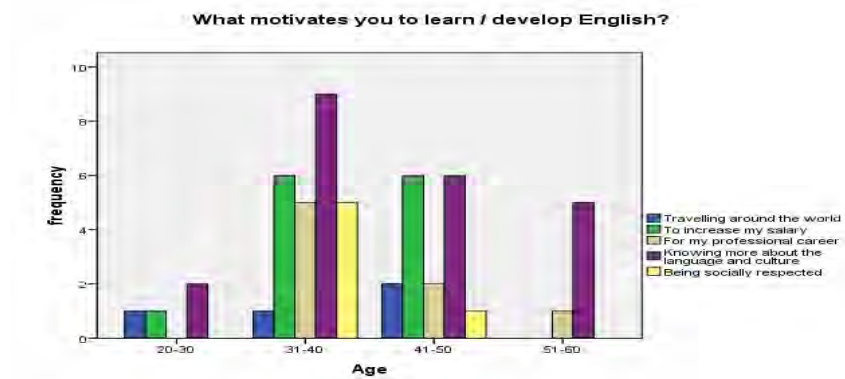
No	Statements	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1	I agree with implementing CLIL in the education system of Kazakhstan.	18 (34%)	32 (60.4%)	2 (3.8%)	1 (1.9%)	-
2	I have learned new ways / methods while integrating English into my subject	15 (28.3%)	37 (69.8%)	1 (1.9%)	-	-
3	I am using English easily and simply in my subject	9 (17.0%)	35 (66.0%)	6 (11.3%)	3 (5.7%)	-
4	The students' interest has increased in CLIL lesson	17 (32.1%)	30 (56.6%)	5 (9.4%)	1 (1.9%)	-
5	Learning English has influenced my personal development.	17 (32.1%)	31 (58.5%)	4 (7.5%)	1 (1.9%)	-

According to the statistics shown in the table above, in general, teachers supported Integrated English Learning using CLIL technology. We found that teachers generally agree between 80-90% in 5 different statements presented in the statistics shown in the table above. Almost 100% of teachers, exactly 98.1%, have learned new methods and techniques in integrating the English language. The number of teachers who consent to the accomplishment of CLIL technology in the education system and the number of teachers who have influenced the personal development of English proficiency are more than 90%, 94.4%, and 90.6% respectively. Among the statements, neutral and disagreeable teachers said that it was not easy to integrate English and that the percentage of teachers who had difficulty identifying students' interests was higher than other statements, at 17 % and 11.3 %, respectively. However, the highest percentages on these issues are teachers, with 83 % and 88.7 % agreeing. There were no teachers who would disagree with all statements.

In the third stage, after determining the level of English proficiency of teachers (Table 5), it was necessary to determine teachers' motivation of learning the language. According to the survey results, the main interest of subject teachers in learning a foreign language lies in the fact that the vast majority of them among 31-40 years old (34.6%), that is 40.9% have a high interest in learning both the language and customs of other countries, self-development, career growth, through communication with people from other countries. It should be noted that teachers' interest in learning English is determined, first of all, by their spiritual development and improvement. Analyzing

the results of the survey, we came to the following conclusion: for teachers, professional spiritual, and moral development was more important than material needs. This is evidenced by the indicators in figure 3.

Figure 3.
Motivation for language learning



Subject teachers trained in integrated English language teaching have developed different levels of skills in conducting classes using CLIL. When conducting classes, some difficulties occurred, and some teachers noticed a successful organization of the lesson, and this is due to their age characteristics, work experience, competence, and knowledge of the English language. These results are shown in figure 4.

Figure 4
An indicator of the successful application of CLIL in the classroom

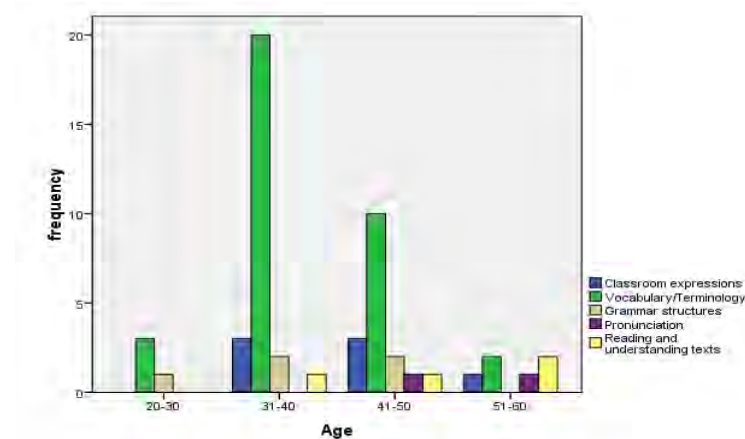
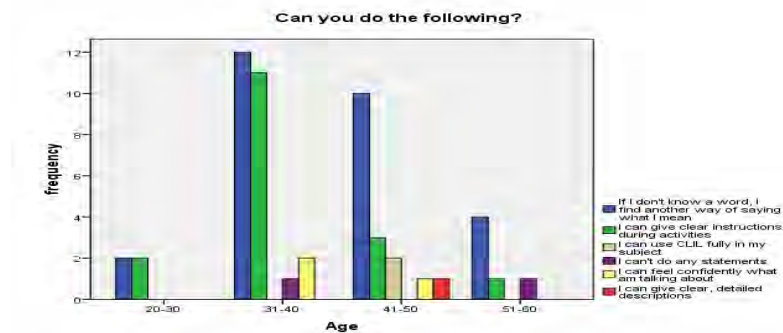


Figure 5
Indicator of the formation of teachers' skills in integrated learning



As can be seen from the diagram, the organized course has shown positive results despite the difficulties and benefits for teachers during the class. Many teachers showed that in addition to using CLIL in the lesson, at the initial stage they know the terminology (25%) in English, at the next stage they should be fluent in communicative and speech constructions (50%) in English, but some teachers could conduct classes completely in English using CLIL.

4. Discussion

The education system of the Republic of Kazakhstan, as a whole, is going through a transition period to integrated teaching of subjects through English (Bokayev et al., 2021). Therefore, it is important to analyze the world experience of training and use them following the peculiarities of the country's education. This study believes that in the future, the above approaches and technologies will help to find and offer a single effective way to integrate English with science subjects in the Republic of Kazakhstan's schools.

When teaching methods of integrated teaching of English in the classroom of natural sciences, it is necessary to take into account the age-related characteristics of specialists and the level of their basic language training (Krotik & Morhun, 2021). Depending on the level of language training of specialists, it would be effective to train CLIL according to step-by-step instructions. That is, at the initial stage, it is necessary to master 25% of the basic terms of the English language, at the next stage it is necessary to learn 50% of the terminological vocabulary and instill skills in using them when communicating depending on situations, at the third stage should be able to correctly use approximately 75% of grammatical and stylistic terms in specialties in English, which contributes to the expansion of the vocabulary of students, in the fourth stage, at the end of the educational process, it is necessary to switch to the free use of English 100% when teaching the studied discipline.

It is important to take into account that a sufficient level of professional training for specialists makes it possible to teach a subject in English (Dearden, 2018). It should be noted that a specialist with fundamental theoretical training, that is, a specialist who has worked in this field for many years and has a deep knowledge of the theoretical aspects of the subject, will now make every effort to master the language. However, due to the lack of pedagogical experience, a young specialist is obliged to direct all efforts to master the English language, while improving his theoretical knowledge, despite the intense perception of information.

Teachers who integrate English with the subjects of the natural science cycle should pay attention to their teaching load and salary to stimulate their professional creativity. To improve, and develop the content and technology of integrated English language teaching in natural science subjects at schools, it is necessary to start training future specialists in the process of studying at the University.

5. Conclusion

Summing up, we can say that the experience of using CLIL technology in Kazakhstan by teachers of the natural science cycle (chemistry, physics, biology, computer science) and the mechanisms of its implementation have not yet been systematized and require improvement. The use of CLIL as an effective method of subject-language integrated teaching of English requires clarification for many teachers as new innovative technology. By studying this technology, we have seen that integrated learning provides effective results.

In this article, to achieve our goals, we based our research on the scientific works of scientists who have studied this problem. As a result of the analysis and comparison of many studies, we are convinced that the technology of subject-language integrated teaching (English) of natural science disciplines has long been introduced in Western countries and has emerged as a more effective method.

Therefore, we believe that the positive direction of our research was influenced by the conclusions and recommendations of foreign scientists when teaching teachers of natural science subjects in English at school. Among foreign scientists, it is important to note the valuable ideas in the articles by Marsh, Coyle, and others.

Along with this, the actual information for our article was the use of innovative methods and forms of organization of training, applied during the practical training course "Ustaz kasibi biliktikti arttyru", held in the Republic of Kazakhstan. Overall, these findings enhance our understanding of the current state of the CLIL approach and may assist policymakers and practitioners in making more informed decisions to use the CLIL approach more effectively for the implementation of trilingual education.

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