

M.P. Nartayeva , A.N. Zhylysbayeva\* , G.A. Rysbaeva 

U. Zhanibekov South Kazakhstan Pedagogical University, Kazakhstan, Shymkent

\*e-mail: zhylysbayeva.akkonyr@okmpu.kz

## THE IMPACT OF CLIL TECHNOLOGY ON THE PROFESSIONAL COMPETENCE OF PRE-SERVICE BIOLOGY TEACHERS

The article examines the impact of content and language integrated learning (clil) technology on students enrolled in the educational program of teacher training in biology. according to the results of the study, conducted on the formation of professional competence of a future biology teacher, the effectiveness of the use of clil technology in biology lessons taught in english is theoretically justified.

The article presents the results of a survey conducted to assess the perception of integrated learning technology by senior students in the context of higher education. the students' understanding of the essence of clil technology, the duration of its use, the advantages and difficulties associated with the application, as well as the impact on the formation of professional competencies of pre-service biology teachers are analyzed. students of u.zhanibekov south kazakhstan pedagogical university took part in the survey. the survey results revealed the prospects and difficulties related to the introduction of clil technology into the educational process of universities. clil classes cannot completely replace the biology lesson taught in the native language, but can only complement it. integrated teaching of biology with a foreign language is an effective way to implement a trilingual education program. the article gives important recommendations to future teachers and researches in the field of education and intercultural communication.

**Key words:** CLIL technology, integrated teaching of a foreign language, pre-service biology teacher, methodological approaches, multicultural personality.

М.П. Нартаева, А.Н. Жылысбаева\*, Ф.А. Рысбаева

Ө. Жәнібеков атындағы Оңтүстік Қазақстан педагогикалық университеті, Қазақстан, Шымкент қ.

\*e-mail: zhylysbayeva.akkonyr@okmpu.kz

### CLIL технологиясының болашақ биология мұғалімдерінің кәсіби құзыреттілігіне әсері

Мақалада биология мұғалімдерін даярлаудың білім беру бағдарламасы бойынша оқитын студенттерге пән мен тілді кіріктіріп оқыту (CLIL) технологиясының әсері қарастырылады. Болашақ биология мұғалімінің кәсіби құзыреттілігін қалыптастыру бойынша жүргізілген зерттеу нәтижелеріне сәйкес, ағылшын тілінде оқытылатын биология сабақтарында CLIL технологиясын қолданудың тиімділігі теориялық тұрғыдан негізделген.

Мақалада жоғары білім контекстінде жоғары курс студенттерінің интеграцияланған оқыту технологиясын қабылдауын бағалау мақсатында жүргізілген сауалнама нәтижелері келтірілген. Студенттердің CLIL технологиясының мәнін, оны қолдану ұзақтығын, қолданудың артықшылықтары мен қиындықтарын түсінуі, сондай-ақ болашақ биология мұғалімдерінің кәсіби құзыреттіліктерін қалыптастыруына әсері талданады. Сауалнамаға Ө.Жәнібеков атындағы Оңтүстік Қазақстан педагогикалық университетінің студенттері қатысты. Сауалнама нәтижелері университеттердің білім беру процесіне CLIL технологиясын енгізудің перспективалары мен қиындықтарын анықтады. CLIL сабақтары ана тілінде оқытылатын биология сабағын толығымен алмастыра алмайды, тек оны толықтыра алады. Биологияны шет тілімен интеграцияланған оқыту-үш тілді білім беру бағдарламасын жүзеге асырудың тиімді тәсілі. Мақалада білім беру және мәдениетаралық коммуникация саласындағы болашақ мұғалімдер мен зерттеушілерге маңызды ұсыныстар берілген.

**Түйін сөздер:** CLIL технологиясы, пән мен тілді кіріктіріп оқыту, болашақ биология мұғалімі, әдістемелік тәсілдер, көпмәдениетті тұлға.

М.П. Нартаева, А.Н. Жылысбаева\*, Г.А. Рысбаева

Южно-Казахстанский педагогический университет имени О. Жанибекова, Казахстан, г. Шымкент

\*e-mail: zhylysbayeva.akkonyr@okmpu.kz

### **Влияние технологии CLIL на профессиональную компетентность будущих учителей биологии**

В статье рассматривается влияние технологии интегрированного обучения содержанию и языку (CLIL) на студентов, обучающихся по образовательной программе подготовки учителей биологии. Согласно результатам исследования, проведенного по формированию профессиональной компетентности будущего учителя биологии, теоретически обоснована эффективность использования технологии CLIL на уроках биологии, преподаваемых на английском языке. В статье представлены результаты опроса, проведенного с целью оценки восприятия технологии интегрированного обучения студентами старших курсов в контексте высшего образования. Анализируется понимание студентами сути технологии CLIL, продолжительность использования, преимуществ и трудностей, связанных с применением, а также влияния CLIL на формирование профессиональных компетенций будущих учителей биологии. В опросе приняли участие студенты Южно-Казахстанского педагогического университета им. О. Жәнібеков. Результаты опроса выявили перспективы и трудности, связанные с внедрением технологии CLIL в образовательный процесс университетов. Занятия CLIL не могут полностью заменить урок биологии, преподаваемый на родном языке, а могут лишь дополнять его. Интегрированное преподавание биологии с иностранным языком – эффективный способ реализации программы трехязычного образования. В статье даны важные рекомендации будущим учителям и исследователям в области образования и межкультурной коммуникации.

**Ключевые слова:** технология CLIL, интегрированное обучение иностранному языку, будущий учитель биологии, методологические подходы, поликультурная личность.

#### **Introduction**

The development of a biology teacher's professional competences, the ongoing updating of instructional strategies, the mastering of novel ideas, and their efficient application are essential in the current information era. At the same time, an educational technology called Content and Language Integrated Learning (CLIL) is gaining popularity due to its unique concept: teaching the second language as part of the curriculum, allowing students to learn content material in an additional language.

This provides an opportunity for future specialists to study the language by implementing a multilingual, trilingual policy reflected in the Message of the Head of the state K.K. Tokayev to the people in 2022.

However, in order for a country to have its place in the global world, we must first understand that it directly depends on the level of the national education system and the direction of its development. In this regard, especially in biology curricula, there is a need for qualified specialists, since the learning goals teach a person to recognize real problems and study them. Moreover, the updated educational system as a program focused on competence and quality requires critical thinking skills, communicative skills, experimental research skills, the ability to apply ICT at the proper level, to work individually,

in pairs and in groups, creating a harmoniously favourable educational environment for the students' personality. Therefore, the training of the specialists who are able to apply optimal methods to solve these problems is the relevance of this article. Considering that this is directly related to the problem of training of future biology teachers in universities, in the course of training, special attention is paid to the formation of professional competence of a pre-service biology teacher based on the best technologies.

#### **Literature review**

At the last twenty years, CLIL has been increasingly popular, particularly at international schools that provide a variety of bilingual education courses (Kampen et al., 2020, Smet et al., 2018) and multilingual education are included into professional development programs for teachers and training programs for future specialists in various fields (Banegas et al., 2020, Zhou&Mann, 2021, Pennelle et al., 2023).

The formation of own national model of the multilingual education system and development of its mechanics, the direction of language teaching methods in a new guidance have been purposefully undertaken in recent years. Nevertheless, the theoretical foundations of integration in education were considered in works by Komensky et al., (1988) almost several centuries ago.

Almost half a century has passed since the Content and Language Integrated Learning method began to be used in European countries. Applying CLIL in teaching process can enable an integration of any subject with English or other foreign languages. CLIL, as an instructional approach outlined by Fortanet-Gomez in 2013, facilitates the development of language and communication proficiency in a foreign language among students. Within CLIL lessons, mastery of any subject is achievable. This program not only enhances the understanding of a specific subject by incorporating a foreign language but also promotes a thorough exploration of the foreign language through the subject being taught. The process of teaching chemistry, mathematics, geography, biology and other subjects with the linking topics in their native language or the language they know can be explained by aforementioned goals to the bachelor or master students (Fortanet – Gomez, 2013) . In CLIL classes, it is accessible to use interesting materials from authentic resources on the Internet. In one of the researches, CLIL lessons showed positive results on the basis of effective use of ICT tools (Martínez-Soto&Prendes-Espinosa, 2023) .

According to Smith (2010) , it is more beneficial to teach the language through CLIL technology than separately. That is why, he concludes that “In the learning process based on CLIL more attention should be paid to a balanced approach”. The theoretical foundations of bilingual education through CLIL in universities were studied by scientists Ball (2010) , Coyle et al., (2010). They highlighted the following advantages of incorporating CLIL into higher education:

1. Integrated lessons boost students’ language learning motivation, as they view language as a tool for mastering other subjects and acquiring intriguing new information.
2. Students gain increased opportunities to express themselves verbally and in writing, sharing their observations and analyses with classmates.
3. Acquisition of new knowledge and skills is emphasized, encouraging practical application.
4. Language learning becomes a potent tool for expanding professional expertise.
5. CLIL aids in broadening horizons and understanding cultural values.
6. Students develop collaboration skills and foster independence.
7. The approach creates an “authentic” language learning experience, tapping into the innate language-learning ability present in childhood and adolescence.

8. The flexibility of CLIL is evident as it can be easily adapted to diverse learning contexts, curricula, or educational systems.

However, despite these benefits, teachers encounter challenges, such as subject teachers facing difficulties in teaching content in a foreign language (e.g. chemistry, physics, history), and language teachers experiencing challenges in interpreting subject content during language lessons.

In recent years, interest in the theoretical foundations of integration in education has been developing quite intensively. The ability to use English as a second language, new national programs of the country oblige to initiate multilingual education. This particularly contributes to the formation of a generation fluent in English using CLIL strategies. Pre-service biology teachers can integrate simple short tasks they can perform daily in English while teaching biology at the same time. Domestic scientists Nurakayeva&Shegenova (2013) , Akhmetova (2020) , Tyutenova et al., (2020) , Zhorabekova&Abilkhaorova (2020) published scientific papers in this direction and Nazarbayev university published a book called “CLIL classroom practices in multilingual education in Kazakhstan: guidelines and examples” edited by San Isidro et al. (2020) . The book examines a number of areas integration of CLIL into educational content. It delves into innovative methods for organizing integration, which plays a role in addressing the coordination challenges in education. Additionally, the book explores interdisciplinary connections as a tool and the necessary conditions for successful learning. It focuses on educational units that are built upon the interrelationship of different components within advanced pedagogical training for students. However, despite the availability of researches on CLIL technology, there is still lack of studying science subjects, encompassing biology courses. Additionally, according to Morton (2023) , CLIL still requires the study of the following outstanding directions: increased attention to the use of CLIL as a basis for content-based learning, focus on academic literacy within CLIL, assessment of CLIL experience, equity, especially, views on the impact of CLIL on low-income group of students, diverse multilingual developments in CLIL settings from a monolingual point of view, teaching experience, identity in CLIL and connection between CLIL and the knowledge in the second language.

This technology offers practical, flexible materials and ideas useful to revise the content by introducing themes. Biology materials in Kazakh can be easily adapted to apply in other foreign languages.

CLIL aims to facilitate pre-service biology teachers introduce English into biology.

*Purpose of study.* Our research in this article is aimed at studying the impact of CLIL on a low-income group of students. Hence, the purpose of our research work was to study the influence of future biology teachers studying in the South Kazakhstan region on their competence in the application of CLIL technology. In addition, our research paper aimed at the identification of problems and challenges that arise while using CLIL.

### Research materials and methods

In this study, the methods were applied comprehensively by the theoretical justification of the effective impact of the CLIL on the professional competence of future biology teachers. In particular, such theoretical methods as analysis and synthesis, generalization and comparison, abstraction and refinement, as well as the design of the results were used. The subsequent approach involved an empirical method, encompassing a survey of prospective biology teachers enrolled in the specialization, engaging in conversations with them, overseeing their practical experiences, and analysing their educational and methodological documents. To assess our hypotheses, we utilized various statistical analyses, which involved discussing the outcomes, drawing conclusions, and formulating recommendations.

*Participants.* The participants of our survey constituted respondents studying biology in the South Kazakhstan pedagogical university named after U.Zhanibekov (34 students).

In order to investigate the influence of CLIL on professional competence of pre-service biology teachers, the third and the fourth years students were considered. The survey questionnaire for university students are as follows:

How do you understand what CLIL technology is? (express your point of view in one or two sentences)

How long have you been studying through CLIL?

What are the advantages of using CLIL in the educational process? (select several options)

What difficulties have arisen while applying CLIL in the learning process? (select several options)

Does CLIL influence the formation of your professional competence as a future biology teacher?

Will you use this technology in your classrooms as a professional teacher in the future?

### Results

The survey was conducted in the form of Google forms and the experiment yielded the following outcomes:

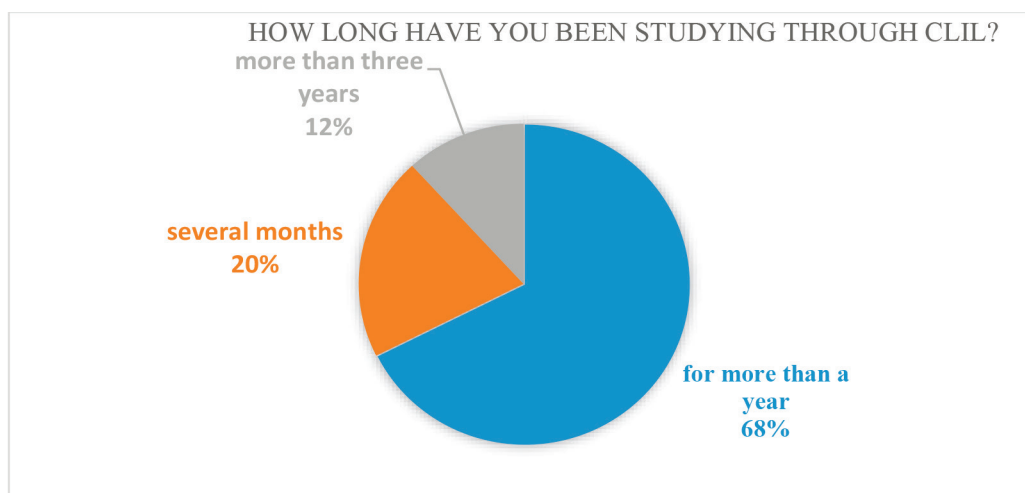


Figure 1 – Duration of leaning through CLIL.

According to the survey results, the respondents are students of the third and fourth academic year, and most of them have been studying through CLIL technology for more than a year (Pic.1). For the question “How do you understand what CLIL tech-

nology is?” the following answers were received: “studying the content of the discipline through a foreign language”, “integrated learning technology”, “technology that teaches natural science disciplines in a foreign language”.

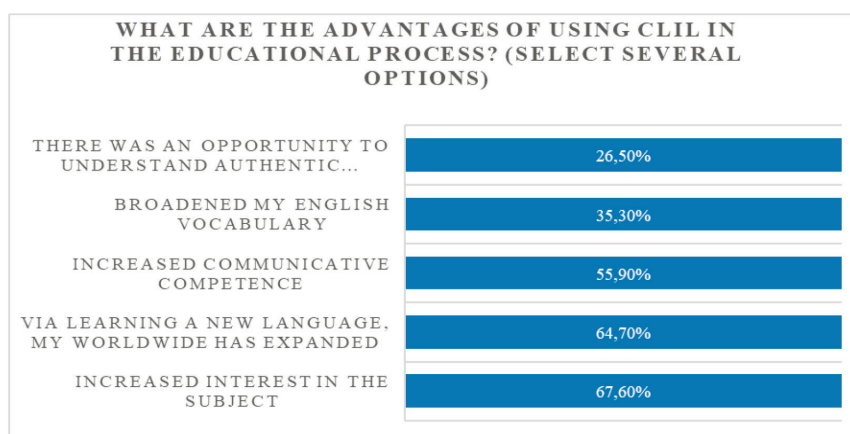


Figure 2 – Advantages of using CLIL technology in the educational process for students.

Among the options demonstrated in the picture 2, the predominant amount of students chose the op-

tion “increased interest in the subject” comprising 67,6%.

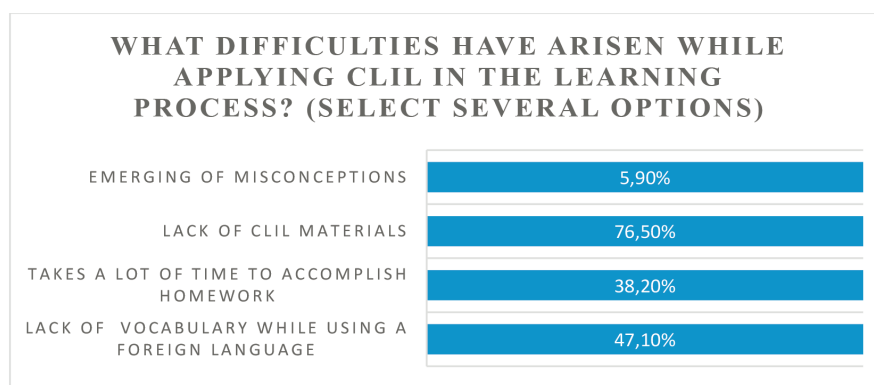


Figure 3 – Challenges faced by CLIL technology during the educational process.

Out of the difficulties that arise in the learning process based on CLIL (Figure 3), “lack of educational material” and “lack of vocabulary” are at the forefront, that is why it is necessary to decide wheth-

er the biology classroom is equipped with teaching equipment, the availability of handouts, age-related features, the level of the students’ readiness must be taken into account.

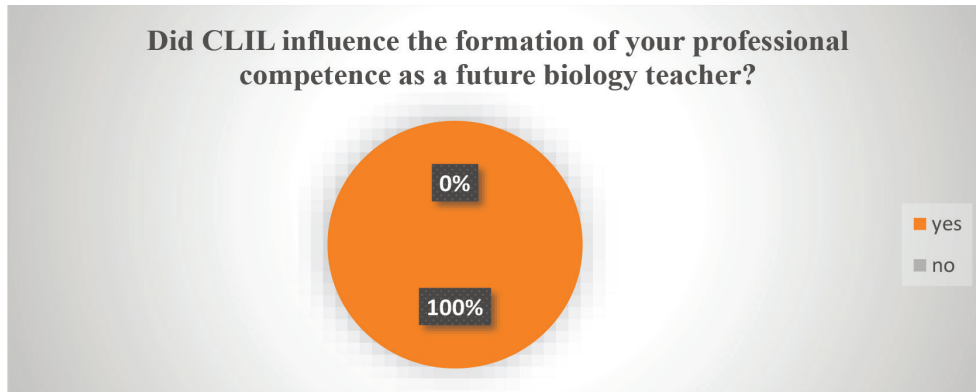


Figure 4 – Improving the professional competence of students based on CLIL.

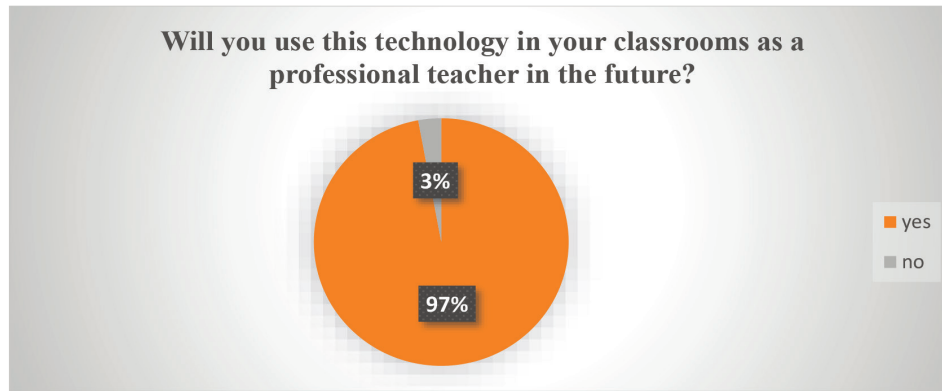


Figure 5 – Expected use of CLIL in teaching process as a future teacher.

Despite all the above mentioned challenges, it is evident from the results that the use of CLIL is a unique approach to teach foreign language. As shown in Figures 4 and 5, 100% of the students surveyed demonstrated that the CLIL affects positively the formation of their professional competence, and 97% of them will apply CLIL in the teaching process when they become teachers. Taking into consideration all the factors pertaining to methodology of CLIL, future biology teachers can develop their professional competence and achieve the following results:

- showcases the global educational standing of the country;
- substantially boosts students' motivation to acquire proficiency in foreign languages;

- instructs in the deliberate and unrestrained utilization of a foreign language in everyday communication;
- expands horizons, fostering an inclination towards knowledge and embracing diverse cultural values;
- equips students for further education in their chosen fields of study;
- enhances linguistic and communicative competencies through the acquisition of a new language;
- there will be an opportunity to flourish students' potential, cognitive and creative skills;
- obtaining a chance to participate in international Olympiads, world-class competitions;
- positive impact on the growth of the number of educated and qualified specialists (Table 1).

**Table 1** – Results of developing the professional competence of a future biology teacher via CLIL.

Formation of professional competence of a pre-service biology teacher through CLIL						
Assists to demonstrate the level of the education of the country at the world level;	Teaches the conscious and free use of a foreign language in everyday communication;	Prepares students to proceed education in their chosen specialty;	Broadening of horizons, orientation towards knowledge and acceptance of other cultural values;	Improves linguistic and communicative competences through learning a new language;	Positive impact on the growth of the number of educated and qualified specialists;	Significantly increases the motivation of students to learn foreign languages.

Students, as future biology teachers, must be constantly in demand and professionally

qualified to contribute to the formation of a competent personality capable of working on the basis of world standards, with deep knowledge, business-like and thoughtful in accordance with the level of advancement of science and technology.

### Discussion

The methodology of integrated language teaching enables a departure from conventional delivery of the subject, facilitating the acquisition of comprehensive, profound knowledge beneficial for both future professional endeavours and everyday communication. Students have the chance to showcase not only their language proficiency but also their expertise in diverse aspects of biology.

The goals of future specialists teaching biology through CLIL:

- introducing students to novel concepts and ideas within the realm of biology;
- facilitating the simultaneous learning of both biology and a foreign language;
- cultivating students' confidence in expressing themselves in a second language apart from their native one;
- setting up the assimilation of the content of the discipline as a main task in biology lesson;
- the ability to plan a foreign language in accordance with the curriculum in biology lessons, present tasks more accurately that enhance their thinking skills and supporting students while mastering two subjects in one lesson at once.

At the seminar classes, students generate various literary sources and get prepared with pre-

made plan. During the lesson, they gain the opportunity not only to tell the essence of a particular issue, but also to compare its presentation in different articles, express their opinion and point of view. This contributes to the development of their intellectual potential, the formation of skills to deal with literary sources. While teaching biology in primary classes, explanatory, visual and research skills are often used, since the age characteristics of students, their level of training require the intervention of a teacher and allocating more time. Research practices and observations are considered as an essential part of extracurricular work. The efficiency of the methods depends on the teacher's ability to enrich them with methodological approaches. The proper use of natural objects, descriptions, schemes, systematizing and accumulative tables in the process of storytelling and conversations establishes conditions for increasing the cognitive activity of students and mastering the basic material. Methods become more rational and more valid via methodological techniques. Methodological approaches are characterised by a close connection with methods.

Utilizing visuals such as charts, tables, and pictures pertaining to the biology topic aids in a swift comprehension of the subject matter presented in the textbook. Once the topic is thoroughly grasped, students should be capable of summarising the text in their own words. The teacher's emphasis should be on guiding students to focus on lexical phrases related to the ongoing study of the topic. When devising assignments, consideration must be given to the students' proficiency levels and learning objectives.

As language serves as a tool for addressing specific communicative tasks, language learning becomes more targeted. Furthermore, students gain insight into the culture associated with the studied language, contributing to the development of socio-cultural competence. Engaging with a substantial amount of language material immerses the student in a natural language environment. It is noteworthy that exploring various topics allows students to refine specific terms and language constructions, enriching their vocabulary with subject-specific terminology and preparing them for further study and application of acquired knowledge and skills.

The CLIL technology, while offering advantages, also presents challenges. On the positive side, it leverages language for specific communicative tasks, fosters the development of socio-cultural competence, and supplements vocabulary with subject-specific terminology. However, this approach places high demands on foreign language teachers to effectively fulfil these tasks.

CLIL classes cannot completely replace the biology lesson taught in the native language, but can only complement it. Tasks performed during the lesson demonstrate the peculiarities of language forms and strengthen the ability to apply various types of verification and evaluation, such as self-control and mutual control. Carefully selected tasks also enhance communicative skills in both oral and written expressions in a foreign language, promoting independent and creative engagement by students. To achieve this, students need to be acquainted with understandable strategies that are responsible for the language acquisition.

Integrated teaching of biology with a foreign language is an effective way to implement a trilingual education program that meets today's requirements imposed by the government. During the training process, we were convinced that the formation of the professional competence of a future biology teacher based on CLIL is an effective method aimed at boosting students' critical thinking skills, fluency of speech, teaching clear and full self-expression and expanding horizons. It is obvious that the CLIL enables finding an answer to a significantly expanded range of educational tasks. Simultaneous integrated teaching of a foreign language and biology is an additional means of achieving educational goals. Despite the current state of knowledge on interdisciplinary connections as a tool of educating and upbringing, the complete system of these correlation still requires improvement.

In this context, students as future specialists and teachers of the school can use the following types of activities with students in the classroom to accomplish pedagogical approaches in teaching biology: be able to organize experimental research; apply modelling methods in the classroom; encourage students to opt for the necessary information from wide range of sources related to the subject; analyse it by giving reliable estimates via comparing the information received; teach to work out potential issues; be able to use various methods of modelling students to comprehend, explain and predict natural phenomena.

Recent advancements in CLIL have made it possible to embed all kinds of communication during the lesson. This takes up most of the learning process. Therefore, biology students are advised to possess the ability to effectively organize lessons, present materials through audio-visual texts, and engage in dialogues and conversations employing advanced teaching methods. When combining oral and written exercises, the oral and writing skills of pre-service biology teachers are formed together. As a result, students master several new words and phrases on the lesson, consequently being able to use them in their speech. The topics from biology textbook, divided into small parts and accompanied by drawings, maps, charts, etc., achieve full absorption of the lesson by students.

In addition, it should be borne in mind that the integration of a foreign language with other subjects lacks coordination in existing programs, hindering students from deliberately applying knowledge, skills, and abilities gained in biology to the foreign language context. Our analysis showed that there are insufficient teaching materials and absence of special methodology while using CLIL. Despite the presence of such problems, the results confirm the validity of CLIL technology as an effective method in the formation of professional competencies of pre-service biology teachers, acquiring necessary knowledge and skills in their subject.

## Conclusion

As a result of the research work carried out, the following conclusions can be drawn:

Training pre-service biology teachers using CLIL technology is an important and promising approach. The results of our research have shown that CLIL contributes to a deeper and more effective assimilation of educational material and the enhancement of student's language skills;



The use of CLIL in biology lessons conducted in English provides future teachers to advance their career in the future by improving their language skills, enabling them to form professional competencies;

A survey among students showed that students support CLIL technology to some extent, and challenges arise while implementing it. These results demonstrated the importance of teaching methods and strategies for carrying out CLIL in the learning process to future biology teachers, as well as the need for its support in educational institutions;

The introduction of CLIL into the educational process of universities and secondary schools requires careful planning and teacher training. However, the advantages in the form of quality education and the enhancement of students' language skills are significant factors aiding the necessity to implement CLIL in the educational process;

Our investigation on literature review and a conducted survey revealed the importance of further research in the field of CLIL for a more detailed study of the impact on the professional competence of future teachers and determining the most appropriate strategies for integrating CLIL into educational practice.

In conclusion, in light of the above analysis, it becomes evident that CLIL boosts the quality of education of future biology teachers and contributes to their professional growth.

## Recommendations

From our findings, we have articulated the following recommendations:

Creation and adaptation of educational CLIL materials in the context of teaching biology. This encompasses textbooks, online resources and methodological tools that correspond to the content of the program enabling students to strengthen their language skills;

Assistance and training of teachers for the successful implementation of CLIL in their teaching practices. It may include methods of teaching English and the application of modern teaching technologies;

Establishing an environment to refine students' language proficiency: initiating language courses, generating supplementary language assignments, and fostering a communicative setting in English;

Broadening interdisciplinarity within the university, i.e. the enhancement of cooperation between biology and foreign language teachers. This will enrich the learning process and create holistic experience for students;

Constantly evaluate and take actions to improve the effectiveness of the realisation of CLIL in the teaching process;

Maintenance for further research on the impact of CLIL on the professional competence of biology teachers. This will assist to expand knowledge about the privileges and limitations of this approach.

These recommendations will facilitate further improvements in the integration of CLIL into biology lessons and the quality of pre-service biology teachers professional training.

## Литература

1. Мемлекет басшысы Қасым-Жомарт Тоқаевтың Қазақстан халқына жолдауы(16.03.2022) [https://adilet.zan.kz/kaz/docs/K22002022\\_1](https://adilet.zan.kz/kaz/docs/K22002022_1)
2. van Kampen E. et al. Do we all share the same goals for content and language integrated learning (CLIL)? Specialist and practitioner perceptions of 'ideal' CLIL pedagogies in the Netherlands //International Journal of Bilingual Education and Bilingualism. – 2017. <https://doi.org/10.1080/13670050.2017.1411332>
3. De Smet A. et al. Classroom anxiety and enjoyment in CLIL and non-CLIL: Does the target language matter? //Studies in Second Language Learning and Teaching. – 2018. – Т. 8. – №. 1. – С. 47-71.. <https://doi.org/10.14746/sslit.2018.8.1.3>
4. Banegas D. L., Poole P. M., Corrales K. A. Content and language integrated learning in Latin America 2008-2018: Ten years of research and practice //Studies in Second Language Learning and Teaching. – 2020. – Т. 10. – №. 2. – С. 283-305.<http://dx.doi.org/10.14746/sslit.2020.10.2.4>
5. Zhou X., Mann S. Translanguaging in a Chinese university CLIL classroom: Teacher strategies and student attitudes //Studies in Second Language Learning and Teaching. – 2021. – Т. 11. – №. 2. – С. 265-289. <http://dx.doi.org/10.14746/sslit.2021.11.2.5>
6. Pennelle S. G., Case R. E., Williams G. Bilingual paraprofessionals in the second language acquisition classroom //Education Inquiry. – 2023. – Т. 14. – №. 2. – С. 251-266. <https://doi.org/10.1080/20004508.2021.1994117>
7. Кларин В. М., Джуринский А. Н. Педагогическое наследие: Коменский ЯА, Локк Дж., Руссо Ж //Ж., Песталоцци ИГ. – 1988.
8. Fortanet-Gomez I. (2013). CLIL in Higher Education towards a multilingual policy. - Bristol: Multilingual Matters Publ., 2013. - 312 p.

9. Martínez-Soto T., Prendes-Espinosa P. A Systematic Review on the Role of ICT and CLIL in Compulsory Education // *Education Sciences*. – 2023. – Т. 13. – №. 1. – С. 73. <https://doi.org/10.3390/educsci13010073>
10. Smit U. English as a lingua franca in higher education: A longitudinal study of classroom discourse. – De Gruyter Mouton, 2010. <https://doi.org/10.1515/9783110215519>
11. Ball Ph. (2010). What is CLIL? [www.onestopenglish.com](http://www.onestopenglish.com)
12. Coyle, D., Hood, P., & Marsh, D. (2010). Content and language integrated learning. [abdn.elsevierpure.com](http://abdn.elsevierpure.com)
13. Нуракаева, Л. Т., & Шегенова, З. К. (2013). Методические рекомендации учителям по использованию метода предметно-интегрированного обучения (CLIL). Астана.–2013.
14. Akhmetova, M.S. (2020) Subject-language integrated teaching of biology. URL: [viewer\\_images/15684311/f/1.png](http://viewer_images/15684311/f/1.png).
15. Tyutenova, A. A., Gumarova, L. Z., & Tyutenov, K. S. Применение технологии CLIL в обучении естественнонаучным предметам общеобразовательных школ Казахстана: опрос учителей // *Вестник КазНУ. Серия педагогическая*. – 2020. – Т. 63. – №. 2. – С. 147-154. <https://doi.org/10.26577/JES.2020.v63.i2.16>
16. Zhorabekova A., Abilkhairova Z. Развитие готовности вузовских педагогов к формированию полилингвальных компетенций будущего учителя // *Pedagogy and Psychology*. – 2020. – Т. 45. – №. 4. – С. 178-186.
17. CLIL classroom practices in multilingual education in Kazakhstan: guidelines and examples /eds.: X. San Isidro, D. Coyle, S.I. Kerimkulova. – Nur-Sultan: Nazarbayev University, 2020. - 146 p.
18. Morton, T., (2023). Chapter CLIL: Future directions, in Book: *The Routledge Handbook of Content and Language Integrated Learning*, Edited By Dario Luis Banegas, Sandra Zappa-Hollman, Published 3 July 2023, Pub. Location London, Imprint Routledge, Pages 568, <https://doi.org/10.4324/9781003173151>

### References

- Akhmetova, M.S. (2020) Subject-language integrated teaching of biology. URL: [viewer\\_images/15684311/f/1.png](http://viewer_images/15684311/f/1.png).
- Ball Ph. (2010). What is CLIL? [www.onestopenglish.com](http://www.onestopenglish.com)
- Banegas, D. L., Poole, P. M., & Corrales, K. A. (2020). Content and language integrated learning in Latin America 2008-2018: Ten years of research and practice. *Studies in Second Language Learning and Teaching*, 10(2), 283-305. <http://dx.doi.org/10.14746/ssl.2020.10.2.4>
- CLIL classroom practices in multilingual education in Kazakhstan: guidelines and examples /eds.: X. San Isidro, D. Coyle, S.I. Kerimkulova. – Nur-Sultan: Nazarbayev University, 2020. - 146 p.
- Coyle, D., Hood, P., & Marsh, D. (2010). Content and language integrated learning. [abdn.elsevierpure.com](http://abdn.elsevierpure.com)
- De Smet, A., Mettwie, L., Galand, B., Hilgsmann, P., & Van Mensel, L. (2018). Classroom anxiety and enjoyment in CLIL and non-CLIL: Does the target language matter?. *Studies in Second Language Learning and Teaching*, 8(1), 47-71. <https://doi.org/10.14746/ssl.2018.8.1.3>
- Fortanet-Gomez I. (2013). CLIL in Higher Education towards a multilingual policy. - Bristol: *Multilingual Matters Publ.*, 2013. - 312 p.
- VM Klarin, AN Dzhurinsky. (1988). Komensky, Y. A., Lock, D., Russo, Z. Z., & Pestalozzy, I. G. *Pedagogicheskoe nasledie* [Pedagogical Heritage]. (in Russian)
- Martínez-Soto, T., & Prendes-Espinosa, P. (2023). A Systematic Review on the Role of ICT and CLIL in Compulsory Education. *Education Sciences*, 13(1), 73. <https://doi.org/10.3390/educsci13010073>
- Memleket basısı Qasım-Jomart Toqaevtiñ Qazaqstan Xalıqına Joldawı [Message of the Head of State Kassym-Jomart Tokayev to the people of Kazakhstan dated March 16, 2022]. [https://adilet.zan.kz/kaz/docs/K22002022\\_1](https://adilet.zan.kz/kaz/docs/K22002022_1)
- Morton, T., (2023). Chapter CLIL: Future directions, in Book: *The Routledge Handbook of Content and Language Integrated Learning*, Edited By Dario Luis Banegas, Sandra Zappa-Hollman, Published 3 July 2023, Pub. Location London, Imprint Routledge, Pages 568, <https://doi.org/10.4324/9781003173151>
- Nurkayeva, L. T., & Shegenova, Z. K. (2013). Metodicheskiye rekomendatsii dlya uchiteley po ispol'zovaniyu predmetno-integririvannogo metoda obucheniya (CLIL). [Methodological recommendations for teachers on the use of the subject-integrated learning method (CLIL)]. Астана. (in Russian)
- Pennelle, S. G., Case, R. E., & Williams, G. (2023). Bilingual paraprofessionals in the second language acquisition classroom. *Education Inquiry*, 14(2), 251-266. <https://doi.org/10.1080/20004508.2021.1994117>
- Smith, U. (2010). English as a lingua franca in higher education: A longitudinal study of classroom discourse. De Gruyter Mouton. <https://doi.org/10.1515/9783110215519>
- Tyutenova, A. A., Gumarova, L. Z., & Tyutenov, K. S. (2020). Primeneniye tekhnologii CLIL pri prepodavanii yestestvennonauchnykh predmetov v obshcheobrazovatel'nykh shkolakh Kazakhstana: opros uchiteley. [Application of CLIL technology in teaching science subjects in secondary schools of Kazakhstan: a survey of teachers]. *Bulletin of KazNU. Pedagogical series*, 63(2), 147-154. <https://doi.org/10.26577/JES.2020.v63.i2.16> (in Russian)
- van Kampen, E., Meirink, J., Admiraal, W., & Berry, A. (2017). Do we all share the same goals for content and language integrated learning (CLIL)? Specialist and practitioner perceptions of 'ideal' CLIL pedagogies in the Netherlands. *International Journal of Bilingual Education and Bilingualism*, 23:8, 855-871. <https://doi.org/10.1080/13670050.2017.1411332>
- Zhorabekova, A., & Abilkhairova, J. (2020). Razvitiye gotovnosti prepodavateley vuza k formirovaniyu poliyazychnykh kompetentsiy budushchego uchitelya. [Development of university teachers' readiness to forming polylingual competences of the future teacher]. *Pedagogy and Psychology*, 45(4), 178-186. <https://doi.org/10.51889/2020-4.2077-6861.22> (in Russian)

Zhou, X., & Mann, S. (2021). Translanguaging in a Chinese university CLIL classroom: Teacher strategies and student attitudes. *Studies in Second Language Learning and Teaching*, 11(2), 265-289. <http://dx.doi.org/10.14746/ssllt.2021.11.2.5>

**Авторлар туралы мәлімет:**

*Нартаева Малика – докторант, Өзбекәлі Жәнібеков атындағы Оңтүстік Қазақстан педагогикалық университеті, (Шымкент қ., Қазақстан, эл.пошта: nartayeva.malika@okmru.kz)*

*Жылысбаева Аққоңыр – химия ғылымдарының кандидаты, химия кафедрасының доценті, жоғары оқу орнынан кейінгі білім беру институтының директоры, Өзбекәлі Жәнібеков атындағы Оңтүстік Қазақстан педагогикалық университеті (Шымкент қ., Қазақстан, эл.пошта: zhylysbayeva.akkongyr@okmru.kz)*

*Рысбаева Галия – биология ғылымдарының кандидаты, биология кафедрасының доценті, Өзбекәлі Жәнібеков атындағы Оңтүстік Қазақстан педагогикалық университеті (Шымкент қ., Қазақстан, эл.пошта: galiya732014@mail.ru)*

**Сведения об авторах:**

*Нартаева Малика – докторант, Южно-Казахстанский педагогический университет имени Өзбекәлі Жәнібеков (г. Шымкент, Казахстан, эл.почта: nartayeva.malika@okmru.kz)*

*Жылысбаева Аккоңыр(корреспондентный автор) - кандидат химических наук, доцент кафедры химии, директор института послевузовского образования Южно-Казахстанского педагогического университета имени Өзбекәлі Жәнібеков (г. Шымкент, Казахстан, эл.почта: zhylysbayeva.akkongyr@okmru.kz)*

*Рысбаева Галия – кандидат биологических наук, доцент кафедры биологии, Южно-Казахстанский педагогический университет имени Өзбекәлі Жәнібеков (г. Шымкент, Казахстан, эл.почта: galiya732014@mail.ru )*

**Information about authors:**

*Nartayeva Malika – PhD student, O.Zhanibekov South Kazakhstan Pedagogical University named after Uzbekali Zhanibekov (Shymkent, Kazakhstan, e-mail: nartayeva.malika@okmru.kz)*

*Zhylysbayeva Akkongyr (corresponding author) – candidate of Chemical Sciences, Associate Professor of the Department of Chemistry, Director of the Postgraduate Education Institute of O.Zhanibekov South Kazakhstan Pedagogical University (Shymkent, Kazakhstan e-mail: zhylysbayeva.akkongyr@okmru.kz)*

*Rysbayeva Galiya – candidate of Biology Sciences, Associate Professor of the Department of Biology, O.Zhanibekov South Kazakhstan Pedagogical University (Shymkent, Kazakhstan, e-mail: galiya732014@mail.ru)*

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