Торайғыров университетінің
ҒЫЛЫМИ ЖУРНАЛЫ

НАУЧНЫЙ ЖУРНАЛ
Торайгыров университета

ТОРАЙҒЫРОВ УНИВЕРСИТЕТІНІҢ ХАБАРШЫСЫ

ПЕДАГОГИКАЛЫҚ СЕРИЯСЫ

1997 ЖЫЛДАН БАСТАП ШЫҒАДЫ

ВЕСТНИК ТОРАЙГЫРОВ УНИВЕРСИТЕТА

ПЕДАГОГИЧЕСКАЯ СЕРИЯ

ИЗДАЕТСЯ С 1997 ГОДА

ISSN 2710-2661

№ 1 (2025)

ПАВЛОДАР

НАУЧНЫЙ ЖУРНАЛ
Торайгыров университета

Педагогическая серия
выходит 4 раза в год

СВИДЕТЕЛЬСТВО
о постановке на переучет периодического печатного издания,
информационного агентства и сетевого издания
№ KZ03VPY00029269
выдано
Министерством информации и коммуникаций
Республики Казахстан

Тематическая направленность
публикация материалов в области педагогики,
психологии и методики преподавания

Подписной индекс – 76137

https://doi.org10.48081/AUYC1911

SRSTI 20.01.45

https://doi.org/10.48081/TAIY1071

Zh. E. Zulpykhar[1], S. A. Nariman[2], *G. F. Nurbekova[3], G. Zh. Yerlanova[4], Zh. A. Bekkozhina[5]

[1,2,3,5]L. N. Gumilyov Eurasian National University,
Republic of Kazakhstan, Astana.
[4]Alikhan Bokeikhan university,
Republic of Kazakhstan, Semey
*e-mail: gulnurfaz@mail.ru
[1]ORCID:https://orcid.org/0000-0001-7086-3766
[2]ORCID:https://orcid.org/0000-0003-2916-6939
[3]ORCID:https://orcid.org/0009-0005-8468-9523
[4]ORCID:https://orcid.org/0000-0002-2817-7110
[5]ORCID:https://orcid.org/0009-0000-2276-2792

PEDAGOGICAL AND METHODOLOGICAL SUPPORT FOR CLIL TRAINING OF FUTURE COMPUTER SCIENCE TEACHERS

The article discusses the pedagogical and methodological support for CLIL (Content and Language Integrated Learning) training of future computer science teachers. As part of this support, a bilingual educational and methodological guide titled «Pedagogical Technology of Trilingual Education CLIL» was developed in Russian and Kazakh languages for students enrolled in the «Computer Science» educational program, tailored to both Russian and Kazakh groups respectively. The bilingual guide provides practical recommendations for the effective implementation of CLIL technology and the planning of CLIL lessons. It addresses the characteristics of the CLIL methodology, assessment techniques for teaching with CLIL, and offers strategies and tools for evaluation. The practical application of CLIL technology is illustrated through the example of the course «IT in Education».

It has augmented content of the educational and methodological complex, Syllabus for the discipline «IT in Education», using CLIL in the Educational Program «6B01511–Computer Science» at L.N. Gumilyev Eurasian National University, Astana

The content of the educational and methodological complex and the syllabus for the discipline «IT in Education» has been enhanced with the application of CLIL (Content and Language Integrated Learning) within the educational program «6B01511–Computer Science» at L.N. Gumilyov Eurasian National University, Astana. An example of the practical implementation of CLIL technology is provided, specifically within the «IT in Education» discipline from the educational and methodological guide.

Keywords: Pedagogical and Methodological Support, CLIL Training, Computer Science Teachers, CLIL Technology, Education.

Introduction

Kazakhstan's education system is currently beginning to introduce profession-specific foreign language instruction for future computer science teachers. However, there is a clear shortage of textbooks and educational-methodological resources on computer science in foreign languages. To tackle this challenge, it is essential for Kazakhstan's higher pedagogical institutions and practicing teachers to take an active role. An ideal textbook tailored for foreign language training in computer science should be aligned with the educational context, include authentic texts, and maintain a consistent structure throughout its sections.

As part of the pedagogical and methodological support for CLIL (Content and Language Integrated Learning) training of future computer science teachers, we propose the educational and methodological guide «Pedagogical Technology of Trilingual Education CLIL» in Russian and Kazakh languages. This guide is designed for students in the «Computer Science» educational program, tailored to both Russian and Kazakh groups respectively (Figures 1, 2).

Figure 1 – Educational and Methodological Guide
«Technology of Trilingual Education CLIL»

Figure 2 – Educational and Methodological Guide
«Pedagogical Technology of Trilingual Education CLIL»

To examine the pedagogical and methodological support for CLIL (Content and Language Integrated Learning) training of future computer science teachers. As part of this support, to develop an educational and methodological guide titled «Pedagogical Technology of Trilingual Education CLIL» in Russian and Kazakh languages for students in the «Computer Science» educational program, tailored to both Russian and Kazakh groups respectively.

To assess the pedagogical and methodological support for CLIL (Content and Language Integrated Learning) training of future computer science teachers. As part of this initiative, the development of an educational and methodological guide titled «Pedagogical Technology of Trilingual Education CLIL» in both Russian and Kazakh languages is proposed. This guide will be specifically designed for students in the «Computer Science» educational program, with versions tailored to Russian-speaking and Kazakh-speaking groups respectively.

Materials and methods

The bilingual educational and methodological guide offers practical recommendations for the effective implementation of CLIL (Content and Language Integrated Learning) technology and the planning of CLIL lessons.

The guide covers the key features of CLIL technology, assessment methods for teaching with CLIL, and provides strategies and tools for evaluation. The practical application of CLIL technology is demonstrated using the example of the discipline «IT in Education» [1;2;3].

The bilingual educational and methodological guide, titled «Pedagogical Technology of Trilingual Education CLIL» is developed in alignment with the syllabus of the «IT in Education» discipline and enhances the educational and methodological support for implementing CLIL training. The guide is structured into six modules. As is commonly understood, a module functions as a cohesive didactic unit, where the educational material is presented as an integrated and interconnected whole (Table 1).

Table 1 – Contents of the educational and methodological guide «Pedagogical technology of trilingual education CLIL» in Russian

Key Principles of Content and Language Integrated Learning (CLIL) Technology
CLIL Technology as a foundation for trilingual education
Effective implementation of CLIL Technology
Practical recommendations for effective implementation of CLIL Technology
Characteristics of CLIL Technology
Development of professional English language skills using CLIL Technology
«Scaffolding» in teaching specialized subjects in English

Planning a CLIL Lesson
Formulation and implementation of CLIL learning objectives
Development and adaptation of CLIL lesson materials in the field of Computer Science
Assessment Process in CLIL Technology
Assessment Methodology for teaching with CLIL Technology
Assessment Strategies and Tools
Practical implementation of CLIL Technology using the example of the discipline «IT in Education»
Practical Work 1: Requirements for functions of electronic educational publications
Practical Work 2: Learning Element «Theory». Application of hypertext for theoretical material of the study session
Practical Work 3: Learning Element «Animation»
Practical Work 4: Learning Element «Tasks». Preparation of exercises and examples on covered material
Practical Work 5: Learning Element «Questions»
Practical Work 6: Learning Element «Test»
Practical Work 7: Learning Element «Thesaurus»
Practical Work 8: Educational Element «Reference»
Practical Work 9: Educational Element «Graphics» for using schemes, drawings, images, photographs, videos in digital educational resources
Practical Work 10: Educational Element «Audio»
Practical Work 11: Educational Element «Video»
Practical Work 12: Feedback. Methods and tools for organizing feedback
Practical Work 13: Educational Element «Font Style and Size». Readability of information in electronic educational publications
Practical Work 14: Software for creating digital educational resources. Development and installation
Practical Work 15: Educational Element «Formatting Certificate of state registration of intellectual property»
Topics for independent study in the discipline «IT in Education»
Self-Assessment Questions in the discipline «IT in Education»

This educational guide is designed with an emphasis on clear and straightforward organization of the material, while also ensuring a gradual increase in complexity. A key recommendation is to ensure a sequential connection between

modules, with each new module building on the content of the previous ones, emphasizing the importance of maintaining a logical flow in the learning process.

To achieve the outlined objectives, the guide includes activities aimed at building skills in reading and comprehending specialized texts while expanding lexical proficiency. Furthermore, it provides practical exercises designed to help students articulate their views on selected readings, strengthen areas of English grammar, and complete a range of written assignments.

The «Pedagogical Technology of Trilingual Education CLIL» guide supports the development of CLIL competence in future computer science educators by:

1 Aligning with the thematic content of the discipline «IT in Education» and serving as an additional educational and methodological resource for CLIL training.

2 The initial module, «Efficient Use of CLIL Technology», offers a well-rounded and integrated approach to all forms of language skills, engaging various perception channels and resources, and enabling students to achieve a high level of proficiency in a foreign language for professional applications [4].

3 The second module provides practical recommendations for the effective application of CLIL technology. The manual maintains a professional communicative orientation. The learning process incorporates communicative exercises designed to help students recreate professional interactions in a foreign language. These exercises enable students to build their foreign language communication skills, enhance both their professional and linguistic abilities, showcase personal attributes, and draw upon their academic, professional, and personal experiences. This approach ultimately supports the development of CLIL competencies.

4 The third and fourth modules are dedicated to the specifics of CLIL technology and the planning of CLIL lessons: this includes the development of professional English skills using CLIL technology, «scaffolding» in teaching specialized subjects in a foreign language, formulating and implementing CLIL learning objectives, and developing and adapting lesson materials for CLIL in the subject area of «Computer Science».

5 The core element in the learning approach presented in the manual is the professionally-relevant text, designed for both reading and listening exercises. These texts are enriched with field-specific information and serve as practical tools for vocabulary and grammar enhancement. Selected to foster CLIL skills in future computer science educators, they highlight interdisciplinary connections with computer science concepts [4].

6 The educational guide includes a range of adaptable activities tailored to shifting learning contexts, addressing the unique needs of future computer science

teachers and the evolving nature of the educational process. This flexibility supports more effective foreign language acquisition [5].

7 Assignments, whether targeting foreign language proficiency or communicative competence, prioritize critical thinking development [6].

8 Additionally, tasks for independent work aim to strengthen self-discipline and self-regulation skills, boost motivation for foreign language learning, deepen understanding of the material, and support the acquisition of new knowledge autonomously [7].

9 An important component is the fifth module, which is dedicated to the assessment process within the CLIL framework. The manual provides a detailed examination of the assessment methodology in CLIL teaching and offers clear strategies and assessment tools.

10 The practical implementation of CLIL technology in the discipline «IT in Education» is presented in the sixth module, consisting of 15 practical tasks.

In each practical task of the educational manual, the objectives are divided into content and language goals. The competencies to be developed for each practical task are also outlined. Practical tasks, according to the objectives of the lesson, are divided into four types: Content, Cognition, Communication, and Culture.

Results and discussions

It's given an example of the practical implementation of CLIL technology in the discipline «IT in Education» from the educational manual [8;9]:

Practical Task No. 6: Learning Element «Test»

Content Objective:

To provide new knowledge about the concept of a test, types of tests, and to teach how to correctly design and create tests using IT tools.

Language Objectives:

1 To expand the students' vocabulary (Content).

2 To teach proper understanding and differentiation of tests (Cognition).

3 To develop speaking skills in professional activities (Communication).

4 To provide an understanding of the application of various types and methods of using tests in electronic educational resources (Culture).

Developed Competencies:

1 Students will learn to correctly design and determine the structure of tests.

2 Students will be able to navigate a vast array of tests, understand them, and properly apply them in electronic educational resources (EER).

3 Students will be capable of developing tests at a professional level.

Task 1/ (Content):

Переведите текст (Translate the text).

The electronic textbook is a software and methodological educational complex that corresponds to the standard curriculum and provides the student with the opportunity to independently master the training course or its section with the support of a teacher.

The electronic textbook has a number of fundamental differences from the traditional printed textbook: it has multimedia capabilities, provides an opportunity to immerse yourself in virtual reality, has a high degree of interactivity and allows you to apply an individual approach to each student.

An electronic textbook is a free creative process of a teacher and a programmer, it is still necessary to adhere to certain methodological requirements.

When making electronic textbooks we offer to the use of the theory of fonts to improve the student's attention in the process of learning the material. A well-chosen combinations of fonts helps to increase student's attention and thus helps to increase the digestibility of the material.

2 Task (Content): Find the correct definition of the following phrases (Table 2).

Table 2 – Task for Determining the Correct Definitions of Foreign Phrases

Formative tests	a	To monitor the learning process
Diagnostic tests	b	To identify learning difficulties
Summative tests	c	To assess learning outcomes
Intelligence tests	d	To determine the intellectual potential of students
Creativity tests	e	To study and evaluating creative abilities
Closed tests	f	The subject’s answers are limited to several options (for example, yes/no/don’t know)
Open tests	g	The subject is not strictly limited to some answer options, but can answer in a free form
Homogeneous	h	Allow measuring a single attribute (level of proficiency in one subject) with homogeneous tasks.
Heterogeneous	i	To measure the level of students’ proficiency in multiple subjects and/or personality traits.
Test	j	A standardized task and procedures for its implementation, allowing to identify the presence or absence of any characteristics, knowledge, skills, abilities, as well as its relation to certain objects.

Task 3 (Communication):

Find information on the types and classification of tests on the Internet and present it.

Task 4 (Culture):

Write a short essay on the topic «Advantages and Disadvantages of Using Tests.»

Conclusion

Thus, the presented educational manual «Pedagogical Technology of Trilingual Education CLIL» is intended for the more effective formation of CLIL competence in future computer science educators [10;11;12].

In implementing the practical foundations of CLIL technology training for future computer science educators, the educational manual «Pedagogical Technology of Trilingual Education CLIL» was created as a CLIL training resource for students in the «Informatics» educational program. This manual is available in both Russian and Kazakh, catering to the respective language groups. The bilingual manual offers practical recommendations for the effective application of CLIL technology and the planning of CLIL lessons. It addresses the specifics of CLIL technology, the assessment methodologies used in CLIL teaching, and provides strategies and tools for evaluation. The practical application of CLIL technology is demonstrated using the discipline «IT in Education» as an example.

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Received 21.08.24.
Received in revised form 17.10.24.
Accepted for publication 26.01.25.

*Ж. Е. Зулпыхар[1], С. А. Нариман[2], *Г. Ф. Нурбекова[3],*
Г. Ж. Ерланова[4], Ж. А. Беккожина[5]
[1,2,3,5]Л. Н. Гумилев атындағы Еуразия ұлттық университетеі,
Қазақстан Республикасы Астана қ.;
[4]Alikhan Bokeikhan university, Қазақстан Республикасы, Семей қ.

БОЛАШАҚ ИНФОРМАТИКА ПЕДАГОГТАРЫНЫҢ CLIL ОҚЫТУЫН ОҚУ-ӘДІСТЕМЕЛІК ҚАМТАМАСЫЗ ЕТУ

Мақалада болашақ информатика педагогтарының оқытудың CLIL оқу-әдістемелік қамтамасыз етілуі қарастырылған. Болашақ информатика педагогтарының CLIL оқытуын оқу-әдістемелік қамтамасыз ету ретінде орыс және қазақ топтарының «Информатика» білім беру бағдарламасының студенттері үшін орыс және қазақ тілдерінде «CLIL Үш тілдік оқытудың педагогикалық технологиясы» оқу–әдістемелік құралы әзірленді. Оқу-әдістемелік құрал екі тілде CLIL технологиясын тиімді қолдану және CLIL сабақтарын жоспарлау бойынша практикалық ұсыныстарды қамтиды. CLIL технологиясының ерекшеліктері, CLIL технологиясы бойынша оқыту кезінде бағалау әдістемесі, сондай-ақ бағалау стратегиялары мен құралдары қарастырылған. «Білім берудегі IT» пәнінің мысалында CLIL технологиясын практикалық іске асыру қарастырылды.

CLIL оқыту, білім беру бағдарламасын қолдана отырып, «білім берудегі IT» пәнінде оқу әдістемелік кешенінің, жұмыс бағдарламасының (Sillabus) мазмұны толықтырылды.

Кілтті сөздер: оқу-әдістемелік қамтамасыз ету, CLIL оқыту, информатика мұғалімдері, CLIL технологиясы, білім беру.

*Ж. Е. Зулпыхар[1], С. А. Нариман[2], *Г. Ф. Нурбекова[3],*
Г. Ж. Ерланова[4], Ж. А. Беккожина[5]
[1,2,3,5]Евразийский национальный университет имени Л. Н. Гумилева,
Республика Казахстан, г. Астана;
[4]Alikhan Bokeikhan university, Республика Казахстан, г. Семей
Поступило в редакцию 21.08.24.
Поступило с исправлениями 17.10.24.
Принято в печать 26.01.25.

УЧЕБНО-МЕТОДИЧЕСКОЕ ОБЕСПЕЧЕНИЕ CLIL ОБУЧЕНИЯ БУДУЩИХ ПЕДАГОГОВ ИНФОРМАТИКИ

В статье рассмотрено учебно-методическое обеспечение CLIL обучения будущих педагогов информатики. В качестве учебно-методического обеспечения CLIL обучения будущих педагогов информатики было разработано учебно-методическое пособие «Педагогическая технология трехъязычного обучения CLIL» на русском и казахском языках для студентов образовательной программы «Информатика» русских и казахских групп соответственно. Учебно-методическое пособие на двух языках содержит практические рекомендации по эффективному применению технологии CLIL и планированию CLIL занятия. Рассмотрены особенности технологии CLIL, методика оценивания при преподавании по технологии CLIL, а также даны стратегии и инструменты оценивания. Рассмотрена практическая реализация технологии CLIL на примере дисциплины «IT в образовании».

Дополнено содержание учебно–методического комплекса, рабочей программы (Sillabus) дисциплины «IT в образовании», с применением CLIL обучения, образовательной программы «6B01511–Информатика» Евразийского национального университета им. Л.Н. Гумилева», г. Астана, приведен пример практической реализации технологии CLIL на примере дисциплины «IT в образовании» из учебно-методического пособия.

Ключевые слова: учебно-методическое обеспечение, CLIL обучение, учителя информатики, CLIL технология, образование.

Теруге 10.03.2025 ж. жіберілді. Басуға 28.03.2025 ж. қол қойылды.
Электронды баспа
2,52 Kb RAM
Шартты баспа табағы 26,47.
Таралымы 300 дана. Бағасы келісім бойынша.
Компьютерде беттеген З. Ж. Шокубаева
Корректорлар: А. Р. Омарова, Д. А. Қожас
Тапсырыс № 4353

Сдано в набор 10.03.2025 г. Подписано в печать 28.03.2025 г.
Электронное издание
2,52 Kb RAM
Усл.п.л. 26,47. Тираж 300 экз. Цена договорная.
Компьютерная верстка З. Ж. Шокубаева
Корректоры: А. Р. Омарова, Д. А. Қожас
Заказ № 4353

«Toraighyrov University» баспасынан басылып шығарылған
Торайғыров университеті
140008, Павлодар қ., Ломов к., 64, 137 каб.

«Toraighyrov University» баспасы
Торайғыров университеті
140008, Павлодар қ., Ломов к., 64, 137 каб.
8 (7182) 67-36-69
e-mail: kereku@tou.edu.kz
www.pedagogic-vestnik.tou.edu.kz