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THE INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN TEACHING ENGLISH TO MIXED-LEVEL GROUPS AT UNIVERSITY

Abstract

This paper presents the findings of a study on the integration of Information and Communication Technologies (ICTs) in teaching English to mixed-level groups. ICTs play a vital role in the educational process, enhancing student motivation and improving the overall quality of education. When incorporated into English language instruction, these technologies create a more engaging and dynamic learning environment. The conducted research explored how ICT tools facilitate cognitive activation and foster an interactive learning experience for students of varying proficiency levels. To collect data, two research methods were employed: a questionnaire and an experiment. The results indicate that university students became highly motivated to learn English through ICT tools despite certain challenges. The experiment demonstrated that integrating online platforms, multimedia resources, and interactive applications into English language instruction significantly enhances students' language skills by offering personalized learning activities. The authors believe that equipping teachers with the necessary training to balance ICT tools with traditional teaching methods can further enhance students' English language proficiency.

Keywords: information and communication technologies, teaching, English, mixed-level groups, interactive activities.

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УНИВЕРСИТЕТТЕ ӘРТҮРЛІ ДЕҢГЕЙДЕГІ ТОПТАРҒА АҒЫЛШЫН ТІЛІН ҮЙРЕТУДЕ АҚПАРАТТЫҚ ЖӘНЕ КОММУНИКАЦИЯЛЫҚ ТЕХНОЛОГИЯЛАРДЫ ПАЙДАЛАНУ

Аңдатпа

Бұл мақала аралас деңгейлі топтарға ағылшын тілін оқытуда ақпараттық және коммуникациялық технологияларды (АКТ) интеграциялау бойынша зерттеу нәтижелерін ұсынады. АКТ білім беру үдерісінде маңызды рөл атқарады, студенттердің мотивациясын арттырып, жалпы білім сапасын жақсартады. Ағылшын тілін оқытуға осы технологияларды енгізу оқу ортасын тартымды әрі динамикалық оқу ортасын құруға әсер етеді. Жүргізілген зерттеу АКТ құралдарының когнитивтік белсенділікті қалай жеңілдететінін және әртүрлі деңгейдегі студенттер үшін интерактивті оқу тәжірибесін қалай қалыптастыратынын зерделеді. Деректерді жинау үшін екі зерттеу әдісі қолданылды: сауалнама және эксперимент. Нәтижелер көрсеткендей, белгілі бір қиындықтарға қарамастан, АКТ құралдары студенттерге ағылшын тілін үйренуде жоғары мотивация бола алды. Эксперимент онлайн платформаларды, мультимедиялық ресурстарды және интерактивті қосымшаларды ағылшын тілін оқытуға интеграциялау жеке оқыту әрекеттерін ұсыну арқылы студенттердің тілдік дағдыларын едәуір жақсартатынын көрсетті. Авторлар оқытушылар АКТ құралдары мен дәстүрлі оқыту әдістерін теңдестіріп пайдалануға қажетті дайындықтан өтсе студенттердің ағылшын тілі деңгейін одан әрі арттыра алады деп санайды.

Түйін сөздер: ақпараттық және коммуникациялық технологиялар, оқыту, ағылшын тілі, аралас деңгейлі топтар, интерактивті іс-әрекеттер.

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ИНТЕГРАЦИЯ ИНФОРМАЦИОННО-КОММУНИКАТИВНЫХ ТЕХНОЛОГИЙ В ПРЕПОДАВАНИЕ АНГЛИЙСКОГО ЯЗЫКА В ГРУППАХ СМЕШАННОГО УРОВНЯ В УНИВЕРСИТЕТЕ

Аннотация

В данной статье представлены результаты исследования интеграции информационно-коммуникационных технологий (ИКТ) в процесс обучения английскому языку в группах с разным уровнем подготовки. ИКТ играют важную роль в образовательном процессе, повышая мотивацию студентов и улучшая общее качество образования. Эти технологии при внедрении в обучение английскому языку создают более увлекательную и динамичную учебную среду. Проведенное исследование изучило, как инструменты ИКТ способствуют когнитивной активизации студентов и формируют интерактивный образовательный опыт для студентов с различным уровнем владения языком. Для сбора данных были использованы два метода исследования: анкетирование и эксперимент. Результаты показали, что, несмотря на определенные трудности, студенты проявили высокую мотивацию к изучению английского языка с помощью ИКТ. Эксперимент продемонстрировал, что интеграция онлайн-платформ, мультимедийных ресурсов и интерактивных приложений в процесс обучения английскому языку значительно улучшает языковые навыки студентов, предоставляя персонализированные учебные задания. Авторы считают, что обеспечение учителей необходимой подготовкой для балансирования использования ИКТ и традиционных методов обучения может еще больше повысить уровень владения английским языком у студентов.

Ключевые слова: информационные и коммуникационные технологии, обучение, английский язык, группы смешанного уровня, интерактивные занятия.

Introduction. The modern educational space is deeply integrated with information and communication technologies (ICT), which play a pivotal role in enhancing the efficiency and quality of teaching. In the context of English language instruction, ICT offers significant opportunities to personalize learning, boost student motivation, and create an engaging, interactive environment. Through the use of ICT tools such as English learning applications and various multimedia resources, students gain access to up-to-date materials. These technologies support the development of essential language skills, including reading, writing, listening, and speaking, while often integrating gamification elements and real-world scenarios to enhance learning. As a result, the learning process becomes more engaging, interactive, and accessible.

Mixed-level English classes consist of students with varying levels of English proficiency, and are common in all educational institutions. In a single language class, there can be students with varying levels of proficiency. For example, students at beginner, elementary, and pre-intermediate levels may find themselves studying alongside more advanced learners. This diversity of skill levels presents a unique challenge for educators, requiring them to tailor their teaching approach to meet the needs of each student. By adapting the curriculum and employing differentiated instruction strategies, teachers can create an effective and inclusive learning environment where all students, regardless of their proficiency level, can thrive and progress.

The integration of Information and Communication Technology (ICT) into English language instruction for such groups plays a crucial role in addressing this challenge. ICT tools facilitate this process by offering online self-study platforms, interactive applications, diagnostic tests, simulators, and a wide range of audio and video materials. These resources help create a more flexible and adaptive learning environment, catering to individual learning paths and ensuring more effective language acquisition.

However, despite its numerous advantages, integrating ICT into English teaching has several challenges. Students need access to technology, teachers require adequate technical training, and they must adapt their teaching methods to address the diverse needs of mixed-level student groups. These challenges emphasize the need for well-planned strategies that guarantee equal access to technology and provide necessary support for both students and teachers. Tackling these concerns is essential to

maximizing the benefits of ICT in improving English language learning results. Moreover, there is a lack of sufficient research on the use of ICT in mixed-level groups. Exploring this issue will help bridge the gap in understanding which ICT tools can be effectively integrated into English teaching and how they influence English language proficiency of mixed-level students.

Therefore, the goal of this research is to examine the impact of using ICT on the improvement of students' English language skills in mixed-level groups.

The use of ICT in education covers a wide range of technologies designed to improve the learning process, interaction and management. The introduction of these technologies into the educational process significantly expands the opportunities for both teachers and students. Teachers can develop innovative and effective teaching methods, while students gain access to interactive and engaging tools that make learning more accessible and efficient. Thus, ICT makes the teaching and learning process more engaging, dynamic, and effective.

Many Kazakhstani researchers devoted their studies to the integration of ICT in education. Bidaibekov E.I. studied the introduction of learning technologies in various areas of education, including the use of ICT to improve the quality of education and develop digital competencies among teachers and students.

Bokayev B. developed approaches to the introduction of digital technologies into the educational system and increasing the level of digital literacy of students and teachers. P.B. Seitkazy researched the issues of media literacy of teachers and students in higher education [1,2,3].

Benefits of use of ICT in English language teaching are tremendous. Integration ICT into teaching English involves the use of various digital tools and resources such as online platforms, apps, e-books, multimedia materials and other technologies that help improve language skills. J.E. Sagimbayeva, in her research on the training of students within the framework of informatization, examined the integration of ICT into the theory and methodology of education. She argued that the use of ICT facilitates more effective learning of educational material and fosters the development of language competencies. J.E. Sagimbayeva highlighted that the informatization of the educational process provides access to a wide range of multimedia resources and enhances the ability to cater to the individual needs of each student. Furthermore, she stressed the importance of training teachers to effectively utilize ICT, enabling them to fully integrate these tools into the teaching process and unlock their potential for achieving improved educational outcomes [4].

E.V.Shum examined the impact of integrating information and communication technology (ICT) on students' motivation and interest in language learning. In her article, she explored effective methods for incorporating ICT into the language learning process. She highlighted that multimedia tools play a significant role in improving listening skills by offering diverse materials to enhance students' perception and comprehension. Furthermore, ICT provides opportunities for students to build confidence in discussions while simultaneously expanding their vocabulary and strengthening their communication skills [5].

This perspective was reinforced by E.Ya. Sokolov, who emphasized the benefits of using ICT in education, including enhancing brain activity, boosting motivation, and sparking interest. Sokolov noted that ICT has the remarkable ability to engage even students who initially show no desire to learn the language, inspiring them to participate actively in lessons and continue learning alongside their peers [6]. Jian Tao (2022) and K.M.Wong (2021) stated that the use of ICT not only ensures a higher quality of teaching but also enhances students' ability to engage in self-directed learning, since they spend significant amount of time in the virtual world [7,8].

Teaching English in mixed-level groups poses significant challenges for educators, as they must adapt their methods and strategies to engage all students effectively. Similarly, it can be challenging for students, as the varying proficiency levels within the group can make the learning process more complex and demanding. The use of ICT in teaching mixed-level groups offers a practical solution for tailoring the learning process to meet students' individual needs while providing flexible tools for differentiated instruction.

According to T. Saranya and M.Saranya, ICT is a critical element in the field of education, playing an essential role in meeting the varied needs of both teachers and students. Its integration into the teaching process is indispensable, especially for enhancing the teaching of English to learners at different proficiency levels. ICT tools offer diverse resources and methods matching to students' language abilities, thereby creating opportunities that align with their language needs. Moreover, ICT fosters greater engagement and motivation, making it a valuable asset for language education [9].

Advantages of use of ICT in teaching English in mixed-level groups were discussed in the scientific article written by Q.Coa. He investigated how ICT influences English learning among multi-level students through the interaction between teachers, students, and resources, as well as its impact on the development of individualized learning for each student. However, the researcher highlighted the importance of integrating ICT with traditional classroom methods to ensure opportunities for authentic language practice [10].

P.Dewi explored the advantages of using ICTs in mixed-level groups, emphasizing their role in creating more engaging and interactive lessons. He highlighted how ICTs contribute to fostering a stimulating educational environment. By integrating various resources, interactive applications, and platforms, educators can better address students' individual needs and varying language proficiency levels. These technologies not only make the teaching process more dynamic and engaging but also offer diverse teaching methods to enhance learning outcomes [11].

Gust Nur Hafifah shares P.Dewi's opinion that integration of ICTs into the language teaching process is helpful for mixed-level students, they provide students with different resources such as interactive platforms, applications and other useful tools. Teachers can adapt the applications to students' levels, offer different activities according to students' language levels [12].

Gokhan focused his research on use of ICTs in English classroom that they can facilitate student engagement. He mentioned that ICTs offer teachers tremendous opportunities starting from planning of the lessons to assessment in mixed-level groups. Teachers are able to adjust the learning methods to the needs of students, as well as adapt teaching strategies to accommodate different learning styles and skill levels [13].

Educational platforms play a crucial role in tailoring the teaching process to meet the specific needs and goals of each student. Interactive and gamified platforms, in particular, offer valuable opportunities for learners in mixed-level groups by making language learning both engaging and accessible. These platforms adapt to individual learning styles, ensuring personalized progress for every student. For intermediate learners, such platforms enhance conversational skills and provide personalized feedback, helping them refine their communication abilities. Advanced students can benefit from academic courses that deepen their knowledge and allow them to practice the language in real-world contexts. Meanwhile, elementary-level students can build a strong foundation through a variety of interactive activities that make learning the basics easier and more enjoyable.

Khasanova M.Sh. distinguishes the most important and useful educational platforms such as Duolingo, Teen talk, LECTA, Lingualeo, Puzzle English and lists the benefits of these platforms. According to her research, these platforms are rich in interactive resources and provide ample opportunities for achieving individual learning outcomes. They support personality-oriented learning by catering to students' unique needs and preferences. Additionally, they incorporate social networking features that enable learners to interact, exchange experiences, share achievements, and collaborate on projects. Furthermore, these platforms are designed for convenience, making them both user-friendly and adaptable to various learning goals [14].

Joko Prayudha investigated the use of various applications in teaching English, focusing on YouTube and WhatsApp voice recordings. The author highlighted several benefits of these tools, including their ability to simplify material creation, engage and motivate students, foster interaction among learners, and enhance the overall learning environment. However, despite these advantages, the study also pointed out certain drawbacks. These include challenges in time management, the difficulty of developing appropriate materials, and the risk of students becoming overly dependent on technology [15].

To our mind, in order to use the educational platforms and applications in teaching English, especially to use them in mixed-level groups, teachers should be prepared well. Teachers must provide clear instructions, manage time effectively, and strike a balance between technology-based and face-to-face teaching. Further research is needed to explore best practices for balancing digital and traditional teaching methods, particularly in mixed-level groups, to enhance the effectiveness of English language learning.

Basic provisions. Since it makes it possible to account for variations in language proficiency and create individual development trajectories for each student, the incorporation of information and communication technologies (ICT) into university English instruction for mixed-level groups is a crucial prerequisite for improving learning effectiveness. Utilizing online platforms, interactive apps, multimedia resources, and adaptive systems guarantees a differentiated approach, fosters language proficiency, and boosts learning motivation.

Materials and methods. Two empirical research methods were employed in this study. The first method involved a questionnaire completed by 75 undergraduate students from L.N. Gumilyov Eurasian National University. The participants were majoring in Physics, Technical Physics, Mathematics, and Mechanics programs. They were enrolled in a General English course during their first year of study. The questionnaire comprised 15 questions regarding the use of ICT in teaching English in mixed-level groups. It covered topics such as students' English proficiency level, their use of ICT for learning English, and their experiences in mixed-level groups. Additionally, two open-ended questions sought students' opinions on whether ICT can enhance their English proficiency and which ICT tool is the most effective for learning English in mixed-level groups. The questionnaire was distributed via Google Forms, and data collection from the participants was completed within three days.

The second method employed in the study was an experiment. For this, we selected 24 Physics majors (N=24) as the experimental group. Initially, a placement test was administered to assess their English language proficiency.

The test comprised 60 questions along with two topics for assessing writing and speaking skills. Students' knowledge was evaluated using the following scoring scale: Reading – 30, Listening – 30, Writing – 20, and Speaking – 20, with a total possible score of 100. Their English language proficiency was categorized as follows:

91-100 – Upper-Intermediate

71-90 – Intermediate

51-70 – Pre-Intermediate

31-50 – Elementary

0-30 – Beginner

Based on the questionnaire results, we identified the platforms that students found most effective and designed various learning activities on those platforms. The experimental phase lasted for two months. Afterward, the students were tested again, and their results were compared with their initial proficiency levels.

Results. The first research method made it possible to reveal the following results. The received data were divided into three parts. The first part of the survey revealed the information about the ICT platforms that students use in learning English, how often they use ICT for learning English and advantages of ICT for learning English. This information is given in Table 1.

Table 1. ICT Usage in Learning English: Tools, Frequency, and Advantages

№	Questions	Min	Max	Mean	Std. deviation
1	Do you use for ICT tools in learning English?	8	17	12,5	3,94
2	How often do you use ICT in learning English?	17	35	25	9,17
3	Are there any advantages of use of ICT for learning English?	7	22	12,5	6,09

The data illustrate that students actively use ICT tools in learning English; however, their level of engagement and perceived usefulness of these technologies vary. This variation is likely influenced by students' preferences and access to these tools.

The second part of the survey demonstrates the challenges faced in using ICT tools in English learning. The information is given in Figure 1.

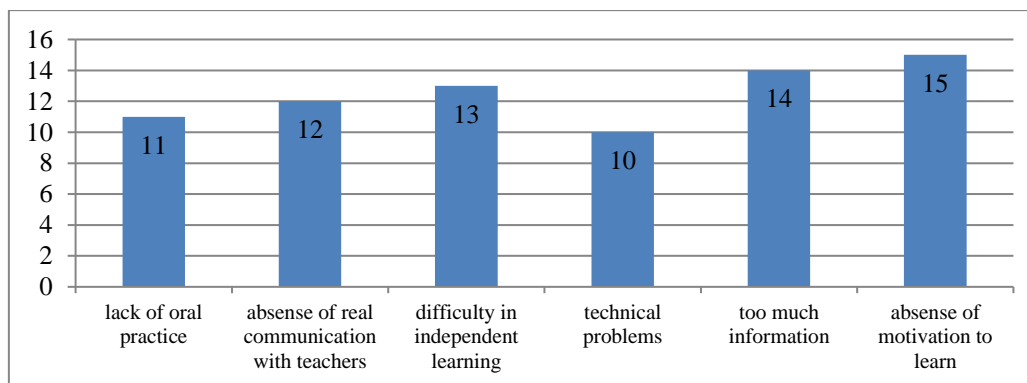


Figure 1. Challenges in using ICT tools in learning English

From this table, we can see that the majority of students believe ICTs provide too much information and that they are not motivated to learn English. Additionally, 10 students reported experiencing technical problems. Overall, all students identified only the listed problems, with no one mentioning personal challenges.

The third part of questions was related to learning in mixed-level groups. The revealed data are given in the following figures. (Figures 2, 3)

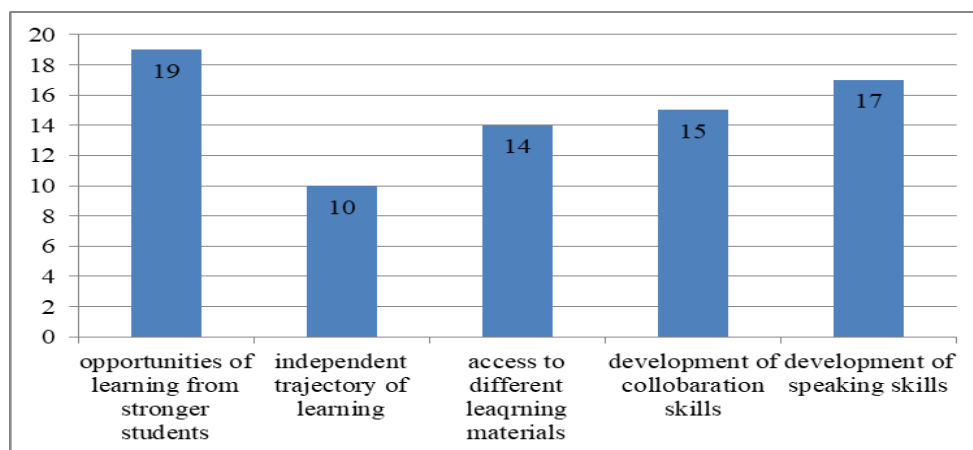


Figure 2. Advantages of use of ICT tools in learning English in mixed-level groups

From this data we can see that respondents are aware of that there are some benefits in use of ICT tools in learning in mixed-level groups as well. Weaker students think that they are able to learn from stronger students and they can develop their speaking skills and collaboration skills through ICTs.

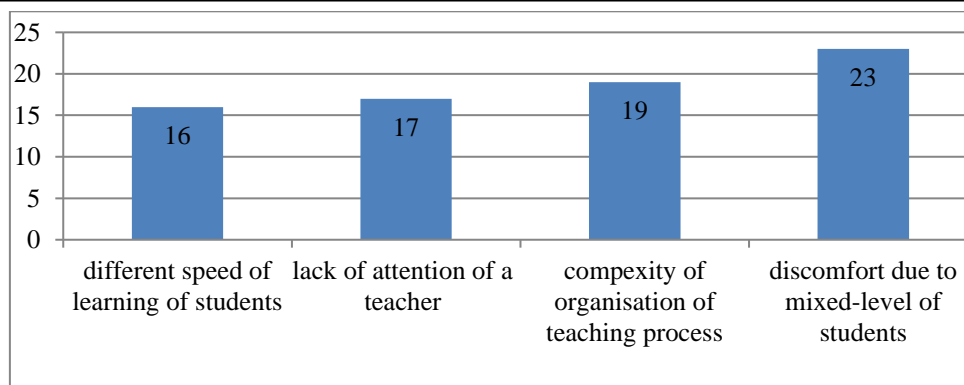


Figure 3. Disadvantages of use of ICT tools in mixed-level groups in learning English

The survey also included open-ended questions, where students were asked to share if teachers can enhance students' English language skills using ICT tools. Out of 75 students, 73 agreed that teachers can enhance students' English proficiency using ICT tools in mixed-level groups.

The question “How do ICT tools influence students’ learning English for mixed-level students” all students (75) responded that they are effective for learning English.

The following figure illustrates the response to the question: Which ICT tool is most effective for teaching English in mixed-level groups?

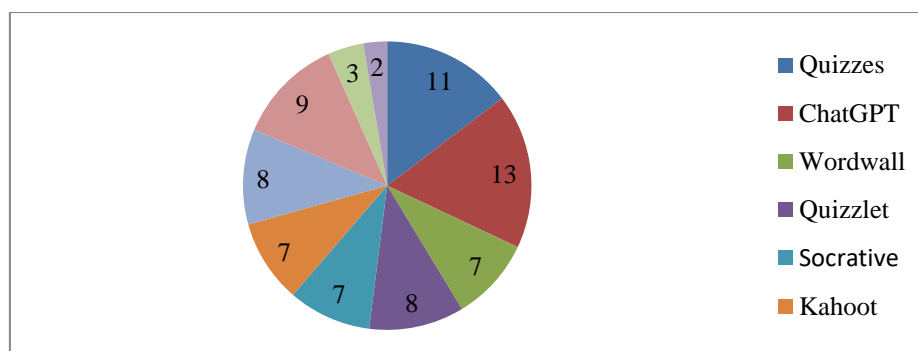


Figure 4. Which ICT tool is the most effective for teaching English in mixed-level groups?

The illustration shows that students use all of the offered tools. ChatGPT, Quizzes, Kahoot are the most frequently used by students among other platforms.

The second method identified students’ English language proficiency. Table 2 demonstrates the results of the placement test.

Table 2. Results of placement test

Beginner	Elementary	Pre-Intermediate	Intermediate	Upper-intermediate
2	4	8	9	1

From the table, it can be observed that only one student has an Upper-Intermediate level, while two students are at the Beginner level and four at the Elementary level. The majority of students fall into the Pre-Intermediate and Intermediate levels. Overall, we can conclude that this is a mixed-level group.

After two months experiment we conducted the following results. Table 3 shows the results of this test.

Table 3. Results of the test after the experiment

Beginner	Elementary	Pre-Intermediate	Intermediate	Upper-intermediate
0	2	8	12	2

From this, we can see that our intervention had a positive impact on students' English language skills. There are no longer any Beginner-level students, as their proficiency has increased to the Elementary level. All four students who were previously at the Elementary level have progressed to Pre-Intermediate. Additionally, four Pre-Intermediate students advanced to the Intermediate level, and one student reached the Upper-Intermediate level. This improvement highlights the effectiveness of our intervention in enhancing students' language proficiency.

Discussions. The questionnaire results indicate that students frequently use ICT tools in their English learning process. They perceive numerous advantages in learning English and believe that ICT tools make the process more engaging and effective. According to the respondents, these tools enhance their listening skills by providing access to a diverse range of online materials. Students highlighted the availability of resources such as podcasts, videos, films, and other educational content. Additionally, teachers can design interactive activities on various platforms tailored to the curriculum topics being studied.

Respondents believe that ICT tools are highly effective for learning English in mixed-level groups. This is because these tools provide numerous opportunities for personalized learning, allowing teachers to tailor instructional materials to meet individual student needs. Students benefit from ICT tools as they make learning more interactive and productive. Additionally, ICT tools enhance students' motivation to learn by enabling them to study at their own pace and from any location. The fact that 100% of respondents provided a positive answer to the question "How do ICT tools influence students' learning of English?" confirms that students recognize the effectiveness of ICT tools in the learning process.

Nevertheless, respondents acknowledge certain drawbacks of using ICT tools for learning English in mixed-level groups. Twenty-three students report feeling discomfort due to varying proficiency levels, while 19 students find it challenging to organize the teaching process. Additionally, 16 students struggle with differences in learning pace among their peers. This indicates that while students recognize the benefits of ICT tools, they are also aware of the challenges associated with their use.

The test results revealed that the experimental group consisted of students with varying levels of English proficiency, ranging from Beginner to Upper-Intermediate. Among them, two students from China had no prior experience studying English. One student at the Upper-Intermediate level had attended a language school and received private tutoring. The remaining students had proficiency levels ranging from Elementary to Intermediate.

The selected ICT tools such as Wordwall, Quizlet, Nearpod, Socrative and other platforms offer a lot of opportunities for effectively learning English. *Wordwall* is an engaging platform for creating interactive activities and didactic games. It allows teachers to adapt tasks to different student levels by modifying questions, simplifying exercises, or making them more challenging.

Quizlet is a valuable tool for creating digital flashcards and interactive exercises, making it effective for memorizing information, improving grammar, and expanding vocabulary. This platform is particularly useful for mixed-level groups, as it offers various tools, including tests, games, and writing exercises. One of its key features is the ability to share learning materials with other students, enhancing collaboration and accessibility.

Nearpod enables teachers to design engaging activities incorporating multimedia elements, tests, and assignments. This platform allows educators to monitor students' progress, provide corrections, and offer recommendations. Additionally, it serves as an effective tool for creating tasks tailored to different proficiency levels. Figure 5 presents various activities designed for students at different levels. For beginner and elementary learners, the focus was on acquiring active vocabulary.



Figure 5 Activities offered for beginner and elementary students

The following figure shows the activities offered more advanced students to enhance their language skills.

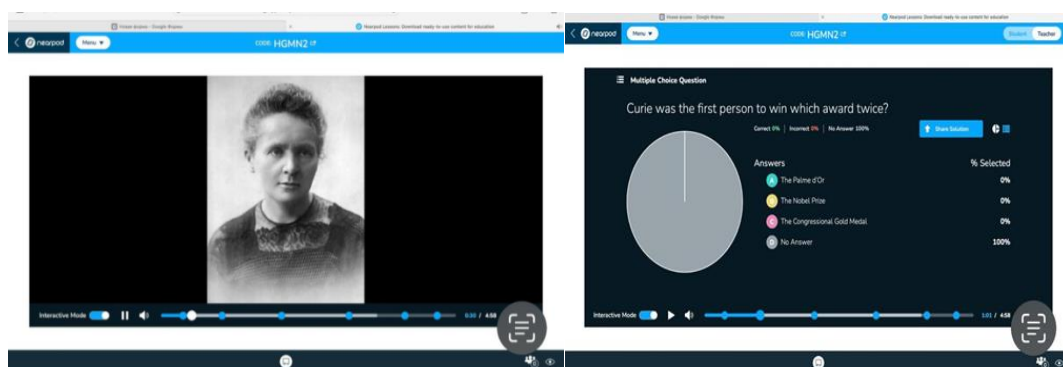


Figure 6 Activities offered for more advanced level students

The study showed that the main challenge in groups with varying language proficiency levels is the need to differentiate tasks and teaching approaches. On one hand, teachers must support advanced students, while on the other, they should provide additional attention to beginners to ensure full engagement in the learning process. Educators must be prepared to assist all students effectively.

Activities created through various platforms are designed to address these challenges and enhance student motivation in language learning. They help develop students' communication skills, expand their vocabulary, and improve their grammar knowledge. ICT tools enable interaction with other students and their teacher, facilitate language learning through diverse platform materials, and encourage the practical application of acquired knowledge in real-life situations.

Conclusion. The use of ICT tools in teaching English to mixed-level groups significantly enhances language proficiency by increasing the effectiveness of instruction, personalizing the learning process, and boosting student motivation. Research indicates that students recognize the advantages ICT offers for learning English, although they also acknowledge certain drawbacks. Online platforms and interactive methods help tailor instruction to individual student needs, ensuring a differentiated approach to learning. When implemented effectively, ICT tools improve the quality of education, foster a supportive learning environment, and facilitate meaningful teacher-student interactions, regardless of learners' proficiency levels. However, to fully harness the benefits of ICT, teachers must receive proper training and carefully plan lessons to strike a balance between digital tools and traditional teaching methods.

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THE USE OF PROBLEM-BASED LEARNING TECHNOLOGIES IN THE PROFESSIONAL TRAINING OF SPECIAL EDUCATION TEACHERS

Abstract

This study examines the effectiveness of integrating problem-based learning (PBL) technologies into the professional training of future special education teachers. With the increasing complexity of inclusive education environments, traditional models of teacher preparation often fall short in developing the diagnostic, corrective, and collaborative competencies needed in the field. This research investigates whether a technology-enhanced PBL framework can better prepare pre-service special educators by fostering critical thinking, professional autonomy, and practical problem-solving skills. A mixed-methods research design was employed. Quantitative data were collected through pre- and post-intervention assessments administered to both experimental and control groups consisting of fourth-year students enrolled in a special pedagogy training program. The experimental group participated in a 15-week intervention involving scenario-based learning, online simulations, and structured reflective exercises, while the control group followed the conventional curriculum. Results revealed statistically significant improvements in the experimental group's professional competencies, particularly in areas related to individualized diagnostics, corrective planning, and collaboration with parents. An independent samples t-test confirmed these findings ($t(58) = 6.41, p < .001$), with a large effect size (Cohen's $d = 1.65$). Qualitative data, drawn from student journals and focus group interviews, supported these results and highlighted increased motivation, cognitive engagement, and the formation of professional identity. Students emphasized that the authenticity of the scenarios and the use of digital tools were instrumental in deepening their learning. Limitations of the study include a restricted sample size, single-institution context, and a relatively short intervention period. Nevertheless, the findings offer valuable insights into the design and implementation of innovative instructional models in special education teacher education. The study concludes that when problem-based learning is supported by relevant technologies and guided facilitation, it holds significant potential to enhance the preparedness of special education teachers for the demands of inclusive and adaptive educational practice.

Keywords: problem-based learning, special education, professional competencies, technology integration, teacher training.

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АРНАЙЫ БІЛІМ БЕРУ СТУДЕНТТЕРІН КӘСІБИ ДАЯРЛАУДА ПРОБЛЕМАЛЫҚ ОҚЫТУ ТЕХНОЛОГИЯЛАРЫН ҚОЛДАНУ

Аңдатпа

Бұл зерттеу проблемалық оқыту (PBL) технологияларын болашақ арнайы білім беру мұғалімдерін кәсіби даярлауға біріктірудің тиімділігін зерттейді. Инклюзивті білім беру ортасының күрделене түсуіне байланысты мұғалімдерді даярлаудың дәстүрлі үлгілері осы салада қажетті диагностикалық, түзету және бірлескен құзыреттіліктерді дамытуда жиі жетіспейді. Бұл зерттеу PBL технологиясының жетілдірілген жүйесі сыни тұрғыдан ойлауға, кәсіби дербестікке және мәселелерді шешудің практикалық дағдыларына ықпал ете отырып, алдын ала дайындалған арнайы оқытушыларды жақсырақ дайындай алатынын зерттейді. Аралас әдістерді зерттеу дизайны