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General information

The journal "Pedagogy and Psychology" of Abai Kazakh National Pedagogical University is a republican scientific and methodological edition. The journal was founded in 2009.

The main thematic focus of the journal "Pedagogy and Psychology" is the problems of the current state of all education levels.

Research, analytical, scientific and methodological articles reflecting the results of fundamental and applied research corresponding to the subject of the journal, as well as review articles with a clear indication of the conceptual position of the author(s) are accepted for publication.

Thematic directions of the journal:
- Innovations and problems of development of modern education
- Psychological and pedagogical problems of training specialists
- Current problems of inclusive and special education.

The mission of the journal is to attract scientists and educators to an open discussion of current problems of education, science; to support creative initiatives in the field of educational policy, theory and practice, to promote the integration of the activities of domestic and foreign scientists and teachers to improve the system of higher, secondary, general, additional and vocational education.

The target audience of the journal: the teaching staff of universities; academic staff and experts in the field of preschool, secondary, vocational and higher, postgraduate education; doctoral students, postgraduates, applicants, undergraduates and students of Kazakhstani and foreign universities and scientific and educational institutions, school teachers, teachers of additional education, etc.

The journal is included in the List of leading peer-reviewed scientific journals recommended for publishing the main scientific results of dissertations for getting degree and academic title by The Committee for Quality Assurance in the Field of Science and Higher Education.

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NON-FORMAL EDUCATION IN THE CONTEXT OF MODERN TRENDS

Abstract

In the modern world, specialists' success depends on their ability to adapt to rapidly changing conditions in their lives and professional activities. Non-formal education is one of the ways to adjust educational trajectories to ensure continuous and flexible development tailored to learners' individual needs and interests. This paper describes the findings of a study on the non-formal education model in higher education institutions. The study aims to develop a non-formal education model considering a three-element interaction: student, university, and external environment. Analytical and statistical information processing methods were used to review references and determine the needs of internal and external non-formal education consumers. The study's findings justify the integration of non-formal education concepts into a traditional education system, that is, ensuring free academic activity, expanding learning options and trajectories, personal development, and forming a constantly growing need for acquiring knowledge and new competencies. Another result of the study is the identification of the key elements of non-formal education and the possibilities for its integration into the higher education system. The map of requests of each educational process participant has been made and some ways of non-formal education implementation have been shown in the example of NPJSC D. Serikbayev East Kazakhstan Technical University experience. The scientific and practical significance of the paper lies in a comprehensive overview of non-formal education scientific and educational potential, and a presentation of mechanisms for creating an educational environment to facilitate learners' self-organization and self-development.

Keywords: non-formal education, competencies and skills, self-education, personal development, motivating environment, flexible educational trajectories.

Basic provisions. Non-formal education is becoming increasingly popular in modern society attracting both students and teachers due to its flexibility, accessibility, and responsiveness to changing educational needs. The paper presents a three-element non-formal education model which includes a student, a university, and an educational environment. Each of these elements has been described with practical examples based on D. Serikbayev East Kazakhstan Technical University experience. A student represents an active educational process participant who has unique needs, interests, and goals. A university shows an educational institution's role in providing quality, diverse, and accessible education. Educational environment includes physical, social, and cultural environment and society.

Introduction. For a long time, the concept of education was associated exclusively with institutions (schools, universities) that provide a wide range of basic scientific knowledge and skills for a future profession. However, in the 21st century, the content field of education concept has expanded significantly and its contextual meaning has changed. This was caused by the emergence of models described as formal, non-formal, and informal education. Why did alternative forms of education emerge? What processes caused their emergence, discussion, and implementation? These questions can be answered by tracing the logic of modern society's socio-economic development, highlighting challenges posed by technological boom, digitalization, humanization, and other processes that are the modern world's characteristic features.

A dynamically developing economy is transforming the labour market and imposing new and increasingly diverse requirements on specialists. To succeed in a professional environment, it is no longer enough to know in a particular field, skills of effective business communication and forecasting, and decision-making skills. Today, it is important to be flexible, socio-culturally competent, civically engaged, emotionally expressive, and adequately responsive to society's demands.

Education organizations and, first of all, higher education institutions face the issue of revising academic policies and reformatting educational process content in connection with the expansion of future specialist's functionality. The interaction and interdependence of different forms of education are becoming more and more important to increase the pedagogical and scientific-innovative potential of education which develops learners socially and individually. Undoubtedly, traditional (formal) education is crucial for forming a personality. At the same time, social and cultural development diversifies non-traditional (non-formal) education forms.

The concepts and terminology used in the paper refer to the International Standard Classification in Education (ISCED) developed by the Institute of Statistics at UNESCO (ISCED, 2013). According to this classification, the following types/forms of education are distinguished.

Formal or institutionalized education is education that is purposefully planned with the participation of government institutions. All aspects of formal education subjects' activities are recognized as standard from the point of view of their implementation at schools and universities in a particular country. In such education, there are well-established mechanisms for interaction between an educator and a learner, the continuity of transition from one education fragment to another, and clear regulation of each step on the way to a specialist's entry into the labour market. Formal education participants are not only educational institutions with their educators and learners but also employers and specialists who already have experience in a certain field. In this case, formal education also includes professional development training and retraining programs the final result of which (certificate, diploma) is recognized by government agencies and other educational institutions (ISCED, 2013).

Informal education/learning is education that is not institutionalized. It means that state institutions are not directly involved in its implementation. This form of education does not imply the availability of a structured curriculum or planning. Learning is intentional for learners as they decide to get educated by reading books and journals, watching educational movies, working with Internet sources, etc. Informal education must be a form of education because learners realize that the ultimate goal of such activities is their self-education (ISCED, 2013). Informal education has less organized and structured forms, is more focused on learners' personal needs, and is determined by educational activities in their everyday lives, and communication with colleagues and society when they interact with information content (Staus et al., 2021). Such education is simultaneous to learners' main activities, accompanies them at different moments of their lives and often is not perceived as education in its pure form.

Non-formal education (which receives the most attention in the above classification) is education which, on the one hand, belongs to public and private institutions, and on the other hand, is an additional, alternative option that offers learners a life-long expansion of their educational trajectories. Such education has well-developed programs, is organized in short periods, and is provided as courses, seminars, trainings, workshops, master classes, etc. The documents obtained through non-formal education programs are not often universally recognized at the state level, but they are recognized by employers as documents of their employees' professional development and growth (ISCED, 2013).

Thus, formal, informal, and informal education are different paths that lead to similar results: forming a well-educated person who is in demand in the labour market. In formal education, this path is structured and has rigid

frameworks, in non-formal education this path is formed by immersion in a certain educational environment based on practical experience. Both of these forms of education are intentional for learners: they know, why and how to learn. The path of informal education provides opportunities to learn something new without realizing the process of learning. In any case, these forms of education shape social mobility and motivate learners' self-improvement and self-development (Kalashnikova, 2019).

Main part. The Institute of Statistics at UNESCO has provided a transparent and clear framework for understanding these three forms of education. A more detailed description of each form as well as their advantages and disadvantages can be found in scientific publications (Harris & Wihak, Whack; Johnson & Majewska, 2022; Alnajjar & Abdulhalim 2021; Allaste et al., 2022; Filippoupoliti & Koliopoulos, 2014).

For the sake of clarity, let us reflect the essence of these papers in a table that summarizes various features attributed to each form/model of education (Table 1).

Table 1. *Main characteristics of formal, non-formal, and informal education*

Main characteristics	Formal education	Non-formal education	Informal education
Educational environment	Public education institutions	Public education institutions	Outside of public or private education institutions
	Private education institutions	Private education institutions	Daily life
	Employers	Employers	On-the-job training
Educational processes	Structured processes	Structured processes	Spontaneity
	Description of all processes in regulatory documents	Description of all processes in regulatory documents	Driven by consumer needs
	Time regulations	Time regulations	Lack of time regulations
Education participants	An employee of a public/private educational organization – a learner	An employee of a training organization – a trainee	Colleagues – a person interested in information
	An employer – a student	A trainer – a trainee	A competent person – a person interested in information
Sources of education	Educational and scientific literature	Course/seminar/training materials	Books, audio and video materials, everyday life experience
Learning outcomes	Diploma of Education (state level)	Certificate	Not certified acquired knowledge

This table shows the intersection points of formal and non-formal education: one educational space and similar educational processes. The similarity of these education models determines some difficulties in their identification: which forms of educational services provision should be considered as formal and which as non-formal. Let us present a more in-depth view of non-formal education based on current scientific literature corpus analysis.

First, let us consider what is included in the non-formal education concept. Non-formal education is an activity organized in content and structure and does not necessarily coincide with the main program of an educational institution. It's aimed at realizing learners' educational needs, provides real practice-oriented learning, and offers variability and flexibility of educational processes (including the choice of place and time of learning). Non-formal educational programs are often considered along with the concepts of continuing education, additional education, and self-education to describe the modern world realities where the process of acquiring new knowledge and skills accompanies learners throughout their lives taking a variety of forms (Pereira & Ortiz, 2022; Flerov, 2022).

Non-formal education is provided primarily by learning centers, clubs, and circles both at schools and universities and in external public and private organizations. The main forms of non-formal education implementation are online courses and professional development courses; thematic seminars, trainings, and master classes; webinars and podcasts; hobby clubs, sports sections, and artistic circles. Non-formal education plays an important role in training those who do not have an opportunity to receive traditional education and those who need to acquire additional competencies for real employment, the emergence of new professional opportunities, and increasing labour mobility. Large enterprises and small firms also use non-formal education principles to improve their employees' qualifications and their retraining (Short-Meyerson, Sandrin & Jimenez-Silva, 2024; Młynarczuk-Sokołowska, 2022; Badger, 2021; Simac et al., 2021; Alon et al., 2015; Beddie & Halliday-Wynes, 2010).

The increasing significance of non-formal education is attributed to the digital revolution which has provided access to open educational resources and massive online courses (Sarsembaeva, et al., 2023). So far, non-formal education is often interpreted as e-learning and distance learning (Liao et al., 2023; Atabekova et al., 2015).

Publications review also allowed us to notice that non-formal education has the opportunity to solve many current social and economic problems. Non-formal education principles help, for example, refugee children to adapt to a new way of life and a new environment: "non-formal education plays a vital role in providing active and responsive citizens, enabling people to learn from others by asking questions, exchanging views, preparing for actions that refugee children need to free themselves from their vulnerabilities" (Zakir, 2023).

The practical system of non-formal education has been initiated by a range of social problems that have determined the need for interaction between public and private educational structures and the population. There was a need for such an educational organization that could fully use students' potential and form their self-

improvement skills. Non-formal education also makes it possible to expand learners' rights and opportunities, to involve even declassified strata of the population in education. As an example, the experience of organizing creative music education for neglected children shows how to include in society those social strata which, on the one hand, experience everyday difficulties, on the other hand, can bring destructive moments in the life of whole society. The functioning of Roemah Musik Harry Roesl art venue which provides music programs for street children in Indonesia brings us closer to solving this social problem, initiating creative efforts to introduce forms of non-formal education in the context of people's empowerment (Purwanti & Widiastuti, 2015).

Non-formal education is also used to foster environmental and ecological thinking. In Ethiopia, there is a project aimed at empowering rural people. The ideas of non-formal education have been realized in the form of project-based learning of skills and knowledge that will help to implement environmental projects, strengthen community participation in improving environmental quality, and improve environmental performance and farming practices (Zikargae et al., 2022). Studies and projects in Malaysia also address the same topic: non-formal environmental education among adults are campaigns to raise public awareness of existing problems and solutions in the form of environmental talks, exhibitions, seminars, workshops, congresses, and outdoor activities (Hassan et al., 2009).

In Malaysia, non-formal education has also been used to build linguistic diversity in schools by organizing language activities outside the school: using the resources of television, game consoles, and computers. Children who participated in these programs adapted more easily to life in a different country, society, and culture (Yamat, 2010).

Another social problem that can also be solved using non-formal education is the problem of employment and unemployment. Macedonian experience shows that involvement of non-governmental organizations in supporting the formal education system provides a kind of

"added value" to education services because in this case, the education system has the opportunity to diversify education programs' content as much as possible and thus to impact different categories of learners (Abdullai et al., 2012).

Inclusion in education, as all society members are involved in educational processes taking into account the diversity of needs, opportunities, and peculiarities, also uses non-formal education principles and mechanisms; social inclusion models are built on their basis, pedagogical conditions are created for adaptation of students with special physical and mental abilities to life, and communication in the society (Popova et al., 2020).

Thus, on the one hand, scientific papers of the last ten years consider non-formal education as a key to overcoming the socio-economic and cultural crises of modern society; on the other hand, they describe non-formal education as a way to build a continuous professional education. The existing large corpus of papers on non-formal education pays less attention to a comprehensive consideration of the above-mentioned non-formal education components and the development of its holistic model. The above-mentioned papers are valuable as a demonstration of real experience in solving specific problems of society. However, these scientific experience fragments have not made a full picture reflecting non-formal education structural and content characteristics yet. We believe that non-formal education, to differ from formal education, should be a synthesis of learners' interests and demands, strategic goals of educational institutions, and external environment that helps to diversify offered services and deepen program content.

Research materials and methods. The study is based on the definition of an aim, an object, a subject, and objectives. An analytical review of modern scientific discourse on the defined study subject allowed us to outline the essence of non-formal education, demonstrate the diversity of options for its implementation in different countries, and identify the social orientation of non-formal education initiatives. Scientific articles, educational organizations' websites, and regulatory documents have been studied. A

practical part included building a three-element non-formal education model, analysing the results of a questionnaire survey for non-formal education participants, discussing these results, and further developing recommendations and study outcomes. The data collection method through questionnaires was used to build a map of non-formal education consumers' requests. The statistics were analyzed by descriptive analysis. The questionnaire recipients were students, Master's Degree and PhD. students at EKTU (300 people) as well as 50 public and private educational organizations.

In this article, non-formal education is considered a system consisting of three fundamental elements: a student, a university, and an environment. This approach is quite innovative as, on the one hand, it fits non-formal education into formal education mechanisms; on the other hand, it provides a systematic and consistent strategic planning and implementation of this model. The non-formal education model is described in the example of NPJSC's East Kazakhstan Technical University experience (hereinafter referred to as EKTU) which is currently implementing this model in its educational process.

Now, the study will focus on each element of this non-formal education model/system.

Students are the main consumers of an educational product. Modern market trends emphasize the importance of such an aspect as human freedom in continuous learning, promoting and strengthening such human values as ethics, emotions, and confidence in one's social status which characterizes human culture as such. A triad of learners' needs which determine the necessity to introduce non-formal education into the general system of the academy emerges.

Educational needs are a quick and accessible learning process; acquisition of practical experience corresponding to the demands of industry, economy, and culture; adaptation of the education system to digital and humanitarian challenges; employment; and effective professional work.

Social needs are interpersonal communication (student to student, student/participant to

teacher/trainer); intercultural communication; team membership awareness; confidence in one's role in the team; satisfaction with work and professional performance; and career building.

Personality needs are a sense of security, physical and mental well-being, social group support; opportunity for self-realization; desire for creativity, and self-expression.

Undoubtedly, a part of these needs is provided by traditional education which forms a set of reliable fundamental knowledge, practical training for future professional work, intercultural and social communication skills, and research competencies. However, modern students are people of a new formation who have access to a huge amount of diverse educational and non-educational content, strive to be pragmatic about their learning experiences, and competently form their trajectories of education and personal development. They are active in social life and creativity and can properly set their priorities. It is no longer enough for them to only attend lectures and practical classes to consider themselves educated people. The modern world's energy and resources stimulate creative realization and social competencies development.

EKTU students are ready to supplement their main educational process with additional programs and courses. This is confirmed by the results of the questionnaire survey, in which 330 respondents took part: Bachelor's, Master's, and Ph.D. degrees students.

The study presents some data obtained from the questionnaire in this article.

The majority of the respondents feel the need to develop their economic and digital literacy and creative thinking. This choice was quite predictable since the modern media sphere actively promotes the values of market relations: the ability to earn money, the ability to think outside the box in problem-solving, and to be mobile in the use of technology (Seyitkazı & Irımbaeva, 2022). However, some students would like to express themselves not in their educational experience, but in their creativity (singing, dancing) and sports (self-defense, combat sports).

On the student's part, non-formal education is of interest as a more flexible and adaptable to their needs form of knowledge acquisition. They are attracted by the availability of online courses, short-term seminars and training, and the opportunity to unlock their creative potential. For many people, an undoubted advantage of participation in non-formal education is the possibility of re-crediting course certificates from their main curriculum. So, the first element of the non-formal education model – students with their needs and interests – is the starting point, the developed model foundation.

Satisfying students' social and educational needs enriches the process of their interaction with society and the economic sphere. Immersion in universal human values, foreign languages, culture, and innovative technologies forms functional, cultural, and emotional literacy of future specialists in various fields.

To fulfil the formulated students' needs, the next element of the non-formal education model – a university – must be a flexible structure with a good material and technical base, professional staff, progressive attitude to academic processes and their content, strong partnership with government and production structures.

Regarding the university's material and technical base for non-formal education, attention should be focused, first of all, on the information component: a well-designed and structured Learning management system (LMS), strong digital technologies that allow organizing mobile learning, using cloud capabilities and gamification; a serious base of advanced online courses created by university teachers; the possibility of joining mass open courses through agreements and licensing, etc.

Thus, EKTU was one of the first universities in Kazakhstan to develop its educational portal. The portal developers follow all innovations and expand and deepen their capabilities. One of the latest implementations was the creation of a digital learner's profile which tracks a student's academic and extracurricular achievements, reflects what competencies and how they are manifested during training, and records the results.

Another strength of the EKTU digital system is the portfolio of online courses developed by a team of university teachers in Kazakh,

English, and Russian. These are 32 courses in such general and specialized disciplines as the History of Kazakhstan, Culture Studies, the English and the Russian languages, Engineering Mechanics, Merchandising, Cloud Computing, Research Organization and Planning, Information Communication Technology, Fundamentals of Geology, Renewable Energy, Road Maintenance, Cartography, etc., as well as several other courses. The online courses are hosted on an open platform at https://open.ektu. kz. Since 2021, 837 students have mastered one or another discipline through online courses. EKTU also has 1,500 licenses for educational content on the Coursera platform. So far, 1000 licenses have already been completed by the university students and certificates have been re-credited in various disciplines of EKTU courses.

Another important role of the university in the formation of non-formal education values is to motivate students to self-education and to form a constantly growing need for continuous learning. Motivation is crucial in this approach to non-formal education. The university can and must provide a motivating environment in which students can constantly learn something. One of the options for creating a motivating environment is a university network of clubs and circles, laboratories, and technology centers.

Clubs/circles / creative groups/sports sections are forms of student interaction with each other and with their tutors/teachers/ university staff; these forms socialize participants, improve their communication skills, intercultural competence, and team cooperation opening up their inner potential. Speaking widely and specifically, they satisfy students' need to create. This format of student community suggests different subjects, forms of communication, and activities. A university that offers different options of a creative environment contributes to students' future fulfilment success. Students involved in club activities get a confident self-esteem, a sense of belonging to the university activities, and satisfaction from the implementation of important social and environmental projects in addition to their acquired competencies. Students can

gain and develop additional competencies and master working professions in scientific centers and laboratories which will expand their employment and career opportunities. It is worth noting that students who participate in non-formal learning show good results in their main educational activities as well. This proves that a motivating environment has a beneficial effect on self-organization and the desire to acquire new knowledge (Tang & Zhang, 2020). Thus, a university as an element of a non-formal education system provides a motivating component on the one hand and a component that satisfies this motivation on the other hand.

The third element of the non-formal education system is the external environment. The external environment in this case means both governmental, non-governmental, and private organizations the activities of which are related to personal development: educational, cultural, creative, and sports activities. This element of the system is the most undeveloped in current conditions: there is no comprehensive, transparent, understandable, and logically structured legal framework that would regulate and coordinate all options for cooperation between the university and its partners to implement non-formal education. As a result, programs and courses are duplicated, educational content is detached from learners' real needs, and traditionally popular and demanded courses and training like languages and IT prevail.

Another problem is to establish effective and productive relations between the university and external organizations. State-run education organizations are often oriented on traditional formats of interaction, and private organizations do not consider it worthwhile to cooperate with the university, as they put financial objectives as their main priority. This opinion is based on the analysis of the educational environment in Ust-Kamenogorsk for possible cooperation options in non-formal education: only 4 organizations (three public and one private) out of 50 organizations that were of interest for our study were willing to cooperate with the university in course preparation, experience sharing and holding events.

In this case, the university's task is to build effective partnership mechanisms that allow filling university programs and courses with real experience, non-standard approach, and creative implementation, as well as to increase the number of communication options with professional communities. It is this direction of university activities that requires updating and diversification, and this will be the subject of our further research.

As we can see, each element of the non-formal education model determines both organizational mechanisms and the content of the model itself (see Figure 2).

To make non-formal education a working model that brings real positive results, it is necessary to take into account the requests of all those interested in this process, to have strong partnerships with the state and private sector, a strong academic base, and creative teachers.

Table 2. *Map of non-formal education participants' requests*

Student	University	Environment
• acquisition of knowledge and competencies: foreign languages, creative thinking, economic literacy, digital literacy, sports, dancing, singing, psychology • flexible educational process: opportunity to obtain new knowledge and additional competencies not directly related to education program; opportunity to re-credit certificates of language examinations (IELTS, TOEFL, Kaztest) at the university; opportunity to re-credit courses taken other than at the university.	• organizational requests: re-crediting of education outcomes; increasing the number of students enrolled in non-formal education; creating an educational environment that encourages students self-education and forms self-organization skills of educational activities • infrastructure requests: In-house online courses and programs; network of clubs, sections and circles; laboratories and centers of competence • external requests: Networking with organizations offering personal development service	• partnership requests: Involvement of EKTU staff to conduct courses / seminars / trainings; involvement of organization's staff to conduct courses / seminars / trainings for EKTU students • organizational requests: development of joint courses / seminars / trainings; sharing already existыing courses / seminars / trainings • financial requests: attracting more customers

Thus, we have shown the model of non-formal education as a synergy of such components as students, university, and environment. This approach allows building a model based on the goals and objectives essential for each component; it identifies problem areas and emphasizes more effective ways of non-formal education development and implementation.

Discussion. Non-formal education is education that offers learners additional programs that aim to develop a wide range of competencies and meet personal development needs. Such programs are implemented through courses, seminars, trainings, master classes, etc.

The available studies on non-formal education issues describe, first of all, the social effect that such education can provide (Abdullai et al., 2012; Yamat, 2010; Zakir, 2023; Zikargae et al., 2022). At the same time, there are almost no papers that describe the paradigm of step-by-step non-formal education development and

implementation. Most of the papers focus on the study of separate areas of non-formal education.

Findings obtained in the course of development of the three-part non-formal education model are consistently in line with the existing studies (Harris & Whack, 2018; Johnson & Majewska, 2022;). However, the difference of the proposed study is that the elements of the model (student – university – external environment) are considered as a whole, while the above-mentioned works emphasize one of these aspects. There is an extensive mosaic of non-formal education issues in the scientific community which made it possible to develop this model.

Today, students who think about their future careers strive to acquire relevant competencies and unlock their creative potential. The demand for non-formal education among young people is quite high. However, in the modern education system of Kazakhstan, there are no clear and

transparent mechanisms to involve students in non-formal education. To solve this problem, it is necessary to implement such a model of non-formal education which ensures the interconnectedness of all participants: students, universities, and external organizations that provide educational services.

Students' needs in non-formal education identified in the study indicate modern trends in the development of society, economy, and culture. To meet these needs, the university should create an educational environment that motivates students to continue self-development. The development of non-formal education courses and programs, the promotion of club activities, on the one hand, and the implementation of partnerships with external organizations, on the other hand, are important aspects of non-formal education implementation.

The non-formal education model developed in the proposed study reflects the challenges facing the modern academy; it shows interested participants as elements of a unified system through its three-element structure; it structures and organizes the ways of implementing non-formal education into activities of any organization.

The issue of effective recognition of non-formal education outcomes requires further elaboration: rules developed in Kazakhstan's legal field are focused on the assessment of content-based compliance of obtained learning outcomes which is not always possible to perform unambiguously. To become viable, non-formal education should be integrated into the national qualification framework, which has not been elaborated at present either (Harris & Whack, 2018; Souto-Otero, 2021).

Conclusion. The widespread of non-formal education ideas and principles and their acceptance by a growing number of higher education institutions indicate that this concept is relevant, it reflects the stage of the entire education system transformation. Non-formal education expands the boundaries of education itself and cultivates knowledge and practical experience. The ultimate goal of non-formal education is personal growth, and personal reformation through participation in any activities that go beyond the set of formal education rules. To understand the paradigmatic basis of this concept, we have conducted a review of relevant papers which allowed us to formulate the following advantages of non-formal education: an opportunity to tailor one's educational path; a wide range of tools to diversify the ways and means of education for all categories of learners and those willing to learn; the opportunity to build a lifelong learning strategy; the availability of educational programs and courses including through distance learning and inclusion. The three-element non-formal education model (student – university – environment) has been formulated and each component of this model has been characterized with practical illustrations of ideas on the example of the EKTU experience. Non-formal education with a goal-oriented approach to each fragment of educational activities promotes the principles of free access to information, expansion of students' communication field, and revealing of personal potential, and thus, it expands the rights of modern people. Universities have great potential to shape these rights, as they can offer non-formal education and create a motivating environment for continuous development and growth.

References

Abdullai, J., Tresi, A., & Ramadani, K. (2012). Non-formal education is a tool for reducing the transition obstacles. *Procedia-Social and Behavioral Sciences*, *46*, 4923-4927. https://www.sciencedirect.com/science/article/pii/S1877042812020964

Allaste, A. A., Beilmann, M., & Pirk, R. (2022). Non-formal and informal learning as citizenship education: The views of young people and youth policymakers. *Journal of Applied Youth Studies*, *5*(1), 19-35. https://link.springer.com/article/10.1007/s43151-021-00059-z

Alnajjar, M., & Abdulhalim, E. (2021). The Impact of a Proposed Science Informal Curriculum on Students' Achievement and Attitudes During the Covid-19. *International Journal of Early Childhood Special Education*, *13*(2).

Alon, N., & Tal, T. (2015). Student self-reported learning outcomes of field trips: The pedagogical impact. *International Journal of Science Education*, *37*(8), 1279-1298. https://www.tandfonline.com/doi/abs/10.1080/09500693.2015.1034797

Atabekova, A., Belousov, A., & Shoustikova, T. (2015). Web 3.0-based non-formal learning to meet the third-millennium education requirements: University Students' perceptions. *Procedia-Social and Behavioral Sciences*, *214*, 511-519. https://www.sciencedirect.com/science/article/pii/S1877042815061091

Badger, J. (2021). Learning in non-formal settings: Investigating cemetery guides' talk during school visits. *International Journal of Educational Research*, *109*, 101852. https://www.sciencedirect.com/science/article/pii/S088303552100121X

Beddie, F., & Halliday-Wynes, S. (2010). Informal and non-formal learning in vocational education and training.

Filippoupoliti, A., & Koliopoulos, D. (2014). Informal and non-formal education: An outline of History of Science in museums. *Science & Education*, *23*, 781-791. https://link.springer.com/article/10.1007/s11191-014-9681-2

Flerov O.V. (2022). Razvitiye neformal'nogo i informal'nogo obucheniya inostrannym yazykam v 2010-kh godakh. Pedagogika i prosveshcheniye. 2022. № 1, 126-142. DOI: 10.7256/2454-0676.2022.1.35523

Harris, J., & Whack, C. (2018). The recognition of non-formal education in higher education: Where are we now, and are we learning from experience? *International Journal of E-Learning & Distance Education/Revue Internationale du e-learning et la formation à distance*, *33*(1). http://ijede.ca/index.php/jde/article/view/1058

Hassan, A., Osman, K., Pudin, S. (2009). The adult's non-formal environmental education (EE): A Scenario in Sabah, Malaysia. *Procedia – Social and Behavioral Sciences, 1*(1), 2306-2311. https://doi.org/10.1016/j.sbspro.2009.01.40.

International Standard Classification of Education. ISCED 2011. (2013). UNESCO Institute for Statistics, 89. URL: https://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf

Johnson, M., & Majewska, D. (2022). Formal, Non-Formal, and Informal Learning: What Are They, and How Can We Research Them? Research Report. *Cambridge University Press & Assessment*. https://eric.ed.gov/?id=ED626005

Kalashnikova, V. YU. (2019). Informal'naya obrazovatel'naya sreda. *Molodoy uchenyy. № 26 (*264), 299-301. URL: Kalashnikov, V. Yu. (2019). Informal educational environment. *Young Scientist, 26*(264), 299-301. https://moluch.ru/archive/264/61134/

Liao, W., Li, X., Dong, Q., & Wang, Z. (2023). Non-university-based teacher educators' professional learning: A systematic review. *Teaching and Teacher Education*, *136*, 104374. https://www.sciencedirect.com/science/article/pii/S0742051X23003621

Młynarczuk-Sokołowska, A. (2022). Intercultural non-formal education: What the children think. *Intercultural Education*, *33*(1), 82–98. https://doi.org/10.1080/14675986.2021.2018171.

Pereira, A., & Ortiz, K. Z. (2022). Language skills differences between adults without formal education and low formal education. *Psicologia: Reflexão e Crítica*, *35*, 4. https://doi.org/10.1186/s41155-021-00205-9

Popova I.N., Popov A.A., Ageyeva L.N. (2020). Razrabotka i aprobatsiya modeley sotsial'noy inklyuzii v sfere dopolnitel'nogo i neformal'nogo obrazovaniya Moskva, 74. Popova I.N., Popov A.A., Ageeva L.N. (2020). Development and testing of models of social inclusion in the field of additional and non-formal education Moscow, 74. https://ideas.repec.org/p/rnp/wpaper/032049.html

Purwanti, I., & Widiastuti, I. (2015). Creative empowerment in non-formal education institutions. Case Study: Education system in Rumah Musik Harry Roesli (RMHR). *Procedia-Social and Behavioral Sciences*, *184*, 63-70. https://www.sciencedirect.com/science/article/pii/S1877042815032966

Sarsembaeva, A. A., Swrova, D. S., Xasenova, L. N., & Toktargalïeva, K. M. (2023). Qazaqstan Joğari Oqw Orindarindaği Beyresmï Bilim Berw: Praktïkaliq Aspekt. *Ïzvestïya. Serïya: Pedagogïçeskïe nawkï, 71*(4). https://bulletinpedagogical.ablaikhan.kz/index.php/j1/article/view/1063

Seyitkazi, P. B., & Irimbaeva, N. A. (2022). Uzdiksiz Bilim Berwdegi Mediabilimnin Roli. https://rep.enu.kz/bitstream/handle/enu/7749/Merged-20230614-102017.pdf?sequence=1&isAllowed=y

Short-Meyerson, K., Sandrin, S., & Jimenez-Silva, M. (2024). Informal Elementary Science: Repertoires of Parental Support. *Education Sciences*, *14*(6), 611. https://doi.org/10.3390/educsci14060611

Simac, J., Marcus, R., & Harper, C. (2021). Does non-formal education have lasting effects? *Compare: A Journal of Comparative and International Education*, *51*(5), 706–724. https://doi.org/10.1080/03057925.2019.1669011

Souto-Otero, M. (2021). Validation of non-formal and informal learning in formal education: Covert and overt. *European Journal of Education*, *56*(3), 365–379. https://doi.org/10.1111/ejed.12464

Staus, N. L., Falk, J. H., Price, A., Tai, R. H., & Dierking, L. D. (2021). Measuring the long-term effects of informal science education experiences: challenges and potential solutions. *Disciplinary and Interdisciplinary Science Education Research*, *3*, 1-15. https://doi.org/10.1186/s43031-021-00031-0

Tang, X., Zhang, D. (2020). How informal science learning experience influences students' science performance: A cross-cultural study based on PISA 2015. *International Journal of Science Education*, *42*(4), 598–616. https://doi.org/10.1080/09500693.2020.1719290

Yamat, H. (2010). Managing linguistic diversity through informal and non-formal education. *Procedia-Social and Behavioral Sciences*, *7*, 707-713. https://www.sciencedirect.com/science/article/pii/S1877042810021002

Zakir, A. M. N. (2023). Educational crisis of Rohingya refugee children in Bangladesh: Access, obstacles, and prospects to formal and non-formal education. *Heliyon*, *9*(7). https://www.cell.com/heliyon/pdf/S2405-8440(23)05554-8.pdf

Zikargae, M. H., Woldearegay, A. G., & Skjerdal, T. (2022). Empowering rural society through non-formal environmental education: An empirical study of environment and forest development community projects in Ethiopia. *Heliyon*, *8*(3). https://www.cell.com/heliyon/pdf/S2405-8440(22)00415-7.pdf

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DEVELOPMENT OF UNIVERSITY STUDENT'S READINESS FOR ACADEMIC MOBILITY

Abstract

Readiness for academic mobility becomes an essential success factor in the context of globalization and greater international cooperation in the sphere of education. The development of readiness of students for academic mobility is one of the crucial elements for preparing them for new opportunities. This article presents the findings of the study focused on improving students' readiness for academic mobility, as a critical aspect of successful international academic experiences. This research aims to investigate the impact of enhancing cognitive capacities on students' readiness for academic mobility. A pedagogical experiment was conducted as an empirical research method. The findings of the research indicate that enhancing students' cognitive abilities positively influences students' ability to plan their studies and design their mobility trajectories. The authors of the article believe that developing students' readiness, particularly cognitive abilities, contributes positively to their success during academic mobility. Moreover, enhancing the academic mobility readiness of students is significant in students' personal growth; they become more independent, confident, and adaptive.

Keywords: university students, academic mobility, designing mobility, readiness, cognitive ability.

Basic provisions. Academic mobility offers students a unique opportunity to immerse themselves in another culture, broadening their vision and improving intercultural competency. Living in another country and interacting with people from various cultures helps to foster tolerance, understanding, and appreciation for variety. Academic mobility initiatives promote

the exchange of knowledge and best practices between educational institutions. Students enrolled in such programs have access to a wide range of educational methods, novel approaches, and specialized resources that assist them improve their education and professional development.

However, students will not benefit from the academic mobility if they are not sufficiently prepared for the program. Thus, universities should provide the conditions for students to develop their readiness for academic mobility. When university students are ready for academic mobility they will have fewer problems in the organization of academic mobility, choosing their learning trajectory, adjustments to new methods and styles of teaching, criteria of evaluation, and many other issues.

Introduction. The Bologna process recognizes academic mobility as integral to the establishment of a unified higher education area. Increasing academic mobility, which involves the exchange of students, instructors, researchers, and administrators, is a central objective of this process.

Academic mobility has emerged as a pivotal strategy for enhancing human capital in recent years. Globalization has accelerated scientific and educational exchanges between countries, fostering the competitiveness of national education systems and promoting interethnic cooperation. This growth in international university collaboration presents new opportunities for Kazakhstani universities, including collaborative research projects, exchange programs, and tailored initiatives for international students.

The topic of academic mobility has been indicated in the research studies (Bayjwmanova, 2021). In the context of higher education globalization, academic mobility is a crucial subject that is covered in a wide range of scholarly publications and studies. It includes a wide range of topics, such as teachers (Abramo et.al., 2022) and students (Valeeva, 2020), and the significance of academic mobility (Aykac, 2021).

Academic mobility significantly shapes the global educational landscape and the flow of human capital, thereby improving the quality, efficiency, and accessibility of higher education. The relevance of this study is underscored by the necessity for students participating in mobility programs to be adequately prepared. Despite the efforts of university international departments, students often encounter challenges while studying abroad, including language barriers, culture shock, accommodation issues, adaptation to new learning environments, and academic-related challenges.

While it is not always possible to avoid these issues, students can deal with them more skilfully if they plan and prepare properly. Universities should set up the necessary frameworks so that students can effectively complete the program's academic requirements and adjust to a new culture through intercultural learning and growth. In other words, universities should create ways for the development of students' readiness for academic mobility.

One of the most important components of preparing students for academic mobility is raising their level of knowledge about it. Understanding academic mobility makes it easier for students to prepare for it, adjust to, and benefit from this experience making them more equipped to spend time studying abroad. Thus, developing the cognitive abilities of students plays a crucial role in readiness for academic mobility. In addition to this, it is significant not only to increase students' awareness of academic mobility, but also their educational direction; orientation toward education, mobility, flexibility, and dynamic qualities in setting educational goals and solving educational tasks. This article aims to define how increasing cognitive abilities impact on enhancing students' readiness for academic mobility.

Main part. In the current world, academic mobility has undoubtedly become an integral part of university education in the modern world. Because of its significance in many facets of research, education, and social development, it is frequently addressed in the scientific community. Kazakhstani scholars such as Yessimova et al., (2022) considered the current state and perspectives for the development of academic mobility in universities in their research and

stressed the importance of academic mobility in the preparation of competitive graduates for the development of the economy.

Seidahmetova et al., (2014) examined the challenges that academic mobility students encounter. Their research revealed a lot of obstacles in the organization of academic mobility programs in Kazakhstan such as the lack of funding and material support, the scarcity of experts in the field, the lack of structures and methods specifically designed for academic exchanges, the amount and calibre of collaborative programs being offered insufficiently, and the lack of infrastructure necessary for efficient collaboration.

Another research conducted by Rustemova et al., (2020) is a continuation of the previous study where they discussed the problems of the academic mobility of students from Kazakhstan to Japan. The study discovered that among the difficulties they listed the low degree of pull factors for students, such as a country's portability, recommendations, lack of knowledge about the country and the program itself, planning his/her studies trajectory, and others.

Shelkunova & Artyuhova, (2019) researched the problems of academic mobility students and created guidelines for management staff to enhance the circumstances around the execution of the academic exchange program and the approaches used when interacting with students or those who are aware of this type of activity.

In another study conducted by Martynenko & Zhukova (2008) explanations of the academic mobility of students were given. They explain that academic mobility is the opportunity for students to transfer between institutions to gain experience and seize chances that, for whatever reason, aren't offered on their own, to get over national isolation.

Brinyov & Chuyanov (2015) emphasize the fact that academic mobility is defined as a student's studying for a length of time in a foreign country. The time is restricted, and it is also assumed that students will return home after completing their studies overseas.

The benefits of academic mobility were underlined in researchers' studies widely.

Woldegiorgis & Doevenspeck (2015) stated that students who travel across borders and remain in another nation to pursue either short- or long-term training in higher education within a region, between countries in different regions, or between regions might be categorized as international students. Kraisman (2022) emphasized the significance of student academic mobility, outlined its primary requirements, and demonstrated the execution of initiatives aimed at getting students ready for academic mobility.

In addition to problems around academic mobility, researchers are interested in the impact of academic mobility on students' academic performance and educational processes as well (Bojica et al., 2023; Annala et al., 2022). Scholars of Ukranian University investigated the enhancement of academic mobility among university students and concluded that most students view and consider academic mobility as a good thing, one that is necessary to develop high-calibre science and a strong, competitive economy (Slipchuk et al., 2021). They highlight and recommend that improving knowledge about international programs and the numerous aspects of studying abroad should be the main priority (Slipchuk et al., 2021; Mizrachi et al., 2022). In many academic subjects nowadays, academic mobility is a crucial component of a successful academic career.

Numerous studies have been conducted on the influence of academic mobility at universities. Pessoni & Pessoni (2021) considered the positive and negative aspects of academic mobility and its implications for universities. Santiago Ruiz et al., (2019) researched the perspectives and educational significance of students who took part in a mobility program. Their study identified that students chose the universities for academic mobility according to the prestige of the teachers, and the native students' academic level. Moreover, students believe that being mobile as a student enables them to evaluate the knowledge they have learned and identify the advantages and disadvantages of their instruction.

Borisenkov et al., (2020) devoted their research to the readiness of students for academic mobility and discovered a defense of the need

for methodical approaches to be developed to remove administrative, organizational, competence-activity, and psychological obstacles to the mobility of international students.

Juskeviciene et al., (2022) evaluated the possibilities of enhancing academic mobility in universities. They concluded that the highest average scores indicate that increased financial aid and paid internships, along with chances for groups of students to attend the same university or business abroad, as well as the variety of locations available for academic exchanges and the excellent calibre of professional training provided by studies, internships, and education, would all motivate students to get more involved in international academic mobility programs.

Creating a common educational environment for candidates is the overall goal of the internationalization process, which ensures that they will have access to the professional education of the highest calibre regardless of the economic and social development of their native country. One of the main requirements for putting the educational internationalization principle into practice is the academic mobility of applicants. Within the framework of educational internationalization, the development of academic mobility guarantees that professional education at the graduate level is elevated to a level that will draw in students from other nations and support economic growth and national development (Vovchasta et al., 2022).

The review of literature on the topic of research allowed us to conclude, that academic mobility attracts researchers' attention all over the world. Many studies are devoted to the importance of academic mobility in gaining higher education, an increase of cultural understanding, obstacles that academic mobility students encounter, and the problems of readiness for academic mobility. However, there is a lack of research studies that offer some solutions to develop readiness for academic mobility. We think that increasing the cognitive abilities of students to readiness for academic mobility would contribute to developing academic mobility.

Two research questions could be set to study in this research:

1) What is the level of students' cognitive abilities related to readiness for academic mobility?

2) What should be done to increase students' cognitive abilities related to academic mobility?

Research materials and methods. The data for the research were collected through a pedagogical experiment. 72 students of Semey Medical University participated in the experiment. Students were divided into two groups (experimental and control groups). In the experimental group, there were 36 students and in the control group, there were 33 students. They were the 3rd year students majoring in Nursing Affairs and Public Healthcare. The students of both groups were interested in academic mobility programs. None of the pupils have had prior experience with academic mobility. The test was used to determine each student's degree of cognitive ability for academic mobility. It covered the following: the students' drive for an international education; language proficiency; adaptation to a new setting and culture; intercultural communication skills; and work preparation. Twenty-five questions made up the test. Students received 100 points total, with four points awarded for each right response. The following levels were used to gauge the students' responses: 0-50 – low level, 51-75- average level, 76-100- high level. Both before and after the experiment, the same test was carried out. The experimental group was exposed to the selected method to improve cognitive ability for academic mobility preparation, while the control group maintained their studies by the standard curriculum.

Results and discussion. The research results demonstrate that students' cognitive abilities in academic mobility were lower before the experiment. Participants have had a limited understanding of academic mobility opportunities. Although most students are very interested in academic mobility, ignorance, communication difficulties, and worries about cultural fit limit their willingness to participate. The pre-experiment test revealed the following data.

The cognitive ability level of students in the development of academic mobility readiness is seen in Figure 1. The figure demonstrates the

information that 25% of students' cognitive level was low, 61% was average and 14 % was high in the control group. And in the experimental 23 % was low, 63 % was average and 14 % was high. These data show that, in general, the level of competitiveness development of students is in the middle level. However, it was found that their knowledge about academic mobility, adaptation to a new setting and culture, intercultural communication skills, preparation, and ways to develop mobility are still insufficient.

During the forming experiment, the students of the experimental group worked on the course materials "Designing Mobility in University Studies".
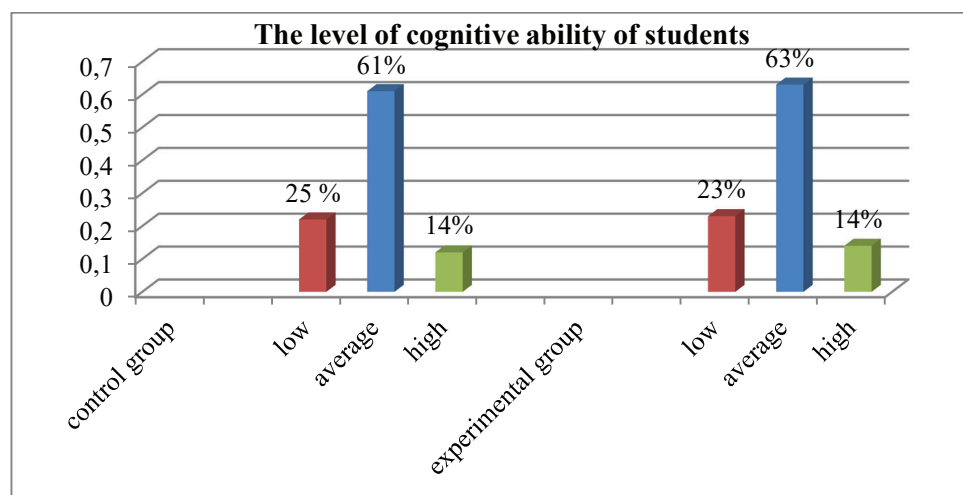
Figure 1: The results of pre-experiment

After completion of the experiment, a re-assessment of the cognitive abilities of readiness for academic mobility of students was carried out in both groups. The following figure demonstrates its results. Figure 2 displays the cognitive ability level of students in the development of academic mobility readiness after the experiment.
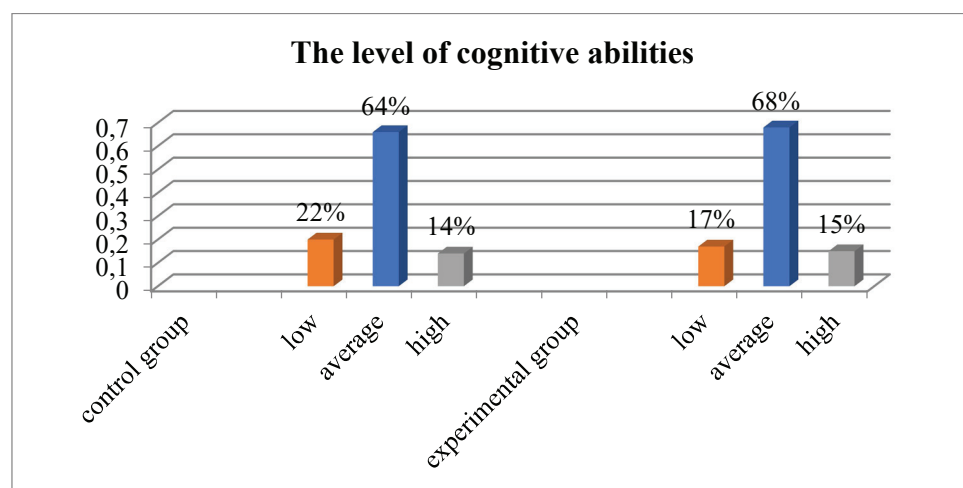
Figure 2: Results of post-experiment

The data show that after the experiment the level of experimental group students increased. The low level decreased from 23% to 17 %, the average level increased from 63 % to 68%, and the high level increased by 1 %. While the low level in the control group decreased from 25 % to 22 %, accordingly the average level went up from 61 % to 64% and the high level remained the same.

Then the results of both groups were compared. The figure below depicts that in

the experimental group, low-level students decreased and average-level students increased more than that in the control group. In addition, high-level students' numbers increased in the experimental group.
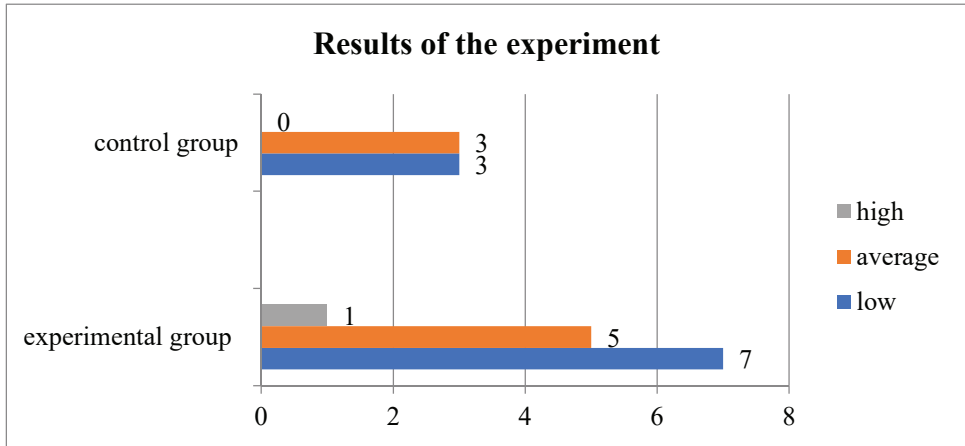
Figure 3: The comparison of results

Figure 3 displays the comparison of the results of both groups.

Comparing the results between the experimental and control groups allows us to evaluate the effectiveness of the technique for improving cognitive abilities on readiness for academic mobility.

The experiment's findings demonstrate the necessity of creating extensive programs with informational sessions, language instruction, intercultural communication classes, and administrative support and planning of the mobility program. The conducted experiment on improving students' cognitive abilities could bring valuable knowledge and assist them in enhancing the quality of preparing for academic mobility. Activities carried out during the experiment not only directed education but also enhanced their capacity to create their educational direction, their orientation toward education, and mobility and expanded their flexibility and dynamism. During the formation period of the experiment the materials of the course "Academic Mobility Designing" were introduced to the students of the treatment group.

The main aim of the course was to direct students to plan their career mobility and provide them with the knowledge needed for independent mobility planning.

The objectives of the course were:

1. Analysis of several approaches to planning a teacher's professional activity by the Bologna process's tenets using the example of European nations.

2. Creating suggestions for how to structure students' professional activities within the framework of the national education system (in a group).

3. Creating the prospective student's educational path (in small groups).

4. Applying the competence experience that has been developed through the student's work activities.

The course consisted of 5 modules where students get acquainted with theoretical materials and did some independent activities. The content of the course is given in Table 1.

Table 1. *The content of the course materials*

Themes	Key issues	Independent work
Designing academic mobility in own studies	Academic mobility, Bologna process, its aims, objectives, principles, ways	Analyze the proposed course structure to determine your educational path.

Designing mobility in professional activities	Professional competence, strategies for designing, recommendations	Analyze the different ways of designing professional activities in the examples of Europe and Kazakhstan and develop recommendations for professional activities' mobility
Designing student's study directions	Modelling of a student's course of study (in micro groups), course of study of students of domestic higher educational institutions and higher educational institutions of other countries.	Create a small project for the implementation of the selected study area.
Use of academic mobility competence in professional activities	Sectors of professional activities, professional competence.	Create a project on how academic mobility competence could be used in professional activities
A representation of the model and actual practice	Correction of the trajectory of self-education and professional education based on accumulated experience	Design your academic mobility program.

The conclusion that students do not have sufficient knowledge made in the diagnostic part of the experiment was changed after the experiment. Students were equipped with the necessary knowledge and showed their potential in post-experiment tests. Certainly, we reject the opinion that students formed their academic mobility fully, however, they became more knowledgeable and skilful in academic mobility issues.

This study's conclusions, which highlight the necessity of preliminary preparation for academic mobility are consistent with earlier research studies in which factors influencing academic mobility readiness (Slipchuk et al., 2021), students' intercultural readiness for academic mobility (Aba, 2019), the significance of tackling obstacles and improving support systems to encourage future educators to participate in academic mobility initiatives (Borisenkov, 2020) were discovered. The main peculiarity of our research is that the home university has to offer courses on developing students' academic mobility readiness.

Students' readiness for academic mobility improved as a result of the training. This shows that the content, methods, or other elements of the course helped students acquire the knowledge and abilities needed to successfully adjust to new learning settings.

Following the experiment, students improved their ability to work independently and to analyze and make decisions in novel situations. Their critical thinking, adaptability, self-confidence, and communication abilities all improved as a result of the course. This research differs from the research studies conducted before in that it contributes to filling the research gap in the development of readiness for academic mobility in terms of improving the cognitive abilities of students.

The focused informational and instructional activities are valuable in developing academic mobility readiness. Facilitating the successful participation of teachers and students in foreign programs can be achieved through streamlining administrative procedures, lowering cultural barriers, raising awareness, and enhancing language proficiency. These kinds of activities make academic mobility more appealing and accessible to all those involved in the educational process.

Conclusion. This research contributed to the enhancement of the experience of self-activation of students in academic mobility, the ability to realize their needs, and designing mobility in the direction of personal education. Improvement of students' cognitive abilities in terms of academic ability during university studies can significantly influence their development and success. When taking part in academic mobility, students frequently experience novel circumstances, difficulties, and cultural settings due to inadequate readiness for

academic mobility. This calls for their capacity for situational adaptation, quick response to changes, and well-informed decision-making. Thus, strengthening cognitive abilities and having preliminary preparedness for academic mobility will impact ultimately students' success in academic mobility to gain new experience and knowledge.

References

Aba D. (2019) Investigating higher education students' intercultural readiness for academic mobility. *Study Abroad Research in Second Language Acquisition and International Education*, 4(2), 280 – 304. https://doi.org/10.1075/sar.17008.aba

Abramo, G., D'Angelo, C. A., & Di Costa, F. (2022). The effect of academic mobility on research performance: The case of Italy. *Quantitative Science Studies*, *3*(2), 345-362. https://direct.mit.edu/qss/article-abstract/3/2/345/111198

Annala, J., Mäkinen, M., Lindén, J., & Henriksson, J. (2022). Change and stability in academic agency in higher education curriculum reform. *Journal of Curriculum Studies*, *54*(1), 53-69. https://doi.org/10.1080/00220272.2020.1836261

Aykac, G. (2021). The value of an overseas research trip. *Scientometrics*, *126*(8), 7097-7122. https://link.springer.com/article/10.1007/s11192-021-04052-4

Bayjwmanova, N. S. (2021). Akademïyaliq Utqirliq-Joo-Da Bilim Berwdiñ Mañizdi Quramdi Böligi. https://elibrary.ru/item.asp?id=48154239

Bojica, A. M., Olmos-Peñuela, J., & Alegre, J. (2023). A cross-country configurational approach to international academic mobility: exploring mobility effects on academics' career progression in EU countries. *Higher Education*, *86*(5), 1081-1105. https://doi.org/10.1007/s10734-022-00963-0

Borisenkov, V., Gukalenko, O., Kazarenkov, V., Kazarenkova, T., & Karnialovich, M. (2020). Development of future teachers' readiness for academic mobility. In *E3S Web of Conferences, 210*, 18063. https://www.e3s-conferences.org/articles/e3sconf/abs/2020/70/e3sconf_itse2020_18063/e3sconf_itse2020_18063.html

Brinyov N. S., & Chuyanov R. A. (2015). Akademicheskaya mobilnost studentov kak faktor razvitiya processa internacionalizacii obrazovaniya. http://www.prof.msu.ru/publ/omsk2/o60/html

Juškevičienė, A., Samašonok, K., Adomas, V. R., Žirnelė, L., & Gegužienė, V. (2022). Development trends and challenges of students' academic mobility in higher education. *Entrepreneurship and sustainability issues*, *9*(4), 304. https://jssidoi.org/jesi/uploads/articles/36/Juskeviciene_Development_trends_and_challenges_of_students_academic_mobility_in_higher_education.pdf

Kraisman, N.V. (2022). Readiness of Engineering University Students for Academic Mobility. *Bulletin of Orenburg State University*. 4(236) 113

Martynenko O.O., & Zhukova N.V. (2008). Upravlenie akademicheskoj mobilnostyu v vuzakh. *Universitetskoe upravlenie: praktika i analiz, 1* (53) 65-75, https://www.umj.ru/jour/article/view/836?locale=ru_RU

Mizrachi, M., Maxwell, C., & Yemini, M. (2022). Buffered mobility: parenting strategies of religious Jewish global middle class families. *Education Inquiry*, *13*(2), 205-225. https://doi.org/10.1080/20004508.2020.1857976

Pessoni, R. B., & Pessoni, A. (2021). Internacionalização do ensino superior e a mobilidade acadêmica. *Educação UFSM*, *46*. http://educa.fcc.org.br/scielo.php?pid=S1984-64442021000100274&script=sci_arttext

Rustemova, A., Meirmanov, S., Okada, A., Ashinova, Z., & Rustem, K. (2020). The academic mobility of students from Kazakhstan to Japan: problems and prospects. *Social Sciences*, *9*(8), 143. https://www.mdpi.com/2076-0760/9/8/143

Santiago Ruiz, A. D. L. A., Garcia Rodriguez, J. F., & Santiago, P. R. (2019). Student Mobility... new academic experiences, other meanings! *ATENAS*, *1*(45), 36-50.

Seidahmetov, M., Kulanova, D., Abdikerimova, G., Myrkhalykova, A., & Abishova, G. (2014). Problem Aspects of Academic Mobility are in the Republic of Kazakhstan. *Procedia-Social and Behavioral Sciences*, *143*, 482-486. https://www.sciencedirect.com/science/article/pii/S1877042814044516

Shelkunova T.V., Artyukhova T.YU. (2019). Praktika izucheniya problem akademicheskoy mobil'nosti studentov (na primere Sibirskogo federal'nogo universiteta) Vestnik KemGU. *Gumanitarnyye i obshchestvennyye nauki, 2019, 3*(3) 255-263. https://doi.org/10.21603/2542-1840-2019-3-3-255-263

Slipchuk, V., Yuzkiv, H., Batechko, N., Pisotska, M., & Klymenko, L. (2021). The development of academic mobility among the students of universities. *Linguistics and Culture Review*, *5*(S3), 224-236. https://www.researchgate.net/profile/Halyna-Yuzkiv/publication/355834557_development_of_academic_mobility_among_the_students_of_universities/links/624b314d8068956f3c69cfe9/development-of-academic-mobility-among-the-students-of-universities.pdf

Valeeva, R., Ziyatdinova, J., Osipov, P., Oleynikova, O. (2020). Development of International Academic Mobility: Success Stories. In: Auer, M., Hortsch, H., Sethakul, P. (eds) The Impact of the 4th Industrial Revolution on Engineering Education. *Advances in Intelligent Systems and Computing,* 1135. Springer, Cham. https://doi.org/10.1007/978-3-030-40271-6_44

Vovchasta N., Dobrovolska L., Melnik S., Piekharieva A., Vasenko V., Dziurakh Y. (2022). Academic mobility in the context of educational internationalization. *AD – ALTA Journal of Interdisciplinary Research. 12*(1), 82-88 https://www.webofscience.com/wos/woscc/full-record/WOS:000797243700014

Woldegiorgis, E. T., & Doevenspeck, M. (2015). Current trends, challenges, and prospects of student mobility in the African higher education landscape. *International Journal of Higher Education*, *4*(2), 105-115. https://eric.ed.gov/?id=EJ1060574

Yessimova, S. A., & Khassenova, L. A. (2022). Sostoyanie i perspektivy razvitiya akademicheskoj mobilnosti v universitetah Respubliki Kazahstan *Ekonomika: strategiya i praktika. T. 17, № 1, 2022 / Economics: the Strategy and Practice. Vol. 17. No 1, 2022,* 127-143. https://www.academia.edu/download/99831718/626-1366-1-SM.pdf

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CONCEPTUAL APPROACHES TO MANAGING AN ANALYTICAL SYSTEM IN THE FIELD OF EXTERNAL ASSESSMENT OF EDUCATION QUALITY

Abstract

This article proposes an innovative idea for the development of a new information-analytical system in the field of external assessment of education quality (competencies) using Artificial Intelligence (AI) and Big Data (BD). This system represents an innovative approach to the external evaluation of education quality, covering various levels of assessment from individual learners to the national level. The system aims to use AI and BD technologies to enhance the objectivity, and reliability of assessments, and provide a broader coverage of students and educators. The system's architecture includes various modules, each designed to address specific aspects of external evaluation, such as education quality, teacher competence, psychodiagnostics, and career guidance, with the innovation of this system lying in the comprehensive interaction of these modules. The implementation of this system is aimed at improving education management and building individual learning trajectories by tracking the dynamics and history of educational achievements. This will also ensure transparency in decision-making, reduce the level of corruption, and create equal educational opportunities for different regions and population groups.

Keywords: external assessment, artificial intelligence, management in education, teacher certification, psychodiagnostic, career guidance.

Basic provisions. The current research addresses conceptual approaches to the development of an analytical system in the field of external education assessment, as a mechanism of management in education. The study acknowledges the existence of insufficient student assessment methods. The existing assessment methods (EVEA and MEDA) are analysed and this research makes recommendations on how to improve the assessment method using Artificial intelligence tools (AI). These are External assessment of the quality of education and monitoring of the individual educational trajectory from primary school to obtaining a specialty/qualification; Generation of test questions for students using AI technologies; External Assessment of Teacher Competence Using AI and Database Technologies; Data

Analysis and Recommendation Generation for Students, Teachers, School Administrators, and Education Authorities Using AI and Database Technologies; Psychodiagnostics of Students and Teachers Using AI and Database Technologies; Career Guidance for Students Using AI and Database Technologies.

Introduction. In today's world, where the job market and educational standards are constantly changing, there is a need for a more precise and adaptive system of competency assessment to prepare modern, qualified professionals. Currently, there is no comprehensive assessment of a learner's competencies that considers the 21st-century skills necessary for success in education and career: critical thinking, creativity, collaboration, communication, digital literacy, problem-solving skills, adaptability, and cultural awareness (Thornhill-Miller et al., 2023).

The assessment of these skills lies at the intersection of educational, psychological, physiological, and career guidance measurements of the learner's condition, yet such a comprehensive assessment is not yet available. Moreover, the comprehensiveness of a learner's assessment is closely related to the assessment of a teacher's competence. Identifying the correlation between these assessments will help in developing the most successful strategies for teaching, self-education, and professional development of teachers, as well as educational policy and management (Zawacki-Richter et al., 2019).

In general, the quality of education is currently assessed in its directions without a comprehensive approach and without considering other factors affecting the success of learning: demographic, cultural, and regional characteristics of the learner, their educational environment at the level of family, school, neighbourhood, district, region. The educational and psychological interaction of the learner with other classmates, peers, and their activity on social networks is not considered. A comprehensive analysis of the results of educational and psychological assessment in practice is not linked to recommendations for career guidance for the learner, choosing schools and universities for further development of their abilities.

Moreover, there is no systematic monitoring of the results of the educational achievements of each learner, taking into account and analysing the above-mentioned factors of the educational environment. There is no consistent history of assessing educational achievements, starting before the beginning of the first grade and ending with the acquisition of a specialty in university. Using the history of education based on regular and adaptive assessment of the specific learner in their natural environment will allow a clearer view of the learner's weaknesses and strengths than conducting standardized tests. It will also help predict the success of their education and develop more effective recommendations for learning and self-learning. Considering the large volume of work, the use of modern Artificial Intelligence (AI) and Big Data (BD) technologies is required to accomplish the aforementioned tasks. The use of AI and BD technologies to assess educational achievements and professional skills is a trend capable of radically transforming approaches in education and assessment (Hinojo-Lucena et al., 2019).

The use of AI to create adaptive tests and personalized curricula, which automatically adjust to the knowledge level and learning speed of each learner, is a cutting-edge practice (Yang et al., 2021). Traditional assessment methods are often subject to subjectivism and do not always take into account the individual characteristics of the learner. With the wide possibilities of AI, it is possible to ensure a more objective and personalized assessment (Boverhof et al., 2024; Misiejuk, Kaliisa & Scianna, 2024; González-Calatayud et al., 2021).

The development of a complex multi-level system (student/teacher – class/group – subject/specialty – school/college/university – district – region – country), which integrates data at different levels—from individual students to entire educational institutions and regions, represents a new approach in the field of educational analytics. Currently, a large amount of data accumulates in the databases of the National Testing Centre, which is not fully utilized in analysis and decision-making. Existing methods of knowledge assessment are also not sufficiently objective and comprehensive.

Considering the development of technologies and their capabilities, it is possible to create a Multi-level Information-Analytical System in the field of external assessment of education quality and competencies (student/teacher – class/group – subject/specialty – school/college/university – district – region – Republic) using AI and BD technologies (hereinafter referred to as the System). This System will allow assessments to be conducted based on machine learning algorithms by processing a massive array of objective data in a short time, ensuring comprehensive coverage, higher reliability, comprehensiveness, and objectivity of assessment results.

The introduction of analytical systems based on AI and BD will optimize the educational process, automatically adapting materials and methods to the needs of each learner. Also, the use of AI will allow the analysis and processing of various types of data, including text responses, test results, and video and audio materials, which is an innovative approach to competency assessment.

Materials and Methods of Research. As noted earlier, the most effective assessment of a student's competence and 21st-century skills occurs at the intersection of academic, psychological, and career guidance assessments. The correlation of these with the evaluation of the teacher's work, as an active participant in the educational process, is also crucial. Thus, a comprehensive assessment of a student is based on the study, analysis, and evaluation (implementation) of the following parameters:

− the academic results of the student;

− analysis of their correlation with the quality of the teacher's work;

− generation of adaptive test assignments for the student;

− psychodiagnostics of the student and teacher to identify factors hindering or facilitating educational goals;

− assistance in choosing a future profession (career guidance) to most effectively realize potential;

− development of necessary recommendations and monitoring their implementation.

These directions should form the basis for the creation of the proposed System. To develop conceptual approaches for creating the System, it is necessary to analyze the current state of the aforementioned assessment directions in education.

Firstly, the development of an understanding of its conceptual foundation is necessary – the main idea of a unified and consistent monitoring program (external assessment) of educational achievements. In many developed countries, national education quality monitoring systems operate (Kobenova, 2021). These systems are based on centrally developed assessment forms that are conducted among various student groups, primarily in secondary education, at certain stages of school education. This process of external assessment is used to analyze educational achievements and serves as a basis for making decisions to improve educational policy.

In Kazakhstan, one of the key external assessment programs in the field of secondary education is the Monitoring of Educational Achievements of Students (MEDA). This monitoring began in 2021. The MEDA program in Kazakhstan covers students in the 4th and 9th grades. It consists of comprehensive testing in three areas of functional literacy: mathematical and science, as well as reading literacy (Analiticheskiy Otchet, 2022).

MEDA is designed for systematic observation of the quality of education among primary and secondary school students through testing, using tasks similar to international educational studies such as TIMSS, PISA, and PIRLS. In addition to schools, MEDA is also conducted in colleges as comprehensive testing in 4 subjects for second-year students in subjects "History of Kazakhstan", "Mathematics", "Kazakh language" or "Russian language" and one specialized subject ("Biology", "Physics", "Chemistry", "Geography") (Shilibekova, 2021).

The Unified National Testing (UNT) is also used for external assessment of educational achievements. This standardized testing is taken by high school graduates for university admissions. Within the UNT in Kazakhstan, three mandatory subjects are tested ("Reading Literacy," "Mathematical Literacy," and

"History of Kazakhstan"), plus a combination of two specialized subjects chosen by the applicant according to an approved list (there are 12 combinations, the most popular being "Mathematics-Physics", "Biology-Chemistry", "Mathematics-Computer Science"). The choice of combination depends on the future specialty the applicant wishes to pursue.

The results of the UNT in Kazakhstan are used not only to assess the knowledge of applicants and award them grants but also for analysis and decision-making at various levels of the education system. The outcomes of the UNT are analyzed at the school and regional levels to assess the quality of education programs, based on which changes are made to educational policy, curricula, teaching methods, and the State Education Standards. They are also used to analyze and develop strategic documents at the regional and national levels to most effectively distribute and manage labour, financial, and other resources.

The development of UNT tests includes several important stages. Based on the approved specification of the test task by the I. Altynsarin National Academy of Education for certain subjects, experts develop questions that should adequately reflect the level of knowledge required of high school graduates. After the tasks are created, they undergo a review process by other experts and are tried among students to check their reliability and validity. This stage also helps determine which questions might be too easy or difficult. Based on the results of the trial, test tasks are adjusted to eliminate any discrepancies and to ensure their clarity and accuracy of phrasing. Tasks that have passed all stages of checks and adjustments are compiled into final test versions. All tests are strictly confidential and stored with necessary security requirements. UNT tests are not adaptive; every student receives the same amount of time and the same set of questions for each subject, despite different test variants.

In addition to the aforementioned forms of external assessment, there are other forms of student knowledge assessment (internal forms of assessment), such as ongoing monitoring of performance, and midterm and final student assessments. However, these are essentially internal assessments of education quality and are not covered by the subject of this article.

It should also be noted that there are other forms of external quality assessment of education in the form of inspections of educational organizations for compliance with qualification requirements conducted by authorized state bodies, licensing, and accreditation. However, they relate more to the management of the education organization, not to the assessment of the quality of knowledge and skills of specific students.

Considering modern trends in technology, there is significant interest in using AI to create test tasks. This helps save considerable labour, and time for teachers and enhances the quality of pedagogical measurements of students' competence. Currently, various platforms offer innovative solutions for automating the process of developing test tasks using AI.

One of them is PrepAI (n.d.). This platform provides an AI-based generator for tests and other assignments. This tool uses natural language processing and machine learning algorithms to automatically generate questions based on a given topic or content, and it can create them in the form of exams, quizzes, and test assignments. According to information from this portal, this program allows educators to quickly create questions, including complex ones based on Bloom's taxonomy for assessing students' critical thinking.

This portal presents a specific case at one of the leading universities in India. At this university, teachers spend a large amount of time preparing quality questions for exams. Therefore, they had less time for other educational and methodological issues (preparation of lectures, additional materials, consultations, or interaction with students). Moreover, year after year, professors used the same test questions for several years, which reduced their value in terms of the reliability of results.

To solve this problem, the university implemented PrepAI (n.d.). According to the portal, this allowed professors to save 71% of their total time, and create a more diverse and interesting question template, which in turn

led to an approximately 59% improvement in student performance. Furthermore, it provided the ability to more effectively assess student knowledge, leading to a 31% increase in students achieving their learning goals.

There are also other programs. The Testportal (n.d.) offers AI capabilities for automatically creating quizzes, tests, and exams from provided textual content. The platform allows users to input documents, and based on these, AI generates corresponding questions and answers, which can then be customized. OpExams (n.d.) offers a free AI-based question generator that can produce multiple-choice, true/false, and open-ended questions from any text. This helps educators quickly and effectively create assessments, with the ability to save and organize generated questions for future use.

These tools demonstrate the growing trend of using AI for educational assessment activities. AI is significantly changing the approaches to creating and conducting testing in education, turning it into a dynamic and adaptive process with significant reductions in labor and time resources spent.

An important component of the System should be the assessment of teacher competence. The teacher is a central link in ensuring the quality of education. Therefore, their assessment linked with the educational achievements of the student is crucial. External assessment of teacher competence in Kazakhstan is conducted as part of the certification procedure. This issue is regulated within the framework of the Rules and Conditions for Conducting Teacher Certification, approved by the Order of the Minister of Education and Science of the Republic of Kazakhstan dated January 27, 2016, No. 83 (hereinafter – Certification Rules).

Based on the results of positive certification, teachers are assigned qualification categories such as 'teacher', 'teacher-moderator', 'teacher-expert', 'teacher-researcher', and 'teacher-master'. According to the Certification Rules, certification occurs in several stages. For admission to certification, the educational organization conducts a qualification assessment of teachers by reviewing the teacher's portfolio. The qualification assessment is carried out by the educational organization based on the assessment of materials (portfolio) of the teacher for compliance with qualification characteristics. The portfolio includes the teacher's essay, as well as a commission assessment of the teacher's work in ensuring the quality of education (commission assessment of the dynamics of mastering the educational program of the class for the last three years), in summarizing and transmitting advanced pedagogical experience (transmission of author's materials recommended by the methodological council, presentations at various seminars, forums, participation in professional development as a mentor, publications of research materials in certain publications, etc.), based on existing achievements in teaching (certificates, diplomas, letters of appreciation, etc.), and results of their professional development. Each indicator is given certain points on a scale (Certification Rules).

After admission to certification, the teacher participates in testing or the Assessment of Teacher Knowledge (ATK). Typically, it consists of 50 questions that relate to 2 types of directions depending on the work performed by the teacher. It may cover "Subject Knowledge", "Teaching Methodology", "Fundamentals of Pedagogy", "Fundamentals of Psychology", "Special Pedagogy and Psychology", and "Preschool Pedagogy and Psychology", among other things (Certification Rules).

When achieving the threshold level in ATK (depending on the claimed category, the level ranges from 50 to 90 percent of correct answers), educators undergo a comprehensive analytical summary of the results of their activities, that is, an evaluation by a specially created commission for compliance of the existing evidence of activity and achievements of the teacher with the requirements of the teacher's qualification category. Recently, changes have been made to the certification process in Kazakhstan, particularly for teachers with 30 or more years of experience, who are now exempt from mandatory testing and undergo only a portfolio assessment. Certification is conducted no less than once every five years, and teachers can use the results to advance their qualification category (Certification Rules).

An important factor in the success of education is the monitoring of psychological health. Therefore, this area of external assessment is an important component of the proposed System. In Kazakhstan, the monitoring of mental health in schools is carried out through psychological services. The psychological service is a collegiate body of the secondary education organization for forming study motivation, performance, creative self-realization, stabilization of psychological state, professional self-determination, and other favourable conditions for the educational activities of students and trainees. Typically, the psychological service includes the school's deputy director, educational psychologist, and social educator. Also involved in the work are class teachers and medical staff who participate in the psycho-pedagogical support of students. The activities of these services are regulated by the Rules of the Psychological Service in Secondary Education Organizations, approved by the order of the Acting Minister of Enlightenment of the Republic of Kazakhstan dated August 25, 2022, No. 377 (hereinafter – Rules of the Psychological Service).

According to these rules, the educational psychologist conducts activities related to psychological diagnostics, consulting, development, and correction of the psychological state of students, psycho-pedagogical enlightenment, as well as organizational and methodological work within their competence.

According to the Rules of the Psychological Service, the diagnostic direction of the educational psychologist should cover issues related to the study of individual characteristics and inclinations of the student, his potential opportunities in learning, and professional self-determination. In the course of this work, the educational psychologist conducts consultative work with students, their educators, and parents, helping them understand the reasons for emerging difficulties, solve psychological problems, and facilitate their self-development.

The developmental (corrective) activity of the educational psychologist should be aimed at forming motivation for new knowledge, skills, and abilities for educational and cognitive activities. Such work is conducted in cooperation with subject teachers, social educators, and special educators. Achieving the goals set before the educational psychologist is aided by psycho-pedagogical enlightenment in the form of class hours, seminars, parent meetings, pedagogical councils, interactive methods, and lectures for educators and parents (Rules of the Psychological Service).

"Besides this, the educational psychologist conducts monitoring of the educational and developmental environment and analyses the results of social and psycho-pedagogical support. Based on these results, necessary recommendations are developed (Rules of Psychological Service).

Directly linked to the psychological aspects of education, student motivation, and their further success in learning and career, are the issues of career guidance. In Kazakhstan, the system of career guidance in schools is built around comprehensive support for students in choosing a future profession (Profone, n.d). This includes introducing students to various professional fields and assisting in identifying their inclinations and interests. Career guidance work in schools includes consultations with specialists, undergoing career orientation tests, and organizing meetings with professionals from various fields. Schools also collaborate with universities and enterprises. This allows students to receive current information about professions and their prospects in the job market.

One of the advanced practices of career guidance is available in the network of Nazarbayev Intellectual Schools (Ruby & McLaughlin, 2014; Nazarbayev Intelektualnye Shkoly, n.d.). In NIS, career guidance work is carried out from grades 7 to 12 according to the Rules for conducting career guidance work in Nazarbayev Intellectual Schools, approved by the decision of the JSC Board on 13.12.2018. As part of career guidance, the professional orientation of each student is diagnosed based on Klimov's Career Guidance Test, Holland's Method of Professional Self-determination, Golomstock's «Interest Maps» and 'Interest Maps' for specific subjects. Assistance is provided to students considering their potential

matched with the requirements demanded by individual professions.

The matching is achieved through the interaction of five elements of educational activity: academic activities, psychological support, extracurricular activities, interaction with parents, and career guidance work itself. When analysing academic activities, the results of tests, elective courses and clubs, olympiads, competitions, projects, specialized subjects, and career orientation events on subjects are considered. During psychological support, various tools (tests, discussions, observations, etc.) are used, and the degree to which a future profession integrates with the individual's overall personality system is determined. This integration is crucial as it serves as the primary psychological driver of professional development. In extracurricular activities, various forms are used: Smart Thursday – meeting with various professionals, assistance from teacher-librarians in selecting literature based on interests, participation in clubs and circles of interest, debates, tutor hours, summer schools, social and professional practices. In these activities, parents, subject teachers, psychologists, and career advisors are actively involved in various forms. The main goal of these activities is to ensure a clear understanding of the world of professions, competencies, and requirements of the chosen profession, to define short-term and long-term goals for its attainment, and to develop on this basis an individual route for the student and monitor its implementation. These activities allow students to gradually form an understanding of their professional interests and abilities, as well as to effectively plan their further education and career.

Various online platforms also provide significant assistance in career guidance. For example, on the EduNavigator platform, students can undergo testing to determine a suitable profession. This process includes receiving a detailed report on personal qualities and suggestions for choosing a profession.

Many centers, such as the Center for Career Guidance and Counseling in Almaty (CCGC), offer personalized career counseling and detailed personality testing that helps students identify their strengths and possible directions for career development. Considering the important role of parents in career guidance, this platform also consults parents to better support their children in choosing a future profession. Professional consultations at this center often include analysis of candidates' creative works and assessment of their abilities. This significantly helps children make a more informed choice of profession. Thus, the system of career guidance in Kazakhstan is somewhat developing and adapting to modern conditions through the integration of digital technologies and strengthening the links between school education and the job market.

Overall, it should be noted that the above-mentioned parameters for student assessments develop with insufficient interconnection and correlation among themselves. Additionally, using a comprehensive approach would allow for a more complete picture of student's knowledge and skills and the prospects for their further enhancement, explain learning difficulties, and more effectively uncover latent personal potential. Moreover, the current state of the external assessment system for student competence has several conceptual flaws that need to be considered when developing and implementing the system. These will be discussed below.

Results and discussion. The system of selective monitoring of educational achievements existed before the creation of MEDA. In 2005, to implement the State Program for the Development of Education in the Republic of Kazakhstan for 2005-2010, the procedure for Interim State Control (hereafter – ISC) was established to monitor the quality of students' mastering of educational programs at corresponding levels and stages. It covered selective monitoring among students in the 4th and 9th grades (according to the list of subjects determined by the relevant ministry), and among students in the 2nd (3rd) year of higher education institutions (for disciplines included in the cycles of social-humanitarian, natural sciences, and general profile disciplines). ISC was conducted to perform an external evaluation of students'

academic achievements, and the effectiveness of the educational process organization, and to develop necessary recommendations.

Subsequently, ISC was replaced by the system of External Evaluation of Educational Achievements (EVEA). It was also conducted selectively in the form of comprehensive testing for two or more subjects, determined by the authorized state body, in primary school (4th grade), basic school (9th grade), and general secondary school (11th grade). In the sphere of higher education, EVEA was conducted among third-year students in selected organizations by the authorized state body to monitor the mastering of typical educational program cycles.

The cancellation of EVEA in Kazakhstan was due to several reasons. One of the main reasons was the need to adapt the system of external evaluation to international comparative studies in the field of education quality assessment and contemporary educational quality standards. According to the OECD, it is important to focus on developing competencies necessary for the successful integration of graduates into society and the economy, not just on theoretical knowledge (OECD, 2021).

The existing EVEA system was criticized for not fully reflecting the actual quality of the educational process and could negatively impact the motivation of students and teachers, focusing attention on preparing for tests rather than learning (Shilibekova, 2021).

Moreover, another reason for the cancellation of EVEA was voiced by the then Minister of Education and Science, Sagadiyev (in Informburo.K. Z., 2019), who stated, "There is no need for EVEA in universities, as with the current level of academic freedom in universities, there is no longer a need for EVEA".

Considering this, the MEDA system was introduced instead of EVEA. This system was discussed earlier. However, MEDA does not fulfil all necessary tasks to ensure the successful acquisition of necessary competencies by students.

The main reason is the selectivity of the assessment and the absence of monitoring the entire education system. MEDA is conducted for specific classes only in secondary and specialized secondary education. It is not conducted in the higher education system. Moreover, MEDA covers only a small portion of educational institutions. MEDA was first conducted in 2021, and its results were summarized in 2022. According to state data, in 2022 there were 7,687 schools in Kazakhstan (GOV.KZ, 2023). MEDA was conducted among 4th grades in 1,441 schools and 9th grades in 1,182 schools. Thus, MEDA covers 15 to 20% of schools in the country.

It must be noted that MEDA is conducted using information and telecommunication technologies. This requires certain material resources in schools. Such resources are not available in all schools. Even considering the rotation of MEDA participants, several schools with insufficient material-technical bases will objectively remain outside MEDA monitoring. As stated in the Concept of Development of Preschool, Secondary, Technical, and Vocational Education of the Republic of Kazakhstan for 2023 – 2029, only 39% of rural schools have broadband Internet. Out of 6,909 public schools, 5,271 are in rural areas (GOV.KZ, 2023). Thus, approximately, at least as of 2023, about 68% of all schools in Kazakhstan will remain outside MEDA coverage (assuming no paper version is conducted, which would be very problematic both in terms of implementation and in terms of validity and reliability of the data obtained).

Also, it must be considered that MEDA, essentially a standardized test, can cause discomfort and stress among the testees. This can affect the reliability and objectivity of educational measurement. Moreover, the results of MEDA are used for comparative analysis of the quality of education in different schools, therefore there is a significant risk that schools will focus on "teaching to MEDA." This, in turn, will limit the educational process, focusing it on MEDA tests, without achieving the ultimate goals of education – acquiring modern competencies necessary for the successful integration of graduates into society and the economy.

It should be noted that MEDA, as a unified form of assessing educational achievements,

does not always take into account the individual characteristics of the student, as well as the ethical, cultural, and local aspects of different regions of Kazakhstan. While MEDA, as a form of assessment necessary for the comparative analysis of educational organizations, may justify itself, it does not fulfil the functions for analysing in the context of monitoring the individual trajectory of a student, identifying their strengths and weaknesses, including personal qualities, identifying gaps and difficulties in their education, and diagnosing the presence or absence of skills.

The role of teacher assessment is also important here, aimed at providing the most effective educational support. As mentioned earlier, in assessing the modern competencies of a student, it is important to correlate it with the assessment of the teacher's work to ensure successful learning. However, the current state of teacher assessment does not fully meet such needs.

It must be noted that the main drawback of the current state of teacher assessment is the high risks of subjective evaluations, as the score of any given indicator of certification is predominantly determined by the internal conviction and subjective approach of the assessor. For example, the lesson evaluation sheet of the teacher being certified is filled out by the head of the secondary education organization, their deputy, another teacher, and a methodologist from the methodical office (center). Then, these evaluation sheets are assessed by members of a specially created commission. Therefore, different assessors from various schools and regions, at different levels, can have different opinions on what constitutes effective teaching.

Thus, the effectiveness of the certification largely depends on the qualifications and training of those who conduct the evaluation. Since such specialized training is not conducted, this can lead to ambiguous evaluations.

Often, the results of the certification are not used for real improvement of professional activity or the educational process but merely serve as a formality. Even if teachers receive feedback with suggestions for improving

certain aspects of their activity, they do not always have the necessary support or resources for further professional development. It should also be said that a proper level of certification requires significant labour, time, and material costs. However, in conditions of high levels of three or more shifts or, conversely, small-complement schools, resources are extremely insufficient for conducting certification. Here it is important to understand that certification does not take into account differences in the conditions under which teachers work, material resources, the number and composition of students, and other external factors that affect the quality of teaching.

These and other problems make the certification process not conducive to students acquiring 21st-century skills. A thorough analysis of many factors is required so that the evaluation system genuinely contributes to improving the quality of education and the professional growth of teachers.

Recent studies highlight the importance of integrating new technologies, particularly AI, into the processes of assessing teacher competencies. High-quality teaching using technical technologies depends on three basic components; pedagogical knowledge (teaching methods, classroom management skills, and assessment techniques of knowledge and skills), subject knowledge, technological knowledge (understanding the possibilities and challenges of applying technologies, as well as skills in using technologies), and those areas of knowledge and skills that intersect between these two components and all three components simultaneously (Celik, 2023). The current certification system and, in general, the entire evaluation system of teacher performance in the country does not take these components into account, let alone have an understanding of how to approach their evaluation, especially in evaluating skills at the intersection of these components.

Psychological diagnostics and career gui-dance are not part of the external assessment of student competencies, but they play an important auxiliary role in ensuring its objectivity, sub-stantiation, and comprehensiveness. However,

there are also problems in these areas today. Key among them is the lack of an integrated relationship between themselves, the results of academic learning, the pedagogical work of the teacher and its evaluation, with the process of forming test questions adaptive considering the psychology and career guidance of the student, the absence of a unified database with history and development dynamics, a systematic approach in the training of psychologists and career advisors. This is exacerbated by a sharp shortage of qualified specialists, the impossibility of covering all students with the services of psychologists and career advisors, the absence of modern methods of educational psychology and career guidance, methodological guidance, and quality control of the work of psychologists and career advisors.

Descriptive model of the System. To address the above tasks and problems, the creation of a System is proposed. It is expected that this system will contain the following parameters or interconnected modules:

Module "External assessment of the quality of education and monitoring of the individual educational trajectory from primary school to obtaining a specialty/qualification". The basis of external assessment should be testing, generated by AI, adaptive to the competence level and inclinations of each student. Such a personalized approach will promote comprehensive assessment and diagnostics of competence. The test adaptation algorithm will be regulated by AI based on the initial responses of the test subject, forming the difficulty level of subsequent questions. Thus, test takers showing a higher level of knowledge will receive more complex questions, while others with a lower level, will get simpler ones. Accordingly, they will receive different scores for these answers. Upon completion of adaptive testing, AI will analyze its results and form a personal report on the level of educational achievements of each student. These results will be used to form an individual plan for learning and self-education to fill gaps in knowledge, as well as to search for and provide didactic materials for further improvement in interaction with other System modules. Adaptive testing simplifies the assessment process, reduces testing time, and ensures more accurate and personal diagnostics and assessment.

To ensure comprehensive coverage of all individuals, considering the weak technical equipment of several educational organizations, it is possible to consider the option of conducting testing through a smartphone application with proctoring based on AI technologies. Considering that the questions for the test will also be generated by AI, this significantly reduces costs and expenses. This advantage provides opportunities for increasing the frequency, scale, and comprehensiveness of testing.

Module "Generation of test questions for students using AI technologies". As mentioned above, AI will generate new test assignments, taking into account their specification, the competence levels of the student, learning goals, trajectory, and history of learning, among other factors. The module will analyze educational materials, textbooks, articles, or other sources of information to identify key, current, and at the same time interesting topics, concepts, and facts for inclusion in the test questions for a specific student. Based on the analysis of these materials, as well as considering educational standards and curricula, the module will automatically generate various types of questions. The type of question will be determined by AI considering the skills to be assessed: reading and mathematical literacy, key profile knowledge, analytical skills, critical thinking, communication, and other modern skills. In generating questions, there should be interaction with other System modules containing information about academic results, psychodiagnostics, career guidance of the student, and the competence level of the teaching teacher. The goal of the module is to create test questions adapted to the individual needs and inclinations of each student, as well as aimed at studying his educational environment, including the class, school, the quality of teaching by the direct teacher, and other important factors.

With the help of AI, the module will automatically evaluate the quality of the created questions, taking into account their relevance,

objectivity, validity, and reliability, as well as other criteria. The module will learn, update, and adapt based on feedback from students, teachers, administrators, and System experts, the results of testing and trials, as well as considering changes in curricula and educational standards.

Module "External Assessment of Teacher Competence Using AI and Database Technologies". This module is designed to assess the professional competencies of educators using AI technologies, integrated with other modules of the System. The module will also develop adaptive test items similar to those in the test generation module for students. As mentioned above, this will allow for a more accurate assessment of competencies.

This module will be integrated with educational portals, social networks, and other online resources where the teacher is professionally involved. It will analyze the results of adaptive testing, as well as the teacher's activities on educational portals, social networks, and other online resources. Additionally, functionality will be established for evaluating the teacher's instruction through AI-powered video monitoring of lessons. This will allow for a comprehensive approach to assessing a teacher's competencies, covering teaching methods, pedagogical practice, subject mastery, and other aspects of professional activity.

This module will compare the results of the teacher's assessment with the educational achievements of students, including comparing the teacher's responses to questions posed to both the teacher and the students ("anchor" questions). Based on the results of these analyses, the module will track and analyze the teacher's professional development, assessing their successes and the effectiveness of their chosen career trajectory. It will also provide feedback and individual recommendations for the teacher to enhance their professional competencies, develop self-improvement and additional training plans, suggestions for improving pedagogical practice, and select optimal future employment options based on an analysis of competence, personal characteristics, interests, and skills.

Additionally, the module can also provide recommendations to potential employers for choosing the most optimal candidates for specific positions or educational programs. For such selection, the module will rely on information regarding the educational organization, other teachers, and the student body.

This module will assist schools, colleges, and universities in selecting the most suitable candidates for teaching and administrative positions.

Module "Data Analysis and Recommendation Generation for Students, Teachers, School Administrators, and Education Authorities Using AI and Database Technologies". This module is a key component of the System and is intended for processing and analysing large volumes of data obtained from testing and studying other resources to generate recommendations. It will collect and process data obtained from testing, as well as open demographic, social, economic, and other information. AI algorithms will analyze vast arrays of data to identify patterns, trends, and key characteristics of a specific student's success and failure in education, and predict future educational success. Based on this, AI will create an individual learning and self-learning trajectory, adjusting the content and methods of education according to the individuality of each student.

Based on the results of the analysis, the module will generate recommendations for teachers, heads of educational organizations, and educational authorities to improve management activities and ensure the implementation of educational policy. The module will monitor the implementation of previously proposed recommendations and assess the effectiveness of their execution. For convenience, the module will include visualization functions, such as graphs, diagrams, and reports.

The module will also perform searches and present content tailored to the specific needs and interests of the user. Analysing data about a student's educational achievements, the module will recommend appropriate resources, adapt educational materials, and organize educational games, and other activities to address knowledge gaps and errors.

Module "Psychodiagnostics of Students and Teachers Using AI and Database Technologies".

This module will analyze the psychological parameters of students and teachers, assessing their emotional states, motivation, levels of stress and anxiety, adaptability, self-esteem, and other psychological aspects.

The module will develop adaptive psychological tests based on available information, including data from other modules of the System and social networks. This will allow for more accurate diagnostics of the psychological state of students or teachers, identifying areas where psychological support is needed. This includes determining the causes of depression, anxiety, behavioural disorders, etc. Additionally, the module will consider the individual characteristics of each participant in the educational process, automatically tracking changes in the psychological states of students or teachers. This will allow for the timely identification of potential problems and the implementation of preventive measures.

The module will also assess the ability to adapt to new learning or teaching conditions, providing feedback and support, if possible, in real time. For example, suggestions for stress management, recommendations for increasing motivation or improving psychological well-being, and achieving success. Based on the analysis results, the module will offer suitable tools for supporting mental health, including relaxation exercises, meditation, stress management, etc. This will help students and teachers quickly adapt and respond to changes in their psychological states.

This module will integrate with other modules of the system for data exchange and comprehensive analysis of the educational process to identify its strengths and weaknesses, the psychological compatibility of participants, and predict the success of learning and teaching considering the psychological characteristics of each participant.

This module plays an important role in creating a supportive environment for learning and teaching and enhancing the overall effectiveness of the educational process.

Module "Career Guidance for Students Using AI and Database Technologies". This module will analyze the interests, inclinations,

and skills of students based on data from other modules of the system, including their academic achievements, preferences in selecting academic subjects, quality of task performance, interactive or extracurricular activities, and results of psychological diagnostics. The module includes conducting online testing and monitoring activity in open social networks.

This module will help students better understand themselves, their interests, and their needs, and analyze their professional interests and preferences, individual abilities, and inclinations toward certain types of activities. In this way, key personality traits, needs, and motivations of the student are identified.

The module will provide students with information about various professions, including future and promising ones, and the requirements for each profession. Based on this and information from other System modules, personalized recommendations are provided for choosing a professional path, educational direction, or career development, as well as the most suitable schools, colleges, and universities considering the student's characteristics.

As a result of the module's interaction with the students, their parents, social educators, and career counsellors, a step-by-step route for obtaining the chosen profession will be developed and monitored by the module. These module capabilities will enable students to make informed decisions regarding their future education and careers.

Conclusion. This System has no analogs in the world, although some individual solutions, as mentioned above, already exist in practice. The information and analytical content of the System's modules is interconnected, allowing for comprehensive analysis and relevant recommendations. The creation of this System will revolutionize education, significantly improve the quality of education, and provide more or less equal opportunities for obtaining quality education for various categories of citizens and regions, including those in need. This will give better starting opportunities to many citizens of the country.

In summary, the following should be noted. The MEDA, as a unified system for monitoring

educational achievements in secondary education, does not meet modern requirements for ensuring the goals of successful learning and the integration of students considering 21st-century trends and skills. The higher education system is not covered by such monitoring at all. The system for teacher certification, the activities of the psychological services in educational institutions, career counsellors, and social educators in schools are not mutually integrated and are not aimed at ensuring the common goal of successful learning and the acquisition of 21st-century skills by students. As shown above, today's technologies, without significant costs, make it possible to build a unified external assessment system incorporating individual learning trajectories. Given the need to assess 21st-century skills, a comprehensive assessment is necessary, and such an assessment is possible at the intersection of core subjects, psychological diagnostics, and career guidance. When developing an external assessment system using AI and Big Data, the most important aspect is the interconnection and integration of systems (modules) for testing, generating test tasks, psychological diagnostics, career guidance, and the analytical block.

The introduction of this system will eliminate corruption risks (in obtaining grades, job placement, grant distribution, rewards, etc.) through its transparency, objective external evaluation, and the impossibility of result correction. Through the System, it is possible to instil progressive values at the national level for the younger generation, promoting self-education skills, the development of critical thinking, and high intellectual preparation. This will, in general, contribute to the formation of an educated and progressive civil society.

The final decision in the system, when forming AI recommendations, should be adjusted by all involved teachers or heads of educational organizations or education management bodies. Given the scale of the System's application, this will allow the AI to improve at a faster pace.

The information-analytical system for external competency assessment can serve as an effective management tool in the education system. It will allow the heads of educational organizations and education management bodies to receive, analyze, and use data for making informed managerial decisions. Such a system, considering the interrelated work of various modules, will ensure effective monitoring and management of education quality. Based on the System's modules, it is possible to introduce the System's functionality in education management with minimal corruption risks and unjustified subjectivity (including in terms of selection and placement of managerial and teaching staff, reward and penalty systems), the functionality of optimal planning of educational programs, schedules, analysis of the current situation, forecasting success and risks, and the development of necessary managerial decisions. Thus, the development and implementation of the technologies described above open new prospects for transforming education into more effective, adaptive, accessible, and inclusive education.

References

Analiticheskiy otchet (2022) *Kompleksnyy analiz rezultatov monitoringa obrazovatel'nykh dostizheniy obuchayushchikhsya organizatsiy srednego obrazovaniya* https://www.gov.kz/uploads/2023/3/1/a681b8560cfb03557 da1ef77e14a20e6_original.6561302.pdf

Boverhof, B. J., Redekop, W. K., Bos, D., Starmans, M. P., Birch, J., Rockall, A., & Visser, J. J. (2024). Radiology AI Deployment and Assessment Rubric (RADAR) to bring value-based AI into radiological practice. *Insights into Imaging*, *15*(1), 34. https://doi.org/10.1186/s13244-023-01599-z

Celik, I. (2023). Towards Intelligent-TPACK: An empirical study on teachers' professional knowledge to ethically integrate artificial intelligence (AI)-based tools into education. *Computers in Human Behavior*, *138*, 107468. https://www.sciencedirect.com/science/article/pii/S0747563222002886

González-Calatayud, V., Prendes-Espinosa, P., & Roig-Vila, R. (2021). Artificial intelligence for student assessment: A systematic review. *Applied Sciences*, *11*(12), 5467. https://www.mdpi.com/2076-3417/11/12/5467

GOV.KZ (2023). Ministerstvo obrazovaniya Respubliki Kazahstan, 2023. Gov.kz. https://www.gov.kz/memleket/entities/edu?lang=en

Hinojo Lucena, F. J., Aznar Díaz, I., Romero Rodríguez, J. M., & Marín Lucina, J. A. (2019). Influencia del aula invertida en el rendimiento académico: Una revisión sistemática. *Campus virtuales: revista*

científica iberoamericana de tecnología educativa. https://redined.educacion.gob.es/xmlui/bitstream/handle/11162/184523/Art.%201.pdf?seq

Informburo, K. Z. (2019). *Sagadiev zayavil ob otmene EVEA v VUZah s 2020 goda*. https://informburo.kz/novosti/sagadiev-zayavil-ob-otmene-voud-v-vuzah-s-2020-goda.html

Kobenova, G. (2021). *Natsional'nye monitoringovye issledovaniya uchebnykh dostizheniy: stranitsy istorii*. Bilimdi El – Obrazovannaya natsiya. https://bilimdinews.kz/?p=174964

Misiejuk, K., Kaliisa, R., & Scianna, J. (2024). Augmenting assessment with AI coding of online student discourse: A question of reliability. *Computers and Education: Artificial Intelligence*, *6*, 100216. https://doi.org/10.1016/j.caeai.2024.100216

Nazarbayev Intelektualnye Shkoly. (n.d.). *Testy dlya opredelenya proffesional'noy orientatsii*. Retrieved May 22, 2024 from https://trz.nis.edu.kz/school_life/uchenikam/professionalnaya-orientatsiya/testy-dlya-opredeleniya-proforientatsii/

OECD (2021), *Skills Strategy Kazakhstan. Assessment and Recommendations*, OECD, Paris, https://www.oecd.org/skills/oecd-skills-strategy-kazakhstan-39629b47-en.htm

Opexams. (n.d.). Opexams: Online platform for creating and conducting exams. Retrieved from https://opexams.com/ru/

PrepAI. (n.d.). How a leading Indian university maximized learning potential with PrepAI. Retrieved May 16, 2024from https://www.prepai.io/case-studies/maximizing-learning-potential-at-a-top-indian-university/

Profone (n.d.). Centr proforientatsii I kariernogo konsultirovanya, Almaty. Profonetest.kz. Retrieved May 20, 2024 from https://www.profonetest.kz/

Ruby, A., & McLaughlin, C. (2014). Transferability and the Nazarbayev Intellectual Schools: Exploring models of practice transfer. *Educational reform and internationalization: The case of school reform in Kazakhstan*, 287-300. https://books.google.com/books?hl=en&lr=&id=iqsZBAAAQBAJ&oi=fnd&pg=PA287&dq=Nazarbayev+Intellectual+Schools,+&ots=ZiBvMxuWYx&sig=O3aYEGzRiRUj8An2HRz2T77Ga3Y

Shilibekova, A. (2021*). Mnogomernoe obrazovanie: otsenivanie dlya uspeha*. Bilimdi News. Bilimdi El Obrazovannaya natsiya.

Testportal. (n.d.). Testportal: Your online testing solution. Retrieved May 20, 2024 from https://www.testportal.net/en/

Thornhill-Miller, B., Camarda, A., Mercier, M., Burkhardt, J. M., Morisseau, T., Bourgeois-Bougrine, S., & Lubart, T. (2023). Creativity, critical thinking, communication, and collaboration: assessment, certification, and promotion of 21st century skills for the future of work and education. *Journal of Intelligence*, *11*(3), 54. https://www.mdpi.com/2079-3200/11/3/54

Yang, A. C., Chen, I. Y., Flanagan, B., & Ogata, H. (2021). Automatic generation of cloze items for repeated testing to improve reading comprehension. *Educational Technology & Society*, *24*(3), 147-158. https://www.jstor.org/stable/27032862

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). A systematic review of research on artificial intelligence applications in higher education–where are the educators? *International Journal of Educational Technology in Higher Education*, *16*(1), 1-27. https://link.springer.com/article/10.1186/s41239-019-0171-0

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MECHANISM FOR ASSESSING THE QUALITY OF TEACHING IN A HYBRID LEARNING FORMAT

Abstract

The article is devoted to the analysis of the theoretical provisions of pedagogical research on mechanisms for assessing the quality of teaching in a hybrid learning format. The purpose of this study is to describe the features of methodological approaches to assessing the quality of teaching in a hybrid learning format in relation to the educational process in higher education. Research methods: The assessment of the quality of teaching was determined by the assessment of the quality of educational technologies (content of lectures and practical classes). Through the structure of evaluation of educational results as the quality of learning of students in the curriculum. How to evaluate the quality of education: subjective self-evaluation of teachers and objective evaluation of students through surveys and questionnaires. The resulting research results made it possible to demonstrate the theoretical and methodological basis for modeling the university's hybrid educational environment. It became clear that the main provisions of the analysis and determination of the quality of education are the constancy of the signs of the quality of education and the component composition of the professional activity of the teacher in the university. The level assessment of the expression of each quality attribute in the analysis of educational activity is determined. The structure of educational evaluation is represented regardless of the details of the subject and the content of the discipline. Indicators for assessing the quality of education in an organized, hybrid learning format include immutability, monitoring, intercommunication, polymorphism, self-deviation, personalization, feedback, etc.

Keywords: hybrid learning, educational technology, teaching quality, objective assessment, assessment standards.

Basic provisions. Our research has allowed us to deduce a number of provisions:

- the mechanism and indicators for assessing the quality of teaching in a hybrid learning format have not yet received high-quality coverage;

- improving the training of a future teacher in the format of hybrid learning, requires psychological content filling in order to become an irreversible process;

- the level assessment of the quality of teaching is: invariance, intercommunicativeness, multiformatedness, personalization, feedback, reflexivity.

Introduction. The fact that hybrid learning makes an undeniable contribution to accelerating the formation of the educational process of the "new generation" is a given. Having initially received widespread use as a synonymous concept with blended learning, today hybrid learning, both in English and Russian literature, retains a broad understanding like any combination of contact (face-to-face, in-person) teaching synchronous and asynchronous learning formats.

With the development of technology, especially the possibility of teaching students online in synchronous mode, B. Managing proposed a special understanding of hybrid learning as a combination of contact classroom and synchronous learning in a virtual environment (virtual synchronous).

The synchronicity of interactions, which creates opportunities to interact with students at educational events, is positioned as the main feature of synchronous hybrid learning. It is due to real-time synchronization that hybrid learning differs from mixed learning, which can include both synchronous and asynchronous activities.

Thanks to modern information technologies, today it is possible to use new forms of presenting material, which improves the communication

policy of an educational institution within the framework of communication and interaction between participants in educational processes. It is the use of digital platforms to organize the educational process that is the basis for the introduction of hybrid learning.

Main part. The productivity of hybrid learning, according to foreign scientists, lies in the fact that:

1. Hybrid learning is an innovative model using information and communication technology, containing various technologies including television, computer media, multimedia presentations, iPhone, video conferencing and weblogs. (Aristika et al., 2021).

1.1 Integration of synchronous learning on Cisco Webex, Google Class, Panopto and asynchronous sessions platforms. The latter is a mobile learning module with self-learning content provided (Cheung, 2015); (Metis & Väljataga, 2021).

1.2 Students taking initiative and gaining practical experience with explanations of abstract digital technologies. The demonstration of a video with a clear algorithm for future work activities activates a creative approach to the mechanism of communication technologies (Wardani et al., 2018).

2. Hybrid learning is a productive pedagogical approach that prioritizes technological developments and can provide experiences using hybrid spaces (Chen & Chiou, 2014).

3. Hybrid learning is an innovative model for the development of critical thinking based on modern technologies (Aristika et al., 2021).

Sadirbekova (2023) confirmed the effectiveness of the hybrid model in their studies, in which hybrid learning can provide a consistent experience through the use of high-order thinking critical thinking technologies.

Due to the rise of the "hybrid learning space", the content of educational programs and disciplines is delivered using a combination of conventional seminars and electronic means of communication (Alamri, H. A., Watson, S., 2021)

B. Tomlinson and C. Whittaker (2012) considers hybrid learning as a pedagogical approach that combines offline and computer-based mobile learning. The use of parallel virtual mechanisms ensures interaction between students and teachers in mixed learning. However, blended learning focuses on the necessary combination of traditional "focused" offline and online learning. Whereas the point of hybrid learning is to master and maximize the use of a combination of educational technologies, regardless of the format of the learning mode (online or offline). Therefore, hybrid learning involves optimal student interaction with an online educational resource. At the same time, the role of the teacher is largely to perform an advisory function.

E. A. Krug (2022) considers the joint use of various educational technologies in teaching as a significant synergistic effect, where, first of all, students' independence is increased, their motivation is increased through the possibility of implementing personalized learning.

Hybrid learning has a huge potential for the development of independent work and organization of students. However, this process requires the development and implementation of special methods of methodological support by the teaching staff.

Improving the effectiveness of hybrid learning can contribute to:

1) providing more additional material on difficult tasks;

2) the possibility of communication with the teacher not only within the framework of classes;

3) the use of video clips and presentations during lectures;

4) increasing the time allocated by teachers to complete assignments;

5) expansion of technical platforms with a large set of functions for conducting classes.

Based on real-time synchronization, Y.I. Mikhailov believes that the indicator of the quality of the learning process can determine the level of achievement of the goal, that is, the degree to which the student and the knowledge, skills and abilities meet the requirements reflected in the educational program. In hybrid learning, authors write, first of all, requirements for faculty in the field of using multimedia learning techniques in relation to certain areas of increased knowledge.

Therefore, it can be concluded that higher education needs to continue to improve the quality of hybrid education, which can be carried out not only through the improvement of technical indicators, but also through the development of rational models of hybrid learning, individual educational trajectories and advanced training of teachers within the framework of information education technologies.

According to the stated purpose of this article, we will examine the educational quality system as a whole – an important understanding of the mechanisms for assessing the quality of education in a hybrid learning format.

Thus, the quality of education, as is known, is a permanently increasing level of educational activity of teachers and is characterized by a high result of student training, which is able to meet the needs of all participants of the educational process. As for the evaluation of the quality of education, this is a flexible and multifaceted procedure of content and form, which includes aspects of activities determined by the university itself according to its own value system. Methods and material of research. When assessing the quality of teaching, it is necessary to assess the conditions created by the university to ensure quality: the "starting" level of students and the resources provided by the university.

In turn, the assessment mechanisms will be:

a) level of student's educational achievements;

b) level of personal development;

c) teaching effectiveness in hybrid learning;

d) degree of motivation to continue learning in a hybrid format.

When developing a mechanism for evaluating the quality of teaching, we were guided by the tools of N.V. Bordovsky's methodology (2019), used to assess the quality of professional activity of university teachers.

The methodology for assessing the quality of teaching is presented by the content of the assessment process, its structure and methods:

1. Contents of assessing the quality of teaching: assessment of the quality of educational results; assessing the quality of the process of achieving such results at the level of giving lectures and conducting practical classes;

2. The structure for assessing the quality of teaching includes assessing the quality of: educational results as the quality of students' mastery of the curriculum; lectures given on the academic discipline; conducted practical classes.

3. Methods for assessing the quality of teaching: teacher self-assessment; student survey; final grade.

These methods are aimed at objectifying the results and process of assessing the quality of teaching in situations of self-assessment and student surveys from the position of multidimensional comparison of the data obtained when measuring the same objects by the teacher and students.

The quality of teaching was measured using an integrated assessment, which was formed by the following approaches (Table 1). A point system in which each indicator is assigned a certain point. The integral indicator is obtained by simply summing the points. The assessment of the quality of teaching is an average weighted assessment based on a set of selected factors. This takes into account external assessment from interested consumers – students, as well as the self-assessment of the teacher himself. Assessing quality indicators on a three-point scale: 2 – "optimal level", 1 – "acceptable level", 0 – "unacceptable level". The generalized indicator was assessed similarly.

Table 1. *Mechanisms for assessing teaching*

Conditions of the teaching process	Implementation of the teaching process	Level of student preparation
Teacher qualifications	Organization of hybrid learning	Assessment of student preparation in the discipline
Digital Resources for Teaching	The effectiveness of using hybrid learning	Having motivation to use hybrid learning
Awareness Level of Hybrid Learning	Impact of Hybrid Learning on Student Development	Satisfaction with hybrid learning

Scientific and professional orientation of the content, reflection of the current state of science and practice

Optimal tempo and expressiveness of speech as an opportunity to listen, understand and write down the main points

Systematic and problematic nature of the presentation of content using modern educational technologies, reasoning of the expressed judgments and confirmation of theoretical positions with facts

Quality of seminars

Continuity of content of seminars, lectures and assignments for student's independent work

The dialogical nature of interaction with students as an opportunity for freedom of opinion, independent assessments and discussions

Optimal consideration of the interests and capabilities of all students

Self-assessment tools:

1. Scaled self-assessment for all indicators of teaching quality.

2. Self-analysis of educational results, process and reflection on the conditions that influenced the quality of the teacher's work with students in conditions of hybrid learning.

27% of teachers participated in the experimental work – young teachers with no more than 5 years of experience at the university, 28% – no less than 10 years, candidates of science – 43%, doctors of science –15%;(PhD) doctors – 28%, senior teachers –15%.

The assessment objects shown in Table 2 are the most important from the point of view of quality assurance and elements of the teaching system.

Table 2. *Indicators for assessing the quality of teaching in the organized format of hybrid learning*

№	indicators for assessing the quality of teaching	Contents of assessment indicators
1	Invariance	educational process in the form of lectures, practical or seminar classes, consultations and exams
2	Monitoring	the teacher's influence on the professionally significant and personal development of students
3	Intercommunication	interactive interaction of students with the teacher, with each other and with educational resources.
4	Multi-format	the educational program, lesson scenario and teaching materials must be adapted to three interactions with the student at once: classical teaching in the classroom; conducting online seminars; independent offline work of students, which can be combined with the use of webinars and workshops.
5	Self-directed	student self-direction: from a passive listener, he turns into an active participant in the educational process, who independently decides what, when and in what form to learn, and also controls the achievement of his educational goals.
6	Personalization	Pedagogical activities are aimed at the development of each student, taking into account his individual needs and interests.
7	Feedback	Regular feedback from students is necessary to maintain educational interest and assess the mastery of the material covered.
8	Portioning	educational content is presented in stages, in "concentrated" portions, which allows students to better assimilate information and dive deeper into the topic.
9	Reflexivity	self-analysis and self-monitoring of educational activities and their results by students.

O. V. Fadeeva (2019), the quality of teaching teaching staff is identical to the quality of mastering competencies by students. An equally important characteristic of the quality of teaching, in our opinion, is the influence of the teacher on the personal development of students, manifested not only in knowledge of their subject and the ability to teach it, but also

in respect for the student's personality, in the communicative qualities of the teacher, in the presence of emotional intelligence, in the ability of pedagogical improvisation. The idea of evaluating the quality of teaching is expressed in a clear selection of signs (significant criteria) of quality, the definition of a point scale to assess the manifestation of indicators of the quality of educational activity in a particular teacher, as well as a methodology with a set of necessary procedures and tools.

The main provisions of the analysis and determination of the quality of teaching according to G.A. Bordovsky (2019) are: the invariance of the signs of the quality of teaching and the elemental composition of the professional activity of teachers at the university; a level assessment of the manifestation of each quality sign in the analysis of teaching activities; typification of teaching assessment structures regardless of the specifics of the subject and the content of the discipline.

Table 3 shows the indicators for evaluating the quality of teaching in an organized hybrid learning format. The content of evaluation indicators is presented: invariance, monitoring, intercommunicativeness, multiformatedness, Self-derected, personalization, feedback, portionality and reflexivity.

Table 3. *Indicators for assessing the quality of teaching Contents of assessment indicators*

Significant indicators	Quality levels		
	2	1	0
Quality of educational results			
Average academic score of students in academic discipline			
Students' attitude to the results obtained, the teacher and his activities			
The quality of students' knowledge in the academic discipline			
Quality of lectures and seminars			
Scientific and professional orientation of the content, reflection of the current state of science and practice			
Optimal tempo and expressiveness of speech as an opportunity to listen, understand and write down the main points			
Systematic and problematic nature of the presentation of content using modern educational technologies, reasoning of the expressed judgments and confirmation of theoretical positions with facts			
Quality of seminars			
Continuity of content of seminars, lectures and assignments for student's independent work			
The dialogical nature of interaction with students as an opportunity for freedom of opinion, independent assessments and discussions			
Optimal consideration of the interests and capabilities of all students			

1 Invariance educational process in the form of lectures, practical or seminar classes, consultations and exams

2 Monitoring the teacher's influence on the professionally significant and personal development of students

3 Intercommunication interactive interaction of students with the teacher, with each other and with educational resources.

4 Multi-format the educational program, lesson scenario and teaching materials must be adapted to three interactions with the student at once: classical teaching in the classroom; conducting online seminars; independent offline work of students, which can be combined with the use of webinars and workshops.

5 Self-directed student self-direction: from a passive listener, he turns into an active participant in the educational process, who independently decides what, when and in what form to learn, and also controls the achievement of his educational goals.

6 Personalization Pedagogical activities are aimed at the development of each student, taking into account his individual needs and interests.

7 Feedback Regular feedback from students is necessary to maintain educational interest and assess the mastery of the material covered.

8 Portioning educational content is presented in stages, in "concentrated" portions, which allows students to better assimilate information and dive deeper into the topic.

9 Reflexivity self-analysis and self-monitoring of educational activities and their results by students.

Thus, in order to assess the quality of education in the course of experimental work, it was found that the activity of research respondents is determined by the quality of educational results at the level of academic disciplines, lectures, seminars, workshops, consultations, exams. The degree of activity of a particular teacher is determined in accordance with general requirements, regulations and standards. The differentiation of the qualitative assessment of education between different teachers is manifested taking into account the length of service at the university, the position held, the presence or absence of a scientific degree and title. The quality of education of an individual teacher is determined according to the expectations and needs of the students, as well as the needs and potential abilities of the teacher himself.

The results of the general assessment of the quality of education are presented in the form of a quantitative and qualitative assessment of the state of the activity carried out by the teacher in connection with the solution of educational problems during the implementation of the program in the academic field, as well as a measure of the correlation between the self-esteem of the teacher and the opinion of the student. Factor structure of self-assessment of the quality of education of teachers. The correspondence between the teacher's self-assessment and the student's assessment using ranking revealed a correlation coefficient from 0.4 to 0.6. Determining the average statistical assessment allowed us to talk about the final state of the quality of teaching of a particular teacher.

The study showed that in the factor structure of self-assessment of the quality of teaching among teachers, the factor conventionally called "Personal responsibility for the quality of educational results of students and the quality of teaching their discipline" dominates (the total variance explained by the action of the factor is 52%), then "Personal meaning of professional activity teacher in the educational process" (the total variance explained by the factor is 22%).

The third factor is "Professionalism of a university teacher" (the total variance explained by the factor is 24%).

In the factor structure of self-assessment of the quality of teaching among teachers of Abai KazNPU, the same factor dominates – "Personal responsibility of the teacher for the quality of educational results of students and the quality of teaching of their academic discipline" (the total variance explained by the action of the factor is 28%), then – "Confidence in ability to improve the quality of teaching" (total variance explained by the factor – 22%), "Reflection of the results of self-assessment" (total variance explained by the factor – 14%) and "Teachers' ideas about the requirements for high quality teaching at a university" (total variance – 14%).

In the factor structure of self-assessment of the quality of teaching among teachers of the Institute of Pedagogy and Psychology, the factor "Personal meaning of the professional activity of a teacher in the university educational process" dominates (the total variance explained by the action of the factor is 18%), then "Confidence in the ability to improve the quality of teaching" (the total variance , explained by the action of the factor –15%), "Style of control and issuing final grades" (total variance explained by the action of the factor –13.2%), "Strategies for improving the quality of teaching" (total variance explained by the action of the factor –13.7%).

In the factor structure of self-assessment of the quality of teaching among teachers of the "Special Pedagogy" department, the factor we called "Teaching Style" dominates (the

total variance explained by the action of the factor is 29%), then "Confidence in the ability to improve the quality of teaching" (the total variance explained by the action factor – 26%) and "Style of control and final grades" (total variance explained by the factor –21%).

During the study, the average value of the integral index for assessing the quality of teaching was determined both for the general sample of teachers (X = 34, standard deviation S = 7), and for teachers of each university separately. In accordance with the average indicator, teachers were conditionally assigned to a group in which the predominant level of self-assessment of teaching quality was above average.

Table 4 shows the results of the teacher's self-assessment, his success in teaching, establishing the level of involvement in teaching and motivation.

Table 4. *Indicators of self-reported success in teaching activities*

		pedagogical effectiveness	adaptability and innovation
Group C (control)	Average value	30.92	26.53
	Standard Deviation	2,841	1,974
	Standard error of the mean	.449	.312
	Dispersion	8,071	3,897
	Excess	-1.417	-1.048
	Standard error of kurtosis	.733	.733
	Asymmetry	-.026	.329
Group D (influences)	Average value	37.68	33.30
	Standard Deviation	1,913	2,267
	Standard error of the mean	,303	.358
	Dispersion	3.661	5.138
	Excess	-1.489	-1.227
	Standard error of kurtosis	.733	.733
	Asymmetry	-.110	.011
Calculation of the nonparametric Mann-Whitney test			
U Mann-Whitney		20,000	12,000
Wilcoxon W		840,000	832,000
Z		-7.544	-7.608
Asymptotic significance (2-sided)		**.000**	**.000**

Teachers in group C (control) rated their teaching effectiveness at an average of 30.92, and their adaptability and innovation at 26.53. In group D, these indicators were higher: pedagogical efficiency averaged 37.68 (6.76 more), and adaptability and innovation – 33.30 (6.77 more). Differences between groups on both subscales were confirmed to be statistically significant as a result of calculating the Mann-Whitney test, which indicates a higher self-assessment of success in teaching among participants in the influence group. The level of involvement in teaching and motivation of teachers from the two groups was also calculated when determining the significance of differences using a nonparametric test for two independent samples (Table 5).

Table 5. *Indicators of the level of involvement in teaching*

		involvement	motivation
Group C (control)	Average value	29.65	29.35
	Standard Deviation	2,732	1,511
	Standard error of the mean	.432	.239
	Dispersion	7,464	2.285
	Excess	-1.345	-.763
	Standard error of kurtosis	.733	.733
	Asymmetry	.071	.350
Group D (influences)	Average value	35.43	36.03
	Standard Deviation	1,583	1.954
	Standard error of the mean	.250	,309
	Dispersion	2,507	3,820
	Excess	-1.136	-1.187
	Standard error of kurtosis	.733	.733
	Asymmetry	.185	-.145
Calculation of the nonparametric Mann-Whitney test			
U Mann-Whitney		42,000	.000
Wilcoxon W		862,000	820,000
Z		-7.331	-7.733
Asymptotic significance (2-sided)		.000	.000

In the control group, teachers reported a level of involvement in teaching at 29.65 and motivation – 29.35, and in the influence group there was an increase in these indicators: the average level of involvement was 35.43 (+5.78), and motivation – 36. 03 (+6.68). The results of the nonparametric Mann-Whitney test indicated statistically significant differences between the groups.

Conclusion. Hybrid learning, first of all, increases the requirements for faculty in the field of using electronic and multimedia learning techniques in relation to a particular field of knowledge. In hybrid learning, the teacher works simultaneously with 2 different classrooms, 1 of which is next to him in the classroom, and the 2nd is connected in video communication mode. The task of teachers in class is to pay equal attention to offline and online groups so that students receive an equal quality educational experience. In an ideal scenario, a hybrid classroom should be equipped with a high-resolution camera and a high-quality microphone that transmits sound without echoes or delays, an interactive whiteboard, a large screen where video from a remote student webcam is broadcast, and a tablet or laptop for each listener of the audience.

The effectiveness of the learning process depends on both the qualitative and quantitative composition of the student's body. Weak knowledge acquired previously can adversely affect the results of subsequent education, which requires sufficient basic training, and the attendance of low-level students to classes conducted in all forms of education. However, to date, there are no current standards for the provision of a hybrid learning process, which complicates the monitoring and measurement of the quality of this process. Indeed, the criteria for providing hybrid learning resources should differ to some extent from the current criteria for full-time education in higher education institutions, which are used in assessing the effectiveness of educational activities in higher education institutions.

References

Al Ghatrifi, M. O. M., Al Amairi, J. S. S., & Thottoli, M. M. (2023). Surfing the technology wave: An international perspective on enhancing teaching and learning in accounting. *Computers and Education: Artificial Intelligence*, *4*, 100144. https://doi.org/10.1016/j.caeai.2023.100144

Aristika, A. Darhim, Juandi, D., & Kusnandi. (2021). Science, technology, and innovation ecosystem transformation toward society 5.0. *International Journal of Production Economics, 220,* 107460

Bordovskaya, N. V., & Titova, E. V. (2002). The quality of the activities of the university teacher (approaches to understanding and evaluation). *Bulletin of the North-West RAO Education and Culture of North-West Russia*, (7), 23-34

Chaeruman, U. A., Wibawa, B., & Syahrial, Z. (2018). Determining the appropriate blend of blended learning: A formative research in the context of Spada-Indonesia. *American Journal of Educational Research*, *6*(3), 188-195. https://www.researchgate.net/profile/Uwes-Chaeruman/publication/323748056_Determining_the_Appropriate_Blend_of_Blended_Learning/links/5aa8c99a458515b024fb13d8/Determining-the-Appropriate-Blend-of-Blended-Learning.pdf

Chen, B. H., & Chiou, H. H. (2014). Learning style, sense of community, and learning effectiveness in the hybrid learning environment. *Interactive Learning Environments*, *22*(4), 485-496. https://www.tandfonline.com/doi/abs/10.1080/10494820.2012.680971

Chouyluam, S., Wannapiroon, P., & Nilsook, P. (2021). Creative Design Thinking Learning Model integrated immersive experiential marketing to enhance digital entrepreneurs. *International Journal of Trade, Economics and Finance*, *12*(1), 26-32. https://www.ijtef.org/vol12/689-L1013.pdf

Fadeev A.A. (2019). Podhodyi k otsenke effektivnosti rabotyi professorsko – prepodavatelskogo sostava v vuze. *Innovatsionnoe razvitie, 2*(29). 120-121

Hamad, F., Shehata, A., & Al Hosni, N. (2024). Predictors of blended learning adoption in higher education institutions in Oman: theory of planned behavior. *International Journal of Educational Technology in Higher Education*, *21*(1), 13. https://doi.org/10.1186/s41239-024-00443-8

Kahn, B. (2005). Managing e-learning strategies: design, delivery, implementation, and evaluation. *Managing E-learning Strategies. Hershey, PA: Idea Group*

Krug, E. A. (2022). Udovletvorennost' studentov sistemoy gibridnogo obucheniya v vuze. Nauchno-metodicheskiy elektronnyy zhurnal «Kaliningradskiy vestnik obrazovaniya», (2 (14)), 3-12. https://cyberleninka.ru/article/n/udovletvorennost-studentov-sistemoy-gibridnogo-obucheniya-v-vuze

Mikhaylov, YU. I. (2022). Osnovnaya professional'naya obrazovatel'naya programma kak produkt garmonizatsii gosudarstvennogo obrazovatel'nogo i professional'nogo standartov. *Sovremennoye obrazovaniye: soderzhaniye, tekhnologii, kachestvo*, 1, 296-298. https://elibrary.ru/item.asp?id=48574047

Sadirbekova D., Issabayeva D.N., Sagimbayeva A.E., Shekerbekova Sh.T., Oshanova N.T., (2024). Metric indicators for evaluating educational initiatives in the context of continuous professional development of a teacher Journal, *Pedagogy, and Psychology, 58*(1)

Skripnik, I. L. (2019). Podkhody k otsenke effektivnosti raboty professorsko-prepodavatel'skogo sostava v vuze. *Innovatsionnoye razvitiye, (2)*, 120-121. https://elibrary.ru/item.asp?id=37164887

Thorne, K. (2003). *Blended learning: how to integrate online & traditional learning*. Kogan Page Publishers. https://books.google.com/books?hl=en&lr=&id=xkBMgdG9up8C&oi=fnd&pg=PR9&dq=hybrid+learning+space%E2%80%9D+(Thorne,+2003&ots=fQkliJmP7W&sig=f1g5E4AaAhDqVu9HefrReWlZvBo

Tomej, K. (2022). Learning motivation of university students in online and classroom teaching: Insights from teaching during Covid-19. *Teaching & Learning Inquiry*, *10*. https://doi.org/10.20343/teachlearninqu.10.35

Tomlinson B., & Whittaker C. (2012). Learning in English Language Teaching: Course Design and Implementation. British Council

Wardani, S., Nurhayati, S., & Safitri, A. (2016). The effectiveness of the guided inquiry learning module towards students' character and concept understanding. *International Journal of Science and Research (IJSR)*, *5*(6), 1589-1594 https://www.academia.edu/download/108511687/2afa6d1dd1d4d7387519e02cc8dfe72848de.pdf

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CHALLENGES AND INFLUENCES ON THE OTHER HALF OF THE PICTURE OF THE TEACHER'S IDENTITY

Abstract

This article provides valuable insights into the professional identity of modern teachers. The actual problem of a modern teacher is his professional image, which ensures the status of a teacher in society. The article reveals the meaning of the concept of "image", the history of the origin of the term, and its introduction as a phenomenon of social expression. The role and importance of developing the professional image and its components in the modern education system are considered. This study answers three research questions about the role of the image in the teacher's professional activity, what is the teaching nature of the other half of the image, and how self-esteem in the educational process affects the development of a professional personality. It aims to integrate and synthesize the research findings presented for a comprehensive understanding of the topic. Research findings suggest that teacher professional identity can provide valuable insights into the long-term development and adaptation of professional identity in response to changing educational landscapes and societal expectations.

Keywords: teacher image, students, education, professional training, personality.

Basic provisions. The professional identity of a modern teacher is a complex and multifaceted concept that includes various aspects of a teacher's role, vision, and responsibility. The professional personality of a modern teacher is a dynamic and multifaceted structure influenced by various internal and external factors. This literature review highlights the key components, challenges, and support systems related to professional identity. There are opportunities for further exploration and a deeper understanding of the "other half of the picture" in the context of professional identity development for contemporary teachers.

Introduction. It is obvious that the opinion of society influences a person's status in society, be it an assessment of his personality or an idea of him as a professional, in a particular case, a teacher, an employee of the education system, as the main figure who is visible to other people. The concept of "image" has been considered by specialists from various fields for half a century in search of a specific and more accurate description of its essence. Thus, the American sociologist Lippmann (1922) formulated a definition of the term "image", calling it a set of ideas that have developed in public opinion about how a person should behave following his status. In the modern world, it is very important to have your place in society and to fulfil a social as well as a professional role (Sadykova et al., 2024; Elewxanova et al., 2022). Image translated from English means representation or visual attractiveness of a person. Consequently, a general definition that may fit our view is that: "Teachers' Professional Identity is the perception that teachers have of themselves at a present time" or the answer to the question: "Who am I as a teacher at this moment?" (Beijaard et al, 2004). This present image consists of a conscious understanding of his/her professional self (Karaolis & Philippou, 2019).

A person is made up of his development and consciousness. Man is an individual, he is a part of nature, and unlike other living creatures, he has consciousness and is different. As a self-

aware subject, he knows not only those around him but also himself in his relationships. Through these factors, development processes take place (Rubinshtein, 2012). Cruess et al., (2019, p. 641) defined a professional identity as "attitudes, values, knowledge, and skills of a person that collectively define a profession". The authors emphasize the importance of understanding the various components of professional identity, including the cognitive, metacognitive, emotional, and behavioural aspects that shape a teacher's professional identity.

What kind of social roles an individual can play is determined by his specific identity, status, and function in the social division of labour. Role determination is an important prerequisite for role-playing. Therefore, the role of teachers is essentially a concept that emerges with the evaluation of the identity, status, and function of the professional group of teachers in society as a whole. It implies that the social professional division of labour has certain role expectations and expectations for the teacher group: Role requirements (Wang, 2023). Teachers cherish their professional reputation and have basic self-esteem to avoid conflicts. The educational power of a teacher often lies in the "model" he "shows" in the classroom: what is dignity, what is conscience, what is education, what is politeness, etc. (Wu, 2022).

Main part. Several studies have identified essential features of teachers' professional identity. Hong (2010) suggests that four essential features can be derived from previous studies, although the specific features are not mentioned in the provided research insight. These features likely play a crucial role in shaping teachers' professional identity. The development of student teachers' professional identity has been a focus of research. Lamote and Engels (2010) observed a shift in students' task orientation during the first year of their course, indicating the evolving nature of professional identity during teacher education. Reflective activities, learning communities, context, and prior experiences have been identified as the main foci of research on student teachers' identity (Luo & Lim, 2024; Ghiasvand, Kogani, & Nemati, 2023).

The literature review shows that various internal and external factors affect the formation of the teacher's professional personality. For example, a study by Cruess et al., (2019) shows the influence of personal experiences, role models, and socialization processes on the formation of a teacher's professional identity. In addition, research findings from the same study suggest that teachers may have difficulty reconciling their personal beliefs and values with the expectations and demands of the teaching profession, which may affect their professional identity development. Furthermore, the influence of external factors on teachers' professional identity has been investigated. The Advanced Skills Teacher grade has been found to contribute to a teacher's sense of professional identity and status (Timostsuk & Ugaste, 2012). On the other hand, neo-liberal pressures on education have brought adverse impacts on teachers' professional identity in Hong Kong (Tsybulsky & Muchnik-Rozanov, 2019).

It is worth noting that teachers' professional identity is not always aligned with their subject area (Sengul, 2024). For example, current high school teachers teaching computer science courses may not necessarily identify themselves as computer science teachers (Xu, 2013). This highlights the complexity of professional identity formation and the need for further exploration in different educational contexts. Although the provided research insights offer valuable contributions to understanding teachers' professional identity, there are still knowledge gaps that warrant further investigation. For instance, the specific essential features of teachers' professional identity, as identified by Hong (2010), need to be explicitly stated and explored in future research. Additionally, more research is needed to understand the impact of various factors, such as cultural and contextual influences, on teachers' professional identity. Teachers' professional identity is a complex construct that encompasses various dimensions and is influenced by multiple factors.

Mentoring and support systems play a crucial role in the formation and education of the professional personality of teachers. According to Cruess et al., (2019), mentoring programs

that provide opportunities for guidance, feedback, and reflection can positively impact teacher professional development. The study highlights the importance of creating supportive environments that help teachers explore and assert their professional identity.

Research methods and materials. This study aims to explore and synthesize the existing research findings on the professional identity of a modern teacher, with a focus on the "other half of the picture" – aspects of professional identity that may be overlooked or underrepresented in the literature. The secondary data on the professional identity of a teacher, the image of a modern teacher from the other half side, and the influence of self-esteem on professional development are analyzed during the study process to answer the following research questions:

1. What is the role of image in the professional activity of a teacher?

2. What teaching character does the other half of the picture have?

3. How does self-esteem influence the development of a professional personality during the educational process?

Research results and discussions. *Role of image in the professional activity of a teacher.* What is the definition of the image of a teacher? Yu believes that "the so-called teacher image, simply put, is the demeanour and behavior that teachers display in professional activities such as education and teaching, governed by certain ideological concepts and moral sentiments, and based on certain cultural literacy and professional skills (Yu, 2003); however, scholars Li and Luo (2000) believe that "the image of a teacher refers to the general impression caused by the impact of a teacher's behavior on others in a certain social situation". Therefore, the image of teachers can be defined as the external manifestation of teachers' comprehensive qualities in educational and teaching activities, as well as social life, and the impression or evaluation formed in people's minds. The external performance of teachers can transcend the internal level through certain modifications, such as hairstyle, clothing, and deportment, among other things, to achieve a certain

aesthetic level recognized by society. At the beginning of the teacher-student relationship, the understanding between teachers and students determines the establishment of the teacher-student relationship. What is particularly important is that being recognized by dozens of students is an important basis for teachers to implement educational policies, implement educational content, and complete teaching plans. Therefore, leaving a good first impression on students is the beginning of establishing a good teacher-student relationship. At the same time, teachers must also maintain a good image, which is an important aspect of maintaining a good teacher-student relationship (Yu, 2012).

In public understanding, image is a set of stereotypical characteristics that make up a full-fledged image inherent in a particular company, institution, profession, or person. An image is a view, an appearance, a figure, or a portrait, associated with time. However, it would not be entirely correct to classify only the external image and characteristics as an image. In modern culture, an "image" is generally considered to be an emotionally charged image of someone or something that has developed in the mass consciousness and has the character of a stereotype. The teacher is the central figure of the pedagogical process and the object of attention of different social groups such as students, parents, and administration of the educational institution, among others. The opinion of others about his personal and professional qualities will shape the very image of him. At the same time, to form the image of a teacher, it should be considered that the image consists of three components external, internal, and procedural components.

In many countries, the teaching profession struggles with image improvement and accountability requirements (Whalley et al., 2021). For example, the central mission of teacher education in Finland has been a research-oriented approach to teaching which will enhance teachers (Westbury et al., 2005). In Finland policy-makers are influenced by notions of 'teacher empowerment' while in England they try to raise standards and 'commercialized professionalism' (Whalley et al., 2021). In

addition, classroom management and discipline issues are the major areas in which novice teachers commonly report having little or no necessary practical skills and needing additional training and support (Abutalip et al, 2023). Moir (1990) reports about six developmental phases a new teacher goes through during his/her initial years in teaching, namely, anticipation, survival, disillusionment, rejuvenation, reflection, and anticipation.

The role of pedagogical image in the modern education system occupies an important position. Teachers' expectations are influenced by the experience and knowledge they acquire during their education in the teaching profession, as during this period teachers begin to build their professional image of themselves as teachers. Many authors emphasize the importance of quality education in shaping expectations and the idea of their role.…" (Makovec, 2018): This is because the pedagogical image is the result of a dynamic system that requires constant development. Professional image is an essential component of teaching excellence and also ensures the process of professional socialization through presenting oneself to society, establishing contact with students, and demonstrating one's creative nature. This research demonstrated that there was no single image of the ideal university teacher, nor is there an image of a static collection of characteristics. Ideals or possible selves, similar to identity, are dynamic and their origins and longevity are influenced by personal goals, interactions, and outcomes that occur within a relevant environment (Hamman et al., 2010).

The idea of an image can change as teachers' professional identities develop over time and through teaching experience. Consequently, in the development of the teacher's professional identity, an analysis of the existing actual self and the imagined ideal self through reflection plays a major role. Therefore, from the aspect of studying the development of professional identity, it is essential to investigate the image of an ideal teacher that helps to understand the dynamics of the developmental process of the teacher (Beauchamp & Thomas, 2010; Lavrinenko et al., 2019).

A teacher has to be mature enough to know what is right and what is wrong. It is important, therefore, for the different stakeholders to reinforce teacher professional ethics, to protect the learners and the image of the profession (Walters et. al., 2017). Despite the use of various conceptualizations in these studies, the analysis of available instruments revealed six domains representing the set of meanings for teacher identity among 59 components in 20 different studies:

- motivation (Why am I teaching);
- self-image (How do I see myself as a teacher);
- self-efficacy (How capable do I believe I am to organize and perform my daily teaching activities);
- task perception (What is my task as a teacher);
- commitment (How committed am I to the profession);
- job satisfaction (How satisfied am I with my job).

Based on the above teacher identity construct, Hanna et. al., (2020) conducted a follow-up study to design and validate the Teacher Identity Measurement Scale for assessing primary student teachers' professional identity, focusing on the first four of those six domains. Hanna et. al., (2020) suggested that empirical research on teacher identity could focus on specific domains underlying this complex construct.

Teaching the character of the other half of the picture. The concept of "Teaching the character of the other half of the picture" aims to explore the importance of sharing parts in one-shot learning. One-shot learning refers to the ability to learn and recognize new concepts or objects with only a single exposure or limited training data (Lake et al., 2011). Psychological mass persuasion is effective in influencing people's behavior (Sapkota et al., 2015). This finding is relevant to the concept of teaching the character of the other half of the picture as it suggests that by strategically targeting and persuading individuals, it is possible to shape their behavior and beliefs. By understanding the psychological mechanisms behind persuasion, educators can design effective teaching strategies that

promote the sharing of parts and enhance one-shot learning.

Sokatch (2017) at a local TEDx conference provides an insight into what education today's youth can achieve. Cognitive education such as test scores and basic knowledge in reading, writing, and math, and students cannot have proper and complete knowledge. Educating learners about behavior is important. Life skills such as persistence, self-control, courage, and humour are important life skills for successful employment, marriage, and for fulfilling civic duties: They prompt the reflection on what it means to be a good teacher and pose issues regarding the calibre of teachers. In addition to providing a high-quality education to all students, building good life skills is a teacher's responsibility (Sokatch, 2017).

There are many opportunities in education for students to develop hope, justice, humour, courage, gratitude, and many other potentials that lead to a happy life. For many teachers, this is a natural extension of their job (Price-Mitchell, 2019). For example, when teaching linguistics to students, character can be taught by teaching vocabulary; such vocabulary should be connected with life situations and connected with academic tasks in the context.

The famous Russian educator Shensky said: "The personality of a teacher is everything in educational work." "Only when you are committed to self-education, can you educate others". Education shoulders the important task of cultivating students, which first requires teachers to have noble moral cultivation, correct outlook on life and values, and make contributions to students in terms of a sense of responsibility, professionalism, work attitude, thoughts and emotions, philosophy of life, moral cultivation, to mention a few (Zhao, 2007).

Teachers should also pay attention to the classroom atmosphere since human memory and stress are interrelated with each other during the learning process. The effects of stress are complex; stress may enhance or degrade human memory, depending on the specific memory process or stage affected by the stress and a person's personality (Vogel & Schwabe, 2016; Kosherbayeva et al., 2024). Good memory is important for storing new knowledge in the classroom for students. It turns short-term memories into long-term ones (Cherry, 2020). Figure 1 shows how long-term memory formation can occur through processes such as establishing links between new information and older information. This integration process is widely known as consolidation. Rehearsal refers to repeating the same information to keep it from short-term to long-term memory by practicing new skills (McGaugh, 2000). Teaching and learning should be brain-friendly.
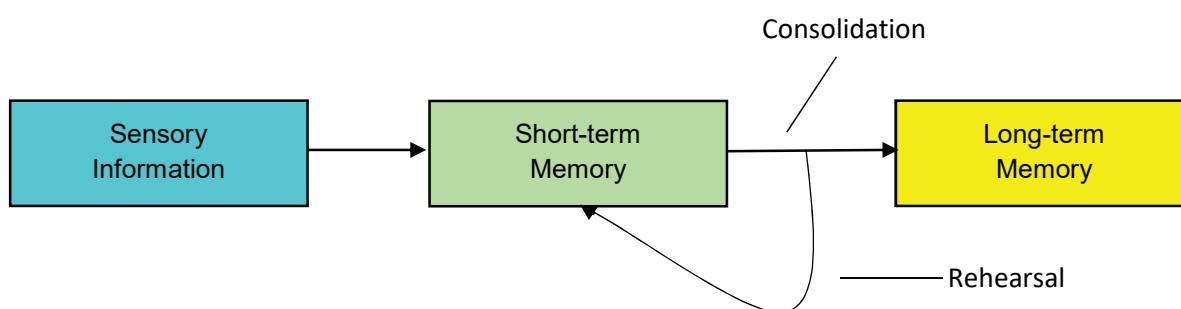
Figure 1: From Short-term Memory to Long-term Memory

Beginning teachers often encounter tension and negative emotions during their professional identity development (Timostsuk & Ugaste, 2012). These tensions may lead to feelings of helplessness, anger, or an awareness of shortcomings. Negative emotions have been found to exert the strongest influence on the professional identity of student teachers (Abednia, 2012).

Influence of self-esteem on the development of a professional personality. Self-esteem, defined as an individual's overall evaluation

of their self-worth, plays a crucial role in the development of a professional personality. Research has shown that self-esteem undergoes a developmental trajectory throughout the lifespan. It increases from adolescence to middle adulthood, reaches its peak around the age of 50, and then gradually decreases in old age (Semanticscholar.org). This finding suggests that self-esteem is not a static trait but rather a dynamic construct that evolves.

The formation of professionalism of an employee is directly related to the development of a person. Professional self-esteem is one of the important factors in professional development. The psychological aspect of the study of the problem of self-awareness includes the discovery of the specificity of self-awareness as a special phenomenon of the human psyche aimed at self-regulation of human behavior and activities in the sphere of activity. The development of a professional person is often influenced by the attitude towards the profession, as well as towards oneself, abilities, aptitudes, and professional qualities. By calculating such various factors, the process

of determining the level of self-esteem of future specialists took place. For this, emotional states of self-esteem are at a sufficient level, a simple questionnaire, a methodology developed by American psychologists Wessman and Ricks (1966) was used (Table 1).

It should be noted that in this case the abbreviated version is presented. The survey consists of 4 questions, each of which must be answered one time. The questionnaire was conducted among 15 future specialists of Abai Kazakh National Pedagogical University in October 2023. They are majoring in pedagogy and psychology faculty in third-grade bachelor's degree. As a result of the questionnaire: 24-32 points came out. This means that the subject overestimates his emotional state. Among them: according to the "Calmness-anxiety" scale – there was a large number of people who scored 5-6 points and showed an average level. It was at an average level on the "Energy-fatigue" scale. "Elation-depression" showed a moderate to high level on the scale. "A feeling of self-confidence feeling of helplessness" appeared on the medium to high scale.

Table 1. *Self-assessment of emotional states by Wessman & Ricks*

Calmness – anxiety (P1)	6
Energy – fatigue (P2)	7
Elation – depression (P3)	6
A feeling of self-confidence feeling of helplessness (P4)	7
Total score (P5)	26

If the sum of points is from 26 to 40, then the subject evaluates his emotional state as high, if from 15 to 25, then the emotional state is average, and if from 4 to 14, it is low. In general, the emotional state is a description of human emotions, which reflects the position of environmental objects. The situation can be observed both externally and internally. The internal state of emotions as an organism as a whole, like its parts, is established by the consciousness of the subject at a certain time of well-being (discomfort). Externally, the assessment of the state of emotions is recorded by the Subject's statements on certain signs. The human condition acts as a regulatory function of adaptation to the environment or situation.

As a result of the questionnaire, it was found that future professionals' emotional states are average, and self-esteem is also at an average level. Interestingly, a professional with high self-esteem always tends to make thoughtful, balanced, and independent decisions. When making decisions, they rely on their life experience and their own opinion and have specific life positions and value orientations. Experience analysis shows that professionals with high self-esteem are better off than their colleagues with low self-esteem.

Self-esteem plays a crucial role in the development of a professional personality. It undergoes a developmental trajectory throughout the lifespan and has significant

effects on various life outcomes, including affect, depression, relationship and job satisfaction, and overall well-being. While the influence of self-esteem on health and occupational status may be relatively small, it has a significant impact on real-world life experiences. Future research could further explore the mechanisms through which self-esteem influences professional personality development and identify additional factors that interact with self-esteem to shape individuals' outcomes in different life domains.

Conclusion. Summarizing all of the above, it can be concluded that a modern teacher, first of all, must be a formed personality, and identify himself as a professional in his field. At the same time, the teacher can develop his characteristics, fully realize himself in professional activities, achieve effective fulfilment of his learning goals, and organize educational cooperation and pedagogical communication. To do this, it is crucial to be aware of professional and personal qualities and strive to improve them, working on the image of a person. A teacher who is engaged in creating his image, as a rule, is not only attractive externally but also blossoms internally. He is more confident in himself, his knowledge, and his competence, and this is an indicator of successful work and achievement of career heights. All this, of course, can be accomplished based on a personal-activity approach to learning, which meets the requirements that the modern stage of educational development places on the learning process and the teacher himself. Professional self-esteem is not a constant value, because it is dynamic and changes under the influence of various factors, life situations, and environmental conditions. Therefore, it should be monitored during professional activity. Teachers' professional identity is a multifaceted construct influenced by various factors and experiences. The existing research provides insights into essential features, the role of teachers, the impact of external factors, and the challenges faced by beginning teachers.

Recommendations. Several knowledge gaps require further investigation. One potential area of future research is to examine the intersectionality of professional identity, particularly concerning factors such as gender, race, and cultural background. Further research is needed to fill knowledge gaps and explore the specific features of professional identity, the influence of cultural and contextual factors, and the role of reflective practices and learning communities in identity development. Educators should make character education a part of their academic syllabus. Positive relationships as the cornerstone of education and healthy youth development should take place for the development of the students' character in the classroom. Understanding and supporting teachers' professional identity is crucial for enhancing teacher well-being and promoting effective teaching practices.

References

Abednia, A. (2012). Teachers' professional identity: Contributions of a critical EFL teacher education course in Iran. Teaching and teacher education, 28(5), 706-717. https://www.sciencedirect.com/science/article/pii/S0742051X12000406

Abutalip, D., Yesbossyn, M., Pertiwi, F. D., Suleimen, S. B., & Kassymova, G. K. (2023). Career guidance for Generation Z: modern methods of professional orientation in a stress Period. Challenges of Science. –2023.– Issue VI, 15-21. DOI: 10.31643/2023.02

Beauchamp, C., & Thomas, L. (2010). Reflecting on an ideal: Student teachers envision a future identity. Reflective Practice, 11(5), 631-643. https://www.tandfonline.com/doi/abs/10.1080/14623943.2010.516975

Beijaard, D., Meijer, P. C., & Verloop, N. (2004). Reconsidering research on teachers' professional identity. Teaching and teacher education, 20(2), 107-128. https://www.sciencedirect.com/science/article/pii/S0742051X04000034

Cherry, K. (2020). How consolidation turns short-term memories into long-term ones. Very well mind.

Cruess, S. R., Cruess, R. L., & Steinert, Y. (2019). Supporting the development of a professional identity: general principles. Medical teacher, 41(6), 641-649. https://www.tandfonline.com/doi/abs/10.1080/0142159x.2018.1536260

Elewxanova, S. V., Jumabekov, J. A., & Wtebaeva, A. D. (2022). 1946-1970 jj. Ortalıq Qazaqstan qalalarınıñ ustazdarınıñ kündelikti ömiri. Qarağandı wnïversïtetiniñ xabarşısı Tarïx. Fïlosofïya serïyası, 107(3), 51-56. https://doi.org/10.31489/2022hph3/51-56

Ghiasvand, F., Kogani, M., & Nemati, F. (2023). "Teachers as conflict managers": mapping novice and experienced Iranian EFL teachers' professional identity conflicts and confrontation strategies. Asian-Pacific Journal of Second and Foreign Language Education, 8(1), 45. https://doi.org/10.1186/s40862-023-00219-z

Hamman, D., Gosselin, K., Romano, J., & Bunuan, R. (2010). Using possible-selves theory to understand the identity development of new teachers. Teaching and teacher education, 26(7), 1349-1361. https://www.sciencedirect.com/science/article/pii/S0742051X10000454

Hanna, F., Oostdam, R., Severiens, S. E., & Zijlstra, B. J. (2020). Assessing the professional identity of primary student teachers: Design and validation of the Teacher Identity Measurement Scale. Studies in Educational Evaluation, 64, 100822. https://www.sciencedirect.com/science/article/pii/S0191491X19301142

Hong, J. Y. (2010). Pre-service and beginning teachers' professional identity and its relation to dropping out of the profession. Teaching and Teacher Education, 26(8), 1530-1543. https://www.sciencedirect.com/science/article/pii/S0742051X10000831

Karaolis, A., & Philippou, G. (2019). Teachers' Professional. TRAMES, 18(68/63), 327-344.

Kosherbayeva, A. N., Issaliyeva, S., Begimbetova, G. A., Kassymova, G. K., Kosherbayev, R., & Kalimoldayeva, A. K. (2024). An overview study on the educational psychological assessment by measuring students' stress levels. Cakrawala Pendidikan: Jurnal Ilmiah Pendidikan, 43(1), 1-18.

Lake, B.M., Salakhutdinov, R., Gross, J., Tenenbaum, J.B. (2011). One-shot learning of simple visual concepts. Cognitive Science, 33.

Lamote, C., & Engels, N. (2010). The development of student teachers' professional identity. European journal of teacher education, 33(1), 3-18. https://www.tandfonline.com/doi/abs/10.1080/02619760903457735

Lavrinenko, S. V., Arpentieva, M. R., & Kassymova, G. K. (2019). The negative impact of the Internet on the educational process. In AIP Conference Proceedings, 2135(1), AIP Publishing. https://pubs.aip.org/aip/acp/article-abstract/2135/1/020034/786528

Li, Ch., & Luo, M. (2000). The quality and image of teachers[M]. Sichuan Education Press, 26.

Lippmann, W. (1922). Public Opinion. New York: Harcourt, Brace.

Luo, W., & Lim, S. Q. W. (2024). Perceived formative assessment and student motivational beliefs and self-regulation strategies: a multilevel analysis. Educational Psychology, 1-19. https://doi.org/10.1080/01443410.2024.2354686

Makovec, D. (2018). The Teacher's Role and Professional Development. (IJCRSEE) International Journal of Cognitive Research in Science, Engineering and Education, 6(2), 33–46.

McGaugh, J. L. (2000). Memory a century of consolidation. Science, 287(5451), 248-251. https://www.science.org/doi/abs/10.1126/science.287.5451.248

Moir, E. (1990). Phases of first-year teaching. Originally published in California New Teacher Project Newsletter.

Price-Mitchell, M. (2019). Character Education: What Good Teachers Do Best. https://www.rootsofaction.com/character-education/

Rubinshtein, S.L. (2012). Fundamentals of general psychology, Sankt-Peterburg: Piter, 713.

Sadykova, A., Al'zhanova, A., Suleymenova, ZH., & Kochkonbayeva, S. (2024). Sotsial'noye Partnerstvo Kak Element Modernizatsii Obrazovaniya: Keys Stadi Kyrgyzstana I Kazakhstana. Vestnik Oshskogo gosudarstvennogo universiteta, (1), 108–119. https://doi.org/10.52754/16948610_2024_1_10

Sapkota, U., Bethard, S., Montes, M., & Solorio, T. (2015). Not all character n-grams are created equal: A study in authorship attribution. In Proceedings of the 2015 conference of the North American chapter of the Association for Computational Linguistics: Human Language Technologies, 93-102. https://aclanthology.org/N15-1010.pdf

Sengul, O. (2024). Learning to Become a Physics Teacher: A Case Study of Experienced Teachers. Education Sciences, 14(2), 195. https://doi.org/10.3390/educsci14020195

Sokatch, A. (2017). Toward a research agenda: Building character strengths in school settings. Journal of youth and adolescence, 46, 1238-1239. https://link.springer.com/article/10.1007/s10964-017-0657-9

Timoštšuk, I., & Ugaste, A. (2012). The role of emotions in student teachers' professional identity. European Journal of Teacher Education, 35(4), 421-433. https://www.tandfonline.com/doi/abs/10.1080/02619768.2012.662637

Tsybulsky, D., & Muchnik-Rozanov, Y. (2019). The development of student-teachers professional identity while team-teaching science classes using a project-based learning approach: A multi-level analysis. Teaching and Teacher Education, 79, 48-59. https://www.sciencedirect.com/science/article/pii/S0742051X17321273

Vogel, S., & Schwabe, L. (2016). Learning and memory under stress: implications for the classroom. npj Science of Learning, 1(1), 1-10. https://www.nature.com/articles/npjscilearn201611

Walters, S. J., dos Anjos Henriques-Cadby, I. B., Bortolami, O., Flight, L., Hind, D., Jacques, R. M., ... & Julious, S. A. (2017). Recruitment and retention of participants in randomized controlled trials: a review of trials funded and published by the United Kingdom Health Technology Assessment Programme. BMJ open, 7(3), e015276. https://bmjopen.bmj.com/content/7/3/e015276.abstract

Wang, Z. (2023). Teacher image: connotation, characteristics, and research significance. Education and Teaching Research, 37(07), 75-91. https://doi.org/10.13627/j.cnki.cdjy.2023.07.004

Wessman A. and Ricks D. (1966). Self-assessment of emotional states. https://onlinetestpad.com/ru/test/1033-metodika-samoocenka-emocionalnykh-sostoyanij

Westbury, I., Hansén, S. E., Kansanen, P., & Björkvist, O. (2005). Teacher education for research-based practice in expanded roles: Finland's experience. Scandinavian Journal of Educational Research, 49(5), 475-485. https://www.tandfonline.com/doi/abs/10.1080/00313830500267937

Whalley, B., France, D., Park, J., Mauchline, A., & Welsh, K. (2021). Towards flexible personalized learning and the future educational system in the fourth industrial revolution in the wake of Covid-19. Higher Education Pedagogies, 6(1), 79-99. https://doi.org/10.1080/23752696.2021.1883458

Wu, F. (2022). Teachers should have professional self-esteem. Educator, (07), 37.

Xu, H. (2013). From the imagined to the practiced: A case study on novice EFL teachers' professional identity change in China. Teaching and Teacher Education, 31, 79-86. https://www.sciencedirect.com/science/article/pii/S0742051X13000097

Yu, F. (2003). On the role of teacher image in teaching and educating people. Journal of Shengli College of China University of Petroleum, (3), 23.

Yu, J. (2012). On the role of teachers' good appearance in establishing teacher-student relationships. Educational Science, 28(02), 27-30.

Zhao, Sh., & Li, Y. (2007). A brief discussion on the educational role of teacher image. Consumer Guide, (03), 108.

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METHODOLOGY FOR DEVELOPING CHEMISTRY TEACHERS' FOREIGN LANGUAGE PROFESSIONAL COMMUNICATIVE COMPETENCIES

Abstract

This study's significance lies in its the need to develop foreign language professional communicative competence (FLPCC) of non-linguistic university students and the exploration of ways to achieve it. Developing FLPCC embodies not only speaking fluently in a foreign language in the professional field but also enhancing linguistic and communicative skills alongside subject knowledge. The purpose of this research is to identify effective methods and approaches for fostering fluent communication skills within the context of teaching chemistry in English. Analysis of the diverse methods of developing FLPCC enables us to reveal the components of this competence and create a set of exercises based on Kunanbaeva's modelling. To evaluate the effectiveness of this set of exercises used in class organization, diagnostic monitoring was conducted. The findings obtained from the final exam revealed that the students enhanced their

professional communicative skills, expanded their vocabulary, and were motivated to further develop their linguistic skills. These research findings are beneficial for young scientists, teachers, and students conducting research in this field.

Keywords: competency, communicative competence, foreign languages, non-linguistic university, chemistry, language skills.

Basic provisions. In recent years, the requirements for foreign language proficiency have increased to expand opportunities for educational exchange in accordance with higher education standards. One of the key functions of modern pedagogical universities is to train professionals capable of communicating in a foreign language fluently in their professional field. However, there is often little focus on fostering communicative skills in the teaching of chemistry and other natural subjects. Most teaching materials contain scientific data and uncomplicated assignments. To address these issues, this study is based on a communicative approach. The key idea of this research is to identify and assess the effectiveness of the lesson organization methodology for fostering fluent English communicative skills in the context of teaching chemistry.

Introduction. Multilingualism is one of the relevant issues not only in our country but worldwide, as comprehending multiple languages enables the expansion of international relations for any nation. In the rapidly advancing technological era, Kazakhstan's international relations with foreign countries are growing daily, raising the demand for specialists proficient in foreign languages.

Today, the key issue emphasized in the President's Address is the education and upbringing of competitive professionals who are proficient in three languages, meeting the needs of modern society. In his address titled "Unity of the People and Systemic Reforms are a Solid Foundation for the Nation's Prosperity", Kassym-Jomart Tokayev highlighted the significance of scientific research and education. Moreover, during an assembly council meeting, the Ministry of Science and Education was authorized to study the practice of multilingualism on each continent and integrate it into the local education system (Tokayev, 2021).

One of the main reasons for conducting this research is the lack of chemistry textbooks designed to develop foreign language professional communicative competence (FLPCC). Existing natural science textbooks and materials in foreign languages are described by general scientific texts. Modern textbooks should contain a sufficient number of exercises to develop several types of speech activities for students. Therefore, the paper focuses on the exploration of the effective methods for teaching chemistry in a foreign language at the university and to development of a set of exercises aimed at enhancing students' FLPCC and testing it in practice.

Main part. When analysing the findings of research methodologies, Oleynikova (2010) concluded that the main goal of teaching a foreign language in non-linguistic faculties is to promote the acquisition of FLPCC. This facilitates the implementation of intercultural professional communication by selecting effective communication methods. Moreover, the researcher identified empirical, linguistic, pragmatic, and traditional methods of grammar data selection. Among diverse criteria and principles, the idea of evaluating the communicative objectives of foreign language learning is particularly significant. Oleynikova (2010) highlights that specifics of the professional activities should be taken into account in the development of FLPCC of non-linguistic faculty students. In this context, future chemist training requires focusing on the intricacies of the chemical industry, technology, production, and laboratory work organization.

Pustovalova (2013) views the development of foreign language communicative competence (FLCC) among non-linguistic university students as the basis for using interdisciplinary communication within the framework of professionally oriented learning (POL). This approach provides that perspective specialists

are capable of solving communicative tasks related to their future professional activity. The conceptual framework of students' FLCC under POL comprises groups of linguistic and linguistic professional competencies that determine the acquisition of both oral and written foreign languages. In other words, linguistic, speaking, and foreign language (FL) abilities include professional and intercultural skills. Pustovalova (2013) also identifies motivational, content, and activity indicators as criteria for developing FLCC under POL. Pustovalova (2013) defines the motivational indicator as the perspective specialist's readiness for self-improvement and enhancing the experience within their field. The content indicator includes mastering FL by state education standards and the ability to comprehend professionally oriented information. The activity indicator involves developing foreign language competence and the ability to apply it in the process of practice in a professional context (SNS, 2024; Sorayyaee et al., 2022). In addition, the researcher considers the use of integrated technology, organizational methods, forms, and teaching tools in the teaching process as one of the sets of pedagogical conditions essential for fostering students' FLCC in non-linguistic universities.

Petrova (2010) describes the pedagogical conditions for developing FLPCC based on communicative-cognitive, competency-based, and activity-oriented approaches. Organizational pedagogical conditions are reflected in the choice of effective teaching methods; content-related pedagogical conditions can be achieved through the provision of the educational-methodical complex and the utilization of didactic material designed in compliance with the curriculum. The scholar describes the use of case studies, problem-based learning, project methods, and modular learning technology in the teaching process as an example. Motivating pedagogical conditions enables students to engage in independent research in the subject area (Bonilla López et al., 2021). Petrova (2010) identifies the FLPCC components as linguistic, sociolinguistic, verbal-cognitive, professional, and discursive criteria, as depicted in Figure 1.
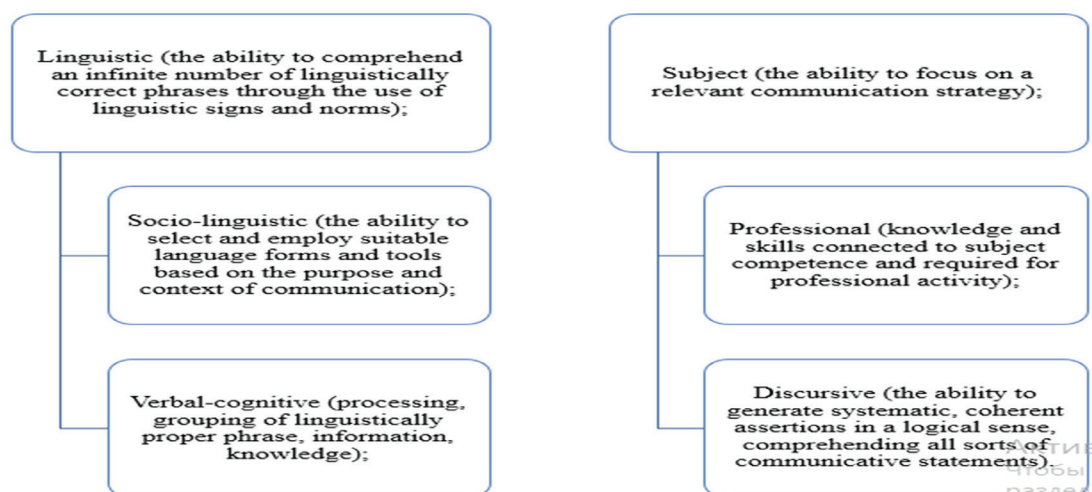
Figure 1: Components of FLPCC

The subsequent criteria for the development of FLPCC have been established in line with the proposed components: intellectual-cognitive, personality-motivational, reflective-evaluative, and activity-behavioural. According to research findings obtained by Shemshurenko et al., (2019), the communicative approach enables learners to enhance their cognitive abilities and become active participants in their learning process. Communicative pedagogy related to a foreign language suggests starting with exercises or hands-on activities. In a broader sense, practical activities in a structured learning process are essential to move from practice to theory, which proceeds with conceptualizing knowledge generated based on practical experience.

The scholars, Shemshurenko et al., (2019), believe that the FLPCC approach relies on active thinking processes and language creativity. Consequently, students create a unique linguistic environment and integrate the data acquired through analysis into their particular personality structure, which requires rules in real situations, passing from the individual to the general. Furthermore, the integrated information can be utilized for overcoming new linguistic or communication challenges at any moment. Self-learned knowledge lasts longer in students' memory and students can recall it on their own, even if it is forgotten or lost over time (Mohammed Idris et al., 2022; Shemshurenko et al., 2019). According to Cimermanova (2021), developing communication skills in a foreign language has been one of the key competencies of lifelong learning for centuries.

To summarize, in a communicative activity, students tackle communication challenges such as denying something, proving, identifying, agreeing, and more. They figure out what to say, how to construct a phrase, and which lexical units and grammatical structures to apply.

A comparative review of psychological, pedagogical, and methodological literature shows that FLCC is defined as students' readiness and competence to successfully engage in professional communication in all types of FL conversation. Furthermore, FLPCC is primarily focused on the objective of teaching languages, which is to ensure students' capacity and genuine readiness to communicate in foreign languages and reach the necessary level for practical application in their subsequent professional activities. This competence is developed through all types of speaking activities, diverse forms of work, and carefully chosen methods and technology.

Research materials and methods. Analysis, deduction, induction, synthesis, comparison, generalization, and diagnosis of scientific-pedagogical literature were conducted to theoretically and empirically substantiate the development of foreign language professional communicative competence (FLPCC) among prospective chemistry teachers and effective methods of teaching a foreign language (FL) at a non-linguistic university.

The analysis of foreign study findings allowed us to highlight three major features of the search and application of new technologies to enhance the level of FLPCC among non-linguistic students:

- investigating the educational system's demands in updating foreign language curricula and programs;
- determining the efficiency of the used technologies through practical implementation;
- researching attitudes of both students and teachers towards the technologies being used.

Even though the issue of developing and using new technologies for enhancing FLPCC of non-linguistic major students is widely discussed in foreign sciences, it should be acknowledged that the solutions that have been suggested are currently unable to be fully applied in the conditions of domestic universities. Teachers frequently emphasize the development of reading and translation skills, as non-linguistic students primarily need foreign language proficiency to obtain professionally important information. Speaking skills are frequently neglected.

Due to the limited number of FL courses in non-linguistic universities, it is vital to constantly seek ways to improve the effectiveness of teaching and enhance FLPCC among students. For instance, English is taught in non-linguistic universities to facilitate the strengthening of students' FL communication skills. However, the proficiency level achieved by the majority of students is insufficient for employment.

As shown in Figure 2, the components of FLPCC for the development of English-speaking abilities in chemistry students at universities have been identified.

Galkina (2018) believes that the process of continuous enhancement of professional and communicative competence will be relevant in addition to the formation of knowledge, qualifications, and skills (competencies) in the development process. Among the methods, forms, procedures, and technologies used for the development of professional and communicative competence, the following are distinguished: professional development,
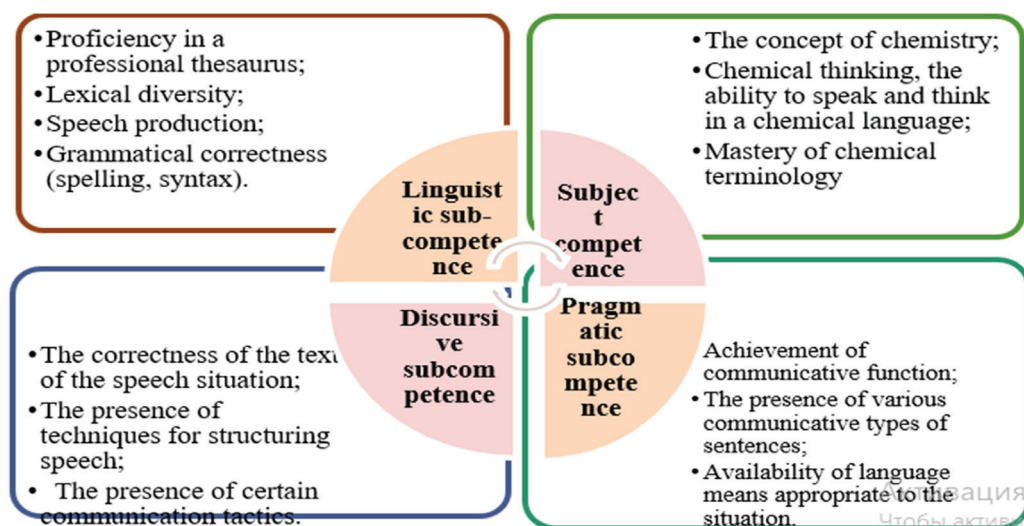
Figure 2: The components of FLPCC for chemistry students

aspects of problem-based learning, master classes, project methods, etc. The researcher suggests that professional-communicative competence can be realized through problem-solving and assignments. This strategy leads to the growth of mutual communication in the team and the improvement of international relations. One aspect of constructive student engagement is problem-based learning. During the lecture, students can be offered the following assignments: creating a list of key assignments, independently developing titles of the lecture topic, independently drawing conclusions based on the lecture materials, creating an information collage, organizing group work, discussing the solution to the problem, making

recommendations and presenting the obtained outcomes in the form of charts or tables.

Kunanbaeva (2005) developed a model of the formation of intercultural communicative competence (ICC) in her scientific work. She determined the organization of the learning procedure for the enhancement of communicative competence through context-oriented communi-cation, modelling of typical communicative situa-tions, and stages of intercultural communication.

Based on Kunanbayeva's model and the components of FLPCC illustrated in Figure 2, a set of exercises was developed for the "Organic Chemistry" course. As shown in Figure 3, students will acquire the following abilities through the completion of the entire set of exercises.
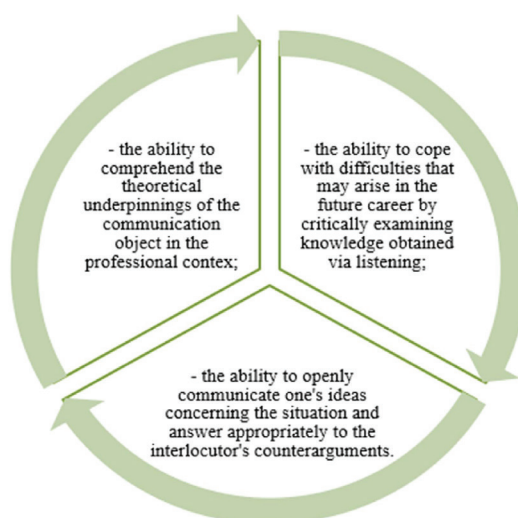
Figure 3: Student abilities are acquired through the completion of a set of exercises designed based on Kunanbayeva's Model

Taking into account the expert evaluations and the specifics of the conducted research, based on the examination of the theoretical rules, the criteria for assessing the level of chemistry students' FLPCC development according to the components illustrated in Figure 2 were identified (Figure 4).
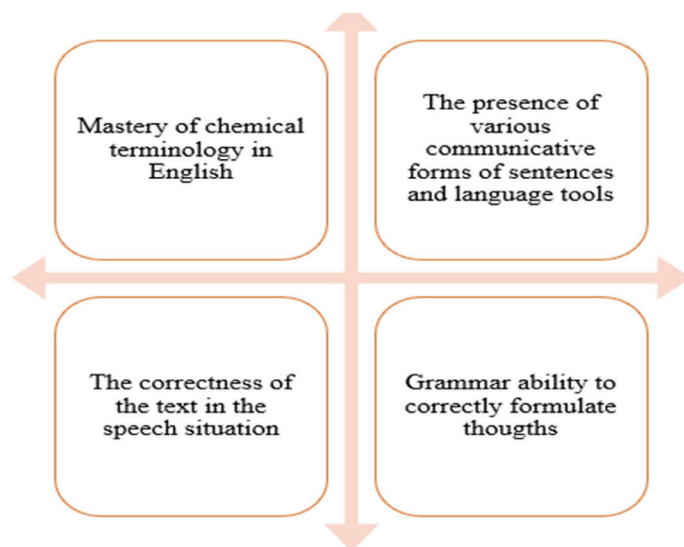
Figure 4: Criteria for assessing the level of FLPCC development in chemistry student

It was determined that the level of development of FLPCC of chemistry students is evaluated at high, medium, and low levels, taking into account the determined indicators of each criterion, depending on the above-mentioned components.

Results. The set of exercises has been tested for 3-year students from Ozbekali Zhanibekov South Kazakhstan Pedagogical University enrolled in the educational program 6B01504 Training of Chemistry Teachers. The number of experiment participants is 45.

The purpose of the experiment is to test the effectiveness of a set of exercises and to consider empirical research approaches that will enhance FLPCC for prospective chemists. The experiment was organized utilizing the principles and theories of scientists such as Biggam (2011) and Shashkov (2005).

The medium level of FLPCC development of the experimental group students indicates a high quality of required competence. Figure 5 shows the findings of pre- and post-experimental tests among control group students.

Before the experiment   After the experiment
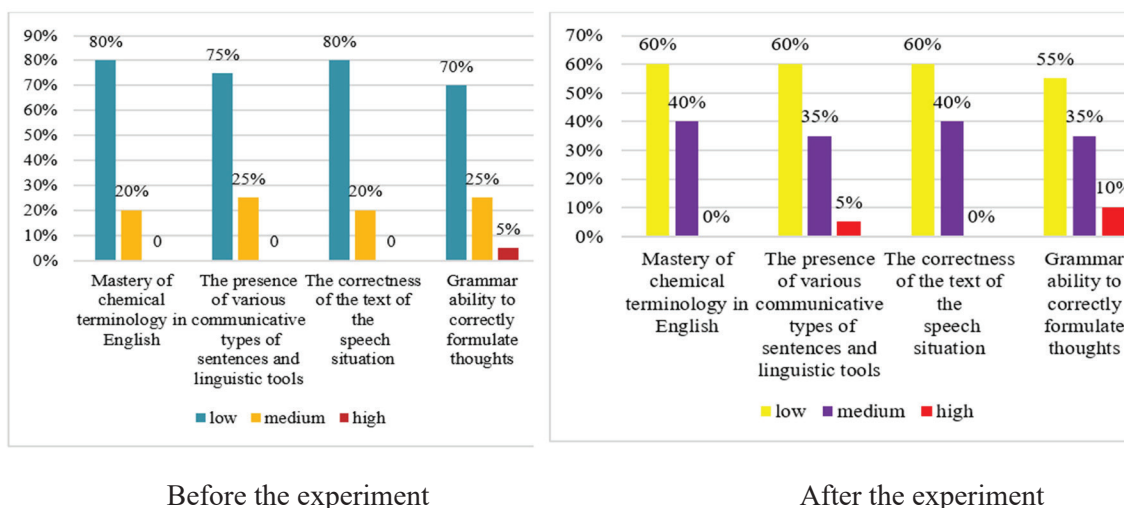
Figure 5: The findings of the pre-and post-experimental tests of the control group students

The graph depicts the findings of the level of FLPCC development in the control group students before and after the experiment.

According to the level of mastering chemical terminology in English, 20% of low-level students enhanced their scores. Based on the third criterion, 20% of low-level participants moved to a medium level, while 5% of low-level learners reached a high level, demonstrating their ability to express their thoughts adequately.

Figure 6 illustrates the pre-and post-test findings of the experimental group of students.
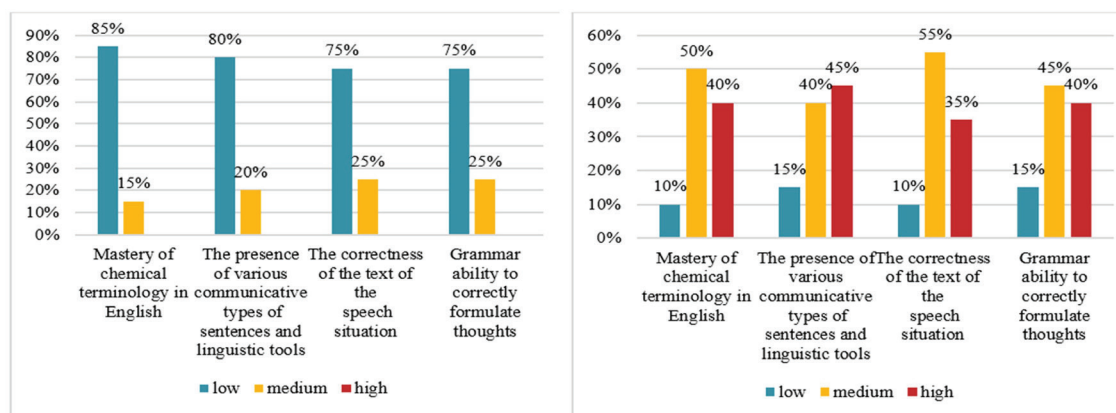
Figure 6: The findings of the pre-and post-experimental tests of the experimental group students

When assessing the participants in the experimental group based on all criteria, it was observed that their level was lower than expected, showing better performance during the experiment. In general, all criteria demonstrated notable improvement. The most significant changes were observed in the comprehension of chemical vocabulary in English.

According to the criterion "The presence of various communicative types of sentences and linguistic tools", the proportion of students with a high level increased from 0% to 45% during the test period, as shown in the graph. In addition, in terms of the correctness of the text of the speech situation, the percentage of participants at the low level decreased to 65%. Similarly, the number of high-level students increased to 40%, demonstrating their grammatical ability to correctly formulate their thoughts. These findings indicate positive results from the study.

Discussion. Jalal and Nawab (2022) explored the challenges of teaching chemistry In English to 7th-grade students in a private school in North Sindh, Pakistan. They assessed the current situation of both students and teachers, conducted the lesson, and during the experiment, demonstrated chemical concepts in English. They used group and pair work assignments to introduce students to content, communication, cognition, and culture. Initially, the students struggled to speak English despite the researcher's assistance. Although they knew some concepts, they could not comprehend them. Therefore, the researchers came to the conclusion that immediately immersing them in English is not an effective strategy. Further strategies and activities were needed to expand their vocabulary. However, due to limited attention to the content by both the researchers and the students, there was a fear of insufficient understanding of scientific concepts among students.

In our study, it was observed that the English proficiency level of the experiment participants was generally high, namely, students of the multilingual group. This is because the prepared set of exercises is intended for students studying chemistry in English. However, even if the level of English is intermediate or higher, it is necessary to master chemical terminology in English to speak a foreign language fluently within the content of the subject. Therefore, if we analyze the results of the experiment, we cannot state that insufficient time was spent on subject knowledge because all the assignments are related to the subject content text. On the contrary, we noticed that the

knowledge of chemistry increased due to performing exercises related to situational problems aimed at conducting independent research. Using video materials, we found out that information is remembered for a long time and can be remembered again in case of loss of consciousness. It can be seen from the results of the experiment that the step-by-step method of modelling in the lesson organization facilitates mastering the topic comprehensively. Compared to the research results mentioned above, we remarked that to achieve the goal of enhancing FLPCC, when using a set of exercises designed, it is essential to allocate at least 3-4 hours to cover one topic to get the expected outcomes.

In addition, if we conduct a comparative analysis, we can study the scientific work of Byrdina et al., (2020). The researchers proposed a model of FLPCC development based on integrated learning and evaluated it during the experiment. The research work assisted in improving the participants' FLPCC level and successfully mastering professional and communicative methods. It was effective in enhancing professional communication and FL skills. In addition, during the study, the researchers identified a lack of pedagogical and methodological materials by filling out a questionnaire of all teachers who conducted integrated learning classes (Byrdina et al., 2020). In our case, as a result of the research work, it was found that chemistry textbooks in English in Kazakhstan are not intended for communicative direction and there is a lack of educational tools in this direction.

Conclusion. Our country's global economic and academic sphere brought shifts through the processes of globalization, fostering a desire to live fairly and competitively in the social spheres. The ability to use FL in the professional field provides significant advantages in terms of expanding opportunities for international cooperation in the field of science and education, as well as full participation in international educational integration. One of the growing trends in the educational paradigm is the competency-based approach, which involves the development of a person's ability to use current knowledge and abilities to solve practical problems in the real world. The development of FLPCC is a prerequisite for the implementation of this methodology. In this direction, the nation is moving from the concepts of "ability" and "skill" to the concepts of "competence" and "competency". The demand for a competency-based approach stems from clarifying the purpose and outcomes of FL teaching in non-linguistic universities.

As a result, several objectives were performed during the research:

- the relevant issues of FLPCC development of non-linguistic university students have been described;

- FLPCC components and their indicators have been identified;

- a set of exercises has been developed based on the FLPCC components and Kunanbaeva's model;

- the evaluation criteria for the prepared set of exercises have been proposed;

- a set of exercises has been tested and analyzed.

The experience indicates that the prepared set of exercises enhanced the chemistry students' interest in learning, expanded their vocabulary, and developed professional speaking skills.

References

Biggam, J. (2011). *Succeeding with your Master's Dissertation: A step-by-step handbook.* New York: McGraw-Hill Education. https://www.academia.edu/5440117/Succeeding_with_Your_Masters_Dissertation

Bonilla López, M., Van Steendam, E., Speelman, D., & Buyse, K. (2021). Comprehensive corrective feedback in foreign language writing: The response of individual error categories. https://doi.org/10.17239/jowr-2021.13.01.02

Byrdina, O. G., Yurinova, E. A., & Dolzhenko, S. G. (2020). Formirovanie inoyazychnoj professional'no-kommunikativnoj kompetencii u studentov pedagogicheskogo vuza posredstvom CLIL. *Obrazovanie i nauka, 22*(7), 77-100. DOI:10.17853/1994-5639-2020-7-77-100

Cimermanova, I. A. (2021). Review of European Research on Content and Language Integrated Learning. *Integration of Education, 25*(2), 192-213. DOI:10.15507/1991-9468.103.025.202102.192-213

Galkina, E. N. (2018). Formirovaniye professional'no-kommunikativnoy kompetentnosti u spetsialistov industrii pitaniya i gostepriimstva. *Internet-journal 6*(3), 1-6. https://mir-nauki.com/PDF/09PDMN318.pdf

Jalal, S., & Nawab, A. (2022). The possibilities and challenges of using content and language integrated learning approach in a private sector school of Northern Sindh, Pakistan. *Cogent Education*, *9*(1), 2141966. https://www.tandfonline.com/doi/abs/10.1080/2331186X.2022.2141966

Kunanbaeva, S. S. (2005). *Sovremennoe inoιazychnoe obrazovanie: metodologiιa i teorii: monografiιa.* Almaty: Dom pechati. https://e.eruditor.link/file/1572073/

Mohammed Idris, K., Eskender, S., Yosief, A., & Demoz, B. (2022). Learning to teach self-study in improving data management practices of student-teachers during an action research course. *Education Inquiry*, *13*(3), 304-320. https://doi.org/10.1080/20004508.2021.1892332

Oleynikova, E. A. (2010). *Metodika testirovaniya grammatiki v protsesse formirovaniya professional'noy inoyazychnoy kommunikativnoy kompetentsii.* https://www.dissercat.com/content/metodika-testirovaniya-grammatiki-v-protsesse-formirovaniya-professionalnoi-inoyazychnoi-kom

Petrova, G. A. (2010). *Formirovaniye inoyazychnoy professional'no-kommunikativnoy kompetentsii studentov.* https://www.dissercat.com/content/formirovanie-inoyazychnoi-professionalno-kommunikativnoi-kompetentsii-studentov

Pustovalova, J. S. (2013). *Formirovaniye inoyazychnoy kommunikativnoy kompetentnosti studentov neyaz'psovykh vuzov v protsesse professional'no-oriyentirovannogo obucheniya.* https://www.dissercat.com/content/formirovanie-inoyazychnoi-kommunikativnoi-kompetentnosti-studentov-neyazykovykh-vuzov-v-prot

Shashkov, V. B. (2005). Obrabotka eksperimental'nyh dannyh i postroenie empiricheskih formul. *Kurs lekciy: ucheb. pos. Orenburg: OGU.*

Shemshurenko, O., Nazarova, G., Nizamieva, L., & Broussois, G. (2019). Creating an effective form of communication strategy in foreign language learning. https://dspace.kpfu.ru/xmlui/handle/net/157172

SNS, G. (2024). A Systematic Review of Empirical Studies Incorporating English Movies as Pedagogic Aids in English Language Classroom. In *Frontiers in Education* (Vol. 9, p. 1383977). Frontiers. doi: 10.3389/feduc.2024.1383977

Sorayyaee, L., Shirvan, M. E., & Akbari, O. (2022). An Ecological Exploration of Iranian English as a Foreign Language Learners' Goal-Directed Visions. *Iranian Journal of Language Teaching Research*, *10*(1), 81-99. https://doi.org/10.30466/ijltr.2022.121123

Tokayev, K.-Zh. (2021, September 1). *Poslaniye Glavy gosudarstva Kasym-Zhomarta Tokayeva narodu Kazakhstana «Yedinstvo naroda i sistemnyye reformy – prochnaya osnova protsvetaniya strany».* Official website of the President of the Republic of Kazakhstan. https://www.akorda.kz/en/state-of-the-nation-addressby-president-of-the-republic-of-kazakhstan-kassym-jomart-tokayev-38126

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DIGITAL GAME-BASED LANGUAGE LEARNING IN PRIMARY EDUCATION: EXPLORING MOTIVATIONAL FACTORS AND EDUCATIONAL OUTCOMES

Abstract

The objective of this study was to assess the efficacy of Digital Game-Based Language Learning (DGBLL) in promoting greater pupil involvement in language acquisition at the primary school level. Three groups of grade four students were examined in this study: a control group that received conventional teaching strategies, an experimental group that utilized Kahoot and Quizizz, and a second experimental group that played digital games competitively. The researchers evaluated students' motivation and attitudes toward the use of gamification in language learning via pre-tests, post-tests, and questionnaires. The experimental groups showed superior performance and increased motivation, with the strongest performance experienced in the second experimental

group which added competition to the learning process. The findings suggest that the integration of DGBLL and peer competition with gamified formative assessment tools significantly enhances language learning by introducing a captivating, efficient, and flexible method for language instruction. This study offers useful insights into the possibilities of gamification in language learning and evaluation, emphasizing its importance in modern educational practices.

Keywords: game-based, digital games, foreign language, education, motivation, competence.

Basic provisions. Digital Game-Based Language Learning (DGBLL) is a method that combines theory and practice to enhance language learning outcomes. The study assesses the efficacy of DGBLL in promoting greater pupil involvement in language acquisition at the primary school level. The current study reveals that DGBLL (Digital Game-Based Language Learning) significantly enhances motivation and educational outcomes in language acquisition through the integration of interactive and competitive elements. The integration of digital games into language instruction has the potential to convert tedious or repetitive content into engaging and interactive learning experiences. As the allure of games is frequently predicated on the interplay between triumph and defeat, it is critical that instructors effectively convey the instructional objectives of gamified language exercises. The principal advantage for pupils lies in the gain of fresh knowledge, specifically in domains like grammar and vocabulary.

Introduction. Kazakhstan's Ministry of Education has formulated pioneering instructional methodologies in response to the swift technological progress occurring on the global stage. Evidence of this is found in the address of the head of state which referred directly to improving digital literacy and supporting Kazakhstani teachers and student learning (Tokayev, 2023). Prior research has examined how learners' behaviors in Digital Game-Based Language Learning (DGBLL) environments affect their learning outcomes as teaching methods continue to evolve in tandem with scientific and technological progress (Lin et al., 2018; Chen et al., 2019; Wang et al., 2020), and the purpose of this research is to add to the body of knowledge through examining the impact of information literacy on the competitiveness of students who are studying English as a second language.

In primary education, DGBLL has emerged as a promising approach to teaching and learning foreign languages (Huang et al., 2013) and as educators and researchers aim to better understand the nature and processes of DGBLL's impact on language learning, the exploration of motivational factors and cognitive outcomes becomes essential. The current project investigates correlations among the characteristics of two digital games, the perceived level of motivational support among learners, and the level of learner cognitive investment. In other words, this research seeks to enhance the comprehension of how DGBLL may efficiently facilitate language acquisition in elementary school.

Literature Review. Educators frequently implement Digital Game-Based Learning (DGBL) to alleviate the monotony of the classroom. The appeal of digital educational games lies in their engaging attributes, enjoyable setting, artistic excellence, well-organized structure, instructional objectives, and gameplay aspect. Modern learning tools and contemporary media are seen as means that enhance education to a higher level (Azïmova, 2022). When used effectively inside a well-organized educational system that includes specific goals, strategic planning, and assessment, digital educational games may be categorized as interactive learning environments.

Educational games are designed with specific educational outcomes in mind, offering structured environments for students to explore complex concepts and practice skills in real-life scenarios (Giannakoulas & Xinogalos, 2023). These games can be serious games or game-based simulations, allowing students to deepen their understanding of the subject matter. Recreational games, although not primarily designed for educational purposes, can still be potent learning tools, engaging users

through compelling narratives, high-quality graphics, and immersive gameplay (Amanbay & Zǝwirbekov, 2023). Educators can leverage these features to motivate and enhance learning by identifying elements within these games that align with educational goals.

Educational recreational games represent a hybrid approach, blending the immersive and engaging aspects of recreational games with intentional educational content and objectives (Borbotko & Yanch, 2021). As the digital gaming industry evolves, there is a growing interest in developing games that are enjoyable and have educational value (Hwang, Lin & Lin, 2023; Kolykhmatov, 2020). Understanding these categories is crucial for pedagogical strategy, engagement and motivation, customized learning experiences, and the future of education.

Table 1, as presented by Ulicsak and Williamson (2010), offers a classification system for digital games in education. It serves as a valuable tool for effectively incorporating gaming into educational environments. It highlights the potential of games as versatile tools for enhancing teaching and learning, emphasizing the need for strategic selection based on educational goals and learning outcomes.

Table 1. *Category of digital educational games*

Category	Description	Examples
Educational Games	Deliberately designed to enhance the teaching and learning processes by including certain educational goals.	«Serious games,» «edutainment,» «game-based simulations,» «epistemic games»
Recreational Games	Games that do not have the primary goal of promoting learning, however, may still be used to facilitate learning.	Commercial games are known as commercial off-the-shelf (COTS) games.
Educational Recreational Games	Games that are interactive activities are used inside educational settings, such as classrooms or laboratories. This area is consistently growing as digital gaming industry businesses see the potential future integration of digital games with education.	- (No specific examples provided)

DGBL in primary education has gained significant attention in recent years due to its potential to enhance students' motivation and educational outcomes. An extensive body of research has explored the pedagogical application of digital educational games in education (Sun et al., 2020; Manesis, 2020; Chen et al., 2021; Yi & Yunus, 2023; Hamzah et al., 2019; Ghani et al., 2019; Belda-Medina & Calvo-Ferrer, 2022; Xu et al., 2019; Hung et al., 2018; Aziz et al., 2019; Al-Obaydi et al., 2023; Ghamdi & Alnajami, 2022; McNeil, 2019; Isa et al., 2022; Sykes, 2018; Yunus & Hua, 2021; Hui & Yunus, 2021; Gumartifa & Sirajuddin, 2021). These studies emphasize the effectiveness of using digital games for learning to enhance motivation among learners, promote language development, and improve educational outcomes, particularly in primary school. For example, the literature review by Sun et al., (2020) highlights the significance of attitude and motivation as significant learning outcomes of DGBL in primary education. More specifically, Chen et al., (2021) found that integrating DGBL positively impacted students' self-confidence, motivation to learn, and overall effectiveness in the learning process. Similarly, Manesis (2020) emphasizes the factors influencing the effectiveness of digital games in the learning procedure and the beliefs of primary school teachers about digital game-based learning. The studies by Hamzah et al., (2019) and Ghani et al., (2019) underscore the adoption of DGBL to achieve educational outcomes and bring an element of fun and entertainment to the learning process. Belda-Medina and Calvo-Ferrer (2022) extend that work to underscore the importance of considering future educators when researching DGBL. They stress the necessity of focusing

on the attitudes and knowledge of preservice teachers about this instructional approach.

Regarding language acquisition specifically, Chen et al., (2021) and Yi & Yunus (2023) highlight the efficacy of digital educational games in vocabulary acquisition and English language education, respectively. These studies collectively support the positive impact of DGBL on language acquisition, also known as Digital Game-Based Language Learning (DGBLL), in primary education. Xu et al., (2019) and Hung et al., (2018) conducted scoping reviews of research on DGBLL to evaluate the content of digital games for language learning. Furthermore, Aziz et al., (2019) and Al-Obaydi et al., (2023) examined the necessity of creating substantial game-based evaluations for language proficiency and the obstacles associated with employing digital games for educational objectives, respectively. These studies shed light on the potential of serious games and the importance of designing digital games for educational purposes.

Earlier Cagiltay, et al., (2015) had already demonstrated that students' learning outcomes could be enhanced by integrating competitiveness into DGBLL, a feature available in gamified educational tools, including Quizizz, and virtual reality, as examined by Sykes (2018) about language learning. More recently, Yunus & Hua (2021), investigated the potential of novel strategies for DGBLL, and the studies by Hui & Yunus (2021) and Gumartifa & Sirajuddin (2021) revealed the positive impacts of board games and intrinsic motivational factors on language learning, providing insights into alternative approaches to DGBLL. Ghamdi and Alnajami (2022), McNeil (2019), and Isa et al., (2022) also offered valuable perspectives on the effects of digital games on the improvement of writing abilities in the English language, the utilization of entertainment-oriented digital games in language instruction and acquisition, and the approach to managing the life cycle of digital educational games, respectively.

Table 2. *Key principles of DGBL*

Principle Number	Principle Description	Implications for Learning
Principle 1	Pre-existing knowledge can aid or hinder learning.	Enables fast identification and correction of misconceptions.
Principle 2	Learners' motivations guide and support their learning process.	Encourages persistence and development of a productive mindset.
Principle 3	Acquisition and application of skills and abilities are necessary.	Creates an interactive environment that adjusts to the learner's pace.
Principle 4	Target-based practice is linked to feedback and quality learning enhancement.	Provides success-motivated feedback and a realistic environment for applying skills.

DGBL is a method that combines theory and practice to enhance language learning outcomes. Key principles of DGBL (see Table 2) by Shaffer (2006) include identifying and addressing misconceptions early on, focusing on learners' motivations, creating interactive learning environments that are responsive to individual learners' pace, and integrating target-based practice with feedback to improve learning quality. These principles are crucial for designing games that engage students and sustain their interest, fostering a resilient mindset toward language learning.

The use of gamified formative assessment tools, as examined in this study, adheres to these principles and exemplifies their practical application in enhancing language learning. DGBLL fosters a more nuanced and effective approach to language education, contributing to Kazakhstan's Ministry of Education's broader pedagogical goals and aligning with global advancements in educational technology.

By incorporating these principles into the design and execution of digital educational games, learners can enjoy and motivate their learning experiences while being pedagogically

sound and effective in achieving educational objectives. This approach bridges the gap between theory and practice, highlighting the relevance of DGBL principles in enhancing language learning outcomes in primary education.

Digital games have shown a significant impact on motivational factors and educational outcomes in primary school language learning. Factors influencing students' engagement include game design, content, difficulty level, relevance to learning goals, and personal preferences. DGBLL enhances intrinsic motivation and enjoyment, leading to increased engagement. The integration of digital educational games has positive impacts on cognitive and affective outcomes in English language education. Additionally, the entertainment factor in digital games reduces anxiety in second language acquisition, positively influencing students' motivation and engagement in language learning (Chung & Chang, 2017).

Shehzad (2021) posits that digital mobile games may catalyse language acquisition, particularly during challenging periods such as the COVID-19 lockout. It has also been observed that these activities affect the anxiety and apprehension levels of participants who are studying English. Furthermore, empirical research has demonstrated that the implementation of DGBLL significantly improves students' scholastic achievements and instils in them a greater motivation to learn the English language. The incorporation of instructor intelligence into digital games has been demonstrated to increase students' motivation to learn in English as a Foreign Language (EFL) courses, as stated by Chu et al., (2023). Moreover, the process of learning a second language via gaming is influenced by several aspects, such as ecological factors, as highlighted by Ibrahim (2017). Regression analysis has indicated that digital games influence students' achievement and motivation in language learning (Wijanarko et al., 2021). DGBLL provides students with opportunities to actively acquire vocabulary, partake in educational activities, develop critical thinking and decision-making skills, and increase their

enthusiasm for language learning, according to research (Ghani et al., 2022).

The use of digital games in language learning has become more popular, since they are now being integrated into task-based, project-based, and content-based approaches, showcasing their progress in educational settings. The educational value of digital games is recognized, and they have become a regular part of the curriculum. The potential of DGBL to enhance children's academic achievements, engagement, and interest renders it a viable approach for language instruction in primary school settings.

In sum, there is a strong body of literature that shows basic education, and language learning in particular, can be enhanced through the pedagogical incorporation of digital educational games. Learning occurs best when the game's design is customized to accommodate the individual learning rate of each player, offering a genuine and engaging setting for critical thinking, acquiring information, and putting it into practice. The game offers feedback to players, catalysing motivation, and compelling them to persist until they achieve the game's objectives. Participants see gaming as a calming and inherent pursuit, promoting the notion of "I engage to acquire knowledge". Teachers also play a vital role in guaranteeing effective problem-solving during gaming activities and facilitating acceptable engagement and digital educational games and gamification to enhance student motivation, increase skills, and optimize information acquisition using key principles (table 1).

The current research attempts to extend the extant literature and provide articulation of the motivational and cognitive elements that impact language acquisition utilizing DGBLL within the primary education sector of Kazakhstan. It is hoped this study's results will enhance the field by offering empirical data on the correlation between game characteristics, motivational support, and cognitive involvement in language acquisition via digital games (Plass et al., 2015). Furthermore, the results will guide the design and implementation of DGBLL interventions in primary schools through the identification of

effective game incentives and an understanding of how they affect the motivation and cognitive engagement of students (Laine & Lindberg, 2020). In addition, this study aims to serve as a practical toolkit for educational game designers and researchers by providing educational game design principles in the context of DGBLL.

Research materials and methods. A four-week research was conducted with 64 fourth graders from six primary schools in Almaty, Shymkent, Turkestan, and Kyzylorda. Four experimental groups used the "Kahoot" and "Qizizz" games for 10 minutes every week, whilst the control group employed books or e-books for the same duration each week to facilitate individual learning. Table 3 provides a summary of the study's groups, their learning approaches, and the structure of the experimental procedure, including durations for each part of the process.

Table 3. *The experimental settings, participants, and technique*

Group	Description	Learning Approach	Pre-test Duration	Intervention Duration	Post-test & Questionnaire Duration	Interview Duration
Control Group	32 students learned the course through a conventional approach using textbooks or PowerPoint.	Conventional Learning Approach	10 min	-	10 min	-
Experimental Group 1	16 students learned by a digital game without competition.	Digital Game-Based Learning (DGBL)	10 min	15 min	15 min	5 min
Experimental Group 2	16 students learned through a digital game with the added structure of competing with classmates.	DGBL + Competition	10 min	15 min	15 min	5 min

This research included three instruments to assess the impact of Kahoot and Quizizz on learners. The first instrument used was English proficiency assessments, which were utilized to ascertain the impact of the digital game, Kahoot and Quizizz, on the language aptitude of learners. The other two assessments (pre-test and post-test) were written examinations specifically intended to assess the student's proficiency in grammar and vocabulary. Each set of students was mandated to take these assessments.

Results and discussion. The study examined three approaches to instruction in improving grade four students' motivation and learning related to binary language conversion. Baseline results demonstrated no statistically significant difference in English language competence between the control group, experimental group 1, and experimental group 2, indicating that they had a comparable level of prior knowledge. However, after the implementation of digital gaming, significant disparities were noted between the control group and the experimental groups. Disparities between the control group and experimental group 2 were found to be extremely statistically significant. In other words, the academic performance of students in experimental groups 1 and 2, which engaged in DGBL, was significantly superior to that of their peers who utilized a traditional learning approach (control group), and students who engaged in DGBLL in a competitive environment (experimental group 2) demonstrated the greatest academic achievement.

Table 4. *Student Feedback on Digital Game-Based Language Learning (DGBLL)*

Question		EG1 (%)	EG2 (%)
How much did you enjoy using DGBLL tools like Kahoot and Quizizz for language learning?	- A lot	93.75	100
	- Somewhat	6.25	0
	- Not much	0	0
	- Not at all	0	0

Question		EG1 (%)	EG2 (%)
How confident do you feel in using English after participating in DGBLL activities?	- Much more confident	81.25	87.5
	- Somewhat more confident	6.25	12.5
	- About the same	0	0
	- Less confident	12.5	0
Do you think DGBLL has helped improve your English vocabulary?	- Yes, significantly	100	100
	- Yes, but only slightly	0	0
	- No, it has not helped	0	0
	- I'm not sure	0	0
What aspect of DGBLL did you find most engaging?	- The competitive element	0	25
	- The interactive exercises	37.5	18.75
	- The game-like environment	62.5	56.25
	- I did not find it engaging	0	0
Did the DGBLL activities make learning English more interesting?	- Much more interesting	100	100
	- Somewhat more interesting	0	0
	- No change in interest	0	0
	- Less interesting	0	0
Would you recommend DGBLL methods to other students learning English?	- Definitely	100	100
	- Probably	0	0
	- Not sure	0	0
	- Probably not	0	0

A substantial majority of students (81.25%) in experimental group 1 saw a boost in their self-confidence in obtaining information in the domain of learning English due to their involvement with a digital game. Some students incorrectly answered in the test that they knew more about the subject than they did (How confident do you feel in using English after participating in DGBLL activities? – less confident 12.5%). In contrast, a substantial majority (87%) of students in experimental group 2 reported a gain in self-confidence after acquiring binary conversion abilities through involvement in a digital game and engaging in rivalry games with their classmates (Table 4). A select group of pupils achieved victory in the game, thereby demonstrating a complete comprehension of the idea. Several students reported a lack of confidence in their abilities and apprehension about their abilities to study at the same level as their peers. The study found that while DGBLL methods improved student confidence, some students still felt uncertain about their language learning abilities and compared themselves negatively to their peers. This could be due to personal insecurities, previous educational experiences, or the competitive nature of the gamified learning environment.

Quantitative analysis performed on the students' surveys revealed insights into their perspectives on the games, classroom activities, and the impact of these elements on their learning. Findings indicate that every participant achieved a notably elevated average score in response to all inquiries (see Table 5 in which ER = Emotional Resilience, CC = Communicative Competence, AE = Ability Enhancement, and GA = Goal Achievement. A p-value below 0.05 is denoted by an asterisk [*], implying the presence of statistical significance). The table contains the mean scores of the pretest and post-test, standard deviations for each group (EG1, EG2, and CG), and F-values utilized in the covariance analysis.

The DGBLL study reinforces the pedagogical transition towards student-centred learning environments, aligning with the research on flipped learning approaches conducted by Chen et al., (2021) and other scholars. Both bodies of research support the idea that learners

should actively participate in their educational processes, which helps to increase their intrinsic motivation and engagement. This study enhances the discussion by showing that digital games can effectively provide knowledge in a way that matches modern educational demands, as outlined in Kazakhstan's progressive educational reforms.

Table 5. *The elements that motivate students and the impact on their educational achievements in primary school by analysing the average scores*

Factor (Test)	Group	Pre-test Mean (M)	Pre-test SD	Post-test Mean (M)	Post-test SD	Adjusted Post-test Mean (M*)	F-Value (F)
Overall	EG1	2.26	0.57	2.68	0.64	2.65	
	EG2	2.05	0.96	2.27	0.84	2.38	
	CG	2.32	0.62	2.48	0.67	2.41	2.01
ER	EG1	2.31	0.67	2.81	0.66		3.30*
	EG2	2.13	1.04	2.28	1.04		
	CG	2.42	0.67	2.63	0.83	2.54	
CC	EG1	2.52	0.80	2.84	0.61		2.03
	EG2	2.52	1.06	2.68	1.03		
	CG	2.68	0.63	2.62	0.86	2.54	
AE	EG1	2.22	0.81	2.54	0.87		0.60
	EG2	1.85	1.13	2.21	1.01		
	CG	2.16	0.86	2.46	1.01	2.42	
GA	EG1	2.11	0.85	2.46	0.63		1.66
	EG2	1.68	1.01	2.00	1.00		
	CG	2.12	1.00	2.30	0.99	2.24	

The research supports the findings of Cagiltay et al., (2015) addressing the beneficial impacts of including competitive elements in educational frameworks. Both studies demonstrate that competition can greatly enhance engagement and accomplishment, especially in gamified learning contexts. The DGBLL study provides a distinct contribution to the existing narrative by demonstrating how competition can be organized in digital games to improve language acquisition in primary school pupils. This study focuses on an aspect that has received less attention in the broader research on competition in education and in so doing, adds substantively to the body of knowledge.

In contrast to the broad educational technology applications examined in previous research, such as those conducted by Hui & Yunus (2021), which explore the use of board games to enhance language skills, the present study focuses on a detailed analysis of particular digital platforms, namely Kahoot and Quizizz. The specificity of this study is essential because it offers comprehensive insights into the impact of various game designs and user interactions on language acquisition. This level of precision is not as common in broader educational technology research.

This study addresses a vacuum in digital learning research by specifically focusing on primary school, an area that is generally overlooked as most research in this field primarily targets adults or higher education students. The study provides useful educational insights that are immediately transferable to early school settings by customizing research methodologies and analyses to align with the cognitive and developmental phases of primary learners. The study's methodological rigor and empirical data make a substantial contribution to the academic knowledge of the impact of DGBLL on primary education. The study confirms and quantifies the usefulness of digital games in educational contexts through systematic assessments of motivational and cognitive results using standardized pre-tests, post-tests, and questionnaires.

The trials conducted by Akhmetsapa et al., (2024) validate the positive impact of digital tools on educational accomplishments. They stress the significance of incorporating technology into educational settings to enhance student engagement and comprehension, by present educational standards.

The current study reveals that DGBLL (Digital Game-Based Language Learning) significantly enhances motivation and educational outcomes in language acquisition through the integration of interactive and competitive elements. However, the study also provides useful insights into how characteristics like gender and the use of additional resources can impact learning outcomes in web-assisted environments. This suggests that while DGBLL can have a broad positive impact, the impact of web-assisted tools may require more tailored approaches depending on the learner's existing knowledge and additional learning materials.

The study incorporates and applies Shaffer's (2006) fundamental concepts of Digital Game-Based Learning in the primary educational context. This serves the purpose of not only testing these ideas but also modifying and broadening them based on fresh data. This theoretical contribution is highly beneficial for the development and execution of the next educational games, guaranteeing that they are academically rigorous and customized to improve specific learning objectives.

This comprehensive analysis of the DGBLL study, about the current body of literature, emphasizes its crucial contribution to the progress of educational practices through the use of technology. It strengthens the case for incorporating gamified learning tools more extensively in primary school, by connecting them with strategic educational goals to optimize both student engagement and learning results. Subsequent studies should expand upon these existing principles by investigating the long-term effects of digital game-based language learning (DGBLL) and broadening the range of participants in terms of demographics and geographic locations. This would improve the potential to apply and generalize the findings to educational settings worldwide.

Conclusion and recommendations. An extensive body of literature shows that pedagogical integration of digital game components such as challenges, controls, interaction, and feedback, improves the academic performance of students and enhances their short-term and long-term memory. This is especially advantageous for students in elementary education, specifically those acquiring English as an additional language. DGBLL is widely recognized as an efficacious methodology for augmenting vocabulary acquisition, bolstering comprehension, and introducing complex subject matter. This study supports previous research with explicit benefits for grade four students in Kazakhstan regarding English vocabulary proficiency.

The current research emphasizes the beneficial impact that gamification has on both student engagement and academic performance. The integration of digital games into language instruction has the potential to convert tedious or repetitious content into engaging and interactive learning experiences. As the allure of games is frequently predicated on the interplay between triumph and defeat, it is critical that instructors effectively convey the instructional objectives of gamified language exercises. The principal advantage for pupils lies in the gain of fresh knowledge, specifically in domains like grammar and vocabulary.

Although the benefits of incorporating gamification into language instruction have been established, there remain several unanswered inquiries that set up opportunities for additional research. For example, comparative research across multiple grades could provide potential insights as to the impacts of chronological age, emotional maturity, and additional academic progression and experience in school learning, as would comparisons across gender. Determining the ideal duration of student engagement with gamified activities before their disinterest is another area critical for consideration. Investigation is also warranted to evaluate the efficacy of additional complementary digital activities to enhance linguistic proficiency. Fourth, comparative research can be utilized to determine which games are appropriate for future

courses to assess the effect of game quantity on student achievement, and which game is most suitable for particular instructional materials.

This study's small sample size, which can restrict the generalizability of the results, is a recognized limitation. Additional student participants should be incorporated into future studies to collect more dependable and precise data and statistics. Enhancing the feedback system's comprehensiveness can yield a more profound comprehension of students' viewpoints and the efficacy of gamification tactics. In addition, qualitative research approaches such as in-depth interviews have the potential to offer a more holistic comprehension of the pedagogical importance of gamification in the context of language learning.

This research offers substantiation for the efficacy of DGBLL methodologies in enhancing the proficiency of grade four students in Kazakhstan regarding learning English vocabulary. These findings, in combination with the extant literature, suggest that incorporating gamification components into language teaching might potentially enhance engagement, improve knowledge retention, and boost academic accomplishment for other primary students as well. However, additional investigation is required to tackle unresolved inquiries and constraints of the research. Further investigation into the potential of gamification in language instruction can enable educators to design learning experiences that are both more captivating and efficacious for students of other grades as well.

References

Akhmetsapa, A., Uzunboylu, H., Zholtayeva, G., & Abdigapbarova, U. (2024). The Effect of Primary School Teachers Using Online Education on Their Professional Creativity. *International Journal of Cognitive Research in Science, Engineering and Education*, *12*(1), 19-29. https://cyberleninka.ru/article/n/english-1

Al-Obaydi, L. H., Pikhart, M., & Klimova, B. (2023). Verifying EFL Autonomous Learning by Digital Gaming: Definitions and Concepts. *International Journal of Emerging Technologies in Learning*, *18*(5).

Amanbay, Ə. A., & Zəwirbekov, N. S. (2023). GIMKIT: VIKTORINALIQ OYIN NEGIZINDE MATEMATIKANI Geymifikaciyalaw. https://repo.kspi.kz/handle/123456789/6755

Azimova, G. W. (2022). Qazaq Tilin Oqitw Adistemesi Salasinda Zamanawi Mobildi Qosimsalardi Qoldanwdin Tiimdi Joldari. Izvestiya. Seriya: Pedagogiceskie nawki, 66(3). https://bulletin-pedagogical.ablaikhan.kz/index.php/j1/article/view/377

Aziz, R., Norman, H., Nordin, N., Wahid, F. N., & Tahir, N. A. (2019). They Like to Play Games? Student Interest of Serious Game-Based Assessments for Language Literacy. *Creative Education*, *10*(12), 3175. https://www.scirp.org/html/62-6304709_96807.htm

Belda-Medina, J., & Calvo-Ferrer, J. R. (2022). Preservice teachers' knowledge and attitudes toward digital-game-based language learning. *Education Sciences*, *12*(3), 182. https://www.mdpi.com/2227-7102/12/3/182

Borbotko, P. V., & Yanch, S. V. (2021). Tsifrovyye tekhnologii kak instrument formirovaniya pamyati drevnikh narodov. https://rep.vsu.by/handle/123456789/29943

Cagiltay, N. E., Ozcelik, E., & Ozcelik, N. S. (2015). The effect of competition on learning in games. *Computers & Education*, *87*, 35-41. https://www.sciencedirect.com/science/article/pii/S0360131515001001

Chen, C. H., Law, V., & Huang, K. (2019). The roles of engagement and competition on learner's performance and motivation in game-based science learning. *Educational Technology Research and Development*, *67*, 1003-1024. https://link.springer.com/article/10.1007/s11423-019-09670-7

Chen, J., Yang, S., & Mei, B. (2021). Towards the sustainable development of digital educational games for primary school students in China. *Sustainability*, *13*(14), 7919. https://www.mdpi.com/2071-1050/13/14/7919

Chu, S. T., Hwang, G. J., Chien, S. Y., & Chang, S. C. (2023). Incorporating teacher intelligence into digital games: An expert system-guided self-regulated learning approach to promoting EFL students' performance in digital gaming contexts. *British Journal of Educational Technology*, *54*(2), 534-553. https://bera-journals.onlinelibrary.wiley.com/doi/abs/10.1111/bjet.13260

Chung, L. Y., & Chang, R. C. (2017). The effect of gender on motivation and student achievement in digital game-based learning: A case study of a contented-based classroom. *Eurasia Journal of Mathematics, Science and Technology Education*, *13*(6), 2309-2327. https://www.ejmste.com/article/the-effect-of-gender-on-motivation-and-student-achievement-in-digital-game-based-learning-a-case-4772

Ghamdi, H. A. A., & Alnajami, M. M. (2022). A Literature Review on the Impact of Digital Games on Improving Students' English Language Writing Skills. https://pesquisa.bvsalud.org/portal/resource/pt/sea-218621

Ghani, M. T. A., Hamzah, M., Romli, T. R. M., Eltigani, M. A. M. A., & Daud, W. A. A. W. (2019). E-Mufradat: a digital game application for learning Arabic vocabulary among non-native Arabic speakers. *International Journal of Academic Research in Progressive Education and Development*, *8*(3), 58-69. https://www.academia.edu/download/86314753/E-Mufradat_A_Digital_Game_Application_for_Learning_Arabic_Vocabulary_among_Non-native_Arabic_Speakers.pdf

Ghani, M. T., Hamzah, M., Wan Daud, W. A. A., & Muhamad Romli, T. R. (2022). The Impact of Mobile Digital Game in Learning Arabic Language at Tertiary Level. *Contemporary Educational Technology*, *14*(1). https://eric.ed.gov/?id=EJ1331727

Giannakoulas, A., & Xinogalos, S. (2023). Studying the effects of educational games on cultivating computational thinking skills to primary school students: a systematic literature review. *Journal of Computers in Education*, 1-43. https://doi.org/10.1007/s40692-023-00300-z

Gumartifa, A., & Sirajuddin, B. (2021). Learning motivation as the basic need in improving English skills for non-EFL learners cooperatively. *PROJECT (Professional Journal of English Education)*, *4*(1), 126-133. https://pdfs.semanticscholar.org/b91c/54f680d68e8058f0aa2ed55b04cad0532681.pdf

Hamzah, M., Ghani, M. T. A., Daud, W. A. A. W., & Ramli, S. (2019). Digital game-based learning as an innovation to enhance student's achievement for Arabic language classrooms. *International Journal of Recent Technology and Engineering*, *8*(3), 2108-2112

Huang, W. D., Johnson, T. E., & Han, S. H. C. (2013). Impact of online instructional game features on college students perceived motivational support and cognitive investment: A structural equation modeling study. *The Internet and Higher Education*, *17*, 58-68. https://www.sciencedirect.com/science/article/pii/S1096751612000826

Hui, C. and Yunus, M. (2021). Board games in improving pupils' speaking skills: a systematic review. *Sustainability, 13*(16), 8772. https://doi.org/10.3390/su13168772

Hung, H., Yang, J., Hwang, G., Chu, H., & Wang, C. (2018). A scoping review of research on digital game-based language learning. *Computers & Education*, 126, 89-104. https://doi.org/10.1016/j.compedu.2018.07.001

Hwang, G. J., Lin, Y. C., & Lin, H. C. (2023). Associating spatial knowledge with concept maps to facilitate learning in digital gaming contexts. *Educational technology research and development*, 71(6), 2221-2241. https://doi.org/10.1007/s11423-023-10274-5

Ibrahim, K. (2017). The impact of ecological factors on game-based l2 practice and learning. *Foreign Language Annals, 50*(3), 533-546. https://doi.org/10.1111/flan.12278

Isa, W., Suhaimi, A., Noordin, N., & Hassan, S. (2022). Mobile game-based learning application about Semai people. *International Journal of Academic Research in Progressive Education and Development*, *11*(3). https://doi.org/10.6007/ijarped/v11-i3/14759

Kolykhmatov, V. I. (2020). Novyye vozmozhnosti i obuchayushchiye resursy tsifrovoy obrazovatel'noy sredy. https://loiro.ru/files/pages/elibrary_44026172_59096200.pdf

Laine, T H., & Lindberg, R S N. (2020). Designing Engaging Games for Education: A Systematic Literature Review on Game Motivators and Design Principles. https://doi.org/10.1109/tlt.2020.3018503

Lin, C. J., Hwang, G. J., Fu, Q. K., and Chen, J. F. (2018). A flipped contextual game-based learning approach to enhancing EFL students' English business writing performance and reflective behaviors. *Educational Technology & Society*, 21, 117–131.

Manesis, D. (2020). Digital games in primary education. https://doi.org/10.5772/intechopen.91134

McNeil, L. (2019). Implementing digital game-enhanced pedagogy: supportive and impeding language awareness and discourse participation phenomena. *Recall*, *32*(1), 106-124. https://doi.org/10.1017/s095834401900017x

Plass, J L., Homer, B D., & Kinzer, C K. (2015). Foundations of Game-Based Learning. https://doi.org/10.1080/00461520.2015.1122533

Shaffer D.W. (2006). *How Computer Games Help Children Learn. 2006th ed.* New York: Amazon; 242.

Shehzad, A. (2021). A case study of English language learning in a mobile game-assisted environment during the COVID-19 lockdown. *University of Chitral Journal of Linguistics and Literature*, *5*(2), 184-198. https://doi.org/10.33195/jll.v5iii.338

Sun, L., Chen, X., & Ruokamo, H. (2020). Digital game-based pedagogical activities in primary education: a review of ten years' studies. *International Journal of Technology in Teaching and Learning*, *16*(2). https://doi.org/10.37120/ijttl.2020.16.2.02

Sykes, J. (2018). Digital games and language teaching and learning. *Foreign Language Annals*, *51*(1), 219-224. https://doi.org/10.1111/flan.12325

Tokaev K. (2023). Poslanie Prezidenta "Ekonomicheskij kurs spravedlivogo Kazahstana". https://www.akorda.kz/en/president-kassym-jomart-tokayevs-state-of-the-nation-address-economic-course-of-a-just-kazakhstan-283243

Ulicsak, M., & Williamson, B. (2010). Computer games and learning. Bristol: Futurelab.

Wang, J. S., Gamble, J. H., & Yang, Y. T. C. (2020). Mobile sensor-based community gaming for improving vocational students' sleep and academic outcomes. *Computers & Education*, *151*, 103812. https://www.sciencedirect.com/science/article/pii/S0360131520300142

Wijanarko, D., Hadi, S., & Puspitasari, I. (2021). The influence of playing digital games in distance learning towards students' speaking skills. *ELT Forum Journal of English Language Teaching*, *10*(3), 290-299. https://doi.org/10.15294/elt.v10i3.48718

Xu, Z., Chen, Z., Eutsler, L., Geng, Z., & Kogut, A. (2019). A scoping review of digital game-based technology on English language learning. *Educational Technology Research and Development*, *68*(3), 877-904. https://doi.org/10.1007/s11423-019-09702-2

Yi, C. and Yunus, M. (2023). Sustaining English language education with digital educational games: a systematic review. *International Journal of Academic Research in Progressive Education and Development*, *12*(2). https://doi.org/10.6007/ijarped/v12-i2/16666

Yunus, C. and Hua, T. (2021). Exploring a gamified learning tool in the ESL classroom: the case of Quizizz. *Journal of Education and E-Learning Research*, *8*(1), 103-108. https://doi.org/10.20448/journal.509.2021.81.103.108

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DESIGN OF A LESSON PLAN IN THE CONTEXT OF STEM EDUCATION FOR PROSPECTIVE PRIMARY SCHOOL TEACHERS

Abstract

This paper explores the issue of organization and implementation of the educational process in the context of STEM education. The relevance of the research arises from the need to train students who are capable of implementing interdisciplinary integration in the educational process, to master the ways and methods of teaching through STEM, and to identify the possibilities for establishing interdisciplinary communication through common topics. The main goal of the study is to develop a lesson plan in the context of stem education for prospective primary school teachers. Stages of developing lesson plans based on STEM include the issue of teaching through STEM, analysis of school textbooks, use of digital resources, STEM lesson planning, and so forth. These actions culminate in the creation of STEM-based lesson plans. This workshop aims to integrate STEM elements, utilize PhET stimulations, and stimulate interest in science subjects. The results of the study demonstrated that students developed skills in problem-solving, critical thinking, cooperation, and interdisciplinary communication. The results of quantitative data during the study were analyzed as descriptive statistics.

Keywords: STEM education, lesson plan, interdisciplinary communication, integration, technology, workshop, statistics, experiment.

Basic provisions. Implementation of activities focused on fostering capabilities necessitates the enhancement and management of new technologies by prospective teachers. In this context, one of the main objectives facing universities is the employment of applied

knowledge and the introduction of innovative methods. In this regard, it is essential to consider ways to incorporate STEM elements into the university and school programs. Such innovations are crucial to be introduced into the educational process nowadays. The central idea of the study is to determine the stages of lesson plan development in the context of STEM education for prospective primary schoolteachers. The implementation of this idea was guided by the following basic provisions: Scientific-theoretical studies on the issue of teaching in STEM education; Information about the stages of lesson planning in the context of STEM education; Data from a survey describing STEM-focused learning.

Introduction. Research in the current education system addresses the issue of teaching in the context of STEM education due to technological progress. STEM education is recognized as an integration of various disciplines focused on solving real problems. Therefore, an interdisciplinary approach enables the development of new knowledge and abilities in addition to enabling the resolution of complicated problems. By incorporating different academic subjects, teaching contributes to innovation and enhances critical thinking (Drake & Reid, 2018).

For the first time in Kazakhstan, the "STEM" concept was observed within the educational program of the development of education and science for 2016-2019. To implement this new education policy, the ways were planned in the curriculum to introduce STEM elements into the educational process, aimed at the development of scientific innovative technologies, natural science, and mathematics (Twlentaeva, Seylova & Berkïmbaev, 2023; Abdikarimova, 2022). In this context, actions were planned to introduce interdisciplinary integrated projects focused on enhancing students' scientific and technological capabilities. These projects facilitate the cultivation of creative thinking, critical thinking, and communication skills. Vasquez et al., (2013) conducted a comprehensive review on STEM integration, emphasizing the essence of increased integration aimed at developing the connection of subjects. They identified four types of interdisciplinary integration:

- disciplinary – teaching concepts and definitions in the framework of a separate discipline;
- interdisciplinary – teaching concepts and definitions within the framework of common topics;
- interdisciplinary – teaching concepts and definitions within different disciplines;
- transdisciplinary – applying knowledge and skills obtained from various disciplines to solve global problems.

According to the methodological proposal from Y. Altynsarin National Academy of Education under the Ministry of Education of the Republic of Kazakhstan, STEM – education is a complex approach that includes teamwork and project work among students, facilitated by progressive teachers, modern technological equipment, integration of several sciences and academic subjects, creativity (Altynsarin Academy, 2022). Therefore, the issue of teaching the educational process in the STEM environment is one of the most relevant and demanding research.

Consequently, to instil students' interest in science from an early age, initiatives such as the development and support of "STEM laboratories" and "STEM education – new opportunities" topics in professional development courses for teachers of pedagogical professions are highlighted within the educational programs. This emphasizes the importance of designing a lesson plan in the context of STEM education within the educational process.

Main part. In this connection, it is crucial to review the research conducted by domestic and foreign scientists who have studied the issue of teaching within STEM education. A comprehensive literature review enables to reveal among many studies, confirming that the utilization of STEM elements in the learning process enhances students' critical thinking, increases interest in learning science, and fosters a positive attitude toward innovation (Vega et al., 2019; Yildirim, & Altun, 2015; Sanz-Camarero et al., 2023).

In the current research, it was noticed that STEM-oriented research is increasing in Kazakhstan (Kwdaybergenova, 2023; Baxıtova

& Kasımova, 2020). For instance, within the framework of the updated educational program, interdisciplinary communication is implemented based on common topics fixed in curricula. However, regardless of the inclusion of some concepts in textbooks such as mathematics, natural science, and cognition of the world, many challenges prevail in incorporating STEM elements into the educational process. This challenge is connected with the need to enhance teachers' competency in STEM-oriented knowledge and skills.

According to Ching et al., (2019), STEM education should begin in primary school. Learning through STEM allows students to see the world as a whole, cultivating meta-subject and cognitive skills among learners (Yesnazar, 2023). Consequently, a basic objective is to direct students in choosing and refining the way they are interested in from primary school. Involving a subject of interest allows students to make predictions, draw conclusions, share experiences, make arguments, and analyze data, acting as a researcher. There is reason to believe that knowledge, skills, and abilities in this direction are cultivated in the context of STEM education. This is because teaching in STEM facilitates the learners' deep comprehension of subjects and the application of interdisciplinary knowledge in practice. In other words, STEM includes the implementation of natural sciences, technology, engineering, and mathematics through interdisciplinary and project-based approaches (Umutlu, 2022; Faulconer & Chamberlain Jr, 2022; Habig & Gupta, 2021). Therefore, presenting knowledge based on natural science within interdisciplinary connections enables learners to enhance their ability to apply academic concepts and knowledge in practice. In this regard, Alatas and Yakin (2021) emphasized in their study that STEM education affects students' problem-solving skills and proves its effectiveness. One of the studies that comes close to our study, Alrwaished (2024), examined the skills and difficulties that develop in creating a STEM-based lesson plan.

It is imperative to prepare prospective teachers for STEM education. In our country, there is an insufficiency of studies concerning educational programs aimed at introducing STEM elements into the educational process. Therefore, focusing on the acquisition of STEM-oriented knowledge, skills, and abilities becomes essential. Attaining this goal entails designing a lesson plan in the context of STEM education.

STEM is considered an interdisciplinary approach that integrates science and technology, engineering, and mathematics. Therefore, it is necessary to organize lesson planning, and comprehensively develop common topics, common concepts, and understandings related to STEM education. According to researchers, it is very important to understand the relationship between disciplines (Pymthong & Williams, 2018).

STEM-based lesson plans aim to cultivate critical 21st-century skills. These plans provide an opportunity to foster science and math literacy and acquire engineering and technology. Studies have indicated that STEM education facilitates perspective teachers' personal and professional growth, enhancing their academic and cognitive skills (Çiftçi et al., 2022).

In his research, Ha (2023) investigates teaching practices in the STEM context. The author emphasizes activities such as educational robots and games, research-oriented engineering design games, and drawing and developing models, which contribute to enhancing students' scientific and technological literacy. Ibrayeva and Shaushekova (2023) developed a program titled "Early STEM Integration" aimed at STEM education. The content of the program includes topics focused on enhancing students' scientific and technical interests, leading to fostering their interdisciplinary knowledge, innovative ideas, and universal learning activities.

Ageyeva & Agranovich (2023) studying the issue related to training prospective primary school teachers, proposed ways to incorporate "STEM education in primary school" and "Steam – approach in primary school" as additional minors to the educational programs of higher education institutions. This introduction is intended to increase the scientific and technical literacy of students. It is an

integrated practice-based study. Moreover, Abdrakhmanova and Kudaybergenova (2023) in their research proposed to introduce subjects related to STEM to educational programs of universities, to implement methodological seminars and trainings aimed at STEM education, thus contributing to the development of educational programs.

The current study found Bekbauova & Turebayeva's (2022) work on implementing the educational process in the context of STEM particularly interesting regarding the enhancement of students' knowledge. In the study, the scientist considered that "STEM education is an experimental teaching pedagogy integrated into contextual projects or tasks oriented to learning outcomes related to the development of students' important skills for choosing a perspective career using knowledge and skills". The author highlights not only the utilization of software equipment, 3D models, SketchUp program, and Blender program to increase interest in the subject but also the central role of the teacher as a mentor and educator rather than just an informant.

Summarizing the abovementioned research, the researchers comprehensively explored the research problem, revealing a gap in the studies aimed at lesson planning in the context of STEM education. Therefore, it is very important to apply the knowledge of different subjects in teaching a particular subject. In this regard, the purpose of this study is to develop a lesson plan in the context of STEM education for prospective primary school teachers. This study aims to address the following questions: How should we design a lesson plan in the context of STEM education? What are the challenges faced in planning a lesson in the context of STEM education?

Research materials and methods. The study was conducted among students enrolled at Ozbekali Zhanibekov South Kazakhstan Pedagogical University. The sample group was randomly selected from the fourth-year students of the educational program 6B01301 "Pedagogy and Methodology of Primary Education Teacher Training".

The survey and descriptive statistics methods were employed during the research. The study was conducted during the fall semester of the 2023-2024 academic year.

Therefore, the following demographic criteria were applied for the respondents who were randomly selected for experimental work, as outlined in Table 1:

Table 1. *Respondent Demographics*

Criterion	Gender		Age		Nationality			Prior education	
Group	Female	Male	18-21	22-25	Kazakh	Russian	Uzbek	School	College
Control group (n=19)	5,3%	94,7%	84,2%	15,8%	94,7%	5,3%	-	84,2%	15,8%
Experimental group (n=22)	-	100%	90,9%	9,1%	81,8%	13,6%	4,6%	86,4%	13,6%

In the sample group, in the control group of the 4th year of the educational program 6B01301 – "training of a teacher of pedagogy and methods of Primary Education", men – 5.3%, women – 94.7%; the average age was 20 years; the largest share of nationalities was determined as Kazakh-94.7%. In the experimental Class, A woman was 100%, the average age was 21 years; Kazakh – 81.8%, and Russian – 13.6%.

The survey was conducted in September 2023, the purpose of it was the confidentiality of the responses provided, and the right to withdraw from the participation at any time that was explained to respondents.

Analysis of the survey results underscored a lack of STEM knowledge among students. Therefore, to compensate for these gaps, practical lessons related to the development of STEM-based lesson plans have been incorporated into the curriculum under the "Methodology of Science Teaching" subject. These lesson plans were developed based on suggestions from teachers of mathematics, science, and digital literacy. We will consider the study in five stages (Table 2):

Table 2. *Stages of developing STEM-based lesson plans*

Week	Schedule	Topics	Hour
1-2	Introduction	Introduction to the STEM approach	1
		Consideration in regulatory documents	1
3-5	Issues of Teaching through STEM	Analysis of psychological and pedagogical works	1
		Ways and methods of teaching through STEM	1
		Study and discuss STEM-focused articles	1
6-8	Analysis of school textbooks	Study of Primary Education textbooks	1
		Identifying possibilities to establish interdisciplinary communication through common topics	1
		Identifying ways to integrate STEM elements	1
9	Utilization of digital resources	Possibility of utilizing PhET simulations for STEM education	1
10-12	STEM Lesson Planning	Choosing appropriate lessons	1
		Implementation of learning objectives in interdisciplinary communication	1
		Connecting common topics with elements of engineering, mathematics, science, technology	1
Total			12

In the first stage, we explored the current state of STEM education in regulatory documents, methodological guidelines, and educational programs.

In the second stage, we investigated pedagogical theories concerning STEM education, as well as different ways and methods of teaching through STEM, etc. Moreover, we conducted a comprehensive analysis of STEM-oriented articles from journals obtained from the Google Scholar and Scopus databases.

In the third stage, we analyzed the existing school textbooks and revealed the possibilities for teaching interdisciplinary communication. Discussions facilitate the development of STEM-based lesson plans, emphasizing the ways of integrating mathematics, natural science, engineering, and technology fields.

In the fourth stage, we scrutinized the possibilities of utilization of innovative digital technologies, including PhET simulations for STEM education.

In the fifth stage – we discussed the first experiments on STEM-based lesson plans.

Students gained experience in mathematics, science, labour training, etc. through the interdisciplinary integration of subjects.

Students actively engaged in 1-hour workshops for 12 weeks, designing and implementing STEM-based lesson plans.

Results and Discussion. At the end of the workshop, students were interviewed. The interview comprised four questions focused on STEM learning. The questions are arranged as follows: Have you acquired the concept of STEM? Were you able to use STEM elements in designing your lesson plan? What challenges did you face in developing STEM-based lesson plans? Were you able to integrate concepts and ideas from different subjects? Then, we analyzed the responses from students and compared them with the results obtained from the original data.

The survey responses comprised in the range of 1-100 points. Table 3 shows the results of the survey conducted on the experimental group both before and after the experiment.

Table 3. *Comparative findings obtained from experimental and control groups*
(descriptive statistical description)

Outcome	Pre-workshop assessment		Post-workshop assessment		Change
	M	SD	M	SD	

1-question	EG	48,4062	12,11200	72,1875	10,34700	+23,7813
	CG	48,0938	11,60467	46,0313	11,74043	-2,0625
2-question	EG	45,5625	11,95674	69,8750	10,65212	+24,3125
	CG	45,0938	10,62972	41,9375	10,58434	-3,1563
3-question	EG	53,4375	8,64697	67,0938	6,08202	+13,6563
	CG	52,9063	8,75236	53,3125	8,49074	+0,4062
4-question	EG	58,8750	11,88860	80,9688	7,46814	+22,0938
	CG	57,9375	11,05102	59,1250	10,78156	+1,1875

During the study, it was found that students faced challenges in integrating STEM elements and establishing connections between subjects in the development of STEM-based lesson plans. This study was proposed as an integrated approach to lesson planning. Therefore, as a result of its implementation in the educational process, students demonstrated improvement in problem-solving, critical thinking, cooperation, and interdisciplinary communication skills. These findings are supported by other scientific studies (Maiorca & Mohr-Schroeder, 2020; Özçakır & Çalışıcı, 2022; Wang et al., 2022). In addition, STEM education contributed to the enhancement of 21st-century skills (Drake & Reid, 2020).

Analysing primary education textbooks, identifying ways to integrate STEM elements, and identifying possibilities to establish interdisciplinary communication through common topics enabled us to develop STEM-based lesson plans (Ching et al., 2019; Pymthong & Williams, 2021).

The effectiveness of such STEM-based lesson plans has been proven in several studies (Aykan & Yıldırım, 2022; Alrwaished, 2024; Hernández & Muñoz, 2020), and our results showed higher indicators compared to other studies.

Thus, the results of the study demonstrate that teaching in the context of STEM education facilitates significant improvement in students' problem-solving capabilities, critical thinking skills, collaboration, and interdisciplinary communication. Moreover, it contributed to the development of group work abilities and research skills among students. Students were guided and assisted by physics, chemistry, biology, and engineering specialists in designing lesson plans in the context of STEM education, thereby establishing cooperative relations. Furthermore,

students engaged in critical planning to address global issues in developing STEM-focused lesson plans. This process enables to fostering of practical skills

Presenting these outcomes, we realize STEM is a new method of lesson planning and recommend incorporating lesson plans focused on STEM into the educational process. The stages outlined in our study provide students with the opportunity to utilize an integrated approach and scientific-methodological support.

Conclusion. The researchers believe that it is appropriate to further update the research and include students from primary schools, other educational organizations, and universities. This study addresses the research questions of how to effectively plan lessons in the context of STEM education.

In summary, our investigation comprises the stages of lesson plan development in the context of STEM education for prospective primary school teachers. These stages include introduction to the STEM approach, teaching through STEM, analysis of school textbooks, utilization of digital resources, and STEM lesson planning. The workshop we have developed encompasses an integrated methodology enabled to foster scientific, creative, and critical thinking skills among prospective primary school teachers. Through the development of STEM-oriented lesson plans, learners establish interdisciplinary integration, and intra- and interdisciplinary communication based on common topics. Therefore, STEM-based teaching will undoubtedly arouse curiosity in science, increase aspirations, and have a positive effect on every student.

Recommendations. To further improve the research results, we offer the following recommendations:

- development and integration of STEM-based lesson plans into the educational process;

- implementation of STEM elements in the teaching of methodological subjects;

- improvement of the stages entailed developing STEM-based lesson plans;

- presenting the research findings at scientific and practical conferences.

References

Abdikarimova, Q.E. (2022). *STEM-bılım beru tehnologiasy: adıstemelık nusqaulyq*. Nur-Sultan: DBBŪ Pedagogikalyq sheberlık ortalygy

Abdrakhmanova, A., & Kudaybergenova, K. (2023). Mektep mugalimderinin STEM-bilim beru adisimen jaratilistanu panderin oqituga dayindigi. *Qazaqstan Respublikasy Ulttyq gylym akademiasynyn habarshysy, 405*(5), 7-19. https://journals.nauka-nanrk.kz/bulletin-science/article/view/4779

Ageyeva, L., & Agranovich, Y. (2023). Obrazovatel'nyye programmy v vuzakh kak faktor sovershenstvovaniya dopolnitel'nykh kompetentsiy studentov. *Vestnik KazNPU imeni Abaia, seria «Pedagogicheskie nauki», 77*(1), 40-50. https://bulletin-pedagogy.kaznpu.kz/index.php/ped/article/view/2051

Alatas, F., & Yakin, N.A. (2021). *The effect of science, technology, engineering, and mathematics (STEM) learning on students problem-solving skills.* https://doi.org/10.26737/jipf.v6i1.1829

Alrwaished, N. (2024). Mathematics pre-service teachers' preparation program for designing STEM-based lesson plan: enhanced skills and challenges. *Cogent Education, 11*(1), 2320467. URL: https://doi.org/10.1080/2331186X.2024.2320467

Altynsarin Academy (2022). *Qazaqstan Respwblikasi Oqw-Ağartw Mïnïstrligi I. Altinsarïn Atindaği Ulttiq Bilim Akademïyasi*. Altynsarin Academy. https://uba.edu.kz/qaz/nauka/2

Aykan, A., & Yıldırım, B. (2022). The integration of a lesson study model into distance STEM education during the Covid-19 pandemic: Teachers' views and practice. *Technology, Knowledge and Learning, 27*(2), 609–637. URL: https://doi.org/10.1007/s10758-021-09564-9

Baxıtova, A. M., & Kasımova, A. G. (2020). STEM-BILIM BERWDIÑ JAÑARTILĞAN TEXNOLOGÏYaSI. https://repo.kspi.kz/bitstream/handle/123456789/3727/1150-al-farabi_56-60.pdf?sequence=1&isAllowed=y

Bekbauova, A.U., & Turebayeva, K.J. (2022). Oqushinin pange qushtarligin arttirwda STEM texnologiyasin qoldanu. *Vestnik KazNPU imeni Abaia, seria «Pedagogicheskie nauki», 76*(4), 227-239. https://bulletin-pedagogy.kaznpu.kz/index.php/ped/article/view/1859

Ching, Y. H., Yang, D., Wang, S., Baek, Y., Swanson, S., & Chittoori, B. (2019). Elementary school student development of STEM attitudes and perceived learning in a STEM integrated robotics curriculum. *TechTrends, 63,* 590-601. URL: https://link.springer.com/article/10.1007/s11528-019-00388-0

Çiftçi, A., Topçu, M.S., & Foulk, J.A. (2022). Pre-service early childhood teachers' views on STEM education and their STEM teaching practices. *Research in Science & Technological Education, 40*(2), 207-233. https://www.tandfonline.com/doi/abs/10.1080/02635143.2020.1784125

Drake, S. M., & Reid, J. L. (2018). Integrated curriculum as an effective way to teach 21st-century capabilities. *Asia Pacific journal of educational research*, *1*(1), 31-50. DOI: 10.30777/APJER.2018.1.1.03

Drake, S.M., & Reid, J.L. (2020). 21st Century Competencies in Light of the History of Integrated Curriculum. Front. Educ. 5:122. https://www.frontiersin.org/articles/10.3389/feduc.2020.00122/full

Faulconer, E. K., & Chamberlain Jr, D. J. (2022). A Case Study of Community of Inquiry Presences and Cognitive Load in Asynchronous Online STEM Courses. *Online Learning Journal*, *26*(3), 46. https://commons.erau.edu/publication/1911/

Ha, V. T., Hai, B. M., Mai, D. T. T., & Van Hanh, N. (2023). Preschool STEM Activities and Associated Outcomes: A Scoping Review. *International Journal of Engineering Pedagogy*, *13*(8). DOI: 10.3991/ijep.v13i8.42177

Habig, B., & Gupta, P. (2021). Authentic STEM research, practices of science, and interest development in an informal science education program. *IJ STEM Ed, 8*, 57. https://doi.org/10.1186/s40594-021-00314-y

Hernández Serrano, M.J., & Muñoz Rodríguez, J. M. (2020). Interest in STEM disciplines and teaching methodologies: perception of secondary school students and preservice teachers. *Educar, 56*(2), 369–386. https://doi.org/10.5565/rev/educar.1065

Ibrayeva, Y.S., & Shaushekova, B.K. (2023). Razvitiye interesa k STEM-obrazovaniyu u detey mladshego shkol'nogo vozrasta v sisteme dopolnitel'nogo obrazovaniya. *Perspektivy nauki i obrazovania, 1*, 276-290

Kwdaybergenova, K. (2023). Mektep Muğalimderiniñ STEM-Bilim Berw Ädisimen Jaratilistanw Pänderin Oqitwğa Dayindiği. Nawçnıy jwrnal «Vestnïk NAN RK», 405(5), 7-19. https://journals.nauka-nanrk.kz/bulletin-science/article/view/4779

Maiorca, C., & Mohr-Schroeder, M. J. (2020). Elementary preservice teachers' integration of engineering into STEM lesson plans. *School Science and Mathematics*, *120*(7), 402–412. https://doi.org/10.1111/ssm.12433

Özçakır Sümen, Ö., & Çalışıcı, H. (2022). The effects of STEM activities applied in mathematics courses for elementary pre-service teachers in Turkey. *International Journal of Mathematical Education in Science and Technology, 53*(12), 3352–3376. https://doi.org/10.1080/0020739X.2021.1944679

Pymthong, P., & Williams, J. (2018). Pre-service teachers' understanding of STEM education. *Kasetsart Journal of Social Sciences, 39*(1), 1-7. https://espace.curtin.edu.au/handle/20.500.11937/70880

Pymthong, P., & Williams, P. J. (2021). Methods course for primary level STEM preservice teachers: Constructing integrated STEM teaching. *Eurasia Journal of Mathematics, Science and Technology Education, 17*(8), em1996. URL: https://doi.org/10.29333/ejmste/11113

Sanz-Camarero, R., Ortiz-Revilla, J., & Greca, I. M. (2023). The Impact of Integrated STEAM Education on Arts Education: A Systematic Review. *Education Sciences*, *13*(11), 1139. https://www.mdpi.com/2227-7102/13/11/1139

Twlentaeva, G. S., Seylova, Z. T., & Berkïmbaev, K. M. (2023). STEAM Bilim Berw Jağdayinda Texnïkaliq Mamandardi Dayarlaw Üşin Joğari Matematïka Mazmunin Jäne Oqw Keşenin Äzirlew. *Vestnïk KazNPW ïmenï Abaya, serïya «Pedagogïçeskïe nawkï»*, 80(4), 154-167. https://bulletin-pedagogy.kaznpu.kz/index.php/ped/article/view/2982

Umutlu, D. (2022). TPACK leveraged: A redesigned online educational technology course for STEM preservice teachers. *Australasian Journal of Educational Technology*, *38*(3), 104-121. https://doi.org/10.14742/ajet.4773

Vasquez, J.A., Cary, S., & Comer, M. (2013). *STEM lesson essentials, grades 3-8: Integrating science, technology, engineering, and mathematics*

Vega, T.M., Morales, S.G.S., Tintaya, R.D.T., Gonzales-Macavilca, M., & Iraola-Real, I. (2019). Results between STEM and non-STEM Teaching for Integral Learning in Primary School Children in Lima (Peru). *In 2019 IEEE Sciences and Humanities International Research Conference (SHIRCON),1*(4). https://ieeexplore.ieee.org/abstract/document/9024744/

Wang, L., Chen, B., Hwang, G., Guan, J., & Wang, Y. (2022). Effects of digital game-based STEM education on students' learning achievement: A meta-analysis. *International Journal of STEM Education, 9*(1), 1–13. https://doi.org/10.1186/s40594-022-00344-0

Yesnazar, A., Zhorabekova, A., Kalzhanova, A., Zhuzimkul, B., & Almukhanbet S. (2024). Methodological system for the formation of meta-subject skills of primary school students in the context of STEM education. *Front. Educ*. 9:1340361. https://www.frontiersin.org/articles/10.3389/feduc.2024.1340361/full

Yildirim, B., & Altun, Y. (2015). STEM eğitim ve mühendislik uygulamalarının fen bilgisi laboratuar dersindeki etkilerinin incelenmesi. *El-Cezeri, 2*(2), 28-40. https://dergipark.org.tr/en/pub/ecjse/issue/4899/67132

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ASSESSMENT CRITERIA AS A WAY OF OVERCOMING THE DIFFICULTIES IN COMPLETING SELF-ASSIGNMENTS: A CASE STUDY AT ENU

Abstract

Assessment in academic writing is a crucial element in evaluating master's students' comprehension, analytical skills, and ability to communicate ideas effectively, ultimately enhancing their critical thinking and professional abilities. This article focuses on the difficulties master's students encountered when practicing academic writing and doing self-assignments (such as their thesis or other degree-mandated papers), as well as the strategies they used to overcome those difficulties. The purpose of the study was to investigate appropriate assessment criteria for self-assignments to address the challenges in completing self-assignments. Data were gathered using a survey. The results show that master's students have had various difficulties in completing their self-assignments. This study raises a few issues to address these students' particular demands in terms of their academic writing backgrounds and to guarantee their academic success. The authors suggest that the implementation of assessment criteria will facilitate master's students in completing their self-assignments and succeeding in their degrees. Some approaches are emphasized for the important aspects of the study to help master's students improve their research abilities as they work in their specific field of study.

Keywords: master's students, academic writing, self-assignments, assessment criteria, research skills.

Basic provisions. Assessment in academic writing is an essential part of the educational process that benefits both master's students and teachers. It is designed to assess comprehension of the topic, analytical skills, and ability to convey ideas clearly and coherently. In academic writing, assessment seeks to improve students' critical thinking and professional abilities. Moreover, assessment determines a student's profound understanding of the topic, as well as his capacity to analyze, synthesize, and think critically. It gives students useful information about the strengths and flaws of their work, which aids in future learning and development. Students can benefit a lot from assessment while completing their self-assignments if it is conducted based on criteria, which provide objectivity and transparency of assessment. Predefined assessment criteria assist students in understanding what is expected from them to complete their assignments. They can understand the particular requirements and standards that their job must follow, which helps them plan and manage their efforts more effectively. In addition, Students can use the rubric to self-test and improve their work before submitting it. This promotes critical thinking and self-esteem.

Introduction. A recognized hub for academics, research, society, and culture, L.N. Gumilyov Eurasian National University (ENU) was established in 1996 and is a significant player in the Eurasian academic community. One of ENU's priorities is that the training system of a modern university student is unthinkable today without recourse to the student's academic training. The concept of academic writing in the modern system of university training is no longer associated exclusively with teaching a foreign language since it is integrated into the system of general language training (Russian/Kazakh) and becomes the basis for the formation of a student's research competence (Bekturova, 2023; Zharkynbekova & Isenova, 2021; Abdirov, 2018).

Following this concept, the Foreign Languages Department where the authors of this study work, created the course "Essentials of Academic Writing" (EAW), which was introduced into the curriculum for master students ten years ago. To address the concerns of Academic writing, which is a key skill in

scientific activity, allowing researchers, in our case master's students, to present the results of their degree-mandated work, as well as exchange ideas and discoveries in their subject area. They are not aware that writing for academic audiences and situations demands criticism, experience, and adaptability. There are general guidelines for clarity, coherence, and correctness that people must adhere to when creating any kind of writing, be it an essay, report, review, or research paper. But they also need to understand the unique customs and requirements of many fields, such as the social sciences, natural sciences, engineering, and humanities (Coombe et al., 2020; Vakili & Ebadi, 2019; Andrade, 2008).

Within the content of the course "EWA" are assignments to improve academic writing in general, but the assignments appear to be affected by the nature of the self-assignments. Writing their self-assessments well has been one of the main assessment criteria in the teaching procedure of the authors, who are teachers of EWA sections. Designing the assessment criteria of self-assignments has been a challenging task, and is what this paper explores.

The "Essentials of Academic Writing" (EAW) course is taught in the non-linguistic master's degree programs at Eurasian National University (ENU) using at Eurasian National University (ENU) using the "Foreign Language (professional)" discipline as a foundation. The courses "English for Academic Study" by McCormack & Slaght, (2012) and "Extended Academic Writing From Paragraph to Essay" by Zemach & Rumisek (2016) as well as instructors' own experiences gained from their internships through Bolashak, Erasmus Mundus, and the course "English for Academic Writing and Publication" taught by Professor Robin Bantel at ENU serve as the foundation for the Academic Writing tutorial for master's students.

The course gives master's students training and practice in developing their research and academic writing skills. It also helps them build their foreign language communication abilities in scientific contexts and domains, taking into consideration the unique ways

that postgraduates think scientifically and professionally. The usual curriculum "Foreign language for non-linguistic majors of post higher education of master's degree programs" (Levels A1- C2) serves as the foundation for the module curriculum's construction.

The course "Essentials of Academic Writing" helps master's students succeed by fostering confidence and the development of critical academic reading, writing, and communication abilities. Master's students who take this course learn how to write in a style that is appropriate for academic texts and effective for meaning-making. The course emphasizes writing techniques that are typical of academic English papers in addition to grammar and vocabulary usage. The course covers a wide range of essential abilities, such as taking notes, effectively conducting class and small group discussions, critically analysing and reacting to readings, creating research topics, making claims, and using academic language and syntax.

The course is designed for ENU master students in the fields of mathematics, economics, engineering, philology, information technologies, construction, and natural sciences who are enrolled for a year.

The course is taken for one semester (fall or spring), with a calculated 2.5 credits, depending on the program's focus. Postgraduate students' independent study and hands-on instruction are combined in this English-taught course. Master's students are expected to meet the Common European Framework of Reference for Languages requirements for English language proficiency at level B2+ or above (CEFRL, 2003).

The goal of the academic discipline is to develop postgraduates in non-linguistic specialties' intercultural and communicative competence at the standard (C1) level of postgraduates in non-linguistic specialties during the foreign language education process (Sagimbayeva et al., 2018).

The course's learning objectives encompass a range of competencies that will be honed during the project writing and presentation phases. Among them are the following:

- brainstorming, planning, and arranging work;

- developing ideas and establishing a specific focus;

- locating information sources from books, journals, and the internet;

- choosing information that is appropriate for the task at hand;

- incorporating concepts and information into your text by summarizing, synthesizing, and paraphrasing without plagiarizing;

- assessing sources and choosing the most relevant and appropriate developing your critical thinking skills;

- discussing your work with your group mates;

- giving a presentation about your work;

- knowing the features of writing an introduction, conclusion, and abstract.

Topics covered in the course include:

- choosing a research topic (developing a focus, ways to narrow the topic);

- working with sources (sourcing information for your project, using evidence, writing a bibliography);

- writing different sections of research work (how to write a dissertation, writing abstracts, introductions, and conclusions);

- developing practical skills (summarizing, paraphrasing, and academic styles);

- teaching and presenting the material (conference preparation, presentation skills).

The study reported in this paper aims to add value to the field's knowledge of improving assessment criteria by teaching the course "Essentials of Academic Writing" for master's students at ENU in Kazakhstan. This should allow us to investigate which criteria characterize quality at each level of this part of the course. Additionally, it will supply data that will enable us to adjust or validate the rater training materials and rating scale descriptors. The research will additionally help to develop a better understanding of teaching the course "Essentials of Academic Writing" for master's students and its assessment for self-assignments and provide us with an opportunity to improve the quality of this course teaching. One unique feature of the current study is that it has brought instructors of the course together to investigate

the assessment of self-assignments; this should enhance the research impact as the findings can be meaningfully translated to changes in the rating course materials (Tavakoli et al., 2023). The study's guiding research question is the following: What difficulties do master's students have in completing self-assignments, and to what extent can aspects of assessment criteria of self-assignments for master's students at ENU in Kazakhstan facilitate learning?

Main part. It is known that Academic writing is a unique genre of written communication in a scientific and educational environment, allowing researchers to share knowledge and raise scientific discussions. Therefore, the course of Academic Writing has been considered by the authors of this paper for ten years. The researchers attempted to upgrade the course materials each academic year.

Some studies have been under our review. In their book "Essential Actions for Academic Writing", Caplan and Johns (2022) identified some important aspects that will probably direct educators to develop students' comprehension of rhetorical choices, linguistic adaptability, and their writing agency more deliberately. It is believed that Academic writing is a difficult process, especially for English as a second language students because their language skills for critical thinking, genre knowledge, and social knowledge are inadequate (Bayjakanova & Martbek, 2023; Manjet, 2015). In this regard, there are difficulties in assessment, in our case, the assessment of self-assignments.

The problem of assessment has been discussed in many studies that investigated different aspects of assessment (Mendoza et al., 2022; Murchan & Siddiq, 2021). Our attention should focus on the study by Tavakoli et al., (2023). They investigated which fluency traits, in this Test of English for Educational Purposes (TEEP) speaking exam section, are characteristic of fluency at each proficiency level. They have made suggestions for improvements that should improve the TEEP's rater training materials and fluency rating descriptions.

Another research is Virtual Special Issues in Language Testing by Chapelle (2020). The author selected articles from the journal

"Language Testing" and noted that the writers of this Virtual Special Issue looked into how exams are used in larger social frameworks for opportunity acquisition as well as in teaching and learning. The articles' researches discuss their studies on the social roles that tests play in both larger social frameworks for opportunity acquisition and in teaching and learning.

In Saykova (2023) since the students' ultimate assignment was to produce an essay, the study also included an initial assessment exam and a performance analysis of the students. It is necessary to state that the majority of students were merely adequately proficient in terms of the predetermined standards. The research indicates that the course appeared to be both skill-worthy and enlightening, as the students demonstrated notable advancements in the challenging domain of scientific writing. In addition, all things considered, the statistical data from the current course leads one to believe that the initiative has been a success.

Winke & Lim (2017) focused on Testwiseness and test management skills where they investigated the effects of listening test preparation. It was noted that testwiseness can help someone receive artificially inflated test scores. Since the current study is focused on the essentials of Academic Writing, the researchers would like to focus on Assessment criteria and research skills because they have something in common. The researchers believe that self-assignments can help to develop research skills.

According to Khonbi and Sadeghi (2013), self-assessment of some assignments results in greater comprehension reduces stress, and gives them a chance to evaluate and enhance their testing abilities. Additionally, Khonbi and Sadeghi (2013) expressed a want for self-assessment to familiarise themselves with various question types. Falk et al., (2023) enumerated their three primary result metrics in their studies: Accuracy of Self-Assessments, Effort and Motivation, and social interaction styles. In this current study, the researchers have been interested in the first two variables. They promote the benefits of using appropriate assessment criteria for the completion of the various self-assignments.

Research materials and methods. The study focuses on assessment of self-assignments in the course "EAW" in the 2023/2024 academic year. Sixty-four master students from non-linguistic specialties participated in the survey. They all had the same syllabus in this course, studying it in their first year at ENU in Astana. A key emphasis of EAW is writing techniques that are taught as a subject and they are also common in academic English articles and writing their thesis.

The course syllabus covered topics such as writing the abstract, introduction, conclusion, research methods, aims, objectives, research statement, and bibliography of their research area, summarising and paraphrasing some sections, and presenting the research in oral form. The researchers created the criteria for these tasks (Table 1.)

The main data collection instrument for this research was a survey that the researchers created. The survey included Likert-scale questions with six options (1 to 6), and those Likert-scale questions are in Table 2. The researchers also had three open-ended questions which were: 1) What challenges do you face in this course, and how do you overcome them? 2) Do you have recommendations on how to fulfil your self-study tasks? 3) Are there any specific changes or improvements you would suggest in your self-assessment tasks to enhance motivation for studying this course? We provided this survey to master's students to examine whether their research skills are particularly useful in their writing self-assignments. The survey results will enable the researchers to explore whether the content of the course is appropriate for the student's skill levels.

Results. The effects of the self-assignments of EAW were examined using an analysis of the survey data. As can be seen from Table 2, most respondents were satisfied with the content of self-assignment tasks in this course and rate well the tasks of self-assignments in this course. The study's findings show that master's students discovered that they need more time to do their self-assignment tasks. 80 percent of them spend just the time between 20 – 50 minutes. They also indicate that the content of self-assignments is needed to have more details and examples.

Common responses from the first open-ended question, which was "What challenges do you face in this course, and how do you overcome them?" included responses such as the following:

Example 1: Difficult tasks

Example 2: Lack of practice

These demonstrate that master students need extra time to master the content of the course. To get advice on how to approach their tasks, students must make an effort to speak with their lecturers in their subject area. Asking instructors for help and direction can be found to be essential when thinking about writing assignments.

Common responses from the second open-ended question, which was "Do you have recommendations on how to fulfil your self-study tasks?", included responses such as the following:

Example 1: More examples

Example 2: More details

Example 3: The self-assignment tasks should be directly related to real-world situations or academic contexts

These demonstrate that using an English language dictionary, searching the internet for websites that may aid in their writing process, and asking their teachers for advice on academic writing standards can all assist students improve their writing and research skills.

Common responses from their open-ended question, which was "Are there any specific changes or improvements you would suggest in your self-assignment tasks to enhance the motivation of studying this course?" included responses such as the following:

Example 1: to add some group tasks

Example 2: to make tasks more relevant

These demonstrate that master's students are very satisfied with the course and even suggest some extra tasks such as group work. The results also showed that the most effective strategies were to be persistent, strive to express oneself in various ways, and take additional time to complete their self-assignments. In addition, master's students in this study supplemented what they learned from the lecturers and seniors with their practices.

Overall, this study discovered that master's students had a harder time adjusting to the demands of studying Academic English language for their master's degrees. Based only on the course's statistical data, it can be assumed that the program has been successful.

Table 1. *Descriptive statistics of the survey*

#	Question	# of responses	Minimum	Maximum	Mean	Std Deviation
1	Do you find the course "Essentials of Academic Writing" helpful for your research skills?	65	2.00	5.00	4.00	0.74
2	How familiar are you with the concept of Academic English?	65	1.00	5.00	3.11	1.08
3	What types of activities do you engage in to improve your Academic English?	64	1.00	7.00	3.53	1.66
4	What motivates you to have Academic English? (e.g., academic goals, personal interest, research skills, identifying the research statement, presenting the project (in oral form, etc)	64	1.00	6.00	2.78	1.32
5	How well do you believe doing self-assignments is helping you achieve your Academic English language learning goals?	63	1.00	5.00	3.65	0.91
6	How much time do you have to do your self-assignment tasks?	63	1.00	5.00	2.65	1.14
7	Do you find self-assignment tasks helped you to achieve your academic goals? RATE them on a scale of 1 to 5	63	1.00	5.00	3.56	0.92

8	How comfortable did you feel doing your self-assignment tasks?	63	1.00	5.00	3.92	0.86
9	How would you rate the tasks of self-assignments in this course?	63	2.00	5.00	4.05	0.67
10	How satisfied are you with the content of your self-assignment tasks in this course?	62	1.00	5.00	4.08	0.89
11	How confident do you feel about achieving your Academic English language learning goals?	63	1.00	5.00	3.67	0.84
12	To what extent do you feel that all given instructions in Academic English are tailored to your individual learning needs and preferences?	63	2.00	5.00	3.52	0.96

Discussion. The students' conception of academic writing practices from their previous academic education is not the same as the equivalent conception and socialization in the master's community of practice currently in progress. Their writing, which is influenced by prior learning styles, makes it difficult for them to understand the new and distinct academic standards in graduate degrees rapidly. According to research, it takes time to adjust to a new educational system, and a foreign culture, and negotiate these differences when learning a foreign or second language (Andrade, 2008; Campbell & Li, 2008; Wong, 2004).

The study's findings show that master's students discovered some challenges with this course such as finding the tasks difficult and not having tools for the research. The results of this research also clearly suggest that even though the master's students met the university's language requirements (TOEFL, IELTS, or an equivalent test), they still had difficulties with academic literacy in key domains like academic writing. Their English language credentials, therefore, do not accurately reflect their level of English language competency as assigned by standardized tests. (Albert, 2023)

As a result, this study offers some suggestions to assist master's students from Kazakhstan in overcoming obstacles in their academic writing practices.

Firstly, the creation of a Learning Support Centre is the first move in the direction of the university's internationalization objective and the good of the students. The research site of the university's academic fraternity is the ideal forum for intellectual discourse to support the crucial path of academic socialization for inexperienced domestic or international graduate students to become accepted members of the master's program. Therefore, the institution should be assisted by the one-stop academic center in enhancing the academic writing experience of its students. Some foreign competent specialists can be invited to conduct academic research with master's students at this Learning Support Center.

Secondly, to help master's students develop effective learning so they can become skilled researchers in the master's program, the university should improve teaching and learning by using transdisciplinary collaboration, which is currently underutilized in Kazakhstan, between lecturers who specialize in content and language. It is recommended that lecturers from both fields work across disciplinary boundaries and gain familiarity with a broad range of subjects. It is possible to establish integrative language and content teaching courses that concentrate on particular discourses within the discipline to provide master students the best possible exposure to the standards of academic writing by integrating the knowledge of both area lecturers (Manjet, 2015).

Thirdly, the authors created the assessment criteria for master's self-assignments. There are several benefits of these criteria. It is obvious that effective assessment improves master's student learning, and it influences students' better understanding of the important goals of the course. In addition, the assessment criteria constitute how we, as teachers, assess master's student learning. The created criteria are given in Table 2.

Table 2. *Assessment criteria of self-assignments at ENU*

Unit	Description	Criteria					
Unit 1	Identify three stages in producing your research project, think about the topic, and find out what you have found interesting about this topic.	Task Achievement	Three stages	Topic	Why is this topic interesting?		
		30	30	10	40		
Unit 2	Choose a general topic for your academic paper and narrow it down by asking questions. Steps. 1. Write a general topic 2. Ask 4-5 questions 3. Narrow your topic and formulate your topic.	Task Achievement	General topic	Questions	Narrow your topic and formulate your topic.		
		30	10	40	20		
Unit 3	What research methods are you going to use in your dissertation? List your research methods and explain why you are using them.	Task Achievement	Research methods in my dissertation	Why are you using them?	Academic vocabulary use		
		30	10	40	20		
Unit 4	1. Aims of your research 2. Objectives of your research 3. Research question 4. Research statement	Task Achievement	Aims of your research	Objectives of your research	Research question	Research Statement	
		30	10	20	20	20	
Unit 5	Write a bibliography using: (4 for each) Book Journal Article Newspaper article Articles With Two to Six Authors On line source	Task Achievement	Book	Journal Article	Newspaper article	Articles With Two to Six Authors	On line source
		30	10	20	10	20	10
Unit 6	Analyze the abstract of the scientific paper in your field. Write an abstract of your research	Task Achievement	Analysis of the abstract (Features)	Own abstract (showing features)			
		30	30	40			
Unit 7	Use evidence in the scientific paper in your research field (3 examples of each piece of evidence should be provided)	Task achievement	Direct quotation	Paraphrase	Summarize	Use of reporting verbs	
		30	10	20	30	10	
Unit 8	Demonstrate the ways of avoiding plagiarism: 1. Summarise one paragraph 2. Paraphrase one paragraph 3. Use direct quotation	Task achievement + Source	Use of summarizing	Use of paraphrasing	Use of direct quotation	Use of reported verbs and vocabulary	
		30	20	20	20	10	
Unit 9	Use paraphrasing and summarizing for your research 2 paragraphs for paraphrasing, 1 paragraph for summary	Task achievement	Source (Presence of the original text)	Quality of paraphrasing	Quality of summarizing	Use of academic vocabulary	
		30	10	25	25	10	

		Task achievement				
Unit 10	Use Parallelism with coordinators (5 sentences), with conjunctions (5 sentences), parallel structure (5 sentences)	Task achievement	Use of co-ordinators	Use of conjunctions	Use of parallel structure	Academic vocabulary
		30	20	20	20	10
Unit 11	Write and analyze the introduction of your research	Task achievement	Organization of paragraphs	Analysis of introduction (features)		Use of academic vocabulary
		30	20	30		20
Unit 12	Demonstrate using graphs and charts in your research.	Task achievement	Use of graphs	Use of chart	Quality of description	Use of academic vocabulary
		30	15	15	30	10
Unit 13	Write and analyze the conclusion of your research	Task achievement	Organization of paragraphs	Analysis of conclusion (features)		Use of academic vocabulary
		30	20	30		20
Unit 14	Outline and organize your presentation on your research (Presentation)	Task achievement	Outline and Introduction	Body	Conclusion	Use of academic vocabulary
		30	20	15	15	20
Unit 15	Present your project (in oral form)	Task achievement	Outline and Introduction	Body	Conclusion	Use of academic vocabulary
		30	20	15	15	20

Conclusion. This study has shown how Kazakhstani master's students at ENU addressed challenges related to academic writing practices in the "EAW" course and offered solutions. The findings only provide a limited picture of the academic endeavour, especially when it comes to the students' experiences writing for academic reasons concerning a larger context of their educational and linguistic background from both the past and present. However, the findings have helped us understand things from their perspective, particularly how students handle challenges in their academic writing habits and take the necessary steps to overcome them. The findings create new opportunities for a more thorough understanding of academic writing that recognizes the linguistic diversity of master's students in target English-language discourse groups.

The study also supports the notion that master's students' research abilities may be developed and that teachers and researchers can enhance the quality of the "EAW" course instruction by using the assessment results from self-assignments. Additionally, ENU should take into account the suggestions made in this study to guarantee that master's students have a great learning experience, both inside their classroom and outside. This is because the university has a sufficiently high level of international authority and is actively working to modernize its educational program to meet international standards and rank among the top universities in the world for postsecondary education. Enhancing students' educational experience could help Kazakhstan's higher education institutions build a more favourable reputation. We noted one way this could be done would be by opening a Learning Support Center students could go to outside of class, which would be like a "Writing Center" at other universities. Thus, putting the recommendations into practice will help the research university's international higher education environment grow and will contribute to the realization of one of the main goals of the internationalization agenda, which is to make the nation a center of excellence for higher education.

The study has also shown the importance of a system for assessing master students' knowledge in the teaching "EAW" by introducing a criteria-based assessment system created by the authors of this study, who are also teachers of the EAW sections. Attention is focused on the importance of the assessment criteria as fundamental in the educational process system. We emphasize that the assessment method is not only a way to diagnose the academic performance of master's students, but also an effective tool to improve the quality of teaching the course "EAW". In this regard, the activity of an English teacher in the application of popular, scientifically based assessment systems is the key to achieving the ultimate goal of the course "EAW"– to enhance the intercultural and communicative ability of postgraduates in non-linguistic fields at the standard (C1) level while they are pursuing foreign language education.

In addition, all given approaches to conducting classes in Academic English allow educators to develop the research skills of master's students as they work within their particular scientific area. It is also emphasized that the assessment criteria are not only a method of diagnosing student academic performance, but also an effective means of improving the quality of teaching the course "Essentials of Academic Writing".

References

Abdirov, A. (2018). Kazirgi kezende alemdik tazhiribede zertteu universitetterindegi mamandardy kasiptik dayaralau erekshelikteri. A. Asaui atyndagy halyraralyr kazak-turik universitetining habarshysy, (110), 7-15. https://dergipark.org.tr/en/pub/habarsi/issue/71471/1150125

Albert, W. L. (2023). Assessing the speaking proficiency of L2 Chinese learners: Review of the Hanyu Shuiping Kouyu Kaoshi. *Language Testing*, *40*(4), 1007-1021. https://journals.sagepub.com/doi/full/10.1177/02655322231163470

Andrade, M. S. (2008). International graduate students: Adjusting to study in the United States. *Graduate students in transition: Assisting students through the first year*, (50), 71-90.

Bayjakanova, A. K., & Martbek, J. (2023). Orta mektep okushirainig agilshin tili sabaktarinda akademyalik zhazu dagdilarin damitu tehnologyalari. https://elibrary.ru/item.asp?id=50745440

Bekturova, M. B. (2023). Osnovnyye Problemy Formirovaniya Kompetentsii Akademicheskogo Pis'ma U Budushchikh Pedagogov Inostrannogo Yazyka. *Izvestiya. Seriya: Pedagogicheskiye nauki, 6*8(1). https://bulletin-pedagogical.ablaikhan.kz/index.php/j1/article/view/689

Campbell, J., & Li, M. (2008). Asian students' voices: An empirical study of Asian students' learning experiences at a New Zealand university. *Journal of studies in international education*, *12*(4), 375-396. https://journals.sagepub.com/doi/abs/10.1177/1028315307299422

Caplan, N. A., & Johns, A. (2022). *Essential actions for academic writing: A genre-based approach*. University of Michigan Press. https://cir.nii.ac.jp/crid/1130855721652844038

Chapelle, C. A. (2020). An introduction to language testing's first virtual special issue: Investigating consequences of language test use. *Language Testing*, *37*(4), 638-645. https://journals.sagepub.com/doi/abs/10.1177/0265532220928533

Common European Framework of Reference for Languages: Studying, teaching, assessment. (2003)

Coombe, C., Vafadar, H., & Mohebbi, H. (2020). Language assessment literacy: What do we need to learn, unlearn, and relearn? *Language Testing in Asia*, *10*(1), 3. https://doi.org/10.1186/s40468-020-00114-1

Falk, A., Kosse, F., Schildberg-Hörisch, H., & Zimmermann, F. (2023). Self-assessment: The role of the social environment. *Journal of Public Economics*, *223*, 104908. https://www.sciencedirect.com/science/article/pii/S0047272723000907

Khonbi, Z. A., & Sadeghi, K. (2013). Self-, peer-, and teacher-assessment: An investigation into Iranian EFL students' attitudes. *Studies in Second Language Learning and Teaching*, *3*(1), 87-107. https://www.ceeol.com/search/article-detail?id=189137

Manjet, K M. (2015). International Graduate Students' Academic Writing Practices in Malaysia: Challenges and Solutions, *Journal of International Students 5*(1), 12-22 http://jistudents.org/

McCormack, J., & Slaght, J. (2012). English for Academic Study -Extended Writing and Research Skills. University of Reading. 174

Mendoza, L., Lindblom-Ylänne, S., Lehtonen, T., & Hyytinen, H. (2022). Writing a master's thesis: Associations between the grade, self-efficacy, approaches to writing, and experiences of the thesis as a teaching

and learning environment. *Journal of Writing Research*, *14*(2), 257-286. https://doi.org/10.17239/jowr-2022.14.02.04

Murchan, D., & Siddiq, F. (2021). A call to action: a systematic review of ethical and regulatory issues in using process data in educational assessment. *Large-scale Assessments in Education*, *9*(1), 25. https://doi.org/10.1186/s40536-021-00115-3

Sagimbayeva, J., Moldakhmetova, G., Kurmanayeva, D., Tazhitova, G., Kassymbekova, N., Smagulova, B., Tusselbayeva, Zh., Tussupova, G., Ustelimova, N. (2018*). Experience and perspectives of teaching foreign languages at the L.N. Gumilyov Eurasian National University. Collective Monograph*. Premier Publishing s.r.o. Vienna, 192

Saykova, M. (2023). Teaching EAP To Students of Healthcare Bachelor's Degrees: The Case of Academic Writing. *Knowledge-International Journal*, *61*(5), 1031-1034. http://ikm.mk/ojs/index.php/kij/article/view/6523

Tavakoli, P., Kendon, G., Mazhurnaya, S., & Ziomek, A. (2023). Assessment of fluency in the Test of English for Educational Purposes. *Language Testing*, *40*(3), 607-629. https://journals.sagepub.com/doi/abs/10.1177/02655322231151384

Vakili, S., & Ebadi, S. (2019). Investigating contextual effects on Iranian EFL learnersmediation and reciprocity in academic writing. *Cogent Education*, *6*(1), 1571289. https://doi.org/10.1080/2331186X.2019.1571289

Winke, P., & Lim, H. (2017). The effects of test preparation on second-language listening test performance. *Language Assessment Quarterly*, *14*(4), 380-397. https://www.tandfonline.com/doi/abs/10.1080/15434303.2017.1399396

Wong, J. K. K. (2004). Are the Learning Styles of Asian International Students Culturally or Contextually Based? *International Education Journal*, *4*(4), 154-166. https://eric.ed.gov/?id=EJ903817

Zemach, D.E., & Rumisek, L. (2016). Academic writing. https://www.academia.edu/download/57903746/Academic_Writing_from_Paragraph_to_Essay.pdf

Zharkynbekova, Sh.K., Isenova, F.K. (2021). Akademicheskoe pis'mo v sisteme vuzovskikh disziplin Kazakhstana: problemy teoreticheskogo obosnavaniya i prakticheskoi aprobazii "Academic writing" in the system of university disciplines in Kazakhstan: problems of theoretical substantiation and practical approbation]. Bulletin of the ENU. *Philology series, 2*(135). https://bulphil.enu.kz/index.php/main/article/view/316/169

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ATTACHING FUTURE PRIMARY EDUCATION TEACHERS TO NATIONAL VALUES THROUGH MOBILE CONTENT

Abstract

The article discusses the issue of instilling national values in future primary school teachers through mobile content. Foreign experience in using mobile content is analyzed. The meaning of the concept of mobile content is revealed, its definition is given, and its effectiveness and capabilities are revealed. The study covers native apps, hybrid apps, web apps, mobile images, mobile music, and mobile video. To determine the effectiveness of teaching future primary school teachers to national values through mobile content, an establishing, formative experiment was conducted. Questionnaires and open testing of students were organized. The results were checked using a ratio scale, the mathematical method of Pearson's t-test, and displayed using a histogram, polygon, diagram, and table. Based on the results of the survey and open testing, the educational level of future primary school teachers in national values was determined, and effective forms of instilling in them national values, as well as the content of mobile content "Ulttyq kazyna" were identified.

Keywords: mobile learning technology, mobile content, mobile space, national values, smartphone, educational program

Basic provisions. K.K. Tokayev, president of the Republic of Kazakhstan, points out the need for future teachers of education to absorb the advanced examples of National Art, Culture, and traditions, the enormous wealth of the language, thereby preparing them for the education of a generation "Who knows seven different teachings". The purpose of the study was to identify opportunities for introducing future primary education teachers to national values through mobile content in universities. The implementation of this idea was guided by the following basic provisions:

- identification of types of mobile content and development of mobile content aimed at introducing future teachers of primary education to national values;

- use of mobile content within the framework of the elective course "Methods of introducing students to national values through the creation of a mobile educational environment" and "Mobile technology in education";

- experimental verification of the effectiveness of mobile content "Ulttyq kazyna".

Introduction. In the ultramodern world, there is a process of adding the significance of access to information and communication. It is impossible to picture someone living without a tablet or smartphone. The capabilities and potential of mobile devices are rapidly expanding, the vacuity of mobile phones is spreading far and wide, and mobile operations are in demand all over the world. The ease and versatility of using these mobile technologies have made it possible to become a useful tool in the lives of both young people and seniors. The active use of smartphones and tablets in society has increased the applicability, and demand for the integration of mobile technologies into the educational process.

It would not be redundant to say that in the period of technological rapid-fire development, the part of mobile content in education changed traditional literacy paradigms and became a revolutionary force in the way of access and operation of knowledge. The experimenters noted that the lack of a developed methodological base, that is, meaningful content, inhibits the use of mobile devices in education (Baek et al.,

2017). Thus, it is purported that it is important to prepare special content in the Kazakh language that glorifies public values in ultramodern universities.

Main part. The demand for mobile content will continue to grow as further mobile devices enter the request. Devices like the iPhone, iPad, and Android have changed the way consumers consume content. The enhancement in device speed also contributed to the increase in demand for mobile content (Teichert, 2022; Sinfield, 2018).

First, this study focuses on the substance of the conception of mobile content (Mobile content is digital content intended for possessors of mobile devices, Khomenko, 2017). As a rule, the researchers discuss the variety of digital content, especially acclimated or indeed produced, taking into account the specialized capabilities of mobile devices and the wireless access channel. With the proliferation of smartphones, tablets, and other movable devices, scholars and preceptors have access to a huge force of digital coffers that transcend the limitations of time and space. Nevertheless, the applicability of mobile content in education cannot be overrated. Because it allows scholars to consume educational accoutrements at anytime and anywhere, creates a culture of lifelong literacy and invention.

Literature review. Research on the advantages of mobile content, and its types, was carried out by scientists, and experts in the fields of media, communications, technology, and marketing. For example, Goggin (2021), describing the types of mobile content for mobile installations, delves into their importance for society. Research by Fortunati & Vincent (2014), Grinter (2015) & Ling (2016) note the impact of mobile technologies, among them mobile content, on everyday life, and their enormous influence on the formation of activities and behavior. Ito's (2020) research focuses on creating a learning environment for mobile devices, focused on mobile content that contributes to the education of young people. Sharples (2019) highlights ways to use mobile devices in teaching for educational purposes. The research is devoted to the problems

of planning mobile learning, developing educational applications, and integrating mobile technologies into the content of formal and non-formal learning. Mobile content is used to meet the various needs of students, increasing their motivation to receive education (Gökçe & Dogerlioglu, 2019; Traxler, 2009).

Moldovan et al., (2014) grouped mobile educational content into slide shows, screencast, presentations, laboratory demonstrations, interviews, documentary film, and animation. This grouping was compiled in the course of the analysis of 1500 educational videos. On websites found on the internet, mobile content types are grouped into mobile applications (hybrid, native, web), images, music, video, streaming (TV, Radio, Live Broadcast, Text Format), Text format (PDF, ePub, audio-visual content). The researchers decided to describe the above-mentioned content below.

Mobile app development is the act or process of developing a mobile app for mobile devices, such as personal digital assistants, enterprise digital assistants, or mobile phones. These applications can be pre-installed on phones during production platforms, or delivered as web applications that use server-side or client-side processing to provide an "application-like" experience in a web browser. *Native applications* are designed for only one mobile operating system, so they are "native" for a specific platform or device. The application for systems such as IOS, Android, Windows phone, Symbian, and Blackberry cannot be used on a platform other than its own. In other words, you can't use the Android app on your iPhone. *Hybrid applications* are created using multi-platform web technologies (for example, HTML5, CSS, and JavaScript). Hybrid applications are mostly website applications hidden in local packaging. Hybrid multiplatform applications are becoming fast and relatively simple. *Web* applications use the browser to run and are usually written in HTML5, JavaScript, or CSS. These apps direct the user to a URL and offer an "Install" option by creating a bookmark for their page. Web applications usually require minimal device memory. Since all private databases are stored on the server, users can access from any device as long as they have an internet connection. Therefore, the use of poorly connected web applications leads to a deterioration in the user experience.

Mobile images are used as mobile phone wallpaper and are also available as a screensaver.

Mobile music is any audio file that is played on a mobile phone. Mobile music is usually formatted as an AAC (Advanced Audio Coding) file or MP3 and comes in several different formats. *Mobile videos* come in several forms, such as 3GPP, MPEG-4, RTSP, and Flash Lite.

In the article" Opportunities to introduce future primary education teachers to national values through the creation of a mobile educational environment", by Zhumabaeva et al., (2022), it was noted that "since we live in a period known as the" mobile age", mobile technologies have affected all areas. One of them is the field of education, that is, knowledge that is acquired independently through a smartphone, or the internet. This is the knowledge that has a wide range of possibilities and is interesting, but unsystematic, quickly acquired, and quickly forgotten. It allows us to consider national values as a new model of today when we focus on the content of education, plan educational goals and expected results within these values, focus on mobile learning technologies, and build on national value" (Zhumabaeva et al., 2022), and to introduce future primary education teachers to national value through mobile content.

For this reason, to introduce future teachers of primary education to the national value through the creation of a mobile educational environment, a methodological complex, and mobile content on cycles of disciplines (scientific and natural science, pedagogical-psychological, aesthetic, etc.) have been prepared. Based on mobile content, a mobile application "Ulttyq kazyna" has been developed, which carries out the promotion of national values.

The purpose of the mobile application "Ulttyq Kazyna" is to introduce students to national values through mobile technology. The mobile application was developed for future teachers of primary education, primary school teachers, and primary school students.

The content of the mobile application "Ulttyq kazyna" consists of cells "world of fairy tales", "Misleading, mysterious, proverbs", "Traditions and customs", "From the pages of history", "Let's respect the language", "Patriotic songs", "Cycle of psychological and pedagogical disciplines", "Cycle of aesthetic disciplines", "Natural Science cycle", "Cycle of humanitarian disciplines".

In the mobile application, information text was given to the issues addressed in each cell. Within the framework of the same text, videos and presentations were presented to complement the student's knowledge. In the end, it was supplemented with tasks developed in various formats (quiz games, Question-Answer, tests, etc.) for consolidating knowledge, and testing. They are Google Forms, padlet.com, learningapps.org, educaplay.com, wordwall. net, and joyteka.com developed on platforms. The design of the mobile application "Ulttyq Kazyna" is decorated with national ornaments. The content of the mobile application will be replenished every day (Zhumabaeva et al., 2023).

In the II half of the 2023-2024 academic year, an elective course "Methods of introducing students to national values through the creation of a mobile educational environment" was introduced on the educational program 6B01303 – primary education with information and communication technologies (in the Kazakh and Russian departments) in the direction of training teachers (teachers) who do not have subject specialization. The discipline is taught in 6 semesters, 3 courses. Number of credits. The program (syllabus) and educational and methodological complex of the discipline (Mobildi bilim beru ortasyn quru arqyly bilim alushylardy ulttyq qundylyqqa baulu adistemesi, 2023) have been prepared.

The content of the syllabus consists of 3 main sections: values at the crossroads of generations; spiritual ideals of Kazakh society; and spiritual and ideological foundations of Kazakh culture in the new era.

The section "Values at the crossroads of generations" contains a system of family values, in particular, the honour of parents, national values in raising female children, raising the future of the nation, nobility, etc.

The section "Spiritual ideals of the Kazakh society" contains philosophical statements about Kazakh spirituality, the idea of Alash and the revival of national consciousness, the pedagogical heritage of the Alash intelligentsia, etc.

In the section" Spiritual and Ideological Foundations of Kazakh Culture in the New Era", cultural innovation trends in the space of modern national civilization are considered.

In the first half of 2023-2024, the elective course "Mobile technology in education" was included in the educational program 7M01301 – Pedagogy and methods of primary education of the direction of training of non – non-specialized teachers of the subject 7M013-5 ECTS for the 1st semester. The program (syllabus) and the educational and methodological complex of the elective course "Mobile Technology in Education" have been prepared (Bilim berudegi mobildi tehnologiya, 2023).

The syllabus includes the regulatory framework of digital education of the Republic of Kazakhstan; the concept of development of the information and Communication Technology Industry of the Republic of Kazakhstan and the digital sphere; mobile educational environment: modern approaches; modeling of the mobile educational environment of universities; mobile technology as a new element of the learning system; features of the use of mobile technologies in the educational process; pedagogical features of the use of mobile technologies in the educational process of universities; psychological features of the use of mobile technologies in the educational process; the principles and stages of working with mobile technologies; the classification of mobile technologies used in the educational process of the University; the use of mobile technologies in the lessons of the cycle of natural science disciplines; the use of the capabilities of mobile technologies in the teaching of the cycle of aesthetic disciplines, among others.

Research methods and materials. *Participants.* 32 students in the 3rd year of the educational program "6B01303 – Primary

education with information and communication technologies" of the Department of Primary Education of the Abai Kazakh National Pedagogical University and 60 undergraduates in the 1st year of the educational program "7M01301Ppedagogy and methods of primary education" took part in the experiment.

Data Collection tool. The experiment consisted of two stages, determinative and formative. In the course of the revealing experiment, the knowledge of future teachers of primary education about national values was revealed and the content of the mobile content "Ulttyq kazyna" was clarified. To determine the knowledge of future teachers of primary education about national values and clarify the content of the mobile content "Ulttyq kazyna", a questionnaire was given to students of the 3rd year bachelor's and 1st year master's degrees.

1. What is National value?

2. Describe the types of national values.

3. Answer the questions below:

a) The main idea of the fairy tale "Tolybai Critic"

b) In yesterday's times

c) the Religion of Muslims

d) Karakipchak

e) his grandfather Toktarbai

f) He was richer than all the nations." from what heroic epic it's taken?

g) If your sickle is sharp ... continue the proverb

h) What is the meaning of the Kazakh tradition "Heat collection"?

i) Who tore up the hard life and feat of Abylai in his youth?

j) What patriotic songs of Kazakhstan do you know?

k) Abai's educational thought in 19 words of edification?

l) Record the achievements of wrestler Sholak

m) Write down the rivers of the Zhetysu land

n) Give an example of eloquence

4. Establish for you the most effective event aimed at instilling national value.

5. What sections do you want mobile content to consist of, designed to bring you national value?

In the formative experiment, the mobile content "Ulttyq kazyna" was used, compiled by the project members to introduce students to the national value in the course of the elective courses" methods of introducing students to the national value through the creation of a mobile educational environment", "mobile technology in education".

After the formative experiment, students were given open test tasks to determine how the knowledge of future primary education teachers about national values has changed, and to check the effectiveness of the mobile content "Ulttyq kazyna".

The content of the open test tasks was aimed at identifying students ' knowledge of fairy tales, songs of heroes, misleading, mysterious, Proverbs, traditions, customs, history of the country, language, patriotic songs, scientists, and their works who contributed to the development of domestic psychology, pedagogy, methods of primary education.

Open test questions are as follows:

1. How do you understand National value?

2. Write the content of one of the fairy tales "The Zhaiyk and Edil", "The Purchase of Oil by Kozhanasyr", and "The Tale of Khan and the Ants".

3. Write the main idea of the Hero song "Er Targyn".

4. Sights with the age of the country, continue the proverb. Give an example of 3 sayings for Homeland, country, language.

5. What is the meaning of the Kazakh tradition "Baigazy"?

6. Give an example of the wisdom and fair decisions of the famous Kazakh Tole bi in the management of the country.

7. Give examples of patriotic songs of Kazakhstan.

8. Describe the psychological heritage of Zh. Aimautov wrote M. Zhumabayev's book "Pedagogy" about the education of the nation.

9. Write the structure of the dombra.

10. Write down the works of scientists and their contributions to the field of Primary Education.

11. Give an example of eloquence.

Data analysis: The results of the experiment were tested using the mathematical method of the ratio scale, Pearson's t-criterion, and depicted using histograms, polygons, diagrams, and tables.

Results. The experimental group was attended by 32 students in the 3rd year of the educational program 6B01303 Primary education with information and communication technologies and 60 undergraduates in the 1st year of the educational program 7M01301Pedagogy and methods of primary education. To determine their knowledge of national value, the question "What is National value?" the question was asked. As a result, 42 out of 92 students in the experimental group answered the question completely correctly, 46%, and 50 out of 54% wrote only a partial answer. The result of the question is shown in Figure 1.
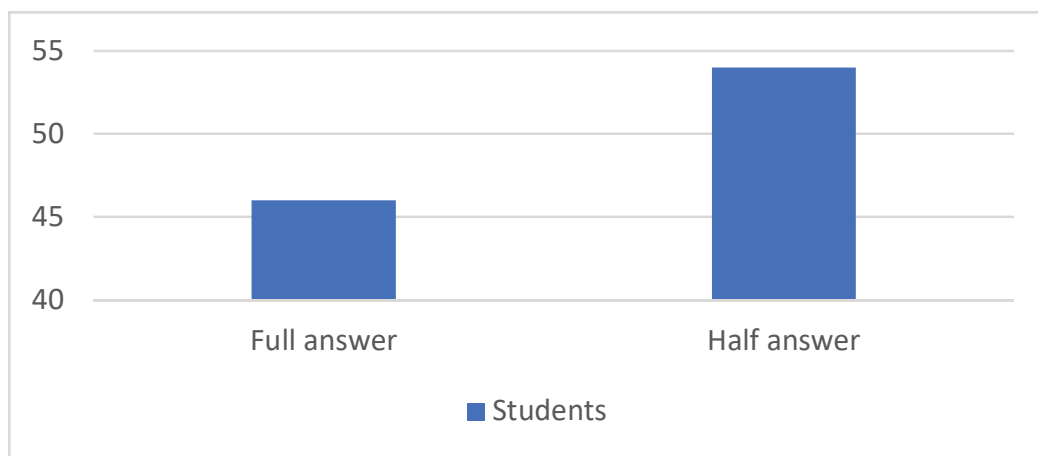
Figure 1: Result of question 1 of the survey

To determine the knowledge of students about the types of national value, the question "Describe the types of national value" was asked. 32 of the respondents correctly indicated 35% of the type 6, 26% of the type 28% of the type 5, 18% of the type 19% of type 4, and the rest of the type 3. The result of the question is shown in Figure 2.
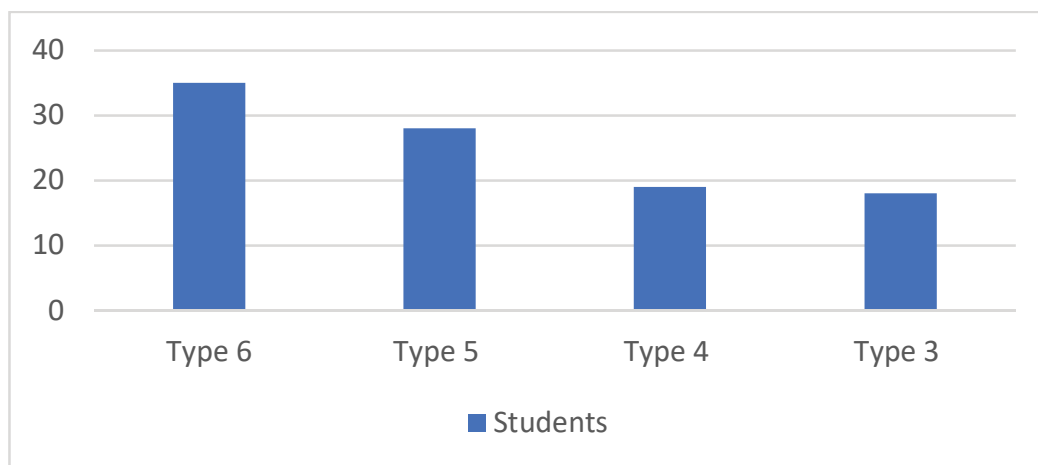
Figure 2: Result of question 2 of the survey

To determine the respondents knowledge of fairy tales, songs of heroes, misleading, mysterious, Proverbs, traditions, customs, history of the country, language, patriotic songs, etc., 10 questions were asked. Its result can be seen in the following *Table 1.*

Table 1. *Result of question 2 of the survey*

№	Task	Number of people who completed the task correctly	%
1	The main idea of the fairy tale «Tolybai Critic».	26	28
2	«In yesterday's times, the Religion of Muslims, Karakipchak..., his grandfather Toktarbai He was richer than all the nations.» from what heroic epic it's taken?	31	34
3	If your sickle is sharp ... continue the proverb.	41	45
4	What is the meaning of the Kazakh tradition of «Heat collection»?	11	12
5	Zhyrau, who tore up the hard life and feat of Abylai in his youth?	49	53
6	What patriotic songs of Kazakhstan do you know?	53	58
7	Abai's educational thought in 19 words of edification?	23	25
8	Record the achievements of Baluan Sholak.	47	51
9	Write down the rivers of the Zhetysu land.	38	41
10	Give an example of eloquence.	39	42
Average:		38	40,8

As a result, out of 92 students, 10 tasks were completed correctly, 38 respondents 40.8%.

The study graphically represents the sample obtained as a result of a given survey, the frequency Polygon, and the frequency histogram. To do this, using the ratio scale, the levels and interval indicators should be determined.

Where k is the number of grouping intervals, it is determined using the formula $k = \sqrt{n}$.

n=10, $\sqrt{10} \approx 3$, 10-4=6, let's find the width of the interval h=6:3=2. Now, determining the border of the interval $a_1 = x_{min} - 0.5h = 4 - 0.5*2 = 3$, the minimum first interval limit is 3. $a_2 = a_1 + h = 3 + 2 = 5$, $a_3 = a_2 + h = 5 + 2 = 7$, $a_4 = a_3 + h = 7 + 2 = 9$, $a_5 = a_4 + h = 9 + 2 = 11$. The maximum interval limit is 11. The results obtained are summarized in Table 2,3.

Table 2. *Level division table*

Level	Number of correctly completed tasks	Frequency (number of students)
Low	3-5	31 (33,7%)
Middle	5-7	23 (25%)
High	9-11	38 (41,3%)

Table 3. *Interval indicators*

Interval number, i	Interval boundary	Interval environment	Interval frequency, n_i
1	3-5	4	31
2	5-7	6	23
3	9-11	10	38

The frequency Polygon and frequency histogram of the result can be seen in Figure 3.4.
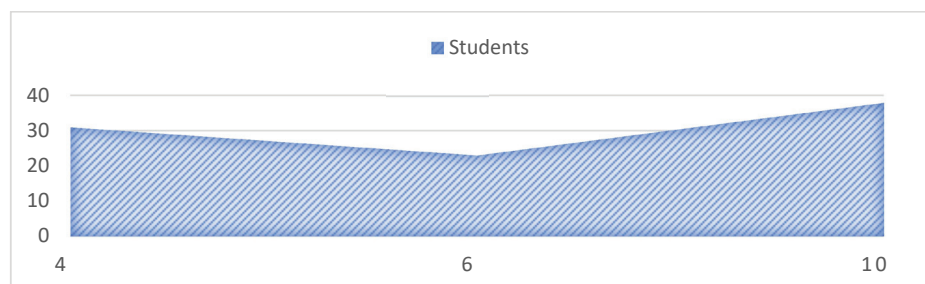
Figure 3: Frequency polygon of the result on question 3 of the survey

Figure 4: Frequency histogram of the result on question 3 of the questionnaire

To determine the most effective form of attracting future primary education teachers to the national value, it is necessary to ask the question: "Establish for you the most effective event aimed at attracting national value? special course, mobile content, club, competition". As a result, 31% of students identified "special courses", 46% – as "mobile content", and 23% – as "club". The result of the question is shown in Figure 5.
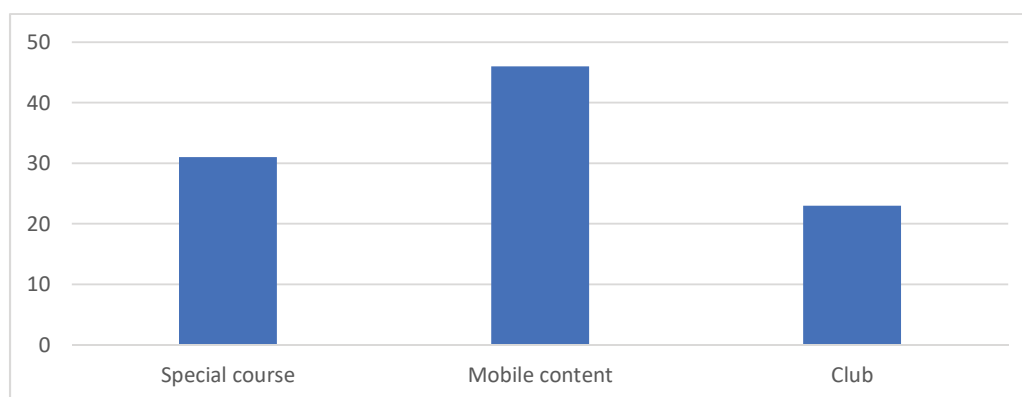
Figure 5: The result of question 4 of the survey

To create the content of mobile content for the national value of future primary education teachers, students are asked: "What sections do you want the content of mobile content for the national value of you to consist of?" the question was asked. The result can be seen in *Table 4*.

Table 4. *The result of question 5 of the survey*

Answers	Number	%
Fairy tale	65	70,6
Song of heroes	75	81,5
Misleading	42	45,6
Mystery	36	39,1
Proverbs and sayings	82	89,1
Traditions and Customs	92	100
Custom	92	100
History of the country	92	100
Language	92	100
Religion	15	16,3
Patriotic songs	57	61,9

To check the change in the level of knowledge of future primary education teachers about national values after the formative experiment, and the effectiveness of the mobile content "Ulttyq kazyna", the respondents were given open test tasks. Its result can be seen in the following *Table 5*.

Table 5. *The result of open test questions*

№	Content of open test questions:	Number of people who completed the task correctly	%
1	Write the content of one of the fairy tales "The Zhaiyk and Edil", "The Purchase of Oil by Kozhanasyr», and "The Tale of Khan and the Ants".	90	97,8
2	Write down the main idea of the Hero song «Er Targyn».	92	100
3	The country is beautiful with age ... continue the proverb. Give an example of 3 sayings for Homeland, country, language	89	96,7
4	What is the meaning of the Kazakh tradition «Baigazy»?	89	96,7
5	Give an example of the wisdom and fair decisions of the famous Kazakh Tole bi in the management of the country.	92	100
6	Give an example of the patriotic songs of Kazakhstan.	92	100
7	Describe the psychological legacy of Zh. Aimautov wrote M. Zhumabayev's book «Pedagogy» about the education of the nation.	88	95,6
8	Write down the structure of the dombra.	86	93,4
9	Write down the works of scientists and those who have contributed to the field of primary education.	80	86,9
10	Give an example of eloquence.	91	98,9
	Average:	89	96,6

We determine the level of knowledge of national values and interval indicators of post-experimental students using the ratio scale shown in the determining experiment. The result is 6 tables.

Table 6. *Interval indicators*

Interval number, i	Interval boundary	Interval environment	Interval frequency, n_i
1 (low)	3-5	4	-
2 (middle)	5-7	6	6 (6,5)
3 (high)	9-11	10	86(93,5)

The frequency Polygon and frequency histogram of the result can be seen in Figure 6,7.
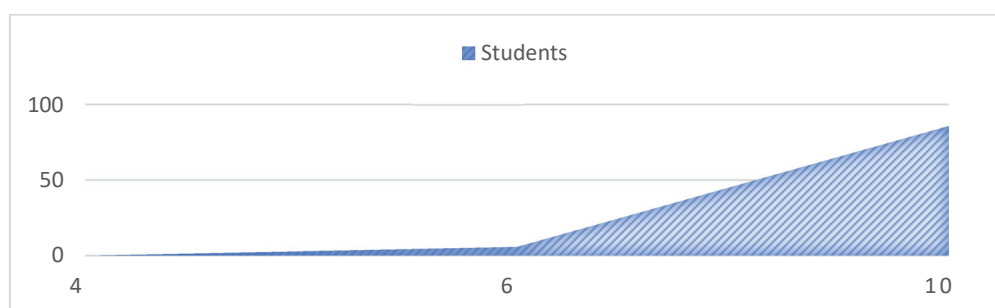
Figure 6: Frequency polygon of the open test result after the experiment
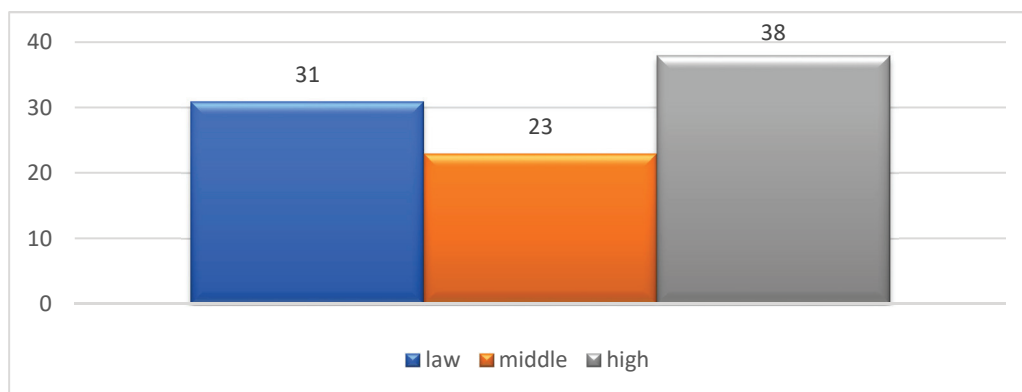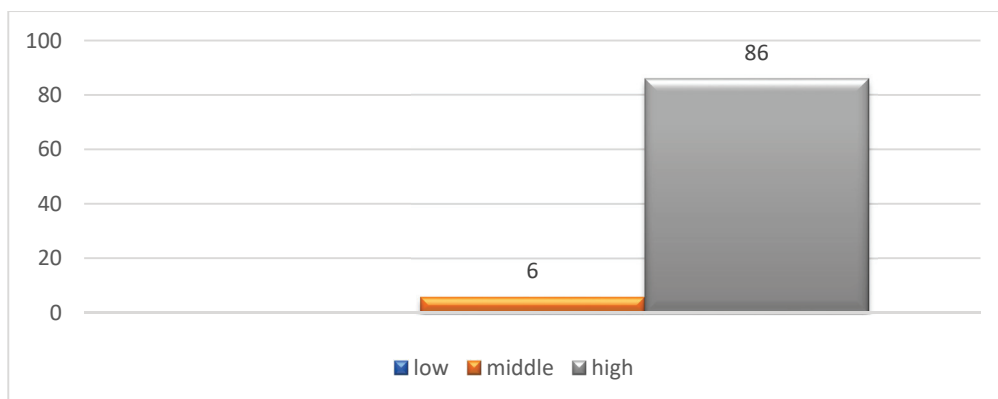
Figure 7: Frequency histogram of the open test result after the experiment

Let's check the effectiveness of the mobile content "Ulttyq Kazyna" in the elective courses "Methods of attracting students to national value through the creation of a mobile educational environment", "Mobile technology in Education" and in the youth club "Ulttyq Kazyna" using Pearson's t-criterion.

To do this, we prove the assumptions that the national values of future primary education teachers will not increase through mobile content "H_0 – "Ulttyq kazyna" and "H_1 – "Ulttyq kazyna" will increase the national values of future primary education teachers through mobile content".

χ^2 - with criteria $\chi^2 = \sum_{i=1}^{k} \frac{\left(f_i^1 - f_i^{\mathrm{II}}\right)^2}{\left(f_i^1 + f_i^{\mathrm{II}}\right)}$ we calculate by the formula. The result is presented in Table 7.

Table 7. *The level of knowledge and final indicators of the initial national values of the experimental group*

Level	Beginning %	At the end %	$\left(f_i^1 - f_i^{\mathrm{II}}\right)^2$	$\left(f_i^1 + f_i^{\mathrm{II}}\right)^2$	$\dfrac{\left(f_i^1 - f_i^{\mathrm{II}}\right)^2}{\left(f_i^1 + f_i^{\mathrm{II}}\right)}$	χ^2
Low	33,7	-	1135,69	33,7	33,7	64,7
Middle	25	6,5	342,25	31,5	10,8	
High	41,3	93,5	2724,84	134,8	20,2	

χ^2 = 64,7 equal. Given q = 0,05 degree of significance and number of degrees of freedom v=k-1=3-1=2 through a special table $\chi^2_{0.05}(2) = 5,99$ we determine the critical value.

$\chi^2 \rangle \chi^2_{0.05}$ because (64,7>5,99) H_0 the forecast is not accepted. That is, through the mobile content "Ulttyq kazyna", the national values of future primary education teachers will increase.

Discussion. According to the results of the survey, 92 students who participated in the determining experiment answered the first question with 42 correct answers, 46% completely correct, 50-54% only partially, and had difficulties with a clear answer, although they had a general idea of national value. In the second question, 32 of them correctly indicated 35% 6 types, 26 of them 28% 5 types, 18 of them 19% 4 types, and the rest 3 types, noting that they are confused in naming types of national values. On the third question, the respondents showed that on average 38 respondents answered 40.8% correctly for all 10 questions: fairy tales, songs of heroes, misleading, mysterious, Proverbs, traditions, customs, history of the country, language, patriotic songs, etc.

Using the ratio scale, we determined the level of students' knowledge about national values. The lower level was 31 students who correctly completed 3-5 tasks, which was 33.7%. The

average level of 5-7 students who correctly completed 23 tasks was 25%. The highest level of 38 students who correctly completed 9-10 tasks, was 41.3%. From this we can conclude that the students who participated in the experiment were interested in national values, types of national values, fairy tales, songs of heroes, misleading, mysterious, Proverbs, traditions, customs, history of the country, language, patriotism songs, etc. we found that, although he knew, he was at an insufficient level. We are convinced of the need to conduct special work with them.

In the Fourth survey "Mark the necessary event for you, aimed at instilling national value?" students identified special courses, mobile content, and clubs as effective forms of attraction to national values. Fifth "What sections do you want mobile content to consist of, designed to bring you to national value?" the respondents wanted the content of mobile content to consist of fairy tales, songs of heroes, misleading, mysterious, Proverbs, traditions, customs, history, patriotic songs, language materials. As a result, the following content of the mobile content "Ulttyq kazyna" was determined: "The world of fairy tales", "Misleading, mysterious, Proverbs", "Traditions and customs", "From the pages of history", "Patriotic songs", "Cycle of psychological and pedagogical disciplines", "Cycle of aesthetic disciplines", "Natural Science cycle", "Cycle of humanitarian disciplines".

During the formative experiment, taking into account the results of the survey, members of the project "AP14872058 Attracting Future Primary School Teachers to National Values through the Creation of a Mobile Educational Environment" Zhumabayeva et al., (2023) developed mobile content "Ulttyq kazyna". Mobile content "Ulttyq kazyna" was used in the elective courses "Methods of attracting students to national value through the creation of a mobile educational environment", "Mobile technology in Education" and in the youth club "Ulttyq kazyna".

Methods of attracting students to national value through the creation of a mobile educational environment", "Mobile technology

in education" elective courses, and the youth club "Ulttyq kazyna" tested the effectiveness of the mobile content "Ulttyq kazyna" using Pearson's t-criterion and proved the assumption that "The national values of future primary education teachers will increase through mobile content "H_1 – " Ulttyq kazyna".

Comparing the results obtained during the study with other studies. Research in a similar direction to our study was carried out in Peru, Turkey, USA, and Belgium. In particular, research by Kearney Burden and Rai examined how teachers use the pedagogical features of mobile learning: collaboration, personalization, and realism. They developed a survey tool based on these three structures and tested it. It was used to explore current mobile learning practices in schools and higher education (Kearney et al., 2015).

The Bano study analyzed high-quality empirical data on mobile learning in high school science and mathematics education. He used the systematic literature review (SLR) using Generally Accepted and reliable guidelines. As a result, the SLR analyzed 49 studies (60 articles) published between 2003 and 2016 and classified the applications and technologies used in these studies according to the type and context of use (Bano et al., 2018).

McConatha, Praul, and Lynch viewed mobile learning using smartphones and small devices as learning using small mobile computing devices (Mcconatha et al., 2008). The Ardies De Maeyer, Gijbels, and Van Keulen research examined six aspects of a relationship, namely interest, career aspirations, boredom, consequences, difficulties, and gender issues (Mirski et al., 2004). Diluting these aspects, he developed a multidimensional model and tested it. As a result of data analysis through a multidimensional multilevel approach, the predictive strength of students ' characteristics about aspects of their approach to mobile technology was determined.

Erkollar and Oberer (2013) discussed the integration of mobile learning with the geographic information system module at the Turkish University, where they were provided with tablet devices with the introduction of Google and Hangout programs to facilitate

communication between each student. Glackin et al., (2014) addressed the integration of mobile devices and e-books to increase students ' familiarity with the digital library.

De Pablos et al., (2015) conducted two studies at the American University of Sharjah to test the effects of iPad use on students for a semester in a mathematics course. Campos Jorge and Barreto (2021) have studied the various challenges that arise in the use of technology and mobile applications for educational purposes for students over the past decade. They surveyed students and teachers from five Cajamarca universities in Peru to determine their attitudes toward the use of mobile technologies in higher education and evaluated the results with the help of confidence Alpha Kronbach. As a result, they found that there are statistically significant differences between the attitude of the participants in the experiment to the type of mobile device, and noticed that their mobile technologies have a positive effect on the education system.

Thus, the main goal of these studies was to determine the impact of mobile technology and tools on the educational process and the attitude of students toward them. The issue of organizing the introduction of future primary education teachers to national values through mobile content is not specifically considered. In Kazakhstan, the issue of introducing future primary education teachers to national values through mobile content is being studied for the first time.

The main difference between the results obtained as a result of our study from other studies lies in the determination of the effectiveness of mobile content for future teachers of primary education, the creation and testing of the educational and methodological complex of the elective course "Methods of attracting students to national value through the creation of a mobile educational environment", "Mobile technology in education", the creation of the youth club "National Qazyna", that is, the creation of a mobile environment, the development of mobile content "Ulttyq Qazyna".

All these results are scientifically valuable and can be used in the process of introducing future teachers of primary education to national values in higher education institutions.

Conclusion. The active use of smartphones and tablets in society revealed the relevance of integrating mobile technologies into the educational process and analyzed foreign experiences in using mobile content. The essence of the concept of mobile content was revealed, the definition was given, and its capabilities and capabilities were revealed.

To determine the effectiveness of introducing future primary education teachers to national values through mobile content, a determinative, formative experiment was conducted, and a questionnaire and an open test were obtained from students. The results were tested using the mathematical method of the ratio scale, Pearson's t-criterion, and displayed using histograms, polygons, diagrams, and tables. According to the results of the survey, a special course, mobile content, and a club were identified as effective forms of attracting future primary education teachers to national values.

In the direction of training teachers (teachers) who do not have a subject specialization, an elective course has been introduced on the educational program 6B01303 – primary education with information and communication technologies (in the Kazakh and Russian departments) "Methods of introducing students to national values through the creation of a mobile educational environment". The subject was taught in the 3rd year. Number of credits – 6. In addition, the elective course "Mobile Technology in Education" was included in the educational program 7M01301 Pedagogy and Methods of Primary Education of the direction of training of non – -non-specialized teachers of the subject 7M013-5 ECTS for the 1st semester. The program (syllabus) and educational and methodological complex of these elective courses were prepared and tested.

To introduce future teachers of primary education to national values, a youth club "National Kazyna", that is, a mobile environment, was created among students of the 1-4 courses of the Department of Primary Education. The club worked in 6 directions: "Cultural heritage", "National language", "Family and dynasty",

"Personality", "Traditions and customs", and "Traditional art".

The project members, remembering the results of the survey, developed mobile content "Ulttyq kazyna" in the content "The world of fairy tales", "Misleading, mysterious, Proverbs", "Traditions and customs", "From the pages of history", "Patriotic songs", "Cycle of psychological and pedagogical disciplines", "Cycle of aesthetic disciplines", "Natural Science cycle", "Cycle of humanitarian disciplines".

During the educational experiment, the mobile content "Ulttyq kazyna" was tested in the elective courses "Methods of introducing students to national values through the Creation of a mobile educational environment", "mobile technology in Education", and the Youth Club "National Kazyna".

The effectiveness of the mobile content "Ulttyq kazyna" in introducing future primary teachers to the national value in the elective courses" methods of introducing students to national value through the creation of a mobile educational environment", "mobile technology in education"and the youth club "National Kazyna" was tested using Pearson's t-criterion.

References

Averyanova, S. (2017). Mobilnye tehnologii v sisteme vysshego obrazovaniya. Nauka YuUrGU: materialy 69-j nauchnoj konferencii. Sekcii ekonomiki, upravleniya i prava. [Elektronnyj resurs]. Mobile technologies in the higher education system. Science of SUSU: materials of the 69th scientific conference. *Sections of Economics, Management, and Law.* URL:https:// www.researchgate.net/ publication /328661871_ mobilnye_tehnologii_v_ sisteme_ vyssego_obrazovania/citation/download

Baek, Y., Zhang, H., & Yun, S. (2017). Teachers' attitudes toward mobile learning in Korea. *TOJET: The Turkish Online Journal of Educational Technology*. https://scholarworks.boisestate.edu/edtech_facpubs/155/

Bano, M., Zowghi, D., Kearney, M., Schuck, S., Aubuson, P. (2018). Mobile learning for science and mathematics school education: A systematic review of empirical evidence. *Computers & Education*. 30-58. https://doi.org/10.1007/s10798-014-9268-x

Campos Jorge & Barreto. (2021). Israel Tecnología móvil en el aprendizaje universitario. *Sophia. 17*(1) 1016.

De Pablos, P., Tennyson, R., Lytras, M. (2015). Assessing the role of Mobile technologies and distance learning in higher education. *Reino Unido: Editorial IGI Global*.

Fortunati, L., & Vincent, J. (2014). Sociological insights on the comparison of writing/reading on paper with writing/reading digitally. *Telematics and Informatics*, *31*(1), 39-51. https://www.sciencedirect.com/science/article/pii/S0736585313000087

Glackin, B. C., Rodenhiser, R. W., & Herzog, B. (2014). A library and the disciplines: A collaborative project assessing the impact of ebooks and mobile devices on student learning. *The Journal of Academic Librarianship*, *40*(3-4), 299-306. https://www.sciencedirect.com/science/article/pii/S0099133314000615

Goggin, G. (2021). *Apps: From mobile phones to digital lives*. John Wiley & Sons.

Gökçe, K. G., & Dogerlioglu, O. (2019). " Bring Your Own Device" Policies: Perspectives of Both Employees and Organizations. *Knowledge Management & E-Learning*, *11*(2), 233-246. https://eric.ed.gov/?id=EJ1245743

Grinter, R. (2015). Collaborative learning in online and offline maker spaces. *11th International Conference on Computer Supported.* https://nyuscholars.nyu.edu/en/publications/collaborative-learning-in-online-and-offline-makerspaces

Ito, M. (2020). Principios, aplicaciones y retos del aprendizaje conectado. Contextos Educativos. Revista De Educación. (26), 157–176. [Elektronnyj resurs]. URL: https://doi.org/10.18172/con.3966 (data obrasheniya: 20.01.2024) Principios, aplicaciones y retos del aprendizaje conectado. *Contextos Educativos. Revista De Educación.* (26), 157–176.

Kearney, M., Burden, K., & Rai, T. (2015). Investigating teachers' adoption of signature mobile pedagogies. *Computers & Education*, *80*, 48-57. https://www.sciencedirect.com/science/article/pii/S0360131514001821

Khomenko, O. V. (2017). Realizaciya mobilnogo obucheniya na primere Portala mobilnogo kontenta OmGTU. [Elektronnyj resurs] Implementation of mobile learning using the example of the Mobile Content Portal of Omsk State Technical University.

Ling, R. (2016). Mobile technologies: life after mobiles: concepts, methods, and debates. _New York, NY: Routledge_.

Mcconatha, D., Praul, M., & Lynch, M. J. (2008). Mobile learning in higher education: An empirical assessment of a new educational tool. _Turkish Online Journal of Educational Technology-TOJET_, _7_(3), 15-21. https://eric.ed.gov/?id=EJ1102943

Mirski, P. J., & Abfalter, D. (2004). Knowledge enhancement on site–guests' attitudes towards m-learning. In _ENTER,_ 592-600.

Mobildi bilim beru ortasyn quru arqyly bilim alushylardy ulttyq qundylyqqa baulu adistemesi. (2023). Pandik mamandandyrylmagan mugalimderdi (pedagogterdi) dayarlau bagytynda 6B01303 –Bastauysh bilim aqparattyq-kommunikaciyalyq tehnologiyalarmen bilim beru baqdarlamasy (qazaq zhane orys boliminde) bojynsha bilim alushylarga arnalgan elektivti kurs. Almaty (2023).

Bilim berudegi mobildi tehnologiya. (2023). 7M013 – Pandik mamandandyrylmagan pedagogterdi dayarlau bagytynyn 7M01301 – Bastauyshta oqytu pedagogikasy men adistemesi bilim beru bagdarlamasy bojynsha bilim alushylarғa arnalgan elektivti kurs. Almaty

Moldovan, A. N., Ghergulescu, I., & Muntean, C. (2014). Learning assessment for different categories of educational multimedia clips in a mobile learning environment. In _Society for information technology & teacher education international conference_ Association for the Advancement of Computing in Education (AACE). 1687-1692. https://www.learntechlib.org/p/131015/

Oberer, B., & Erkollar, A. (2013). Mobile learning in higher education: A marketing course design project in Austria. _Procedia-Social and Behavioral Sciences_, _93_, 2125-2129. https://www.sciencedirect.com/science/article/pii/S1877042813036227

Sharples, M. (2019). Distance Learners' Use of Handheld Technologies: Mobile Learning Activity, Changing Study Habits, and the 'Place' of Anywhere Learning. _The International Review of Research in Open and Distributed Learning._ 20(2). https://doi.org/10.19173/irrodl.v20i2.4040

Sinfield, D. (2018). The Boundaries of Education: Using mobile devices for connecting people to places. https://doi.org/10.25304/rlt.v26.2121

Teichert, L. (2022). A Secret "I still have it on the iPad": Unsanctioned Digital Literacies in the Home. _Nordic Journal of Digital Literacy_, (3), 190-201. https://doi.org/10.18261/njdl.17.3.5

Traxler, J. (2009). Mobile Learning Transforming the Delivery of Education and Training. _Issues in Distance Education. AU Press._ 320.

Zhumabaeva, A. E., Bazarbekova, R. Zh., Nurzhanova, S. A., Zhumabaeva, Zha.A. (2022). Opportunities to indoctrinate future elementary education teachers into national values by creating a mobile educational environment. _Bulletin Series of Pedagogical Sciences._ 1, 76.

Zhumabaeva, A. E., Stambekova, A. S., Bazarbekova, R. Zh., Nurzhanova, S. A., Zhumabayeva, Zh. A., Ospankulov, E.E. (2023). Ulttyq Qazyna. Mobile app. [Elektronnyj resurs]. URL: https://apps.apple.com/app/ulttyq-qazyna/id6470817265 (data obrasheniya: 14.02.2024) Ulttyq Qazyna. Mobile app. https://apps.apple.com/app/ulttyq-qazyna/id6470817265

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THE PILOT STUDY OF THE CLIL LESSONS IN CHEMISTRY AND BIOLOGY FOR LOWER SECONDARY SCHOOLS

Abstract

In recent years, CLIL technology has been widely used around the world as a tool for studying various disciplines. However, there is a significant lack of its applications in chemistry and biology lessons. This method improves the study of chemical and biological terms and concepts, contributing to the improvement of communication abilities. Therefore, this study aimed to develop and pilot study the CLIL lessons in chemistry and biology based on a subject-language integrated approach for 7-8 grades. The experiment was conducted at Lyceum-Internet from 1.03-14.04.2023. The study developed CLIL lessons on the following topics: «Movement», «Coordination and regulation», «Human body», «Oxides», and «Chemical bonds» for students of grades 7-8. The lessons developed by the authors were successfully used in chemistry and biology classes, as evidenced by an increase in the academic level of knowledge of the experimental group in chemistry and biology. In addition, a questionnaire was conducted after the experiment to determine the students' attitudes towards CLIL lessons. The study found that the students enjoy working in CLIL lessons, which has a positive effect on the acquisition of knowledge in the subjects.

Keywords: CLIL, trilingual education, questionnaire, secondary school, chemistry, biology.

Basic provisions. The approach known as Content and Language Integrated Learning (CLIL) involves the integration of content subjects with the learning of a second or foreign language. CLIL involves integrating content and language, developing language proficiency, using support strategies, assessing language and content, and aligning with curriculum standards. The articles presented discuss the scientific and methodological foundations of CLIL-learning technologies, as well as the types and prospects for using CLIL technologies in teaching chemistry and biology. CLIL lessons in chemistry and biology for 7th and 8th-grade students were developed and pilot-tested. In these classes, the CLIL methodology incorporated authentic materials and resources from educational English-language websites. The author successfully implemented CLIL lessons in chemistry and biology, leading to an improved academic level of knowledge in the experimental group for both subjects.

Introduction. The educational process should aim to cultivate specialists with qualities such as flexibility of thought, mobility, competitiveness, initiative, and constructiveness. A specialist needs to possess a range of competencies, including the ability to self-educate, knowledge of innovative technologies and their potential applications, independent decision-making skills, adaptability to new social and professional environments, teamwork abilities, and stress management skills (Sadykov & Ctrnactova, 2019).

Kazakhstan is currently developing a new education system aimed at global integration (Ïsmaïlova et al., 2023; Ismailova, Karabazar & Alimzhanova, 2023). This shift involves significant changes in both instructional theory and practice. Our country prides itself on being highly educated, with a population fluent in three languages: Kazakh as the official language, Russian for interethnic communication, and English for effective participation in the global economy. Currently, proficiency in the English language is considered essential for expanding professional knowledge and opportunities.

The use of CLIL technologies in chemistry and biology will help both students and teachers understand the current world situation (Mambetalina et al., 2021). The integration of computer technology into education should

not prompt the immediate abandonment of traditional teaching methods. The combination of traditional and innovative teaching methods with modern information technologies is the only way to achieve tangible results in the development of skills and abilities to work with professional materials (Carrión Candel et al., 2021). Free access to modern computer technologies is a favourable fact for their application in chemistry and biology teaching. The computerization of the process of pedagogical knowledge control allows for a comprehensive and objective assessment of students' knowledge levels. Internet access freedom helps address the lack of authentic resources needed for presentations and interactive lessons. Free content enables the use of authentic texts, as well as access to audio and video materials in different languages for listening and viewing (Sadykov et al., 2023; Satayev et al., 2022).

Main part. The Czech philosopher and pedagogue John Amos Comenius proposed the approach of learning a language via content, emphasizing the significance of successful foreign language education (Gejdoš & Pošteková, 2023). Bilingual and multilingual persons might have been found in the most affluent and privileged families in the 1890s. Rich families either sent their children abroad to learn a foreign language or hired tutors (male instructors for boys and female teachers for girls) to tutor their children. The deployment of CLIL served two main purposes at the time: political and educational. The political aim was to ensure a higher level of language proficiency in the specified dialects, in line with the transferability requirements across the European Union (Ball, 2009). The pedagogical driver, influenced by successful multilingual programs such as those in Canada, aimed to improve and modify current dialect teaching approaches to provide better proficiency levels to a diverse range of students. CLIL has recently gained popularity as a means of introducing innovative methodologies into the curriculum while also promoting access to different languages (Dalton-Puffer, 2014).

In 1965, Canada saw the emergence of contemporary CLIL for the first time. Parents of English-speaking children in French-speaking Quebec were worried about how their kids would fare in a French-speaking environment and inquired (Chun, 2015). Matthias Bel (as cited in Jwman, 2021) was involved in teaching, philosophy, philology, and history. Bel directed two grammar schools in a bilingual area, to make the process of learning many languages easier. He tried to broaden his vocabulary to better understand the world and its reality (De la Fuente et al., 2019).

In 1966, a new technique for studying foreign languages called Language Across the Curriculum (LAC) was introduced in England. The approach is cross-curricular and aims to support children's language learning through bilingual education. In 1970, subject and language-integrated learning systems were introduced in various linguistic areas. Following that, language immersion systems, which were designed to teach both the subject and a non-native language, became widely used in Canada, the USA, and other countries (Madrid & Perez-Canado, 2018).

Cummins' (2013) concept is referred to as the «BICS/CALP» model. BICS represents a general language proficiency in interpersonal communication, while CALP represents a cognitive language proficiency. Cummins' (2013) approach is based on B. Bloom's taxonomy of cognitive skills. He identified lower-order thinking skills (knowledge, comprehension, and application) as basic skills and higher-order thinking skills (analysis, synthesis, and evaluation) as cognitive skills. Cummins (2013) developed a two-factor communication model based on the 'BICS/CALP theory, which is commonly regarded as the theoretical foundation of the CLIL model in higher education. This model can aid in identifying didactic methods and tools for distinguishing between ESP and CLIL. ESP is a form of context-supported learning, located in the first quadrant of Cummins' (2013) theory (context-conditioned learning). On the other hand, CLIL involves the development of cognitive skills, such as analysis, synthesis, and evaluation of the phenomenon being studied, and is considered context-unconditioned learning (Coyle & Meyer, 2019). The success of these

projects prompted a new attempt to enhance the quality of language education, as outlined in a 1983 European Parliament Regulation. CLIL is a general education technique that teaches students a school regulation while instructing them in a foreign language. The term CLIL was developed by a group of linguists who investigated a bilingual and multilingual educational program initiated by the European Commission in the late 1990s (Mehisto et al., 2008).

CLIL was coined by David Marsh in 1994 (as cited in Marsh, 2013) to describe a system that is distinct from, but similar to, language immersion or content-based learning. Its supporters aimed to create a «generic term» that would describe the different ways language is used as a medium of education. It is widely recognized as an effective method. After a pan-European discussion among experts in Finland and the Netherlands, there is a focus on how to bring the high-quality language learning found in certain types of schools to mainstream state-funded schools and universities. This approach is being used to expedite the teaching of corporate executive management issues in English in Italy. Marsh (2013) put forth the idea of using the term CLIL to describe a variety of two-way learning strategies that focus on content and language. Recently, CLIL research has largely concentrated on the language component of technology. This integrated approach involves the collaboration of linguists, educationalists, psychologists, and other professionals. The objective of studying 2-way learning (subject and language) is to gain insight into students' cognitive abilities. It's worth noting that many European universities already offer teacher preparation courses in CLIL (Marsh & Frigols, 2012).

Coyle et al. 's (2023) «4Cs Framework» comprises four key concepts that teachers can use to develop CLIL courses, blending content, communication, cognition, culture, and context with the 4Cs technique. According to the conceptual framework, it is critical to foster cognitive capabilities, creative learning, and cooperative social interaction.

The 4Cs Framework:

- content gives a platform for analysis and interpretation, which promotes cognitive skill development. Instead of accumulating knowledge, this perspective considers disciplinary content knowledge to be the creative construction of knowledge through idea formation, planning, and output.

- communication is viewed as social, cultural, and personal (i.e., interpersonal contact involving scaffolding, mediation, and meaning and form negotiation).

- cultural aspects, it is believed, are unavoidably connected to the merger of content and language. CLIL's goal is to promote cultural awareness and comprehension of the traditions formed in the subject's language.

- context. The remaining three components – content, communication, and cognition – are also considered part of context. The framework recognizes the complex relationships that exist between these four components, each of which supports learning (Villabona & Cenoz, 2022).

It is becoming increasingly common for students to learn a second language alongside their main subject. It might be the case that science lessons are taught in English. In this way, you will not only learn science but also the required language and vocabulary. Learning English using the CLIL technique can be a helpful way to learn subjects like biology and chemistry. This approach encourages students to familiarize themselves with biological vocabulary, which can improve their critical thinking and communication skills. It's important to note that CLIL doesn't involve teaching students what they already know in a new language or limiting the topic (San Isidro, 2018).

The purpose of the study is to develop and pilot study the CLIL lessons in chemistry and biology based on a subject-language integrated approach for 7-8 grades.

Research materials and methods. In teaching chemistry and biology in English: writing, listening, reading, and speaking are all used. Teachers and students engage in discussions, critiques, and corrections of the covered content. CLIL in the classroom aids in the development of student's critical thinking abilities, which in turn helps them assimilate the material they are learning. It is important to outline the key stages that a CLIL-based lesson

should include, depending on the training material (figure 1).

When developing lesson plans, it's important to set both content and language objectives. A lesson should meet the SMART criteria, that is, objectives should be specific, measurable, achievable, relevant, and time-bound. While working with text is a primary method, various speaking activities should also be incorporated into the sessions. Texts should include images and diagrams to help readers visualize what they are reading. Students need structural markings in the text, such as line numbering, paragraphs, headers, and subheadings, when working with a foreign language. This makes working with the text much easier. Texts should be presented in diagram form to aid understanding and description of the text's concept and material.

Group: 8B	Time: 40 min
CLIL Lesson Plan: 9.2 IONIC BOND	
Previous knowledge	*Previous skills*
- Outer shells of an atom - Electron dot representation - Line representation	- Observing and taking notes - Counting, describing signalling - Making inferences
Aim(s)	
- develop students content knowledge - foster language skills such as speaking and listening - understand how atoms or ions gain/lose of electrons; - draw the dot and cross diagrams of ionic compounds; - understand the mechanism of formation of ionic bond and predict the properties of ionic compounds	
Teaching objectives	Learning outcomes
A. Content	**A. Content**
- Gain or lose of electrons - Drawing dot and cross diagrams for ionic bonding. Ionic crystalline networks	Students acquire the vocabulary related to the unit Students become acquaintance with ionic bond and how gain and lose electrons.
B. Cognition (functions)	**B. Cognition**
Evaluate: determine the possible outcomes of processes *Analyse:* (draw connections and differences among varied occurring events and phenomena) *Understand:* report ionic bonding	- Students are able to draw dot and cross diagrams for ionic bonding. - Students understand how gain or lose of electrons - Students identify and arrange
C. Communication	
Terminology ionic bond – иондық байланыс / ионная связь; to transfer – ауыстыру / переводить; melting – балқу / плавление; freezing – қату / замораживание; dot and cross – нүкте мен крест / точка и крест; crystalline network – кристалдық тор / кристаллическая решетка; neighbor – көрші / сосед.	
Language for learning (=language needed to operate in the learning environment or in a particular lesson – discuss, justify, explain, etc.) *arrange* *cut out* *Paste* *discuss*	
D. Culture/Citizenship	
Ionic bonds are important because they allow the synthesis of specific organic compounds.	
Materials & resources	Interactive board Worksheets Images for cutting and labelling Notebooks Colours and pencils

Figure 1: CLIL lesson plan on the topic: «Ionic bond»

The pilot study was conducted at the lyceum-internet «Bilim-Innovation № 2» of Karaganda, in the period from 1.03.2023 to 14.04.2023. Students of 7th and 8th grades took part in the approval of the CLIL lessons, there are a total of 48 students in 7th grade and 46 students in 8th grade.

Lessons in grades 7 «A» and 8 «A» (group 1 – control) were conducted in a traditional style. Traditional teaching involves the passive acquisition of information from the teacher.

Lessons in grades 7 «B» – 8 «B» (group 2 – experimental), the CLIL method, and tasks were used in class. Students following the CLIL approach learn a second language and a subject at the same time. In CLIL teaching, it's important to develop four language skills: listening, reading, speaking, and writing, as well as subject knowledge, skills, and understanding. The same final test was designed for all classes. The exams were given out on A4 pieces of paper. Students in seventh

grade had 30 minutes to complete the final test, which consisted of 20 questions in biology. Topics included in testing: «Movement», «Coordination and regulation, Human body». Students had 20 minutes to complete the final test, which consisted of 10 questions in chemistry. Topics included in testing: «Oxides» and «Chemical Bonds».

Result. Figures 2-3 show the average score and grades for the final test in grades 7 "A" (group 1- control group) and 7 "B" (group 2 – experimental group).
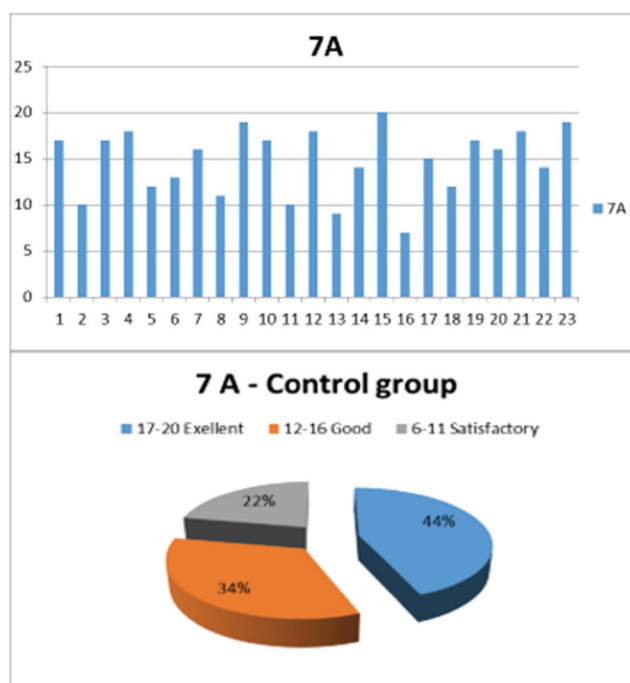
Figure 2: Results of final testing in grade 7 "A" (group 1 – control)

5 students – satisfactory (22%);
8 students – good (34%);
10 students – excellent (44%).

The average score was 13 points. The level academic of knowledge is 78%.
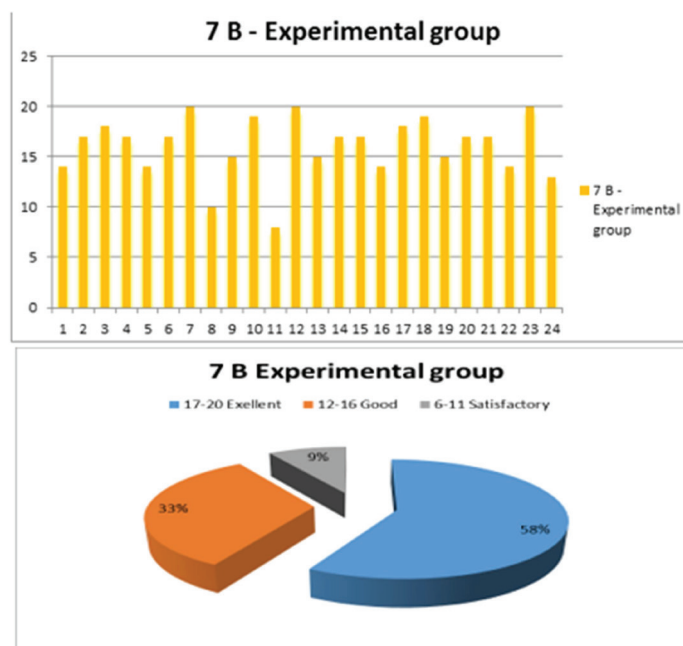
Figure 3: Results of final testing in grade 7 "B" (Group 2 -experimental)

2 students – satisfactory (9%);

8 students – good (33%).

14 students – excellent (58%)

The average score was 17 points. The level academic of knowledge is 91%. Comparing two groups the average score increased by 4 points.

The level academic of knowledge increased by 13%.

Analysis of results of CLIL lessons in chemistry. Figures 4-5 show the average score and grades for the final test in grades 8 "A" (group 1- control group) and 8 "B" (group 2 – experimental group).
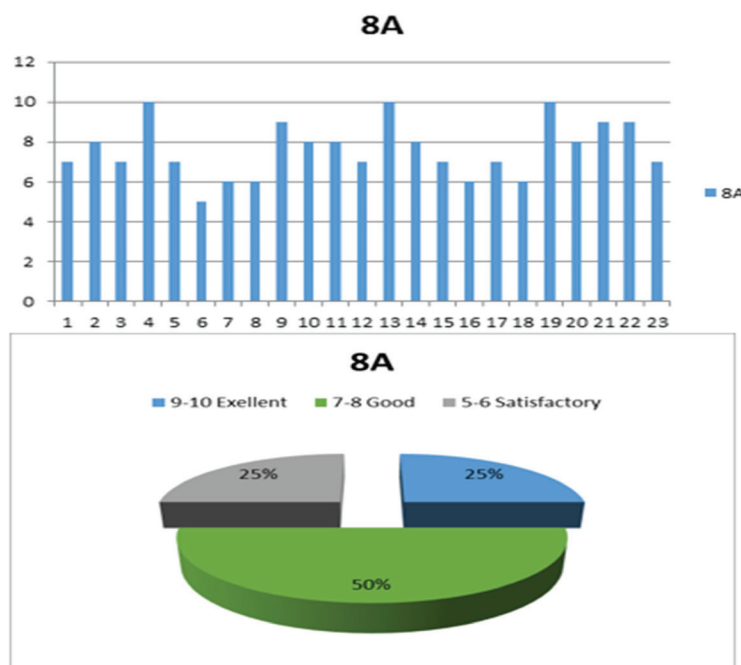
Figure 4: Results of final testing in grade 8 "A" (group 1 – control)

6 students – satisfactory (25%);

12 students – good (50%);

6 students – excellent (25%).

The average score was 7.5 points. The level academic of knowledge is 75%.
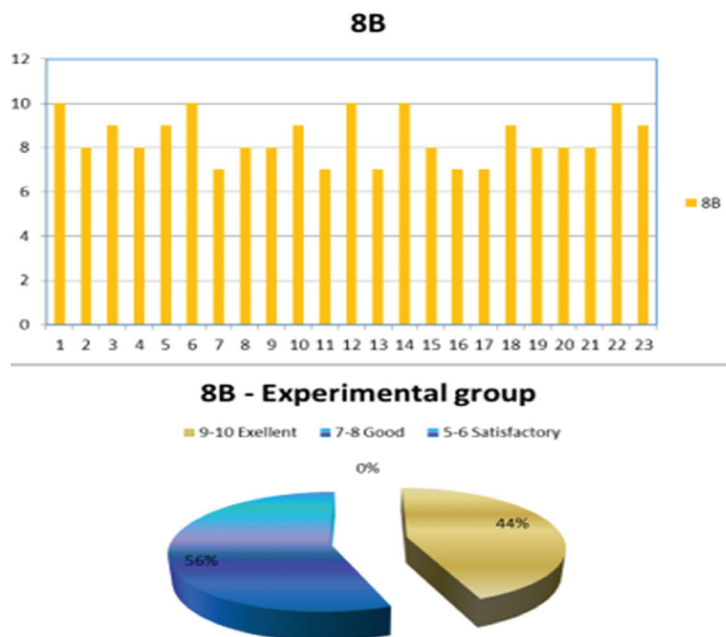
Figure 5: Results of final testing in grade 8 "B" (group 2 – experimental)

13 students – good (56%);

10 students – excellent (44%).

The average score was 8.7 points. The level academic of knowledge is 100 %.

Comparing two groups the average score increased by 1.2 points. The level academic of knowledge increased by 25%.

Analysis of the results to determine the attitude of students towards CLIL lessons. To determine the attitude of students towards CLIL lessons, a questionnaire was conducted after the experiment. The study's questionnaire comprised nine questions:

1. Do you find lessons with the use of CLIL methodology engaging?

2. Does the lessons with the application of CLIL methodology be more engaging than traditional lessons?

3. Do you find the explanations in the CLIL lessons to be sufficiently clear to enable you to understand the topic well?

4. Do you believe the CLIL lessons had too much information, graphs, and photos, making them difficult to understand?

5. Do you believe the knowledge gained in CLIL lessons was applied in real life?

6. Would you wish to participate in more CLIL lessons like these?

7. Do you enjoy the Wordwall.net game? Is it easy and enjoyable, and does it allow you to evaluate your knowledge?

8. Do you believe that performing CLIL issues in this form is more fascinating than using the traditional method?

9. Would you prefer CLIL tasks like this to be performed more frequently?

The researchers used a three-point answer scale, with "yes" (1), "neutral" (2), and "no" (3). Figure 6 illustrates overall 7 «В»-8 «В» grades students' opinions toward CLIL lessons before the experiment. It shows separate answers for all questions. The students' answers to the question were as follows:
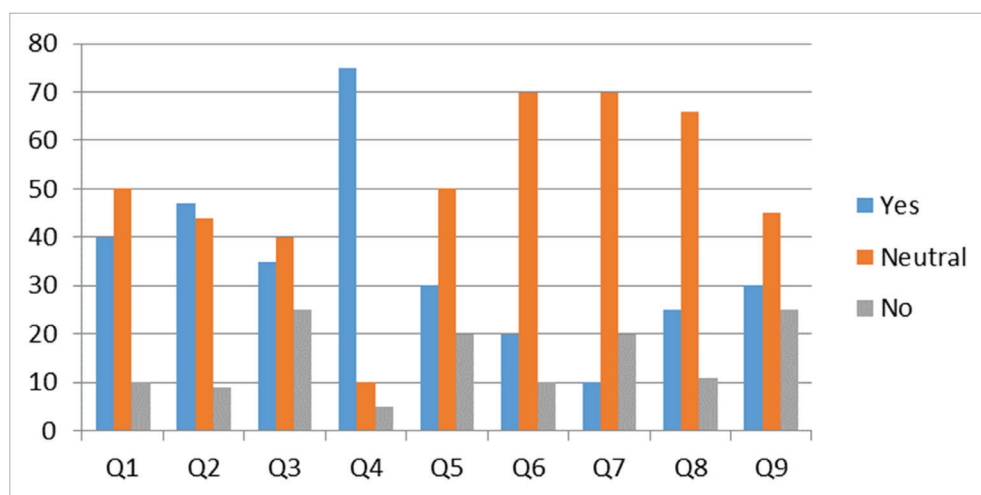
Figure 6: The overall 7 «В» -8 «В» grades students' opinions toward CLIL lessons before the experiment

More than 45 % of students think that CLIL lessons are more interesting than the traditional, compared to just 8 % saying they "disagree" in this area. Similarly, more than 35 % of the students like lessons with the use of CLIL methodology and would like the CLIL lessons carried out more often, while less than (40 %) say, they have "no opinion" in this area. Only 10 % of students rate themselves as "disagree". In comparison, the proportion who prefer CLIL tasks instead of traditional solving and would like to solve CLIL tasks more often is 25 %. It is interesting to note, that more than 70 % of students think that the CLIL tasks had too much information, diagrams, and images.

Figure 7 illustrates overall 7 «В»-8 «В» grades students' opinions toward CLIL lessons after the experiment. It shows separate answers for all questions. The students' answers to the question were as follows:
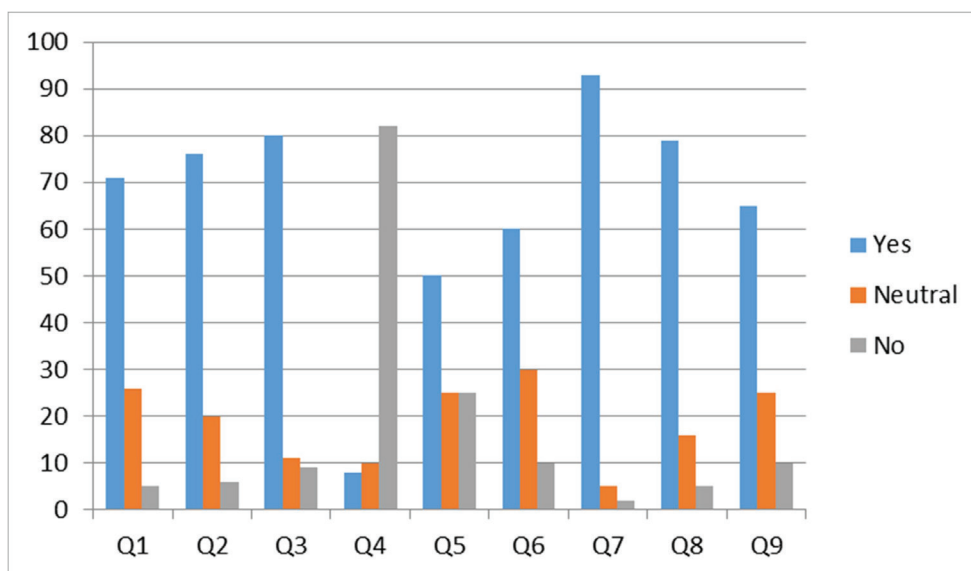
**Figure 7: The overall 7 «B»-8 «B» grades students' opinions
toward CLIL lessons after the experiment**

According to Figure 7, it is clear that the highest proportion (70 %) of 7 «B»-8 «B» grades students like lessons with CLIL methodology and believe that they are more interesting than the traditional lessons. We can also see that the greatest proportion of students would like CLIL lessons could be carried out more often. Similarly, the majority of students (80 %) like the game wordwall.net and think CLIL tasks are more interesting than traditional solving. Only 4 % of students rate themselves as "disagree". There is a smaller percentage of students (5 %) who believe that the CLIL lessons had too much information, diagrams, and images.

Discussion. The present pilot study extends the small and so far, limited evidence on the effects of CLIL on science learning. The reasons for the development of CLIL lessons in this article are threefold:

1. Teaching and learning biology and chemistry through the CLIL approach exposes students to the target language since it serves as the medium of instruction not as a language lesson. That is why this immersion aids in developing language skills more naturally and contextually hence enhancing fluency as well as comprehension. This accords with the findings of Juan-Garau & Salazar-Noguera (2015) and Pimmer et al., (2016).

2. Our pilot study confirms the findings by Hüttner et al. (2013), and Döring (2020) that CLIL teaching subjects through a foreign language may be more interesting for lower secondary school students.

3. CLIL linked to better academic outcomes. Tavares (2015) and Surmont et al., (2016) attributed this to the deeper understanding and retention of content when learning a second language. Following our test results obtained, students can achieve higher results not only in language proficiency tests but also in the subjects taught through the CLIL approach.

According to the student's opinions in this survey, the reasons are learning materials that were more stimulating and varied for the CLIL approach than those for traditional education. While students in CLIL teaching worked collaboratively, writing on a worksheet and a computer, students in traditional learning focused primarily on the text and virtually entirely without the use of a computer. It would be beneficial to carry out research with students from other populations. In addition, most CLIL design research involves participants being exposed to only a few lessons over a short period. The relationship between performance during instruction and performance on criterion measures also needs to be investigated.

Conclusion. The pilot study of CLIL techniques has led to the conclusion that the use of this approach in educational practice varies across different countries due to national specifics. Therefore, it is essential to consider the particular characteristics of the environment in which CLIL will be applied. A pilot experiment was conducted with 7th and 8th-grade students. After calculating the percentages, it was found that the academic level of knowledge in the experimental group increased by 25% in chemistry and 13% in biology, respectively.

Our study, however, showed that more than 75 % of the students enjoy working with CLIL lessons and this positively affects their opinions towards the subject. We suggest that CLIL lessons are sizeable teaching material,

and its verification in practice will require quite demanding and extensive research.

In recent years, we have noticed a steady increase in the usage of the CLIL approach in school instruction across the great majority of European nations, as well as Kazakhstan. Educators and instructors believe that CLIL is an effective way to provide students with the greatest possible preparation for their future lives, and mobility will become more common. In the future, improving and spreading this approach at the higher school level will face challenges due to globalization and internationalization of education, academic mobility, changes in the technological structure of society, and the need for professional communities to respond quickly to these changes.

References

Ball, P. (2009). Does CLIL work? In D. A. Hill & A. Pulverness (Eds.), *The best of both worlds? International Perspectives on CLIL* (pp. 32-43). Norwich: Norwich Institute for Language Education.

Chun, D. M. (2015). Language and culture learning in higher education via telecollaboration. *Pedagogies: An International Journal*, *10*(1), 5–21. https://doi.org/10.1080/1554480X.2014. 999775.

Coyle, D. & Meyer, O. (2019). Quality assurance in CLIL in HIGHER Education. In J. de Dios Martínez Agudo (Eds.), *Quality in TESOL and Teacher Education,* 159–170. Routledge. https://doi.org/10.4324/9780429198243-17.

Coyle, D., Bower, K., Foley, Y., & Hancock, J. (2023). Teachers as designers of learning in diverse, bilingual classrooms in England: an ADiBE case study. *International Journal of Bilingual Education and Bilingualism*, *26*(9), 1031-1049. https://www.tandfonline.com/doi/abs/10.1080/13670050.2021.1989373

Dalton-Puffer, C. (2013). Content and language integrated learning: a research agenda. *Language Teaching*, *46*(4), 545–559. https://doi.org/10.1017/S0261444813000256.

De la Fuente, J., Cubero, I., Peralta, F.J, Sánchez, M.C, Salmerón, J.L., & Fadda, S. (2019) Characteristics, structure, and effects of an online tool for improvement in adolescents' competency for interaction with alcohol: The e-ALADOTM Utility. *Frontiers in Psychology*, *10*, 127. https://doi.org/10.3389/fpsyg.2019.00127.

Döring, V. (2020). Student voices on CLIL. Suggestions for improving compulsory CLIL education in Austrian technical colleges (HTL). *CELT Matters*, *4*, 1-11. https://anglistik.univie.ac.at/fileadmin/user_upload/i_anglistik/Department/CELT/CELT_Matters/CeltMatters_Doering__2020__4_01_.pdf

Hüttner, J., Dalton-Puffer, C., & Smit, U. (2013). The Power of Beliefs: Lay Theories and their Influence on the Implementation of CLIL Programmes. *International Journal of Bilingual Education and Bilingualism*, *16*(3), 267–284. https://doi.org/10.1080/13670050.2013.777385.

Juan-Garau, M., & Salazar-Noguera, J. (2015). *Content-based language learning in multilingual educational environments.* Springer.

Madrid, D. & Perez-Canado, M.L. (2018). Innovations and challenges in CLIL teacher training. *Theory into Practice*, *57* (3), 241-249. https://doi.org/10.1080/00405841.2018.1492237.

Marsh, D., & Frigols Martín, M. J. (2012). Content and language-integrated learning. *The encyclopedia of applied linguistics*. https://onlinelibrary.wiley.com/doi/abs/10.1002/9781405198431.wbeal0190

Mehisto, P., Marsh, D., & Frigols, M. J. (2008). *Uncovering CLIL: Content and language integrated learning in bilingual and multilingual education*. Oxford: Macmillan Education, 2008. https://redined.educacion.gob.es/xmlui/handle/11162/64524

Pimmer, C., Mateescu, M., & Gröhbiel, U. (2016). Mobile and ubiquitous learning in higher education settings. A systematic review of empirical studies. *Computers in Human Behavior*, *63*, 490–501. https://doi.org/10.1016/j.chb.2016.05.057.

Sadykov, T., & Ctrnactova, H. (2019). Application interactive methods and technologies of teaching chemistry. *Chemistry Teacher International*, *2*(1). https://doi.org/10.1515/cti-2018-0031.

Sadykov, T., Kokibasova, G., Minayeva, Y., Ospanova, A., & Kasymova, M. (2023). A systematic review of programmed learning approach in science education. _Cogent Education_, _10_(1). https://doi.org/10.1080/2331186X.2023.2189889.

San Isidro, X. (2018). Innovations and challenges in CLIL implementation in Europe. _Theory into Practice_, _57_, 185–195. https://doi.org/10.1080/00405841.2018.1484038.

Surmont, J., Struys, E., Van Den Noort, M., & Van De Craen, P. (2016). The Effects of CLIL on Mathematical Content Learning: A Longitudinal Study. _Studies in Second Language Learning and Teaching_, _6_(2), 319-337. https://doi.org/10.14746/ssllt.2016.6.2.7.

Tavares, N.J. (2015). How Strategic Use of L1 in an L2-Medium Mathematics Classroom Facilitates L2 Interaction and Comprehension. _International Journal of Bilingual Education and Bilingualism, 18_(3), 319–335. https://doi.org/10.1080/13670050.2014.988115

Villabona, N., & Cenoz, J. (2022). The integration of content and language in CLIL: a challenge for content-driven and language-driven teachers. _Language, Culture and Curriculum_, _35(1)_, 36–50. https://doi.org/10.1080/07908318.2021.1910703.

Ball, P. (2009). Does CLIL work? In D. A. Hill & A. Pulverness (Eds.), _The best of both worlds? International Perspectives on CLIL_ (pp. 32-43). Norwich: Norwich Institute for Language Education.

Carrión Candel, E., Pérez Agustín, M. M., & Giménez De Ory, E. (2021). ICT and gamification experiences with CLIL methodology as innovative resources for the development of competencies in compulsory secondary education. https://doi.org/10.1344/der.2021.39.%25p

Chun, D. M. (2015). Language and culture learning in higher education via telecollaboration. _Pedagogies: An International Journal_, _10_(1), 5–21. https://doi.org/10.1080/1554480X.2014. 999775.

Coyle, D. & Meyer, O. (2019). Quality assurance in CLIL in HIGHER Education. In J. de Dios Martínez Agudo (Eds.), _Quality in TESOL and Teacher Education,_ 159–170. Routledge. https://doi.org/10.4324/9780429198243-17.

Coyle, D., Bower, K., Foley, Y., & Hancock, J. (2023). Teachers as designers of learning in diverse, bilingual classrooms in England: an ADiBE case study. _International Journal of Bilingual Education and Bilingualism_, _26_(9), 1031-1049. https://www.tandfonline.com/doi/abs/10.1080/13670050.2021.1989373

Cummins, J. (2013). BICS and CALP: Empirical support, theoretical status, and policy implications of a controversial distinction. In _Framing languages and literacies_ (pp. 10-23). Routledge. https://api.taylorfrancis.com/content/chapters/edit/download?identifierName=doi&identifierValue=10.4324/9780203070895-2&type=chapterpdf

Dalton-Puffer, C. (2013). Content and language integrated learning: a research agenda. _Language Teaching_, _46_(4), 545–559. https://doi.org/10.1017/S0261444813000256.

De la Fuente, J., Cubero, I., Peralta, F.J, Sánchez, M.C, Salmerón, J.L., & Fadda, S. (2019) Characteristics, structure, and effects of an online tool for improvement in adolescents' competency for interaction with alcohol: The e-ALADOTM Utility. _Frontiers in Psychology_, _10_, 127. https://doi.org/10.3389/fpsyg.2019.00127.

Döring, V. (2020). Student voices on CLIL. Suggestions for improving compulsory CLIL education in Austrian technical colleges (HTL). _CELT Matters_, _4_, 1-11. https://anglistik.univie.ac.at/fileadmin/user_upload/i_anglistik/Department/CELT/CELT_Matters/CeltMatters_Doering__2020__4_01_.pdf

Gejdoš, M., & Pošteková, B. (2023). Pedagogical and Philosophical Directions of Jan Amos Comenius. _Pedagogika, zarządzanie, psychologia i inżynieria zarządzania wobec wyzwań współczesności_, 179. https://pracenaukowe.wwszip.pl/prace/PN_53.pdf#page=181

Hüttner, J., Dalton-Puffer, C., & Smit, U. (2013). The Power of Beliefs: Lay Theories and their Influence on the Implementation of CLIL Programmes. _International Journal of Bilingual Education and Bilingualism_, _16_(3), 267–284. https://doi.org/10.1080/13670050.2013.777385.

Ismailova, R. B., Karabazar, Z. A., & Alimzhanova, A. A. (2023). Modern innovative methods in the education system. _Bulletin of Alikhan Bokeikhan University_, _2_ (57), 67-72. https://vestnik.semuniver.kz/index.php/main/article/view/529

Ïsmaïlova, R.B., Äbiş, A.M., Öskenbay, A.Q., Gïlmanova, D.T. (2023). Oqw ürdisinde ïnnovacïyalıq texnologïyalardı qoldanwdıñ negizgi bağıttarı. _Älïxan Bökeyxan wnïversïtetiniñ xabarşısı, 3_(58), 46-52. https://vestnik.semuniver.kz/index.php/main/article/view/553

Juan-Garau, M., & Salazar-Noguera, J. (2015). _Content-based language learning in multilingual educational environments._ Springer.

Jwman, G. Ö. (2021). Xïmïya pänin ağılşın tilinde kiriktire oqıtw (CLIL) ädistemesin jetildirw. http://dspace.ayu.edu.kz/bitstream/handle/123456789/4985/%20%20%20%20%20%20%20%20%20%20%20%20%20%20%20%20%20%20%20%20%20%20.pdf?sequence=1

Madrid, D. & Perez-Canado, M.L. (2018). Innovations and challenges in CLIL teacher training. *Theory into Practice*, *57* (3), 241-249. https://doi.org/10.1080/00405841.2018.1492237.

Mambetalina, A. S., Sadulova, ZH. K., Salimgerey, Z. M., & Vasich, B. K. (2021). Realizatsiya tekhnologii CLIL v poliyazychnom obrazovanii RK. https://rep.enu.kz/bitstream/handle/enu/3079/implementation-of-clil-technology-in-multilingual-education-in-the-republic-of-kazakhstan_.pdf?sequence=1

Marsh, D. (2013). Content and Language Integrated Learning (CLIL). A Development Trajectory. https://helvia.uco.es/handle/10396/8689

Marsh, D., & Frigols Martín, M. J. (2012). Content and language-integrated learning. *The encyclopedia of applied linguistics*. https://onlinelibrary.wiley.com/doi/abs/10.1002/9781405198431.wbeal0190

Mehisto, P., Marsh, D., & Frigols, M. J. (2008). *Uncovering CLIL: Content and language integrated learning in bilingual and multilingual education*. Oxford: Macmillan Education, 2008. https://redined.educacion.gob.es/xmlui/handle/11162/64524

Pimmer, C., Mateescu, M., & Gröhbiel, U. (2016). Mobile and ubiquitous learning in higher education settings. A systematic review of empirical studies. *Computers in Human Behavior*, *63*, 490–501. https://doi.org/10.1016/j.chb.2016.05.057.

Sadykov, T., & Ctrnactova, H. (2019). Application interactive methods and technologies of teaching chemistry. *Chemistry Teacher International*, *2*(1). https://doi.org/10.1515/cti-2018-0031.

Sadykov, T., Kokibasova, G., Minayeva, Y., Ospanova, A., & Kasymova, M. (2023). A systematic review of programmed learning approach in science education. *Cogent Education*, *10*(1). https://doi.org/10.1080/2331186X.2023.2189889.

San Isidro, X. (2018). Innovations and challenges in CLIL implementation in Europe. *Theory into Practice*, *57*, 185–195. https://doi.org/10.1080/00405841.2018.1484038.

Satayev, M., Barrios, E., Fernandez-Costales, A., Agaidarova, S., Izbassarova, R., & Balta, N. (2022). The Effect of CLIL Combined with Language Instruction on Language Learning and the Role of Individual and Institutional Factors in Students' Perspectives: Empirical Evidence from Kazakhstan. *EURASIA Journal of Mathematics, Science and Technology Education*, *18*(10). https://doi.org/10.29333/ejmste/12425

Surmont, J., Struys, E., Van Den Noort, M., & Van De Craen, P. (2016). The Effects of CLIL on Mathematical Content Learning: A Longitudinal Study. *Studies in Second Language Learning and Teaching*, *6*(2), 319-337. https://doi.org/10.14746/ssllt.2016.6.2.7.

Tavares, N.J. (2015). How Strategic Use of L1 in an L2-Medium Mathematics Classroom Facilitates L2 Interaction and Comprehension. *International Journal of Bilingual Education and Bilingualism, 18*(3), 319–335. https://doi.org/10.1080/13670050.2014.988115

Verdugo, M. D. R., & Sáez, M. V. S. (2012). The Value of a Digital Story in a Content and Language Integrated Learning (CLIL) European Context. *Digital Education Review*, 52-67. https://doi.org/10.1344/der.2012.22.52-67

Villabona, N., & Cenoz, J. (2022). The integration of content and language in CLIL: a challenge for content-driven and language-driven teachers. *Language, Culture and Curriculum*, *35(1)*, 36–50. https://doi.org/10.1080/07908318.2021.1910703.

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ASSESSMENT OF COLLEGE TEACHERS' PROFESSIONAL COMPETENCIES IN ACCORDANCE WITH PROFESSIONAL STANDARDS: A CASE STUDY FROM KAZAKHSTAN

Abstract

The article presents the results of a study aimed at evaluating the alignment of college teachers' professional competencies with the Teacher Professional Standard requirements. The research objective was to analyze the current competency levels among college teachers and develop recommendations for their further professional development. This study involved teachers from pedagogical colleges in Kazakhstan and focused on a comparative analysis of data based on indicators such as education levels, urban/rural location, and language of instruction. A quantitative research method was employed for the assessment of teachers. A closed-ended questionnaire, developed based on the competency framework of the Professional Teacher Standard, utilized responses on a five-point Likert scale. The survey was conducted online using the 360° method. The results identified "risk zones" in the development of professional competencies of college teachers concerning education levels, urban/rural location, and language of instruction. Compared to teachers in preschool and secondary education, college teachers' professional competency development indicators are at an average level. The competency framework highlighted a need for the development of college teachers' competencies, especially for those working in urban colleges and teaching in the Kazakh language. Based on the research data, recommendations were developed for the further professional development of pedagogical college teachers.

Keywords: professional competencies, Teacher Standard, college teachers, 360-degree evaluation method, survey.

Basic provisions. To equip the upcoming generation for the difficulties of the modern century, Kazakhstan is revamping its educational system. This study assesses how well college instructors' professional competencies match the demands of the Teacher Professional Standard for the reformation of Kazakhstan's educational revamp. The study shows that compared to schoolteachers; college instructors have a lesser level of professional competence formation. It is not entirely appreciated that college instructors can engage in several kinds of professional development. The study confirms researchers' conclusions about the existing low level of teacher training, where one-third of future teachers «do not possess subject knowledge and teaching methodology according to knowledge assessment results. The current research provides recommendations for the improvement of teachers' professionalism, such as teachers must prioritize the development of specific professional competencies; urban environments place demands that are more stringent on college teachers than their rural counterparts.

Introduction. Alongside the international community, Kazakhstan is reforming its educational system to prepare the next generation for the 21st-century challenges. Educational programs at schools, colleges, and universities are oriented towards social constructivism in teaching and learning. This approach fosters active interaction among students and emphasizes their participation in the educational process, focusing on critical thinking (Erdem, 2020). Teachers are pivotal in achieving the expected learning outcomes. Consequently, a teacher's professional compe-

tence is crucial, and developing a model or framework for these competencies is a key stage in advancing Kazakhstan's pedagogical education (Janswgwrova et al., 2024; Guerriero, 2017).

Teachers are central to educational changes (Zandvliet & Paul, 2023). As student competency requirements evolve, so must those for teachers (Soysal & Soysal, 2023; Roll & Ifenthaler, 2021). Teachers need to update their values, knowledge, and skills to effectively prepare future generations for emerging challenges. As Abylkasymova (2021) notes, 'Pedagogical education today is becoming the foundational system that shapes social progress'.

The competencies of a teacher are defined as «a set of knowledge, skills, and experiences necessary for the future, manifested in professional activity» (Abylkasymova, 2021). Additionally, these competencies include the ability to continually and progressively meet complex demands in specific contexts by activating comprehensive psychosocial resources (cognitive, functional, personal, and ethical (Guerriero, 2017).

The structure of a teacher's competencies encompasses cognitive and affective-motivational characteristics (Guerriero, 2017):

− *Professional knowledge*: the content of subject knowledge (what to teach?), knowledge of learners' characteristics and their peculiarities (whom to teach?), and pedagogical content knowledge (how to teach?).

− *Affective-motivational characteristics*: the teacher's beliefs and attitudes towards the subject content and teaching; their motivation to work, personal qualities, and stress resistance.

Based on international experience, researchers have determined that the requirements for a teacher are contained in one or more regulatory documents: (1) the teacher model, which includes general professional and special professional qualities; (2) the teaching standard (Teacher Professional Standard), describing the requirements for various qualification levels; (3) the job responsibilities of a teacher (Margolis, 2019). In Kazakhstan, the Teacher Professional Standard defines these requirements.

Kleinhenz & Ingvarson (2007) identify the following types of Teacher Standards:

- *Standards as professional values*: These definitions or expressions describe what is valued in the teaching profession, what constitutes quality education, and how quality teaching is defined.

- *Standards as measures*: These standards are used to reasonably determine and assess the quality of teaching. It is essential to develop an understanding of what effective teaching looks like and how teachers can demonstrate high-quality teaching. It is also crucial to define what compliance with standards in teaching and learning entails.

The purpose of the Professional Standard can be:

- a «core base», representing a universal set of competencies necessary at all stages of career growth or professional development.

- a roadmap for a teacher's professional development, describing professional competencies at various career stages, from basic to advanced.

- a semi-roadmap, including some professional career stages (e.g., entering the profession) (Toledo et al., 2017).

In 2022, a new Teacher Professional Standard was developed in Kazakhstan (Law, 2022). A distinctive feature of this standard is its inclusion of a general description of professional activities, incorporating a framework of professional competencies for teachers, along with criteria for competency by qualification categories. This framework integrates four areas of practice: professional values, professional knowledge, professional teaching/learning practice, and professional development.

The professional competencies of a teacher are presented on the principle of «building up» professional qualities from the beginner level «teacher-intern» to the « teacher-master» level. Research emphasizes that Standards can constructively influence pedagogical education if they are developed and used as a normative basis for a strategic vision of what a teacher should be (Ingvarson, 2019; OECD, 2018; Nawab et al., 2021). The pedagogical community

worldwide uses Standards to reasonably determine and measure quality teaching and strategies to enhance the professionalism of teachers (Kleinhenz & Ingvarson, 2007). Ensuring the quality of pedagogical education is a global priority (OECD, 2023).

In Kazakhstan, the Teacher Professional Standard (Law, 2022) serves as both a measure for determining and measuring quality teaching and as a roadmap for a teacher's professional development, detailing professional competencies by the principle of building up. The research objective was to analyze the current competency levels among college teachers and develop recommendations for their further professional development.

Research materials and methods. The study was conducted to identify the level of development of teachers' professional competencies according to the norms of the Professional Standard.

Participants. The study used the 360° method, a tool that assesses a teacher's professional activity from four distinct perspectives: administration, colleagues, students or parents/guardians, and the teacher's self-assessment.

Colleague assessments provide an expert opinion on the teacher's soft skills and their interactions, offering a deeper assessment of teaching quality than other study participants can provide.

Student or parent/legal guardian assessments evaluate the teacher's soft skills and their impact on learners. This tool fosters critical thinking among students, contributing to more conscious learning. Student feedback aids the development of future learning skills and allows teachers to view their professional activities from another perspective. Likewise, parents/legal guardians independently assess the impact of the teacher's pedagogical influence on their children.

A teacher's self-assessment facilitates reflective evaluation of their professional competencies, proving to be one of the most effective methods for self-improvement and self-awareness.

Thus, the 360° method effectively organizes education to assess and understand teachers. Feedback from various viewpoints yields a complete and more balanced picture, facilitating the formation of a teacher's portrait from all participants' perspectives in the educational process. However, the results must serve as a starting point for further professional development of the teacher, not as a source of censure.

Data collection instrument. The researchers developed and tested questionnaires based on the Teacher Professional Standard: «Teacher Self-Assessment Sheet», «Survey Sheet for Administration/Colleagues», «Survey Sheet for Students», and «Survey Sheet for Parents/Guardians».

These surveys contained closed questions based on indicators of the teacher's professional competencies as defined by the Professional Standard. Researchers asked respondents to reflect on their attitudes toward the professional competencies of the assessed teacher on a five-point Likert scale.

The team used quantitative research methods in the study. They evaluated respondents' statements using the Likert scale, where responses of «strongly agree» scored 4 points; «agree» 3 points; «undecided» 2 points; «disagree» 1 point; and «strongly disagree» 0 points.

They averaged the data obtained from the evaluation of each teacher from four perspectives using the formula (1):

$$a+k+s+or \ /4, \qquad (1)$$

where a represents scores from the administration, k from colleagues, s from self-assessment, and or from students or parents/guardians.

Data analysis. The results were rounded that scores from 3.5 to 4 were categorized as «strongly agree»; scores from 3.0 to 3.4 as «agree»; scores from 2.5 to 2.9 as «undecided»; scores from 2.0 to 2.4 as «disagree»; and scores from 1.0 to 1.9 as «strongly disagree».

Finally, they conducted a comparative analysis of the data on the development of professional competencies of college teachers by levels of education, as well as across urban/rural colleges and language of teaching.

Researchers selected respondents for the study using the 3*6*6 principle. Representatives

from three regions participated in the survey: Kostanay, Karaganda, and Zhambyl. The regions were selected based on geographical location. In each region, six educational organizations participated: two preschool education organizations, two secondary education organizations (SEOs), and two technical and vocational education organizations (VET). The organizations were chosen by regional education departments according to criteria such as education levels, location of pedagogical colleges, and language of instruction. In each educational organization, six teachers of various qualifications were assessed.

Results. The assessment of pedagogical college teachers according to the norms of the updated Professional Standard in Kazakhstan is being conducted for the first time. The study engaged 342 respondents, comprising 108 teachers conducting self-assessments, 18 administrators from educational organizations, 108 peers evaluating teachers, 36 school students, 36 college students, and 36 parents of preschool students.

Of these respondents, 173 (50.6%) completed the survey in Kazakh and 169 (49.4%) in Russian. The survey that assessed the engineering-pedagogical staff in colleges included 114 participants, featuring 36 teachers -17 (47.2%) teaching in Kazakh and 19 (52.8%) in Russian along with 6 college administrators, 36 peers, and 36 students. Teachers from three educational levels participated, enabling a comprehensive comparative analysis of

professional competencies' development and the identification of «risk zones» in the competency matrix for engineering-pedagogical staff in colleges.

The matrix of professional competencies for engineering-pedagogical staff is represented by: professional values (1.1 Commitment to the teaching profession; 1.2 Citizenship; 1.3 Adherence to professional ethics; 1.4 Responsibility; 1.5 Proactivity), professional knowledge (2.1 Understanding individual student characteristics and applying them in teaching; 2.2 Knowledge of the subject, teaching methodologies, and student assessment tools), practice of teaching/learning and education (3.1 Planning the teaching process; 3.2 Creating a safe, supportive, and developmental learning environment; 3.3 Implementing the learning and upbringing process; 3.4 Assessing educational achievements of students; 3.5 Collaborating in education processes), professional development (4.1 Reflecting on personal and colleagues' practices; 4.2 Managing self-development quality and aspiring for leadership).

The results of the study indicate an insufficient level of professional competence formation among college instructors based on the following criteria: (1) 1.1 Commitment to the teaching profession; (2) 1.4 1.4 Responsibility; (3) 2.1 Understanding individual student characteristics and applying them in teaching; (4) 3.3 Implementing the learning and upbringing process; (5) 3.5 Collaborating in education processes (Figure 1).
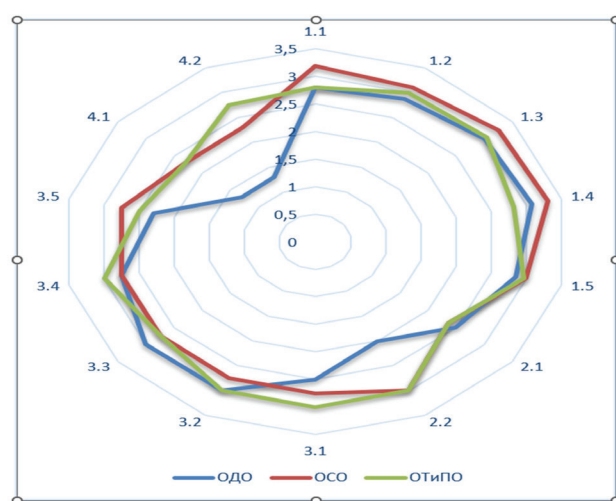

Figure 1: Matrix of indicators across education levels

According to the Professional Standard for Teachers (Law, 2022), the indicators of professional competence under the criteria «1.1 Commitment to the teaching profession» are demonstrating confidence in the ability of all students to achieve educational goals; showing dedication to the teaching profession; and adhering to the applicable legal and regulatory acts in their activities.

For the criteria «1.4 Responsibility», the indicators are demonstrating responsibility for maintaining and developing one's professional level, as well as the academic success and upbringing of students; contributing to the safety of students within their competencies; and sharing the educational community's responsibility for the educational and upbringing process.

The criteria «2.1 Understanding individual student characteristics and applying them in teaching» include indicators such as: understanding the age-related, personal, and socio-cultural characteristics of students; possessing strategies for creating an inclusive environment and engaging students in the learning and upbringing process; having theoretical knowledge and practical skills for effective teaching in a multilingual environment, ensuring quality assimilation of the subject, language, and cultural values; and organizing the teaching, learning, and upbringing process considering the individual characteristics of students.

The criteria «3.3 Implementing the learning and upbringing process» is reflected through indicators such as: achieving the goals of teaching and upbringing during lessons; motivating students to achieve high learning and upbringing results and supporting them in this; and using teaching technologies by the teaching and upbringing goals, considering the individual characteristics and needs of the student.

The criterion «3.5 Collaborating in education processes» is expressed through indicators such as: interacting with parents/legal representatives to build an individual development trajectory for the student; and cooperating with colleagues within professional communities and interested parties to improve the educational process.

It should be noted that compared to other levels of education, college teachers should pay special attention to forming such a professional value as responsibility. Table 1, comparing other levels of education, reflects a low indicator of professional competence of college teachers in the formation of the criterion «1.4 Responsibility» (2.83).

Table 1. *Indicators by level of education*

Indicators	Education levels		
	PE	SE	VET
1.1 Commitment to the teaching profession	2,8	3,19	2,8
1.2 Citizenship	2,87	3,1	3
1.3 Adherence to professional ethics	3	3,25	3,04
1.4 Responsibility	3,08	3,31	2,83
1.5 Proactivity	2,86	3	2,97
2.1 Understanding individual student characteristics and applying them in teaching	2,5	2,37	2,37
2.2 Knowledge of the subject, teaching methodologies, and student assessment tools	2	3	3
3.1 Planning the Teaching Process	2,5	2,75	3
3.2 Creating a safe, supportive, and developmental learning environment	3	2,75	3
3.3 Implementing the learning and upbringing process	3	2,75	2,75
3.4 Assessing the educational achievements of students	2,75	2,75	3
3.5 Collaborating in Education Processes	2,3	2,75	2,5
4.1 Reflecting on personal and colleagues' practices	1,3	2,3	2,3
4.2 Managing self-development quality and aspiring for leadership	1,3	2,3	2,75

It should be noted that *across educational levels*, college teachers demonstrated a sufficient level of development in professional competencies according to criteria such as 2.2, 3.1, 3.2, 3.4, 4.1, and 4.2.

The study results from *urban and rural colleges* reveal that engineering-pedagogical staff in urban colleges display lower professional competencies than their rural counterparts (Figure 2).
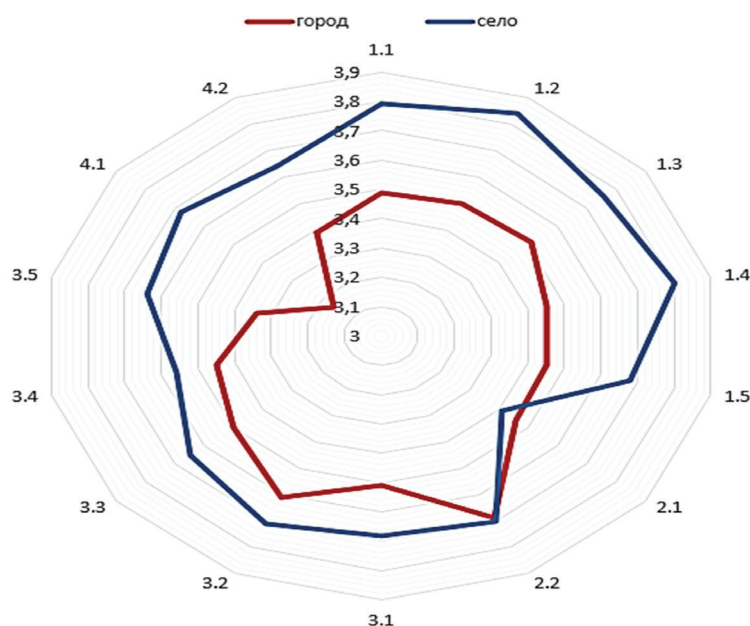

Figure 2: Matrix of indicators across urban/rural location

To determine the extent of existing differences in the indicators of professional competence of college teachers between urban and rural areas, the difference was calculated, where «-» indicates lower scores for urban college teachers, and «+» indicates higher scores.

Significant differences were noted in criteria such as 4.1 «Reflecting on personal and colleagues' practices», 1.4 «Responsibility», 1.2 «Citizenship», 1.1 «Commitment to the teaching profession», and 3.5 «Collaborating in education processes». According to these indicators, respondents rated urban college teachers lower than their colleagues from rural colleges. Conversely, in criterion 2.1 «Understanding individual student characteristics and applying them in teaching», urban college teachers showed higher (+0,05) competencies than their rural peers (Table 2).

Table 2. *Indicators by urban/rural location*

Indicators	Differences
1.1 Commitment to the teaching profession	-0,30
1.2 Citizenship	-0,34
1.3 Adherence to professional ethics	-0,25
1.4 Responsibility	-0,35
1.5 Proactivity	-0,23
2.1 Understanding individual student characteristics and applying them in teaching	+0,05
2.2 Knowledge of the subject, teaching methodologies, and student assessment tools	-0,01
3.1 Planning the Teaching Process	-0,17
3.2 Creating a safe, supportive, and developmental learning environment	-0,10
3.3 Implementing the learning and upbringing process	-0,15
3.4 Assessing the educational achievements of students	-0,11

3.5 Collaborating in Education Processes	-0,30
4.1 Reflecting on personal and colleagues' practices	-0,52
4.2 Managing self-development quality and aspiring for leadership	-0,25

The study examining differences *across teaching languages* indicates that engineering-pedagogical staff teaching in Kazakh exhibit lower professional competencies than those teaching in Russian (Figure 3).

Significant disparities emerged in criteria such as 3.5 «Collaboration in the educational and upbringing processes», 2.2 «Knowledge of the subject, teaching methodologies, and assessment tools», 1.1 «Commitment to the teaching profession», 1.4 «Responsibility», 3.3 «Implementing the learning and upbringing process», and 1.2 «Citizenship».

Respondents rated teachers who teach in the Kazakh language of instruction lower than other colleagues. The difference in the performance of teachers teaching in the Kazakh language of instruction is marked with a «-» sign (Table 3). However, for criterion 2.1 «Understanding individual student characteristics and applying them in teaching», Kazakh-speaking teachers demonstrated a higher (+0,02) competency level than their Russian-speaking colleagues.
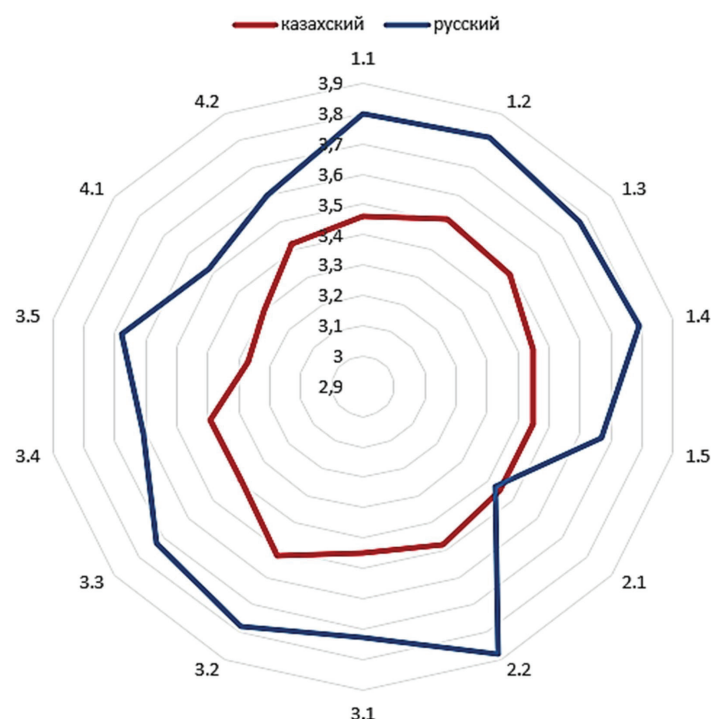

Figure 3: Competency matrix of college teachers across teaching languages

Table 3. *Indicators by teaching languages*

Indicators	Differences
1.1 Commitment to the teaching profession	-0,34
1.2 Citizenship	-0,30
1.3 Adherence to professional ethics	-0,28
1.4 Responsibility	-0,34
1.5 Proactivity	-0,22
2.1 Understanding individual student characteristics and applying them in teaching	+0,02
2.2 Knowledge of the subject, teaching methodologies, and student assessment tools	-0,40
3.1 Planning the Teaching Process	-0,28

3.2 Creating a safe, supportive, and developmental learning environment	-0,26
3.3 Implementing the learning and upbringing process	-0,34
3.4 Assessing the educational achievements of students	-0,22
3.5 Collaborating in Education Processes	-0,41
4.1 Reflecting on personal and colleagues' practices	-0,22
4.2 Managing self-development quality and aspiring for leadership	-0,18

Several key findings emerged from the analysis:

- *data comparing* the development of teachers' professional competencies across various educational levels showed a particularly low competency level among preschool education teachers, while college teachers typically demonstrated a moderate competency level.

- researchers identified *«risk zones»* in the professional competencies of college teachers, particularly in the areas of Professional Values (1.1 Commitment to the teaching profession; 1.4 Responsibility), Professional Knowledge (2.1 Understanding individual student characteristics and applying them in teaching), and Professional Practice (e.g., 3.3 Implementing the learning and upbringing process; 3.5 Collaborating in education processes).

- the study also profiled a *«typical college teacher»* with low professional competency levels, specifically one teaching in the Kazakh language within an urban college context.

Discussion. The general insufficient level of training of teaching staff is noted by domestic researchers who analyzed the results of Kazakhstan in international studies (Irsaliev et al., 2020) and the current state of education quality in the country context (Akhmetzhanova et al., 2023). Given that the method of observing teachers during lessons is labour-intensive and requires extensive documentation (Sartain et al., 2024), and testing is not sufficiently effective (Swisher & Saenz-Armstrong, 2022), the current study adhered to the viewpoint of researchers (Aygunova et al., 2017) who note that the advantage of the 360° method is «the ability to assess the teacher's everyday work, their actions and behavior in real professional situations, their impact, and the result of their influence on students, parents, colleagues, and school administration, which aligns with

the idea of the competency-based approach». Additionally, Fauth et al., (2020) highlight the benefits of receiving feedback from students about teaching and the limitations of the survey method.

According to the research results, college teachers have a lower level of professional competence formation compared to schoolteachers. As a result of the Nazarbayev Intellectual Schools' experience being shared, educators now have more favourable circumstances for professional growth, even within the institution (Amirova, 2020). At the same time, the potential for college teachers to participate in various forms of professional development is not fully realized (Kariyev et al., 2022). College teachers need planning for continuous professional development, and one of the tools for identifying the current state of professional competence formation among college teachers is the 360° survey (Margolis, 2019).

Using this method, the current study received positive feedback, especially from students who objectively expressed their opinions on the impact of teaching practices on them (Fauth et al., 2020; Finefter-Rosenbluh, 2020), and from the teachers themselves, who noted the opportunity for self-reflection on the results of their teaching practice compared to the best examples, as well as the need to conduct such surveys with feedback. The results of this study allowed us to obtain data on the current state of professional competence formation among college teachers, which can serve as a starting point for developing internal college plans for teachers' professional development.

The study by Sharimova (2021) emphasizes the professional isolation of rural schoolteachers, which is proposed to be addressed through their participation in professional communities. At the same time, the results of this study indicate

a higher level of professional competence formation among rural college teachers compared to urban ones. However, there is a threat that the survey data was obtained due to the possible professional stagnation of rural college teachers who are satisfied with the general level of professional skills development and resist innovations (Cheng et al., 2023).

Regarding the risk areas in the development of college teachers' professional competencies, the results obtained in the study confirm researchers' conclusions about the existing low level of teacher training, where one-third of future teachers «do not possess subject knowledge and teaching methodology according to knowledge assessment results ...» (Akhmetzhanova et al., 2023) and «the need to analyze teachers' actual competencies» (Irsaliev et al., 2020). The issue of differences in the development of professional competencies in the context of the language of instruction can be addressed by microlearning, perceived as a flexible and stress-free phenomenon, allowing teachers to focus on relevant tasks using small learning segments (Kohnke et al., 2021).

An important aspect of college teachers' professional development is the support of educational organization leaders in building trusting relationships with teachers (Sartain et al., 2024). Leaders of pedagogical colleges need support in implementing initiatives to improve the teaching quality of the teaching staff. The results of the study will allow the administration of pedagogical colleges to focus on developing the «lagging» professional competencies of teachers when planning professional development. Additionally, when planning teachers' professional development, it is important to emphasize the need for mentoring support for teachers and the creation of conditions (professional comparison and cooperation within and beyond the school) for their self-efficacy (Sharimova, 2021).

Finally, as a contribution to the growing body of research on finding effective methods for teacher assessment for their professional development, this study highlights the importance of alternative teacher assessment (360° method) to address the problems of professional development of pedagogical college teachers.

Conclusion.

College teachers, alongside college administrations, educational authorities, professional development providers, and other stakeholders, must consistently oversee the quality of continuous professional development for teachers.

Addressing issues in teachers' continuous professional development effectively involves conducting an initial state analysis. In this context, we conducted a study using the 360° method, which offered insights into the status of this issue. This research led to the creation of an evaluative framework based on Professional Standard norms to assess teachers' professional activities.

Based on the results of the study, recommendations were developed for planning further professional development of teachers.

Firstly, teachers must prioritize the development of specific professional competencies:

- Professional Values: 1.1. Commitment to the teaching profession; 1.4. Responsibility;

- Professional Knowledge: 2.1. Understanding individual student characteristics and applying them in teaching;

- Professional Practice: 3.3. Implementing the learning and upbringing process; 3.5. Collaborating in education processes.

Secondly, urban environments place demands that are more stringent on college teachers than their rural counterparts. The urban environment imposes higher demands on teachers in urban colleges compared to those in rural areas. This is because urban colleges are compelled to compete with universities in terms of specialist training, as colleges and universities are competitors under conditions of academic freedom. The data obtained in the study suggest that teachers in urban colleges require targeted professional development efforts, with special attention to the identified "risk areas" in the formation of their professional competencies.

Additionally, it should be noted that in rural colleges, there is close interaction between teachers and all participants in the educational

process. As a result, the assessment of teachers' professional activities is influenced by subjective factors, primarily based on individual relationships between the evaluator and the evaluated. Consequently, the evaluation of a rural college teacher may be distorted due to the underestimation or overestimation of indicators influenced by subjective preferences.

Thirdly, teachers whose language of instruction is Kazakh are in dire need of high-quality continuous professional education. The professional development of pedagogical college teachers should include all forms of

training aimed not only at enhancing knowledge and teaching practice but also at fostering professional values among teachers. Organizing professional development within educational institutions is of particular importance.

In this regard, we believe that the results of the analysis will enable teachers, college administrations, methodological centers/cabinets, regional education departments, and professional development providers to plan further professional development for teachers, taking into account the existing professional needs of educators.

References

Abylkasimova, Abylkasymova, A. Ye. (2021). Modernizatsiya sistemy obrazovaniya v Respublike Kazakhstan: nauchnoye izdaniye. – Almaty: Mektep, 218. ISBN 978-601-07-1603-2A.E. (2021). Modernization of the education system in the Republic of Kazakhstan: scientific publication. Almaty: Mektep, 218

Akhmetzhanova, A., Zhumazhanova, S., Smanova, N., Adikhanov, I., Tokenov, A. (2023). Rol'biznesa v reshenii problem obrazovaniya. *Qazaqstan: na puti k modeli ustoychivogo razvitiya. Vzglyad molodykh ekspertov. Sbornik analiticheskikh materialov po voprosam sotsial'no ekonomicheskogo razvitiya strany. Astana* https://drive.google.com/file/d/12NeUl0y3HIICctYdiU4h1xpMkst7tYdM/view

Amirova, B. (2020). Study of NIS teachers' perceptions of teacher professionalism in Kazakhstan. *IAFOR Journal of Education, 8,* 7-23. https://doi.org/10.22492/ije.8.4.01

Aygunova, O. A., Vachkova, S. N., Remorenko, I. M., Semonov, A. L., Timonova, Ye. N. (2017). Otsenka professional'noy deyatel'nosti uchitelya v sootvetstvii s professial'nym standartom pedagoga. Vestnik MGPU, seriya «Pedagogika i psikhologiya», 2(40), 8-23 https://www.elibrary.ru/download/elibrary_29308327_89278390.pdf

Cheng, C., Diao, Y., & Ding, X. (2023). What motivates rural teachers to retain? A study on Chinese rural teachers' turnover from grounded theory and FsQCA. *Front. Psychol., 13,* 998422. https://doi.org/10.3389/fpsyg.2022.998422

Erdem, E. (2020). Reflections of a Social Constructivist on Teaching Methods. *European Journal of Educational Sciences, 7(4).* http://dx.doi.org/10.19044/ejes.v7no4a2

Fauth, B., Wagner, W., Bertram, C., Göllner, R., Roloff, J., Lüdtke, O., Polikoff, M. S., Klusmann, U., & Trautwein, U. (2020). Don't blame the teacher. The need to account for classroom characteristics in evaluations of teaching quality. *Journal of Educational Psychology, 112(6),* 1284–1302. https://doi.org/10.1037/edu0000376

Finefter-Rosenbluh, I. (2020). "Try walking in my shoes": Teachers' interpretation of student perception surveys and the role of self-efficacy beliefs, perspective taking and inclusivity in teacher evaluation. *Cambridge Journal of Education, 50(6),* 747–769. https://doi.org/10.1080/0305764X.2020.1831444

Guerriero, S. (Ed.). (2017). Pedagogical knowledge and the changing nature of the teaching profession. Paris: OECD Publishing. https://doi.org/10.1787/20769679

Ingvarson, L. (2019). Teaching standards and the promotion of quality teaching. *Eur J Educ., 54,* 337–355. https://doi.org/10.1111/ejed.12353

Irsaliyev, S. A. I dr. (2020). Akademicheskiy otchet «Rezul'taty Kaazkhstana v mezhdunarodnykh issledovaniyakh kachestva obrazovaniya: issledovaniye prichin otstavaniya». Tsentraniza i strategii «Beles», po red. https://www.soros.kz/ru/results-of-kazakhstan-in-international-education-quality-assessments-a-study-of-the-underperformance-causes/

Janswgwrova, K. T., Awbakïrova, G. M., & Wtebaeva, B. T. (2024). Kommwnïkatïvtik-Tanimdiq Keyster–Bolaşaq Muğalimniñ Käsibï Quzirettiligin Qaliptastirw Qurali. *Ïzvestïya. Serïya: Pedagogïçeskïe nawkï*, 72(1). https://bulletin-pedagogical.ablaikhan.kz/index.php/j1/article/view/1347

Kariyev, A.D., Sapiyeva, M.S., Topanova, G.T. (2022). Issledovaniye effektivnosti kursov povysheniya kvalifikatsii pedagogicheskikh kadrov v Kazakhstane. *Pedagogika i psikhologiya, 2*(51), 5-13 https://doi.org/10.51889/2022-2.2077-6861.01

Kleinhenz, E., & Ingvarson, L. (2007). *Standards for Teaching: Theoretical Underpinnings and Applications.* New Zealand Teachers Council. https://research.acer.edu.au/teaching_standards/1

Kohnke, L., Foung, D., & Zou, D. (2024). Microlearning: A new normal for flexible teacher professional development in online and blended learning. *Educ Inf Technol*, 29, 4457–4480. https://doi.org/10.1007/s10639-023-11964-6

Law (2022). Prikaz i.o. Ministra prosveshcheniya Respubliki Kazakhstan «Ob utverzhdenii professional'nogo standarta «Pedagog» https://adilet.zan.kz/rus/docs/V2200031149

Margolis, A.A. (2019). Assessing teacher qualifications: review and analysis of the best foreign practices. *Psychological Science and Education*, 24(1), 5–30. https://doi.org/10.17759/pse.2019240101

Nawab, A., Bissaker, K., & Datoo, A.K. (2021). Contemporary trends in professional development of teachers: importance of recognizing the context. *International Journal of Educational Management*, 35(6), 1176-1190. https://doi.org/10.1108/IJEM-10-2020-0476

OECD (2018). Education at a Glance 2018: OECD Indicators. Paris: OECD Publishing. https://doi.org/10.1787/eag-2018-en

OECD (2023). Education at a Glance 2023: OECD Indicators. Paris: OECD Publishing. https://doi.org/10.1787/e13bef63-en

Roll, M. J., & Ifenthaler, D. (2021). Multidisciplinary digital competencies of pre-service vocational teachers. *Empirical Research in Vocational Education and Training*, 13(1), 7. https://doi.org/10.1186/s40461-021-00112-4

Sartain, L., & Morris, W. T. (2024). Are Teachers Satisfied with Their Evaluations? The Importance of Teaching Context and Trends Over Time. *AERA Open, 10.* https://doi.org/10.1177/23328584231221539

Sharimova, A. (2021). Understanding informal learning in virtual professional communities of teachers in Kazakhstan (Doctoral thesis). https://doi.org/10.17863/CAM.59461

Soysal, Y., & Soysal, S. (2023). Describing teacher educators' metatalk moves enacted for teaching how to teach concepts. *Education Inquiry*, 1-33. https://doi.org/10.1080/20004508.2023.2299055

Swisher, A., & Saenz-Armstrong, P. (2022). State of the States 2022: Teacher and principal evaluation policies. *National Council on Teacher Quality*. https://www.nctq.org/publications/State-of-the-States-2022:-Teacher-and-Principal-Evaluation-Policies

Toledo, D., Révai, N., & Guerriero, S. (2017). Teacher professionalism and knowledge in qualifications frameworks and professional standards, in Guerriero, S. (ed.), *Pedagogical Knowledge and the Changing Nature of the Teaching Profession.* Paris: OECD Publishing. http://dx.doi.org/10.1787/9789264270695-5-en

Zandvliet, D. B., & Paul, A. (2023). Social ecology and environmental diversity in teacher education. *Journal of Teacher Education for Sustainability*, 25(1), 168-181. https://doi.org/10.2478/jtes-2023-0011

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CONTENTS AND ORGANIZATION ASPECTS OF PREPARING FUTURE ELEMENTARY SCHOOL TEACHERS FOR PROFESSIONAL CREATIVE ACTIVITIES

Abstract

This article is dedicated to the issues of improving the professional training of future elementary school teachers. The article justifies the relevance of developing the creative abilities of younger students and preparing future elementary school teachers for professional creative activity. To determine the organizational and substantive aspects of preparing future primary school teachers for professional and creative activity, a survey was conducted among 114 teachers, including 93 teachers of grades 1-4 and 21 teachers of preschool education. The results of a search and analytical work are presented. The authors considered the methodological approaches that underlie the preparation of future teachers, the structure and content of the preparation of future elementary school teachers, as well as the conditions and organizational-content aspects of preparing future elementary

school teachers for professional-creative activity, which include interdisciplinary interaction and integration of disciplines within the educational program.

Keywords: academic disciplines, creativity, creative activity, educational program, methodological approaches, primary school teacher, professional activity.

Basic provisions. The article discusses the current aspects of the training of future primary school teachers, various approaches and research in the field of general pedagogical creativity, and teacher training for professional and creative activities. Theoretical studies and the current state of readiness of practicing primary school teachers for professional and creative activity are analyzed. Statistical data obtained by questioning teachers to determine the level of their readiness to implement professional and creative activities are presented. Based on the analysis of the current state of readiness of primary school teachers for professional and creative activity, the relevance of the problem of creative activity for most teachers is substantiated and the main issues requiring study in this direction are formulated. It also describes the revealed interest of teachers in expanding their knowledge, and skills and the desire to develop skills of professional and creative competence. It is noted that many problems require further study, such as conditions for organizing effective professional and creative activities of participants in the educational process, establishing optimal feedback with students using new technologies; correcting teachers' actions when working in a modern educational environment, critical assessment of behavior, formation of independence and creative skills of teachers in the development of educational tasks; effective application of professionalism and creative competencies, communication and involvement of students in the organization of group work and project activities with students, prospects for their development are described.

Introduction. The modern stage of education development is characterized by the emergence of a humanistic attitude towards learning and upbringing, which presupposes a personality-oriented approach to organizing the educational process and promoting personal development (Salfiyadi et al., 2023). This is associated with changes that affect all spheres of human life (Holban, 2023). The changes in social and economic life raise new tasks for the upbringing of a capable person not only of acquiring knowledge, and adapting quickly to new conditions, but also of influencing the course of vital public processes, thinking independently, and creatively solving existing problems.

The effectiveness of solving these tasks largely depends on the professionalism of the teacher in constructing such an educational process in the school that would strengthen the child's interest in cognition, the discovery of the new, ensure the strength and reliability of the acquired knowledge and contribute to the formation of a real and creatively thinking, self-critical personality (Alshumaimeri, 2023). The development of students' creative abilities is important at all stages of school education, but special importance is attached to the formation and development of creative abilities at an early school age since it is the age that the foundations of conscious and managed creative activity are laid.

Pedagogical science and practice prove that only a creative personality can raise another creative personality (Ahıskalı, 2023; Snepvangers & Rourke, 2020). Creativity in pedagogical activity requires the formation of a wide range of professional and creative, professional and methodological skills, abilities, and talents among future primary school teachers (Mansouri & Hamzaoui, 2023; Abo Orabi, 2023). However, as analysis of various publications and real educational practice shows, standardization in a teacher's work is often encountered in school. Teachers sometimes use the repetition of the same techniques and methods in teaching. This can lead to a reduction in the independent and creative thinking of students. Therefore, a modern school teacher is required to pay attention not only to the formation of general learning skills but also to the organization of students' creative activity, and their performance of search-and-creative tasks.

In this regard, there is a need to address this issue, primarily driven by the requirements of

real educational practice and the presence of certain difficulties faced by teachers in practical organization and implementation of professional and creative activities (Chiu, 2024). The emergence of such difficulties among teachers is largely determined by their insufficient development of creative competence, as well as the presence of a fragmentary, non-systematic basis of readiness for teachers to carry out professional and creative activities. It is precisely because teachers who are currently teaching and educating students do not possess the necessary level of a developed complex of professionally significant qualities that their pedagogical work is still predominantly focused on students' cognitive activities rather than creative activities; if there is a creative activity, then its effectiveness is often low. Therefore, questions related to the professional training of future primary school teachers for creative activities are relevant and significant.

Consequently, there is a need for serious theoretical and practical preparation of primary school teachers for professional and creative activities. This necessitates a revision of the content of educational programs for the training of primary school teachers, and the modernization of methodological approaches and pedagogical technologies aimed at their effective professional and creative activities (Walter, 2024). Given the novelty of the situation and the possibility that future teachers will face work related to the creative development of students in the future, it was extremely important to learn more about the experience of practicing primary school teachers and the professional qualities necessary for creative activities.

Therefore, this work aimed to determine the organizational and substantive aspects of the preparation of future primary school teachers for professional and creative activities. The following tasks have been identified to achieve the goal: Study and analyze the current state of readiness of elementary school teachers for professional and creative activities; Study regulatory and legal documents in the field of education, psychological and pedagogical research, experience in preparing elementary school teachers for professional and creative activities.

Thus, this study is aimed at identifying what problems and difficulties teachers face in carrying out professional and creative activities and what knowledge and skills they need for successful creative activities. It also aims to determine the structure and content of the preparation of future elementary school teachers for professional and creative activities.

Main part. *Literature review.* At the present stage, the development of a comprehensively developed personality the student, the development and implementation of his creative abilities, is one of the priority directions of educational policy in the Republic of Kazakhstan. Special attention is paid to the issues of forming and developing the creative personality of schoolchildren and the importance of the teacher's creative potential in this area in regulatory and legal documents in the field of education. The Law "On Education" of the Republic of Kazakhstan (Zakon, 2023) highlights the development of creative abilities, and aesthetic education (Section 1, Article 2) as an important task of the education system, emphasizes the development of diverse interests and abilities of children and youth in extracurricular education and training (Section 2, Article 14), and the duties of teachers include "creating conditions for the manifestation and development of individual and creative abilities of students" (Section 3, Article 29).

In the Professional Standard "Teacher" (Minister of Education, 2022), which determines the basis for educational programs for teacher training, the section "Criteria for teacher competency by qualification categories, structured on the principle of accumulation," subsection 2.1 notes the following professional knowledge of a university graduate (teacher-trainee/teacher): "...knowledge of modern pedagogical and psychological approaches for the individual development of students/wards." In the State compulsory standard of elementary education (Zakon, 2022), along with other values, work, and creativity are defined as basic values in the updated content of elementary education. It is noted that an educational

environment conducive to the harmonious formation and development of the personality of the student, possessing the basics of functional and creative application of knowledge, should be created, and one of the aspects of determining the updated content of education is the need to develop critical, creative, and positive thinking (Chapter 2, Paragraph 1). In such conditions, the problem of preparing highly qualified and creative teachers for elementary school becomes of great importance, capable of ensuring the all-round development of the child as a holistic personality, developing their creative abilities and talents, and enriching the intellectual potential of the people, their spirituality, and culture on this basis.

Currently, the development of human creative abilities is a significant theoretical and practical problem of pedagogy and psychology (Wu & Liu,2022; Fan et al., 2022). The study of the problem of creativity and creative abilities in the 21st century is influenced by new vital requirements of society. Significant experience has been accumulated in the history of science in studying the theory of creativity. The problem of creativity has always been at the center of attention for many outstanding philosophers, who have made a significant contribution to the development of ideas about the essence of creativity and creative activity (Sternberg & Karami, 2022).

It is necessary to highlight the study of the problems of creativity by psychologists. They analyzed different approaches to the essence of the concepts of "creativity" and "creative abilities," substantiating the prerequisites and levels of development of the creative abilities of the individual. Pedagogues have made a significant contribution to the study of the problems of creative abilities. Pedagogical innovators testify to the necessity of a creative approach by teachers to the development of creative skills in children (Cockerill, 2022). The features of forming a creative personality in the educational process were covered in the works of Koshanova et al., (2021). Questions about forming and developing the creative abilities of elementary school children have been analyzed as well.

Psychologists and teachers emphasize the importance of educational activities for the formation of cognitive activity, creative thinking, and accumulation of experience in creative search activities of students (Apostolopoulou & Issari, 2022; Zhang, 2021). Researchers, considering different aspects of the problem, draw the attention of teachers to the need for a creative approach to their work for the successful development of children's creative abilities, and give recommendations for organizing creative activities of students, selecting means, methods, and forms of learning.

Currently, updated programs have been introduced in schools, the implementation of personality-oriented education, the formation of the ability to learn, and the development of a student's interest in learning, and cognitive abilities (Hofer et al., 2024). Nevertheless, the issues of creating pedagogical conditions, including organizational and methodological aspects of the development of creative abilities of elementary school students, remain relevant. Therefore, the modern teacher in school is required to pay attention not only to the formation of general learning skills but also to the organization of creative activities of students and their performance of search-creative tasks (Richterich, 2022). Accordingly, improving the professional training of future primary school teachers, and increasing attention to their development as creative teachers who stand at the forefront of the development of a child's creative abilities, is an important problem.

This problem has received significant attention in the past. The theoretical and methodological foundations for the preparation of future teachers were developed in the works of Khabibullayevna, (2021) and others. Studies by Tutolmin (2006), Varlakova (2013), Yurevich (1998), Turgynbaeva (2012), and others were devoted to the study of the problem of preparing teachers for creative pedagogical activities. They considered organizational and pedagogical conditions for the functioning of the system of teacher training for professional and creative activities, the formation of the teacher's professional and creative competence,

the development of creativity among future bachelors of pedagogical education, etc.

Various aspects of the formation readiness of primary school teachers for creative activities were examined in the dissertation research of Rodionova (2010), Usova (2002), Rakhmanova (2013), and others. For example, Rodionova's work [8] was devoted to the development of a technology for the formation of creative activity experience in future teachers of primary classes, while Usova (2002) aimed to determine the pedagogical conditions for the formation of readiness for professional and creative self-realization of future teachers of primary classes. Strokova (2007) studied the pedagogical conditions for the creative activities of future teachers of primary classes in a pedagogical college, and Rakhmanova (2013) investigated the conditions for the development of creative abilities of future teachers of primary classes in the process of pedagogical practice. The issue of preparing primary school teachers for creative activities was also addressed in the research of domestic scientists such as Zhiyenbayeva (2022), Kurakbayeva (2008), Dzhanbubekova (2010), and others.

In some studies, it has been shown that the goal and result of preparing a teacher for professional and creative activity is their readiness for creative implementation of pedagogical activities, and the criteria for the effectiveness of the teacher's preparation system for professional and creative activity are distinctive features by which one can judge its state, level of functioning, and development (Sawyer, 2015; Borodina et al., 2019; Levchenko, 2020).

An analysis of the studied works shows that both foreign and domestic researchers recognize the significance of preparing future teachers for professional and creative activities.

Materials and Methods. The survey was conducted among teachers of grades 1-4 and preschool classes in secondary schools in the Almaty region. One-hundred and fourteen (114) people took part in the survey, including 93 teachers of grades 1-4 and 21 teachers of preschool education. Of these, 44 (38.6%) had 6-10 years of work experience, 23 (20.2%) teachers had 11-15 years of experience, 10 (8.7%) teachers had 16-20 years of experience, 18 (15.8%) teachers had 21-25 years of experience, 14 (12.3%) teachers had 26-30 years of experience, and 5 (4.4%) teachers had more than 30 years of experience.

Data collection tool. To form an understanding of the current state of readiness of primary school teachers for creative work, a survey was conducted. One of the tasks of the survey was to identify problems and difficulties in implementing professional and creative activity, as well as types of enhancing the competence of teachers for successful implementation of creative activity. The questionnaire contained the following items:

Do you consider professional and creative activity necessary?

How do you evaluate your readiness for professional and creative activity?

What resources and educational technologies did you use for creative activity?

Do you need help to carry out creative activity?

What problems and difficulties most hinder you in carrying out creative activity?

What kind of help do you need to implement professional and creative activity?

Is special training necessary for professional and creative activity?

What kind of competence enhancement do you prefer?

Your opinions and recommendations on preparing teachers for distance learning.

Procedure. To determine the organizational and substantive aspects of preparing future primary school teachers for professional and creative activity, the study was conducted in the following sequence:

- conducting a search-analytical work, during which the state of the problem was studied, an analysis of regulatory legal documents in the field of education and psycho-pedagogical literature was carried out, and the methodology of the study was determined.

- surveying to establish the actual state of readiness of primary school teachers for professional and creative activity and determine the structure and content of preparing future

primary school teachers for professional and creative activity.

- studying the results of the research, processing the obtained materials, and conducting systematization and generalization of the results of the research.

Results and discussion. The survey results showed that 65.1% of respondents noted that they are generally ready for creative work, but some things have to be learned in the process of pedagogical activity; 30.2% answered that they are not sufficiently prepared and need to learn many things, and 4.7% stated that they are not ready. Thus, the majority of teachers surveyed said that they have to learn a lot in the process of work. The survey results also showed that the majority of teachers (88.4%) noted the need for special knowledge on issues of creative activity, that is, the need for special training.

Regarding the question "What assistance do you need to implement professional and creative activities?", 47.4% of respondents answered that they need methodological assistance; 37.7% answered that they need the expansion of creative competence; 10.5% answered that they need the organization of creative activities for students with special educational needs; and 29.5% answered that they need the development and creation of resources (educational and methodological materials, means of control and evaluation, etc.).

In the section "Your opinions and suggestions on preparing teachers for creative activities", respondents also noted the need for greater attention to special training in professional development courses, seminars, and master classes, exchanging experiences, as well as preparing future teachers for professional and creative activities in higher educational institutions (universities).

It should also be noted that the respondents' answers indicated their insufficient knowledge of the essence of the concept of "professional and creative activity". Thus, it was revealed that the problem of implementing professional and creative activities is relevant for the majority of surveyed teachers. If this task is not solved, there is a high probability of reducing the effectiveness and creative activity of students, which can affect the quality of education.

An analysis of the general state of the problem showed that teachers, psychologists, and methodologists have done significant work related to the theoretical and practical aspects of preparing teachers for professional creativity. However, further research is required in modern conditions, studying and generalizing existing experience, testing recommended means, methods, and forms of work on preparing future primary school teachers for creative activities. The content and structure of training, the criteria for preparing primary school teachers for professional and creative activities in the conditions of education modernization, and the conditions for training in the system of higher pedagogical education are insufficiently defined in pedagogical theory.

Thus, the results of the study indicate the need for further research into the preparation of teachers, particularly those teaching primary classes, for professional and creative activities. Given the features of the updated programs, teachers need to: expand their knowledge about the psychological characteristics of younger students; master teaching methods oriented towards developing students' creative abilities; acquire skills in using new approaches to teaching and learning in the classroom; expand their knowledge about using adaptive approaches, methods for organizing collaborative work among students, pedagogical reflection, and effective feedback forms.

One possible strategy for organizing and designing the training of future teachers for professional and creative activity is the need to review the content of educational programs, modernize methodological approaches and pedagogical technologies that focus on teachers' implementation of professional and creative activity, as well as interdisciplinary interaction and the use of interdisciplinary connections within the educational program.

The professional activity of a future teacher requires daily solutions to a huge number of creative tasks, including organizing the educational process under different, often changing socio-cultural conditions; designing,

implementing, and regulating the educational process; creating educational and methodological developments, creatively using them, etc. In their professional activity, a teacher encounters a large number of sometimes unpredictable and unforeseen situations related to various circumstances that affect the development of their students. The more a teacher develops their creativity, the easier it will be for them to choose the right methods and techniques to solve problems.

The study and analysis of theoretical and practical materials on the professional training of future teachers and the organization of creative activities allowed for the identification of several approaches to the problem of preparing primary school teachers for creative activities:

First is the systemic approach, which is necessary for managing the educational process in a professional educational institution as a holistic pedagogical system (Lopatiev et al., 2017). In modern conditions, the need for a systemic approach to the professional training of future teachers is determined by the high degree of integration of social processes, when theoretical and practical issues of training acquire a complex nature. In the system of professional training of future teachers for creative activities, it is necessary to have sufficient educational, methodological, technical, personnel, and other resources for students to fully master the educational program. All these resources are subsystems of the higher education system. Thus, we understand that the successful preparation of future teachers for professional and creative activities is possible only based on a systemic approach.

Second is the activity approach, which is considered a process of human activity aimed at the formation of their consciousness and their personality as a whole (Melenteva, 2018). The activity approach to forming teachers' readiness for professional and creative activity has clear advantages since all pedagogical measures are directed toward activating students' cognitive independence and research activities. Of course, all of this should be carried out at a level accessible to the students and with the help of the teacher. When selecting the content of educational material for students, their educational needs must be taken into account. The teacher's task is to select the appropriate content, methods, techniques, and teaching technologies. This approach is evident in the studies of Batishchev (1997), Potashnik (1988), Rudenko (1991), and others.

Third is the personality-oriented approach allows for ensuring and supporting the self-realization of the student's personality, and the development of their individuality in educational activities: The contents and features of formation of emotional concepts and their verbalization in children of senior preschool age. This approach is based on the humanistic principle of the relationship between teacher and student, taking into account the subjective experience of the student and providing pedagogical support. The personality-oriented approach in education provides an educational process aimed at forming a personality capable of independent exploration of the world, further self-education and self-development, and self-assertion (Savitskaya, 2010).

Next is the competence approach, which involves the acquisition of knowledge and skills by learners that enable them to act effectively in their future personal and professional lives, and views the individual as a carrier of specific competencies. This approach is reflected in the pedagogical research of Tutolmin (2006).

Also, there is the culturological approach that allows for the consideration of the formation of the competence of the future specialist from the perspective of culture and serves as a guide for the individual towards creative and developmental activities and a conscious approach to one's learning and development. This approach is embodied in the works of Isaev (2004), Levina (2001), Mudrik (2011), and others. According to the culturological approach, readiness for creative activity is formed as a result of the development of the professional culture of the future teacher and presupposes the presence of deep knowledge and qualitative mastery of professional activity.

Lastly, the problem-solving approach involves the intellectual and creative development of

learners through the resolution of modelled non-standard problem situations (Apostol, 2017). Such engagement of future teachers in creative activity ensures the development of personal qualities of the future teacher.

As researchers of this study note, the effectiveness of preparing teachers for professional and creative activity largely depends on the integrity, systematicity, and integrativeness of the educational process. Several researchers focus on the importance of implementing interdisciplinary connections in education, as well as implementing an integrative approach and others (Kremer & Kuznetsova, 2017). The need for a synthesis of scientific knowledge, and integration of educational disciplines in the preparation of future elementary school teachers is due to the multi-profile nature of the educational process in primary education, the diverse individual interests, abilities, and opportunities of younger students. Furthermore, the question of forming a new creative integrative way of thinking for primary education teachers becomes more acute, necessary for creating a favourable emotional-psychological atmosphere for each student, solving complex problems and tasks, etc.

Therefore, the preparation of students in the educational program (EP) 6B01301 – Pedagogy and Methods of Elementary Education for professional and creative activity should be carried out in the process of studying educational disciplines of all three cycles of the EP and with the following pedagogical conditions: creating a special atmosphere of creativity in educational classes and extracurricular work, conducting systematic work to form students' motivational readiness for professional and creative activity in educational institutions, introducing an elective course "Professional and Creative Activity of Elementary School Teachers" into the educational process, widespread use of student teaching practice as an important means of forming the professional and creative readiness of future elementary school teachers, diagnosing the initial state and dynamics of forming professional and creative skills and abilities in students.

Thus, disciplines included in the cycle of general education disciplines (modern history of Kazakhstan, sociology, psychology, philosophy, political science, interdisciplinary course "Sociological Knowledge," foreign language, ICT, physical education) allow for solving such tasks as forming a system of methodological knowledge about the nature and regularities of creative activity, forming a general creative culture, knowledge of common creative methods, psychology of creativity and skills in creative activity, and motivational-personal attitude towards creative activity.

The subjects in the cycle of basic disciplines include mandatory courses (new technologies in teaching specific disciplines, pedagogy, theoretical foundations of the initial course of Kazakh (Russian) language, theoretical foundations of elementary school mathematics, basics of natural science, development physiology of schoolchildren, history and spelling of writing, inclusive education, theory and methodology of educational work in elementary school, working with parents as a teacher of elementary classes) and elective courses. These create favourable conditions for the future teacher to master a system of knowledge about creativity in pedagogical activity, advanced creative pedagogical experience, self-development and self-education of personality, modern technologies of developmental learning, and general and special pedagogical and psychological knowledge as the basis of pedagogical creativity. This forms the theoretical basis for the creative activity of future teachers of elementary classes, skills in pedagogical creative activity, pedagogical technique as a tool for pedagogical creativity, professionally significant qualities and properties of the teacher as a master-creator.

Disciplines and the cycle of profiling disciplines play an important role in preparing future teachers for creative activity. Mandatory components include teaching methods of mathematics, teaching methods of cognition of the world, teaching methods of the alphabet, teaching methods of literary reading, teaching methods of the Kazakh (Russian) language, and teaching methods of natural science.

Innovative approaches in elementary education equip students with knowledge of the basics of planning, organizing, and conducting lessons, teaching technology of subject matter and methodical lines of elementary school subjects, skills in designing and implementing student activities to form subject and integrated competencies, skills in researching and analysing the pedagogical process.

Proposed elective course program. Taking into account the above provisions and the experience in training future teachers in universities of the Republic of Kazakhstan, we have developed an elective course program "Professional-Creative Activity of Elementary School Teachers", which is implemented at the Higher School of Pedagogy and Psychology of I. Zhansugurov Zhetysu State University. Studying this course will contribute to the development of students' scientific, psychological, and pedagogical thinking and teaching skills, as well as artistic aesthetic, and technological abilities, as well as the cultivation of general labor culture, the development of the ability to solve creative and inventive tasks, the formation of the ability to think independently and creatively use acquired knowledge.

Considering the elective course program "Professional-Creative Activity of Elementary School Teachers", students can learn about the basic concepts of "creativity" and "creative abilities," as well as the various forms and subjects of creative work, the content of an elementary school teacher's creative activity, the theory and methods of fostering primary school students' creative abilities, and more.

This course is worth 5 academic credits/ECTS, including lectures of 30 hours, practical work of 15 hours, independent work of 30 hours, and guided work of 75 hours. The discipline aims to develop a systematic understanding of the theoretical foundations and practical aspects of the professional and creative activities of teachers of primary classes and to evaluate their results.

The objectives of studying the discipline are:
- Familiarization with the key concepts, characteristics, and features of creative activities, understanding creativity as a special kind of human activity;

- Mastery of the principles of organizing creative work, documenting, and evaluating its results;
- Preparation for professional activities at the level of creative skills and abilities;
- Equipping with skills to organize creative activities for younger schoolchildren;
- Development of personal qualities, and positive attitudes towards the implementation of creative activities.
- As a result of studying the discipline, the student should know:
- The general theoretical foundations of creativity in educational activities;
- The peculiarities of planning and organizing creative activities;
- The laws of creative activities of primary school children;
- The specifics of primary education and the peculiarities of organizing work with younger schoolchildren;
- Modern trends in the development of primary education.
- As a result of studying the discipline, the student should be able to:
- Analyze educational and methodological materials to determine the purpose, selection of means, methods, and content of creative work;
- Plan, carry out, and evaluate creative activities;
- Perform motivational, diagnostic, corrective, communicative, and methodological activities in the educational process;
- Creatively use pedagogical knowledge in teaching activities;
- Identify and implement the developmental potential of the primary school educational program.
- As a result of studying the discipline, the student should possess:
- Ways of motivating and organizing the creative activities of students;
- Methods and techniques of creating a creative environment;
- Technologies for creatively constructing the process of teaching and educating primary school children;
- Skills for conducting diagnostic examinations of elementary school children;

- Skills for self-analysis of professional and creative activities.

Teaching methods include reproductive, explanatory-illustrative, partially problem-solving exposition, research, and heuristic. The topics considered are:

Creativity. The nature of creativity.

Psychological foundations of creativity.

Creative activity. The main types of creative activity.

Creative character of pedagogical activity. Content and structure of professional and creative activity of a teacher.

Historical and pedagogical analysis of the problem of professional and creative activity of primary school teachers.

Creativity is a personal ability for creativity.

Creative and creative competencies.

Methods and techniques of creative activity.

Forms and means of developing creative activity.

Technologies of creative activity.

Ways of developing creative abilities of elementary school children.

Organization of creative activities for elementary school children.

Features of development of creative abilities of elementary school children in the educational process.

Monitoring the formation and development of creative abilities of elementary school children.

Diagnosis and expertise of the professional and creative activities of a teacher.

The most effective techniques for developing students' creativity, stimulating original thinking, and promoting self-directed learning of new knowledge are student-led research activities and the creative process of solving scientific and educational problems, organizing discussions, using situational analysis (case studies), and other interactive teaching methods.

These conditions are provided by the methodological approaches underlying the training of future primary school teachers.

Conclusion. During the study of the problem of labor and creativity, basic values of the content of primary education were identified; and one of its tasks is the necessity of developing critical and creative thinking in students, as well as the obligation of teachers to create favourable conditions for the manifestation and development of individual and creative abilities of students. To prepare specialists who meet the requirements, the structure and content of the preparation should be determined, and certain conditions should be created. One of the conditions for the preparation of future elementary school teachers, in our opinion, is the inclusion in the module of an additional educational program of an elective course "Professional and Creative Activity of Elementary School Teachers" and the development of a curriculum that integrates questions on the formation of knowledge, skills, abilities, and competencies of future elementary school teachers for professional and creative activity. These conditions are provided by systemic, activity, personality-oriented, and competence-based, problem, and cultural approaches to the preparation of future teachers. The systematic study of the mandatory disciplines of the educational program 6B01301 – Pedagogy and Methods of Primary Education will contribute to deepening students' knowledge and developing competencies that correspond to their professional activity. It will also promote a deeper mastery of the psychological and pedagogical foundations of creative activity in schools, the ability to use pedagogical innovations and technologies of developmental learning in conducting lessons, to use interdisciplinary connections, to develop diagnostic and control-evaluation materials to determine students' intellectual and creative abilities, and more. Thus, an interdisciplinary approach and integration of academic disciplines will allow for a new quality of teacher readiness.

References

Abo Orabi, M. (2023). Required training needs for talented student teachers after the coronavirus pandemic. *International Journal of Special Education and Information Technologies*, *9*(1), 1–9. https://doi.org/10.18844/jeset.v9i1.9133

Ahıskalı, E. E. (2023). Turkish language teachers' creative drama competence and opinions. *International Journal of Innovative Research in Education*, *10*(2), 123–131. https://doi.org/10.18844/ijire.v10i2.8881

Alshumaimeri, Y. A. (2023). Understanding context: An essential factor for educational change success. *Contemporary Educational Researches Journal*, *13*(1), 11–19. https://doi.org/10.18844/cerj.v13i1.8457

Apostol, E. M. D. (2017). Problem-solving heuristics on non-routine problems of college students. *American Journal of Educational Research*, *5*(3), 338-343. https://www.academia.edu/download/56097272/education-5-3-16.pdf

Apostolopoulou, A., & Issari, P. (2022). Constructions of artistic creativity in the letters of Vincent Van Gogh. *The Qualitative Report*, *27*(1), 96-113. https://www.academia.edu/download/84855570/viewcontent.pdf

Batishchev G.S. (1997). Vvedeniye v dialektiku tvorchestva / G. S. Batishchev; [Vstup. st. V. A. Lektorskogo, s. 5-20; Poslesl. V. N. Sherdakova]. – SPb.: Rus. khristian. gumanitar. in-t, 1997. – 463 s.

Borodina T., Sibgatullina A., Gizatullina A. (2019). Developing Creative Thinking in Future Teachers as a Topical Issue of Higher Education. *Journal of Social Studies Education Research, 10*(4), 226-245. https://jsser.org/index.php/jsser/article/view/919

Chiu, T. K. (2024). Future research recommendations for transforming higher education with generative AI. *Computers and Education: Artificial Intelligence*, *6*, 100197. https://doi.org/10.1016/j.caeai.2023.100197

Cockerill, A. (2022). The educational legacy of VA Sukhomlinsky. *Independence*, *47*(2), 74-76. https://search.informit.org/doi/abs/10.3316/informit.664762848015119

Dzhanbubekova M.Z. (2010). Jahandanw jağdayında bolaşaq bastawış mektep muğalimin käsibï is-äreketke dayarlawdıñ pedagogïkalıq negizderi. – Almatı, 2010. –287 s.

Fan, H., Ma, Y., Xu, J., Chang, Y., & Guo, S. (2022). Effects of homework creativity on academic achievement and creativity disposition: Evidence from comparisons with homework time and completion based on two independent Chinese samples. *Frontiers in Psychology*, *13*, 923882. https://doi.org/10.3389/fpsyg.2022.923882

Hofer, S. I., Heine, J. H., Besharati, S., Yip, J. C., Reinhold, F., & Brummelman, E. (2024). Self-perceptions as mechanisms of achievement inequality: evidence across 70 countries. *npj Science of Learning*, *9*(1), 2. https://doi.org/10.1038/s41539-023-00211-9

Holban, C. (2023). A theoretical approach to talent management. *International Journal of New Trends in Social Sciences*, *7*(1), 46–53. https://doi.org/10.18844/ijss.v7i1.8985

Khabibullayevna, H. M. (2021). Scientific-Theoretical Fundamentals of Improving the Methodological Training of Future Primary School Teachers to Teach the Subject of Education. *Turkish Online Journal of Qualitative Inquiry*, *12*(10).

Koshanova, M. T., Abdirkenova, A. K., Seiitkazy, P. B., Koshanova, Z. T., & Seitkassymov, A. A. (2021). The use of media technologies in the formation of creativity in future psychological and pedagogical specialists. *Thinking Skills and Creativity*, *41*, 100891. https://www.sciencedirect.com/science/article/pii/S1871187121001061

Kremer, I. Yu., & Kuznetsova, I. I. (2017). An integrative approach is the basis for the formation of a professionally competent personality of a future teacher. *Bulletin of the Donetsk Pedagogical Institute, 3*, 25-31.

Kurakbaeva A.Zh. (2008). Formirovaniye kreativnogo myshleniya budushchikh pedagogov nachal'nogo obrazovaniya. // *Nauka i zhizn' Kazakhstana* №7/2, 2020. –S.136-143.

Levchenko, T.A. (2020). Formirovaniye kreativnogo myshleniya budushchikh pedagogov nachal'nogo obrazovaniya. // Nauka i zhizn' Kazakhstana №7/2, 2020. –S.136-143.

Levina, M.M. (2001). Tekhnologii professional'nogo pedagogicheskogo obrazovaniya: Ucheb. posobiye dlya stud. vyssh.ped. ucheb. zavedeniy. – M.: Izdatel'skiy tsentr «Akademiya», 2001.— 272 s.

Lopatiev, A., Ivashchenko, O., Khudolii, O., Pjanylo, Y., Chernenko, S., & Yermakova, T. (2017). Systemic approach and mathematical modeling in physical education and sports. *Journal of Physical Education and Sport (JPES)*, 17(1), 146-155. https://www.efsupit.ro/images/stories/01feb2017/art23.pdf

Mansouri, F., & Hamzaoui, H. (2023). Developing critical thinking across the curriculum through embedded personal epistemology: An immersion approach. *International Journal of Learning and Teaching*, *15*(3), 109–121. https://doi.org/10.18844/ijlt.v15i3.9078

Melenteva, M. (2018). *Meaning making in special needs pedagogy: a theoretical study of Vygotsky's framework ideas and their impact on cognitive and social constructivist research on meaning making* (Master's thesis, UiT Norges arktiske universitet). https://munin.uit.no/handle/10037/14311

Minister of Education. (2022). Professional'nyy standart "Pedagog" Utverzhden prikazom i.o. https://adilet.zan.kz/rus/docs/V2200031149#

Mudrik A.V. (2011). Sotsializatsiya cheloveka: ucheb. posobiye dlya stud. vyssh. ucheb. zavedeniy /A.V. Mudrik – 3-ye izd., ispr. i dop. – M.: Izd-vo Moskovskogo psikhologo-sotsial'nogo inta, 2011. -736 s.

Potashnik M.M. (1988). Pedagogicheskoye tvorchestvo: problemy razvitiya i opyt : Posobiye dlya uchitelya / M. M. Potashnik. – Kiyev : Rad. shk., 1988. – 189 s.

Rakhmanova D.Z. (2013). Razvitiye tvorcheskikh sposobnostey budushchikh uchiteley nachal'nykh klassov v protsesse pedagogicheskoy praktiki. Dis... kand.ped. nauk: 13.00.01. – Dushanbe, 2013. -184 s.

Richterich, A. (2022). "Forget about the learning?" Technology expertise and creativity as experiential habit in hacker-/makerspaces. *Cogent Education*, *9*(1), 2034239. https://doi.org/10.1080/2331186X.2022.2034239

Rodionova S.A. (2010). Formirovaniye gotovnosti k professional'nomu tvorchestvu u budushchikh uchiteley nachal'nykh klassov. Dis... kand.ped. nauk: Shuya – 2010. –274 s.

Rudenko N.G. (1991). Individual'no-tvorcheskiy podkhod v protsesse psikhologo-pedagogicheskoy podgotovki studentov: dissertatsiya ... kandidata pedagogicheskikh nauk: 13.00.01 / Mosk. ped.gos. un-t. – Moskva, 1991. – 174 s.

Salfiyadi, T., Nuraskin, C. A., & Reca, R. (2023). Indonesian students' perceptions of the new normal implementation post-COVID-19. *Cypriot Journal of Educational Sciences*, *18*(4), 622–630. https://doi.org/10.18844/cjes.v18i4.7113

Savitskaya A.V. (2010). Lichnostno-oriyentirovannyy podkhod i usloviya yego realizatsii pidistantsionnom obuchenii v vuze. // Chelovek i obrazovaniye. – 2010. – № 4 (25). – S.93-96 *4*(25), 93-96.

Sawyer, K. (2015). A call to action: The challenges of creative teaching and learning. *Teachers College Record*, *117*(10), 1-34. https://journals.sagepub.com/doi/abs/10.1177/016146811511701001

Snepvangers, K., & Rourke, A. (2020). Creative Practice as a Catalyst for Developing Connectedness Capabilities: A Community Building Framework from the Teaching International Students Project. *Journal of International Students*, *10*(S2), 17–35. https://doi.org/10.32674/jis.v10iS2.2762

Sternberg, R. J., & Karami, S. (2022). An 8P theoretical framework for understanding creativity and theories of creativity. *The Journal of Creative Behavior, 56*(1), 55-78. https://onlinelibrary.wiley.com/doi/abs/10.1002/jocb.516

Strokova, E. K. (2007). Organizatsionno-pedagogicheskiye usloviya tvorcheskoy deyatel'nosti budushchego uchitelya nachal'nykh klassov v pedagogicheskom kolledzhe: dissertatsiya. Kandidata pedagogicheskikh nauk: 13.00.08 Lipetsk, 2007 236 s.

Turgynbaeva, B.A. (2012). Bolashak mugalimderdin aleuetin damytu: kasibi shygarmashylyk zholynda. Almaty: Polygraphy, 316.

Tutolmin A. V. (2006). Professional'no-tvorcheskaya kompetentnost' pedagoga nachal'nogo obrazovaniya: metodologicheskiye aspekty. – Moskva: Moskovskiy gosudarstvennyy otkrytyy pedagogicheskiy universitet (MGOPU), 2006. – 113 s. – Rezhim dostupa: po podpiske. https://biblioclub.ru/index.php?page=book&id=458749

Usova S.N. (2002). Formirovaniye gotovnosti k professional'noy tvorcheskoy samorealizatsii budushchego uchitelya nachal'nykh klassov. Dis... kand.ped. nauk: Kazan' -2002. -188 s.

Varlakovayu, R. (2013). Razvitiye kreativnosti budushchikh bakalavrov pedagogicheskogo obrazovaniya v vuze: Dis... kand.ped. nauk: 13.00.08. – Krasnoyarsk, 2013. -207 s.

Walter, Y. (2024). Embracing the future of Artificial Intelligence in the classroom: the relevance of AI literacy, prompt engineering, and critical thinking in modern education. *Int J Educ Technol High Educ* 21, 15. https://doi.org/10.1186/s41239-024-00448-3

Wu, T. T., & Liu, W. S. (2022). Effectiveness of remote-control cars and authentic learning in strengthening creative thinking and problem-solving abilities. *Educational Technology & Society*, *25*(2), 163-181. https://www.jstor.org/stable/48660131

Yurevich S.N. (1998). Organizatsionno-pedagogicheskiye trebovaniya podgotovki uchitelya k professional'no-tvorcheskoy deyatel'nosti v usloviyakh sovremennoy shkoly: Dis. ... kand. ped. nauk: 13.00.08. – Magnitogorsk, 1998. – 169 c.

Zakon K. Z. (2022). Kazakhstan ot 3 avgusta 2022 goda № 348 «Ob utverzhdenii gosudarstvennykh obshcheobyazatel'nykh standartov doshkol'nogo vospitaniya i obucheniya, nachal'nogo, osnovnogo srednego i obshchego srednego, tekhnicheskogo i professional'nogo, poslesrednego obrazovaniya» *(s izmeneniyami ot 04.10.2022 g.)*. https://online.zakon.kz/Document/?doc_id=36860185

Zakon K. Z. (2023). Zakon Respubliki Kazahstan ot 27 iyulya 2007 goda № 319-III „Ob obrazovanii" (s izmeneniyami i dopolneniyami ot 26.02.2023) https://online.zakon.kz/Document/?doc_id=30118747&pos=172;-60#pos=172;-60

Zhang, L. F. (2021). Revisiting the role of cognition and teachers in cognitive and non-cognitive outcomes. *Educational Psychology*, *41*(6), 675-677. https://doi.org/10.1080/01443410.2021.1951978

Zhienbayeva S. N., Adamova M. E., & Abylgazina A. E. (2022). Povysheniye kvalifikatsii pedagoga kak odin iz faktorov kachestva obrazovaniya //Transformatsiya mirovoy nauki i obrazovaniya v epokhu peremen: strategii, instrumenty razvitiya, 243-248.

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CONCEPTUAL THEORIES OF THE FORMATION OF REFLECTIVE SKILLS IN A FUTURE TEACHER

Abstract

The article examines the conceptual foundations of the formation of a teacher's reflective skills. Reflective skills are defined as an important component of professional competence, which consists of the ability to comprehend and analyze one's pedagogical activity to improve it and adapt it to the needs of primary school students and the educational environment. The purpose of the study was to theoretically substantiate the conceptual foundations for the formation of a teacher's reflective skills. The authors analyzed various theories and the concept of critical reflection. The analysis of the theories demonstrates that a teacher's reflective skills are a multifaceted and dynamic process that includes self-analysis, critical thinking, and continuous professional development, and have several stages in their formation. The formation of reflective skills requires awareness, readiness for change, and a desire for continuous improvement of pedagogical practice. The importance of forming reflective skills in future teachers to enhance a teacher's professional competence in an inclusive environment is particularly relevant, as it contributes to improving the quality of the educational process and creating a supportive and equitable educational environment for all primary school students.

Keywords: reflection, reflective skills, reflective skills of a future primary school teacher, theories of the formation of a teacher's reflective skills.

Basic provisions. The formation of reflective skills in teachers plays a key role in their professional development, as these skills contribute to the comprehension and analysis of their pedagogical activity. These skills allow teachers to adapt to the needs of primary school students and the changing educational environment, which ultimately leads to an improvement in the quality of education. The study aimed to theoretically substantiate the conceptual foundations necessary for the formation of reflective skills in teachers. In this context, an analysis of the theories of well-known scientists, including John Dewey, David Kolb, Donald Schön, Lawrence Kohlberg, James Rest, Graham Gibbs, and Albert Bandura, as well as the concept of critical reflection, was conducted. It was revealed that reflective skills are a complex and multi-stage process that includes elements of self-analysis, critical thinking, and continuous professional growth. Teachers who develop these skills must possess awareness, readiness for change, and a desire for continuous improvement of their practice.

Introduction. The development of modern society is characterized by increasing dynamism, penetration to new levels of understanding nature, changes in social structure, and the emergence of qualitatively new types of activities in previously unknown areas (Morris, 2023). To ensure high rates of socioeconomic, scientific-technical, and cultural development in the Republic of Kazakhstan, the Framework of Professional Competencies of a Teacher (Şraymanova et al.,2019; Brookfield, 2017) involves the training of competent teachers who are ready for successful professional and personal self-realization. The increasing volume of innovations; active development of inclusion, integration of all students into one educational environment, new requirements for educational outcomes; a different system of evaluating learning outcomes; issues of subject separation; and the introduction of new disciplines require updating the content of primary school teachers' activities, concentration of intellectual resources, and the desire for independent search for necessary information for critical, creative

mastering of new strategies of behavior in the professional activities carried out (Bunt & Gouws, 2020; Kyttälä et al., 2019).

Reflective skills become an important tool for solving the problems that have arisen since they contribute to the creation of a flexible and adaptive educational environment that meets the needs of all students (Sullivan et al., 2018; Greetham & Ippolito, 2018). The purpose of the study was to theoretically substantiate the conceptual foundations for the formation of a teacher's reflective skills.

Research methods and materials. Analysis of scientific literature has shown that to date, science has accumulated a certain amount of knowledge necessary for the formulation and solution of the problem of forming reflective skills in the conditions of professional training of teachers.

Two of the most influential theorists in the field of reflective practice, Dewey (1933) and later Schön (1983), laid the foundation for the modern understanding of the concept of reflection. Dewey (1933) defined reflective practice as an action that involves «active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further consequences to which it leads» Schön (1983) distinguished between reflection «in action» – a kind of reflection that arises during problem-solving, and reflection «on action» which occurs after the event, is consciously carried out, and documented (Bauer, 1991). Eraut (1995), criticizing Schön's concept of reflection «in action» contributed to the literature on reflection by introducing the concept of reflection «for action, » which gives reflection a more prospective value (Eraut, 1995).

Gouldner (1970) considered reflection as a process of forming professional identity: «There is no knowledge of the world that is not knowledge of our own experience of perceiving it». Taking all this into account, we begin to see the teacher as a reflective practitioner who, through a process involving interpretation and rethinking of experience, acquires knowledge about the teaching profession and develops their professional identity as a teacher.

Aisuvakova (2004) notes that psychological science investigates reflective processes that allow understanding the essence of such phenomena of the human psyche as the arbitrariness of self-knowledge, and theoretical thinking; reveals the essence of reflective management of other activities; studies reflexivity as a mental property. In the study by Stetsenko (2006), the content of the concepts of «pedagogical reflection» and «methodological reflection of a teacher» are presented; the content and methods of forming a teacher's ability for pedagogical reflection are determined.

An increase in the number of works devoted to the formation of pedagogical reflection defines the reflective skills of a teacher as an important component of professional competence, which consists of the ability to comprehend and analyze one's pedagogical activity to improve it and adapt it to the needs of students and the educational environment (Panova, 2005; Rubanova, 2003). The development of reflective skills allows the teacher not only to effectively solve current tasks but also to constantly improve in the profession, adapting to the changing conditions and requirements of the educational process in an inclusive setting.

Firstly, reflection allows the teacher to evaluate the effectiveness of their teaching methods and strategies. This includes analyzing successes and failures, identifying the strengths and weaknesses of the approaches used, as well as identifying factors that affect student performance and motivation. Such analysis helps the teacher to adjust their actions, and seek new methods and approaches that better meet the educational goals and needs of students.

Secondly, reflective skills contribute to the personal growth and professional development of the teacher. Through reflection, the teacher becomes aware of their emotional reactions, values, and beliefs, which allows them to better understand their motives and behavior in various situations. This understanding promotes the development of emotional competence, improves interaction with students and colleagues, and helps to cope with stress and professional difficulties.

Reflective skills play a key role in the development of critical thinking and a creative approach to teaching. Reflecting on one's actions and their results encourages the teacher to search for new solutions and innovative working methods. This is important in the constantly changing educational landscape, where flexibility and readiness for change are required. A teacher with reflective skills can adapt to new educational standards, use modern technologies and methods, and effectively respond to the challenges of the time.

An important component of reflective skills is the teacher's ability for self-analysis and self-regulation through keeping a pedagogical diary, participating in professional communities and exchanging experiences with colleagues, regularly conducting self-assessments and student surveys, as well as participating in training and seminars on professional development. Self-analysis helps the teacher to be more conscious of their work, and to plan and organize the educational process in such a way that it is as effective and efficient as possible.

It is also worth noting that reflective skills contribute to improving the interaction of the teacher with students and parents. Understanding one's actions and their consequences helps the teacher to build trusting and productive relationships with participants in the educational process. This includes the ability to listen and understand, take into account the opinions and needs of students, as well as find a common language with parents, which is especially important for creating a favourable educational environment.

Larrivee (2008) defined, based on an extensive review of literature, four levels of reflection:

- pre-reflection – represents the 'zero' level of reflection in which teachers react to students and classroom situations automatically, without conscious consideration of alternatives;

- surface reflection – teachers' reflections focus on strategies used to reach predetermined goals;

- pedagogical reflection – teachers reflect on educational goals, theories underlying approaches, and connections between theoretical principles and practice;

- critical reflection – teachers reflect on moral and ethical implications and consequences of their classroom practice on students.

Reflective skills, being an important part of a teacher's professional competence, are explained and developed through various conceptual theories that offer structured approaches to understanding and analyzing reflection in teaching practice. Among them, several key ones can be distinguished (Table 1):

Table 1. *Characteristics of conceptual theories*

Name of the theory	The leading idea of the theory
The John Dewey Theory	John Dewey, one of the founders of the theory of reflexive thinking, considered reflection to be a central component of learning and professional development. In his opinion, reflection is an active and purposeful process in which a person analyzes his actions, has doubts, and evaluates the consequences for making more informed decisions. In the context of teaching, this means that the teacher constantly evaluates and rethinks his methods and approaches in order to improve them (Dewey, 1933).
Theory David Kolb	David Kolb has developed a cyclic learning model in which reflection plays a key role. According to Kolb, the learning process includes four stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation. For a teacher, this means that he must go through all these stages, analyzing his pedagogical experience, formulating theoretical generalizations, and applying them in practice to improve the educational process (Kolb, 2005).
The theory of reflexive practice by Donald Schön	Donald Schön introduced the concept of a «reflective practitioner», emphasizing that professionals, including teachers, must constantly reflect on their actions in the process of work. He distinguished two types of reflection: reflection in action

	(comprehension of actions at the moment of their execution) and reflection on action (analysis of actions after their completion). These types of reflection help the teacher to be more flexible and adaptive in his professional activity (Schön, 1983).
Cognitive development theory by Lawrence Kohlberg and James Rest	The researchers studied the development of moral and cognitive thinking. Their work highlights the importance of moral and ethical reflection for teachers, as decision-making in the educational process is often associated with moral dilemmas. Teachers should be able to reflect on their moral beliefs and actions in order to ensure fair and ethically based learning (Rest, 2000).
The Graham Gibbs Reflexive Cycle Model	Graham Gibbs proposed a model of the reflexive cycle, which includes six stages: description, feelings, assessment, analysis, conclusions, and an action plan. This model helps teachers analyze their pedagogical actions and emotions related to them in a structured way, which contributes to a deeper understanding and improvement of their professional practice (Oviawe, 2020).
The socio-cognitive theory of Albert Bandura	Albert Bandura in his theory emphasizes the role of self-efficacy and self-regulation. Reflection in this context is considered as a mechanism through which teachers can develop confidence in their abilities (self-efficacy) and manage their actions and emotions (self-regulation). Teachers who actively reflect are better able to adapt and overcome professional challenges (Chubar, 2019).
The concept of critical reflection	Critical reflection focuses on analyzing not only personal experiences but also social, cultural, and political contexts that influence the educational process. Teachers who practice critical reflection strive to understand and change those structures and practices that may be unfair or ineffective (Brookfield, 2009).

Theories emphasize that the reflexive skills of a teacher are a multifaceted and dynamic process involving introspection, critical thinking, and continuous professional development. The formation of reflexive skills requires awareness, readiness for change, and a desire for continuous improvement of pedagogical practice.

Research results and discussions. Let's consider how these theories are used at the present stage. For example, Rodgers (2002) revisits the concept of reflection based on the ideas of John Dewey. The author offers a clear definition of reflection, viewing it as an active, systematic process that involves purposeful consideration of experience. Rodgers emphasizes the importance of reflective thinking in pedagogical practice, highlighting its role in teachers' professional development and the improvement of the educational process. The author seeks to deepen the understanding of reflection by offering practical recommendations for its integration into educational activities.

In the article «Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education» Alice Kolb explores how learning styles and educational spaces can enhance experiential learning in higher education, drawing on David Kolb's theory of experiential learning. According to Kolb's theory, learning is a process that involves four stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation. The author emphasizes the importance of reflective skills, stressing that the ability to reflect allows students to analyze and interpret their experiences, leading to deeper and more effective learning. The author suggests creating educational spaces that stimulate reflection and take into account students' different learning styles.

Kinsella (2007) analyses Donald Schön's theory of reflective practice. The author examines how Schön contrasts technical rationality with reflective practice, criticizing the former for its limitations in complex, uncertain situations. Kinsella discusses the epistemological aspects of Schön's theory, emphasizing its non-dualistic nature, where knowledge and action are integrated. The article highlights the importance of reflection for professional development, proposing reflective practice as a way to improve understanding and problem-solving in

professional activities, especially in fields such as medicine and education.

Rest et al. (1999) propose a neo-Kohlbergian approach to the study of morality. This approach focuses on moral development as a dynamic process in which people constantly re-evaluate their moral beliefs and values. The authors argue that for effective moral development, people need to possess reflective skills. These skills allow individuals to critically assess their moral judgments, understand the perspectives of others, and justify their moral decisions.

From the perspective of the necessity of developing reflective skills in teachers, the article by Rest et al. (1999) has the following implications:

- Teachers themselves must possess reflective skills to effectively teach moral values to their students.

- Teachers should create conditions for the development of reflective skills in their students. This can be done, for example, by using teaching methods based on discussions, problem-solving, and the analysis of moral dilemmas.

- Teachers should encourage their students to critically evaluate their moral judgments, understand the perspectives of others, and justify their moral decisions.

In the study by Quinton & Smallbone (2010), the authors discuss Graham Gibbs' model of the reflective cycle as a method of using feedback to stimulate student reflection and learning. The authors emphasize the importance of reflection for learning and propose a method of stimulating reflection on written feedback using a self-copying sheet. The method helps students actively engage with feedback, reflect on it, and use it to improve their future work. The authors stress that this model, based on the reflective cycle, helps students recognize their successes and shortcomings and plan further steps to enhance their learning.

Tschannen-Moran & Hoy (2001) turn to Albert Bandura's social cognitive theory to understand this construct. According to this theory, a teacher's belief in their ability to influence learning (teacher efficacy) is formed through self-observation, social comparison, verbal persuasion, and physical and psychological states. The authors seek to understand how this construct can be measured and assessed and how teachers can improve their teaching efficacy through the formation of reflective skills and beliefs in their abilities.

The main idea of the article «The 'Critical' in Critical Reflection» is to explore the concept of critical reflection and its importance for professional development. The authors, Fook and Askeland, emphasize that critical reflection goes beyond ordinary self-analysis and includes awareness and analysis of hidden biases, social and cultural contexts that influence professional practice. This concept is based on the work of Brookfield, who argues that becoming a critically reflective teacher requires deep reflection on one's assumptions and actions. The article discusses methods and strategies that can help professionals develop critical reflection, such as dialogues, collective discussions, and written reflective practices. Thus, critical reflection is a tool for increasing awareness and improving professional practice, promoting a deeper understanding of one's own experience and the contexts in which work is carried out.

The analysis of contemporary research in the presented articles provides an in-depth understanding of various theories and models of teachers' reflective skills, which can be useful for a more thorough study of this issue. The development of these skills requires constant awareness and analysis of one's activities, readiness for change, and a desire for improvement, which ultimately leads to more effective and efficient teaching.

Conclusion. An analysis of the conceptual foundations of developing reflective skills in teachers allows us to conclude that it is a complex and multifaceted process that requires a comprehensive approach. Reflective skills play a key role in the professional growth of teachers, helping them adapt to the changing conditions of the educational environment, evaluate the effectiveness of their work, and constantly improve their pedagogical practice.

The theoretical concepts discussed in this article provide a valuable basis for understanding and developing reflective

skills in teachers. The theories of Dewey and Kolb emphasize the importance of active and purposeful analysis of experience for effective learning and professional growth. Schön's model of reflective practice highlights the need for constant reflection in the process of work to adapt to changing situations. The cognitive-developmental theory of Kohlberg and Rest, as well as the concept of critical reflection, point to the significance of moral and ethical reflection in pedagogical activity. Gibbs' model of the reflective cycle and Bandura's social cognitive theory offer practical tools for structured analysis and development of teacher self-efficacy.

However, despite a sufficient theoretical foundation, the formation of reflective skills in teachers in practice remains a challenging task. Further research is needed on effective methods and strategies that can help teachers integrate reflection into their daily work. It is especially important to explore how to create a favourable environment and conditions that will encourage and support reflective practice in the context of professional training of future teachers.

Educational programs should be based on modern theoretical concepts and include practical tools and strategies for fostering reflection, taking into account the individual characteristics and needs of future teachers.

In conclusion, it should be noted that the formation of reflective skills in future teachers is an important and relevant task of modern education. The theoretical concepts discussed in this article provide a valuable basis for understanding and developing these skills. However, further research and practical developments are needed to help teachers effectively integrate reflection into their daily work and contribute to creating a more effective and equitable educational environment.

References

Ajsuvakova, T. P. (2004). Razvitie refleksivnyh umenij v processe professionalnoj podgotovki budushego uchitelya. In Vospitanie budushego uchitelya v processe predmetnoj podgotovki (pp. 238-241)

Bauer, N. J. (1991). Dewey and Schon: An Analysis of Reflective Thinking. https://eric.ed.gov/?id=ED344299

Brookfield, S. (2009). The concept of critical reflection: Promises and contradictions. European journal of social work, 12(3), 293-304. https://www.tandfonline.com/doi/abs/10.1080/13691450902945215

Brookfield, S. D. (2017). Becoming a critically reflective teacher. John Wiley & Sons. https://aura.antioch.edu/facbooks/91/

Bunt, B., & Gouws, G. (2020). Using an artificial life simulation to enhance reflective critical thinking among student teachers. Smart Learning Environments, 7, 1-19. https://link.springer.com/article/10.1186/s40561-020-00119-6

Chubar, N. N. (2019) Summary: Albert Bandura: Socio-cognitive theory of personality. Albert bandura-social learning theory. https://istrador.ru/en/obustrojjstvo/referat-albert-bandura-socialno-kognitivnaya-teoriya-lichnosti-albert/

Dewey, J. (1933). How we think: A restatement of the relation of reflective thinking to the educative process. Chicago: Henry. https://www.scirp.org/reference/ReferencesPapers?ReferenceID=1434306

Eraut, M. (1995). Schon shock: a case for refraining reflection-in-action? Teachers and teaching, 1(1), 9-22. https://www.tandfonline.com/doi/abs/10.1080/1354060950010102

Gouldner, A. W. (1970). The coming crisis in Western sociology. New York: Basic Books. https://journals.sagepub.com/doi/10.1177/000271627139400179

Greetham, M., & Ippolito, K. (2018). Instilling collaborative and reflective practice in engineers: using a team-based learning strategy to prepare students for working in project teams. Higher Education Pedagogies, 3(1), 510-521. https://doi.org/10.1080/23752696.2018.1468224

Kinsella, E. A. (2007). Technical rationality in Schön's reflective practice: dichotomous or non-dualistic epistemological position. Nursing Philosophy, 8(2), 102-113. https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1466-769X.2007.00304.x

Kolb, A. Y., & Kolb, D. A. (2005). Learning styles and learning spaces: Enhancing experiential learning in higher education. Academy of management learning & education, 4(2), 193-212. https://journals.aom.org/doi/abs/10.5465/AMLE.2005.17268566

Kyttälä, M., Kanerva, K., Munter, I., & Björn, P. M. (2019). Working memory resources in children: Stability and relation to subsequent academic skills. Educational Psychology, 39(6), 709-728. https://doi.org/10.1080/01443410.2018.1562046

Larrivee, B. (2008). Development of a tool to assess teachers' level of reflective practice, Reflective Practice, 9:3, 341-360. https://doi.org/10.1080/14623940802207451

Morris, E. M., Qargha, G. O., & Winthrop, R. (2023). Elevating the purpose of education to achieve the spirit of SDG 4. International Journal of Educational Development, 103, 102926. https://www.sciencedirect.com/science/article/pii/S073805932300202X

Oviawe, J. (2020). Application of Graham Gibbs model of reflection to improve teaching understanding among technical education students in Ambrose Alli University Ekpoma Edo State. Sumerianz Journal of Education, Linguistics and Literature, 3(2), 1201-2617. https://www.sumerianz.com/

Panova, L. V. (2005). Pedagogicheskie usloviya formirovaniya refleksivnyh umenij budushih uchitelej nachalnyh klassov

Quinton, S., & Smallbone, T. (2010). Feeding forward: using feedback to promote student reflection and learning–a teaching model. Innovations in education and teaching international, 47(1), 125-135. https://medialibrary.uantwerpen.be/files/53980/2b38a56c-e7df-4ea4-8b71-df8a066ddf36.pdf

Rest, J. R., Narvaez, D., Thoma, S. J., & Bebeau, M. J. (2000). A neo-Kohlbergian approach to morality research. Journal of moral education, 29(4), 381-395. https://www3.nd.edu/~dnarvaez/documents/Restetal2000.pdf

Rodgers, C. (2002). Defining reflection: Another look at John Dewey and reflective thinking. Teachers college record, 104(4), 842-866. http://dx.doi.org/10.1111/1467-9620.00181

Rubanova, O. I. (2003). Formirovanie refleksivnyh umenij budushih uchitelej pri izuchenii pedagogicheskih disciplin

Schön, D. (1983). The reflective practitioner. New York: Basic Books.

Şraymanova, G. S., Täjiğulova, G. O., Wtegenova, B. M., & Axmetjanova, A. A. (2019). KÄSIBİ PEDAGOGÏKA. https://repo.kspi.kz/handle/item/3164

Stesenko, I. A. (2006). Pedagogicheskaya refleksiya: teoriya i tehnologiya razvitiya. Dok. dis, 13(01)

Sullivan, R., Neu, V., & Yang, F. (2018). Faculty development to promote effective instructional technology integration: A qualitative examination of reflections in an online community. Online Learning, 22(4), 341-359. https://doi.org/10.24059/olj.v22i4.1373

Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: Capturing an elusive construct. Teaching and teacher education, 17(7), 783-805. https://www.sciencedirect.com/science/article/pii/S0742051X01000361

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INTERDISCIPLINARY LINKS AS A DIDACTIC CONDITION FOR IMPROVING THE QUALITY OF THE EDUCATIONAL PROCESS

Abstract

In geographical education, interdisciplinary links allow to identify the main elements of educational content, to develop system-forming ideas, concepts, general scientific methods of learning activities, opportunities for students to comprehensively assimilate knowledge from different scientific disciplines. Interdisciplinary links influence the composition and structure of each academic discipline. Therefore, it is very important to emphasize the interdisciplinary connections taken into account in the content of geography and, conversely, in other fields of science besides geography. The aim of this study was to conduct a systematic review of interdisciplinary related science fields that integrate geographic educational technologies. The study used methods of analysis, differentiation, systematisation to identify the interdisciplinary links between geography and sciences such as history; biology; ecology; mathematics; cartography; physics and chemistry. As a result of the study, it was found that these branches of science – form a holistic scientific worldview in the student, strengthen interdisciplinary

links. Thus, interdisciplinary links in geographical education are a modern principle of learning, influencing the choice and structure of teaching material in a number of disciplines, and an integrated organisational form that activates teaching methods.

Keywords: geography; education; interdisciplinary links; systematic review; analysis.

Basic provisions. This study aimed to find out how cross-curricular links affect the improvement of the quality of the learning process. This is because identifying interdisciplinary linkages is considered the most important factor in building a complete and quality education system. Interdisciplinary communication improves critical thinking, objective and subjective thinking in value acquisition by involving collaboration between researchers from different disciplines to solve complex problems.

Therefore, this study presents a systematic review of the interdisciplinary fields of science that integrate natural geography education technologies. This has enabled the relationship of geography to natural history and other sciences to be explored and a number of generalisations to be made. The study details the interdisciplinary relationship of geography with history, biology, ecology, mathematics, cartography, physics and chemistry. The methods of analysis, differentiation, systematisation were used to determine the interdisciplinary relations of geography. Because there are very few scientific studies that reveal the interdisciplinary links between geography and other sciences. Therefore, these methods were chosen to conduct the study.

Thus, curricula designed on the basis of interdisciplinary linkage have proved to be very flexible in the pragmatic use of subjects. Proper integration of topics from different fields motivates a person to participate in the educational process and thus ensures quality training. The interdisciplinary approach does not contradict the disciplinary approach, but rather complements it. It also helps to bridge the gap between geography and the natural sciences and improve understanding and co-operation.

Introduction. In the period of globalisation, geography and natural sciences have become an interdisciplinary field that integrates educational technologies (Taylor, 2009). Since

geography is the most appropriate discipline for interdisciplinary learning as it serves as a bridge between humanities and natural sciences (Sağdiç et al., 2014). In this sense, there are very few subjects in today's updated educational programme that are not related to geography. In fact, the subject of geography is a science connected to all scientific fields. Interdisciplinary communication through close interaction with each other facilitates the learning of any science, the acquisition of knowledge and its effective use by students (Mansurjonovic et al., 2023; Gao et al., 2023). Therefore, when studying science, teachers should pay attention to such issues.

Interdisciplinary connections are integral to a quality education system because when students understand a problem, they learn more about a scientific discipline (Didonato, 2013). Therefore, interdisciplinary learning allows students to improve their thinking and reading skills, have higher cognitive abilities, and make connections between different contexts (Yang et al., 2014). Interdisciplinary communication is necessary to create a balance between objective and subjective thinking, critical thinking, and interdisciplinary learning is a natural process of structuring and implementation(Sarsebayeva et al., 2023; Ibrahim, 2020). At this stage, teachers come to the fore, for example, when considering the topic of migration in a geography lesson, it is necessary to relate it to migration events in literature, migration of tribes studied in history, migration activities of living beings past biology. Accordingly, it is necessary to invite students to plan their study time effectively within the curricula of these disciplines.

Among the branches of science that study nature, geography, physics, astronomy, biology, chemistry, and ecology are called natural sciences. The main place among them is occupied by physics, because the meaning of this term means "nature" (Margot et al., 2019). At the same time, the relationship between

geography and other branches of science that study nature is very broad and encompasses various aspects. Therefore, several disciplines have emerged to study various phenomena occurring in the environment. However, as new knowledge accumulated, the objects of study became more complex and biology was separated from geography and then from geology (Shogan et al., 2020). Currently, thanks to the work of scholars such as D'agostino & Santus (2022), Walshe (2016), Lyall et al. (2013), who have investigated the various components of the geographical envelope, the link between geography and other sciences continues to strengthen. Thus, given the structure and research characteristics of geographical science, the main purpose of this research paper was to explore the interdisciplinary links between geography and other sciences. The research will reveal a wide range of interdisciplinary links between geography and physics, chemistry, history, mathematics, cartography, biology and ecology. Prediction of the study: teaching a geography lesson using an interdisciplinary approach enhances cognitive development, abstract thinking, creativity and problem-solving skills through the integration of different disciplines.

Main part. The notion of interdisciplinary connections not only implies solving a concept or problem using several disciplinary methods, but also separately considers the interconnection of disciplines (Wang et al., 2020; Alieva, 2020). While an interdisciplinary approach is effective in deepening subject knowledge, they look for mutually relevant connections with an emphasis on higher level thinking (Mancas, 2011). In addition, interdisciplinary communication of educational knowledge implements the dialectical method, performing primarily methodological functions. The most basic dialectical task of interdisciplinary communication is to create a link between the educational and developmental nature of the learning process. Challenges such as globalisation, environmental and social changes, and the transition to the information society can be addressed very effectively through an interdisciplinary approach (Orazymbet, 2014). This is because planning the

teaching and learning process based on an interdisciplinary approach plays an important role in consolidating the in-depth knowledge gained in the study of individual disciplines and maintaining the educational process. However, some teachers believe that the integration of subjects may become overload for students.

In this context, the desire to study a wide range of problems involving a complex combination of phenomena and processes is the impetus for research that brings together traditional disciplines. Indeed, geographers play an active role in many interdisciplinary projects. Geography draws on such majors as spatial analysis, human-environment interaction, and geographical and regional analyses, which fosters links with many other disciplines. It studies the dynamics of space, place and interactions, especially within and between spaces and places, as well as geographical perspectives and ideas, peripheries (Terranova, 2022). It is through interdisciplinary collaboration that faculty members, noting the many positive aspects of working with colleagues from other fields, confirmed their desire for interdisciplinary work in the future. Patience and open-mindedness is one of the most important factors contributing to the success of interdisciplinary collaboration (Bloodworth et al., 2011). Therefore, geographers should continue to demonstrate interdisciplinary leadership by accepting different perspectives, seeking knowledge and methods that other fields can share, supporting institutional arrangements that foster interdisciplinary work.

Therefore, the aim of this study was to explore the interdisciplinary links between geography and other sciences. This is because the use of interdisciplinary links in geography lessons normalises students' holistic view of the environment and increases student's cognition. Also, such interdisciplinary links in geography lessons build freedom of thought and expression, which allows the teacher to take an interest in their subject.

Research materials and methods. Interdisciplinary studies are seen as an amalgamation that preserves the autonomy of different disciplines and does not lead to changes in

existing theoretical structures. Interdisciplinarity of school subjects has one major feature, as do the processes of integrated teaching of many sciences. Mutually coordinated teaching of subjects by content – not only improves the quality of students' knowledge, but also promotes the practical application of acquired knowledge, expands the scientific worldview, opening the way to the formation of a unified world thought. Moreover, since geography is a universal school subject, integration and connection with any subject can be found at the will of the teacher. Therefore, in this study the links between geography and other sciences (history, biology, ecology, mathematics, cartography, physics and chemistry) were examined in detail. The methods of analysis, differentiation, and systematisation were widely used to maximise the disclosure of geography's interdisciplinary links. The research was based on the results of the international study and aimed at analysing their features. In the course of the analysis, the peculiarities were evaluated and special attention was paid to each field of science. In addition, a comparative analysis was carried out to identify the specificities of the study. This analysis made it possible to identify the relationship of the fields of science with geography.

Results and discussion. As a result of this study, the interdisciplinary connection between geography and other sciences has been fully described (Figure 1). The role of such sciences as history, physics, chemistry, biology, economics and ecology in the interdisciplinary connection with geography is particularly high.
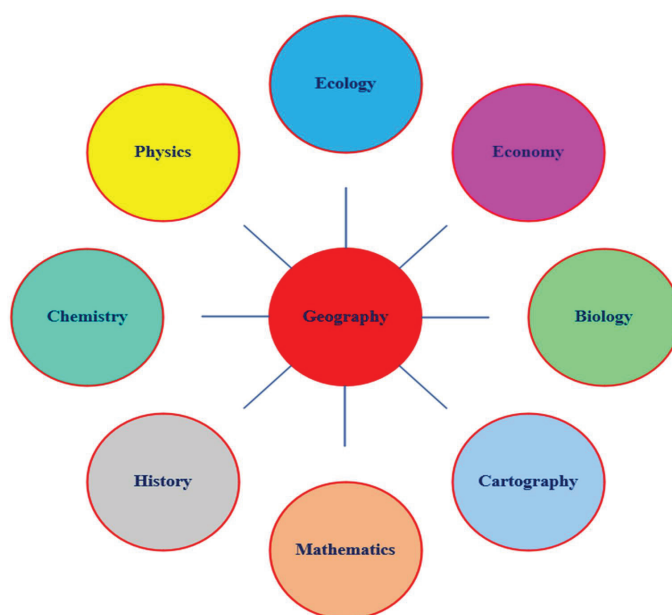

Figure 1: Interdisciplinary links between geography and other sciences

1. Interdisciplinary links between geography and history

Since history is geography in time and geography is the history of the universe, young geographers need to know this. This is why, despite the idea of scholars to merge the two disciplines, some universities have "History and Geography" curricula. In this regard, as a result of a review of research in this context, methods of using interdisciplinary connections between geography and history were identified (Table 1).

Table 1. *Methods of interdisciplinary communication of geography and history disciplines*

Mansurjonovich et al. (2023) D'agostino & Santus (2022)	Updating previously acquired knowledge and skills. Explanation of new material based on material known before history courses
Walshe (2016), Ibrahim (2020)	The use of argumentation tasks in other courses and disciplines that require recalling the main content of the previously studied material

Lyall et al. (2013)	Creating problem situations on an interdisciplinary basis, setting problem tasks that require education and generalization
Gao et al. (2023)	Conducting integrated classes
Yang et al. (2014)	Conducting interdisciplinary conferences or events

Close relationships between geography teachers and history teachers are mainly based on the relationship between time and place, and it is the teachers who create these relationships (Kaimuldinova et al., 2020). In this regard, Sarsebayeva (2023) found that geography teachers' relationships with teachers of other subjects were insufficient in 82.7% of cases, sufficient in 17.3%, and absent in the remaining 2% (Figure 2).

Historical science is a science that explains the events created by mankind in the past by defining time and place within the principle of cause and effect (Abdulvagabova et al., 2020). Therefore, the change of natural and human phenomena in relation to time and space determines the dynamics of geographical science and also requires co-operation between geographical and historical sciences.
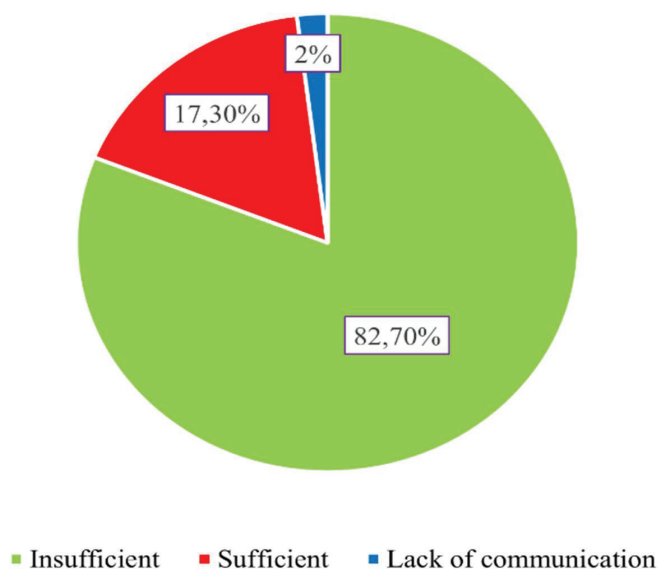

Figure 2: The share of interdisciplinary communication communication of subject teachers

2. Interdisciplinary links between geography and biology

Biology is essentially the science of life (Wood et al., 2020). Biology answers many questions, such as: what living beings are there on Earth and how many of them?; how is a living organism organised?; how do organisms reproduce and develop?, their relationships with each other and with inanimate nature.

Regarding the relationship between geography and biology, biology studies living organisms and geography studies non-living components such as rocks, rivers, lakes, climate, etc. Due to the close relationship between living and non-living objects in nature, the fusion of biology and geography

has led to the formation of a new discipline, biogeography. The two sciences are linked by the problem of the rational use of nature, and geographers and biologists must combine all their efforts to find the right answer to this question. This is because biological topics occupy an important place in the curriculum of modern geography.

3. Interdisciplinary links between geography and ecology

It is safe to say that geography and environmental education are very closely related and that it is geography that is the basis for the emergence of ecology as a science. This is due to the fact that the dependence of nature on geographical conditions becomes a problem

of environmental studies. Also, the solution of modern environmental problems, unlike other sciences, requires not only accurate knowledge of geographical processes and phenomena, but also a comprehensive understanding of the natural and social environment. Therefore, to study the relationship between geography and ecology, it is necessary to compare objects from a scientific point of view. Since the connection of ecology with physical geography is 80-90%, it led to the formation of a new science – geoecology (Natter, 2003). In the human environment, one of the main tasks of geoecology is rational nature management, assessment of prospects for sustainable development of individual regions and territories.

4. Interdisciplinary links between geography and mathematics

As for the interdisciplinary relationship between mathematics and geography, the link between the two subjects is so tight that the teaching of topographical and geographical maps in primary schools is impossible without mathematics. Therefore, the connection between mathematics and geography is expressed in the form of geographical tasks (Fig. 3). In addition, correlation, balance, statistics and computer modelling based on mathematical methods are often used in geography.
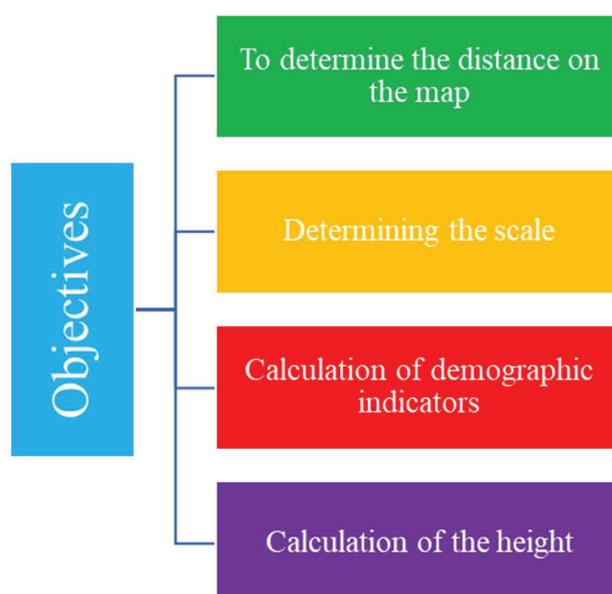

Figure 3: Mathematics objectives in relation to geography

5. Interdisciplinary links between geography and cartography

Cartography is the science of geographic mapping, its creation and use. Cartography is a science that studies the combination and relationship of natural features using a map (Slocum et al., 2022). Cartographic concepts include globes, terrain maps, celestial bodies and starry sky maps, spatial models represented by cartographic symbols (Table 2).

Table 2. *The main areas of communication of cartography with geography*

Kainz (2020)	The subject and methodology of cartography, the doctrine of the map, the theory of cartographic projections, theories of generalization and imaging methods
Edney et al. (2020)	History of the science and production of cartography
Fairbairn et al. (2021)	Recognition of cartographic data (differentiation of cartographic data and related problems of scientific and information theory)
Talmar et al. (2020)	Theory and technology of designing maps and preparing them
Yang et al. (2014)	Theory and methodology of using cards

Thus, the relationship between cartography and geographical sciences is not contradictory, because maps are the language of geography, and science cannot be imagined without cartography. Geographical maps are widely used as an important source of information in many disciplines, including history and economic studies.

6. Interdisciplinary links between geography and economics

The discipline of Economic geography emerged as a result of the interaction between geography and economic sciences. Economic geography emerged in the 18th century and became an area of interest in the problems of the location of productive forces and urbanisation (Broz et al., 2021) (Figure 4).

Economic geography is a branch of human geography that studies economic activity and the factors that influence it. It can also be considered as a department or method in economics (Hidalgo, 2011). There are four divisions of economic geography. Economic geography is the relationship between international trade, real estate, industrial location, transport, agglomeration economy, development, ethnic economy, environment and economy.
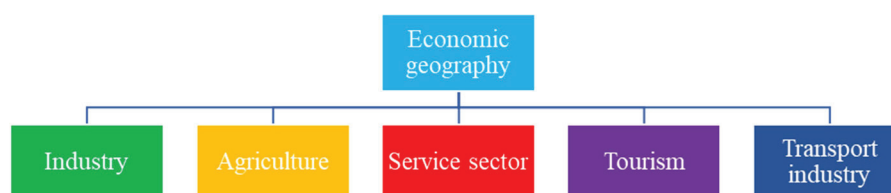

Figure 4: Branches of economic geography

7. Interdisciplinary links between geography and physics

Physics is a science that studies various phenomena of nature (Chorley, 2019). For example, the motion of objects, the changes that occur when objects are heated or cooled, electricity, sound, light, why lightning flashes or thunder rumbles, how echoes occur, what a rainbow is, and so on. But physics explains not only what is found in nature, which is the basis for engineering. Without knowledge of physics, it is very difficult to explain concepts such as aeroplane, car, crane, refrigerator, computer or the formation of wind, atmospheric pressure. That is why some secondary schools have classes related to physics and geography. The link between these two sciences helps to improve schoolchildren's knowledge and increases their cognitive interest in related sciences.

8. Interdisciplinary links between geography and chemistry

Chemistry is the science of substances and their transformations (Laubach et al., 2019). Much of this is known today, and each substance has its own properties, and with the exception of a few substances, all substances can manifest themselves under certain conditions. There is no great magic in these transformations, and through chemistry people learned to obtain the substances they needed at home from laboratories and chemical plants. Chemistry is a natural science closely related to the geography of soils in geography (Agrawal et al., 2022).

Based on these connections, new scientific fields have emerged, related to hydrosphere chemistry, geochemistry, landscape geochemistry and atmospheric chemistry. To teach them, the geographer must have a good knowledge of chemistry, otherwise he will not be able to explain the topic properly. Students will absorb this material best in an integrated laboratory or chemistry classroom based course.

Conclusion. Thus, learning based on an interdisciplinary approach increases cognitive development, creativity, and problem-solving skills. Curricula created through interdisciplinary linkage will be very flexible in the pragmatic use of subjects. Proper integration of topics from different fields can motivate an individual to participate in the educational process and thus provide quality training. In addition, the integration and unification of curricula of different subjects to realise the overall aims of

the school can be done in different ways. This allows for the active use of interdisciplinary links for the formation of universal learning actions, especially metaedisciplinary ones. The use of interdisciplinary links allows to solve several tasks at once:

- promotes the development of a scientific style of thinking;

- allows studying the material as a whole within the framework of different disciplines;

- stimulates mental activity;

- promotes understanding of the practicality of knowledge;

- enhances the use of techniques for analysing information;

- expands visualisation and the possibilities of using technical means;

- encourages students to search, study and research activities;

- improves the emotional mood of the class in accordance with sanitary and hygienic requirements.

In addition, the methods and forms of using interdisciplinary links in geography lessons, the type of lesson in which they are applied, are chosen by the teacher. Effectiveness directly depends on the willingness to master the technology, the competence of the teacher. The teacher must have extensive knowledge of various subjects and be able to apply them methodologically competently.

References

Abdulvagabova, S.A., & Nukhov O. M. (2020). Ispolzovanie mejpredmetnih svyazei na urokah i vo vneuchebnoi deyatelnosti po geografii. *Psihologo-pedagogicheskie nauki*, *14*(1), 5-9. https://doi.org/10.31161/1995-0659-2020-14-1-5-9

Agrawal, A. A., Espinosa del Alba, L., López-Goldar, X., Hastings, A. P., White, R. A., Halitschke, R., & Duplais, C. (2022). Functional evidence supports adaptive plant chemical defense along a geographical line. *Proceedings of the National Academy of Sciences, 119*(25), e2205073119. https://www.pnas.org/doi/abs/10.1073/pnas.2205073119

Alieva, M.E. (2020). Mezhpredmetnye svyazi kak odin iz principov sovremennyh obrazovatel'nyh processov. *Vestnik nauki i obrazovaniya, 11*(89), URL: https://cyberleninka.ru/article/n/mezhpredmetnye-svyazi-kak-odin-iz-printsipov-sovremennyhobrazovatelnyh-protsessov

Broz, J. L., Frieden, J., & Weymouth, S. (2021). Populism in place: the economic geography of the globalization backlash. *International Organization, 75*(2), 464-494. https://www.cambridge.org/core/journals/international-organization/article/populism-in-place-the-economic-geography-of-the-globalization-backlash/98ED873D925E0590CB9A78AEC68BB439

Bloodworth, G. & Petersen, N. (2011). Developing Visualization Tools for Geographic Literacy in a Museum Exhibit: An Interdisciplinary Collaboration. *Journal of Geography, 110,* 137-147. https://www.tandfonline.com/doi/abs/10.1080/00221341.2011.542619

Chorley, R. J. (2019). *Introduction to physical hydrology.* Routledge

D'agostino, L, & Santus D. (2022). Teaching geography and blended learning: interdisciplinary and new learning possibilities. *AIMS Geosciences, 8*(2), 266-276. https://iris.unito.it/handle/2318/1855269

Didonato, N. C. (2013). Effective self- and co-regulation in collaborative learning groups: An analysis of how students regulate problem-solving of authentic interdisciplinary tasks. *Instr Sci, 41,* 25–47. https://link.springer.com/article/10.1007/s11251-012-9206-9

Edney, M. H., & Pedley, M. S. (2020). Writing cartography's enlightenment. *The Cartographic Journal, 57*(4), 312-334. https://www.tandfonline.com/doi/abs/10.1080/00087041.2020.1884428

Fairbairn, D., Gartner, G., & Peterson, M. P. (2021). Epistemological thoughts on the success of maps and the role of cartography. *International Journal of Cartography, 7*(3), 317-331. https://www.tandfonline.com/doi/abs/10.1080/23729333.2021.1972909

Gao, X., Li, P., Shen, J., & Sun, H. (2020). Reviewing assessment of student learning in interdisciplinary STEM education. *International Journal of STEM Education, 7*(1), 1-14. https://link.springer.com/article/10.1186/s40594-020-00225-4

Hidalgo, C. A. (2021). Economic complexity theory and applications. *Nature Reviews Physics, 3*(2), 92-113. https://www.nature.com/articles/s42254-020-00275-1

Ibrahim, A.A. (2020). K metapredmetnym rezul'tatam cherez mezhpredmetnye svyazi (iz istorii kompleksnogo prepodavaniya). *Seriya: Gumanitarnye i social'nye nauki, 3*(88), 171-173. https://cyberleninka.ru/article/n/k-metapredmetnym-rezultatam-cherez-mezhpredmetnye-svyazi-iz-istorii-kompleksnogo-prepodavaniya

Imbruce, V., Jaeger, V., Rinkus, M. A., Hua, J., & O'Rourke, M. (2024). Raising undergraduate researchers' interdisciplinary consciousness through dialogue. *Journal of Environmental Studies and Sciences*, 1-12. https://doi.org/10.1007/s13412-024-00942-0

Kaimuldinova, K., Abdimanapov, B., Abilmazhinova, & S., Saipov, A. (2020). *Geografiya. Zhalpy bilim beretin mekteptin qogamdyq-gumanitarlyq bagytyndagy 11-synybyna arnalgan oqulyq.* Mektep

Kainz, W. (2020). Cartography and the others–aspects of a complicated relationship. *Geo-Spatial Information Science, 23*(1), 52-60. https://www.tandfonline.com/doi/abs/10.1080/10095020.2020.1718000

Laubach, S. E., Lander, R. H., Criscenti, L. J., Anovitz, L. M., Urai, J. L., Pollyea, R. M., & Pyrak-Nolte, L. (2019). The role of chemistry in fracture pattern development and opportunities to advance interpretations of geological materials. *Reviews of Geophysics, 57*(3), 1065-1111. https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2019RG000671

Lyall, C., Bruce, A., Marsden, W. & Meagher, L. (2013). 'The role of funding agencies in creating interdisciplinary knowledge'. *Science and Public Policy, 40,* 62–71. https://academic.oup.com/spp/article-abstract/40/1/62/1649389

Mansurjonovich, J. M., & Davronovich, A. D. (2023). Interdisciplinary Integration is an Important Part of Developing the Professional Training of Students. *Open Access Repository, 9*(1), 93-101. https://oarepo.org/index.php/oa/article/view/1237

Margot, K. C., & Kettler, T. (2019). Teachers' perception of STEM integration and education: a systematic literature review. *International Journal of STEM education, 6*(1), 1-16. https://link.springer.com/article/10.1186/s40594-018-0151-2

Mancas, E.A. (2011). When learning and assessment become meaningful: students get involved in interdisciplinary project work. *Procedia – Social and Behavioral Sciences, 11,* 205-209. https://cyberleninka.org/article/n/304555.pdf

Natter, W. (2003). Geopolitics in Germany, 1919–45. *A companion to political geography*, 187-203. http://ndl.ethernet.edu.et/bitstream/123456789/2176/1/35.pdf.pdf#page=195

Orazymbet, A.D. (2014). Geografiya panin oqytuda zhana tekhnologiyalardy qoldanudyn tiimdiligi. https://45minut.biz/?p=94900&ysclid=ldki5e9q88377505140

Pryor, K. N., & Steinberg, L. J. (2023). Fostering an Interdisciplinary Campus Community: Faculty Hiring Committee-Work as Successful Interdisciplinary Collaboration. *Innovative Higher Education*, *48*(5), 813-835. https://doi.org/10.1007/s10755-023-09655-8

Sağdiç, M., & Demirkaya, H. (2014). Evaluation of interdisciplinary teaching approach in geography education. *Elektronik Sosyal Bilimler Dergisi, 13*(49), 386-410. https://dergipark.org.tr/tr/doi/10.17755/esosder.30182

Sarsebaeva, A., Abdimanapov, B., Usenov, N., & Issakov, E. (2023). Mektep geografiasyn oqytuda pänaralyq täsıldı paidalanudyñ tiimdılıgın zertteu. *Pedagogika jäne psihologia*, 55(2), 231–243. https://journal-pedpsy.kaznpu.kz/index.php/ped/article/view/1315

Semilarski, H., Soobard, R., Holbrook, J., & Rannikmäe, M. (2022). Expanding disciplinary and interdisciplinary core idea maps by students to promote perceived self-efficacy in learning science. *International Journal of STEM Education*, *9*(1), 57. https://link.springer.com/article/10.1186/s40594-022-00374-8

Shogan V.V., & Storojakova, E.V. (2020). *Metodika prepodavaniya istorii v shkole: uchebnoe posobie dlya vuzov.* Moskva: Izdatelstvo Yurajt

Slocum, T. A., McMaster, R. B., Kessler, F. C., & Howard, H. H. (2022). *Thematic cartography and geovisualization.* CRC Press. https://www.taylorfrancis.com/books/mono/10.1201/9781003150527/thematic-cartography-geovisualization-fourth-edition-terry-slocum-robert-mcmaster-fritz-kessler-hugh-howard

Talmar, M., Walrave, B., Podoynitsyna, K. S., Holmström, J., & Romme, A. G. L. (2020). Mapping, analyzing and designing innovation ecosystems: The Ecosystem Pie Model. *Long Range Planning, 53*(4), 101850. https://aaltodoc.aalto.fi/items/b6358398-1d95-4bef-9862-b0517dc971b2

Taylor, C. (2009). Towards a geography of education. *Oxford Review of Education, 35*(5), 651–669.

Terranova, G. (2022). The new geography of asylum: digital identity, artificial intelligence and blockchain. *AIMS Geosciences, 8*(3), 385-397. http://www.aimspress.com/aimspress-data/aimsgeo/2022/3/PDF/geosci-08-03-022.pdf

Tvarijonaviciute, A., Roca, D., Escribano, D., Franco-Martínez, L., Bernal, L. J., Ceron, J. J., & Rojo-Villada, P. A. (2020). Interdisciplinary collaboration between veterinary and communication students to promote communication skills: A qualitative pilot study. *Frontiers in Veterinary Science*, 7, 586086. https://www.frontiersin.org/articles/10.3389/fvets.2020.586086/full

Walshe, N. (2016). An interdisciplinary approach to environmental and sustainability education: developing geography students' understandings of sustainable development using poetry. *Environmental Education Research, 23*(8), 1130–1149. https://www.tandfonline.com/doi/abs/10.1080/13504622.2016.1221887

Wang, H. H., Charoenmuang, M., Knobloch, N. A., & Tormoehlen, R. L. (2020). Defining interdisciplinary collaboration based on high school teachers' beliefs and practices of STEM integration using a complex designed system. *International Journal of STEM Education, 7*(1), 1-17. https://link.springer.com/article/10.1186/s40594-019-0201-4

Wood, S., Henning, J. A., Chen, L., McKibben, T., Smith, M. L., Weber, M., & Ballen, C. J. (2020). A scientist like me: demographic analysis of biology textbooks reveals both progress and long-term lags. *Proceedings of the Royal Society B, 287*(1929), 20200877. https://royalsocietypublishing.org/doi/abs/10.1098/rspb.2020.0877

Yang, C. H., & Heo, J. (2014). Network analysis to evaluate cross-disciplinary research collaborations: The Human Sensing Research Center, Korea. *Science and Public Policy, 41*(6), 734-749. https://academic.oup.com/spp/article-abstract/41/6/734/1714595

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