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Integrating Innovations and Traditions in Teacher Education Through Project-Based Learning

Abstract

Introduction. The study examines project-based learning as a tool for integrating innovations and traditions in teacher training, addressing the need for more effective approaches to preparing future educators who can balance innovative methodologies with traditional pedagogical values and cultural heritage preservation. **Methodology and Methods.** The research employed literary analysis and empirical methods including survey and pedagogical experiment to determine the possibility of using an active model of project-based learning in teacher preparation, using elementary education as an example. A comparative analysis was conducted between experimental and control groups to evaluate the effectiveness of the proposed approach. **Results.** The study revealed that the current level of development of project-based learning in pedagogical universities is low, indicating a need for its enhancement. Seven integration-focused projects were tested in practice: cultural heritage in the classroom, innovative technologies in teaching, environmental education through traditions, grandparents' stories, creative workshop, from traditions to innovations, and virtual tours of historical places. The effectiveness of the model was confirmed through comparative analysis, which demonstrated positive impact on students' knowledge and skills levels in the experimental group. **Scientific novelty.** The research establishes a theoretical framework for integrating innovations and traditions through project-based learning in teacher education, providing a systematic approach to teaching future educators how to incorporate innovative approaches into traditional teaching while maintaining respect for cultural heritage. **Practical significance.** The developed model and tested projects provide practical tools for pedagogical universities to enhance teacher preparation programs, enabling future teachers to effectively integrate innovative methodologies with traditional values in their professional practice and improve the quality of elementary education.

Keywords: project-based learning, innovations, traditions, pedagogical education, pedagogical technologies, students.

Introduction. In the context of modern educational reforms in the Republic of Kazakhstan, the integration of innovative pedagogical technologies with traditional teaching practices has become a critical priority, especially in the field of primary education. This transformation is driven by rapid technological advancement and the resulting shift in societal and educational demands. Therefore, the training of future teachers must focus not only on the preservation of cultural heritage and pedagogical traditions but also on equipping educators with the skills necessary to navigate

and implement modern innovations. Project-based learning (PBL) emerges as a pedagogical strategy that effectively bridges this gap, offering a practical framework for combining the values of the past with the tools of the present.

The relevance of research topic is that the modern education system of the Republic of Kazakhstan meets the need to develop the training of teachers in terms of integration of more modern innovative approaches and traditional teaching methods. Their need is especially manifested in the field of primary education. It is conditioned by the fact that in

the conditions of rapid development of modern technologies, changes in all spheres of social development are noted, which results in the need to approach more flexibly to the preparation of students for future pedagogical activity. As a modern teacher in the process of his work, it is necessary to take into account, especially in primary grades, both the achievements of the past (or traditional methods) and modern challenges (innovative approaches). In such conditions, project-based learning is one of the important tools that gives an opportunity to combine both traditions and innovations more effectively in the training of teachers. All this makes this topic relevant and significant.

Project-based learning, grounded in constructivist theory, promotes active and student-centered learning through real-world problem-solving, collaboration, and interdisciplinary approaches. In pedagogical sciences, PBL is characterized as a multifaceted method that synthesizes various educational dimensions-cognitive, social, creative, and practical. The term “project” itself implies forward-looking, structured actions aimed at achieving defined educational outcomes. It encompasses elements such as goal-setting, research, teamwork, creativity, and reflection, all of which align with the competencies required in 21st-century teaching.

In the Kazakhstani context, the methodology of PBL in teacher education emphasizes several core stages: problem formulation, team collaboration, data collection and analysis, project development, practical implementation, and reflective evaluation. These stages are designed not only to develop academic skills but also to foster a deeper understanding of the integration of traditional and innovative methods. By navigating this model, future teachers can apply theoretical knowledge to real classroom scenarios and learn to balance innovation with cultural and pedagogical heritage.

Despite the growing recognition of the importance of PBL, several barriers hinder its systematic application in teacher education. As noted by researchers such as H. Chen (2021), C. Martinez (2022), and others, issues include the lack of a unified methodology that

incorporates both traditions and innovations, the dominance of outdated teaching methods, and educators’ limited familiarity with modern PBL frameworks. Studies by Kurmanbekova (2019) and Tyunnikov (2024) highlight that successful integration requires more than technological tools-it demands a pedagogical mindset that values both the preservation of cultural identity and the adoption of modern educational strategies.

International perspectives also reinforce the value of blending traditions with innovations. For instance, Nxasana et al. (2023) underscore the significance of creativity and traditional arts in PBL, advocating for the integration of STEAM (Science, Technology, Engineering, Arts, and Mathematics) to enhance student engagement. Barak (2021) and Rodriguez (2024) emphasize the synergy between digital tools and conventional methods in teacher training. Meanwhile, Hero and Lindfors (2019) note that project work fosters critical thinking and autonomy-key elements of effective teacher preparation.

This body of research validates the hypothesis that project-based learning, when carefully structured to integrate both innovative and traditional pedagogical elements, can significantly enhance the preparedness of future teachers. It facilitates a holistic educational experience that respects heritage while fostering the skills necessary for modern classroom environments. The purpose of the study is to determine the possibility of using an active model of project-based learning as a tool for integrating innovations and traditions in the training of teachers of elementary education.

In order to achieve this goal, the following objectives are set:

1. To analyze the existing concepts, methods and practices of project-based learning in the system of teacher education.
2. To identify the features and advantages of the project approach in the training of elementary school teachers.
3. To develop a model of project-based learning that takes into account the specifics of primary education and combines innovation and tradition.

4. Evaluate the effectiveness of the proposed model.

The significance of the study lies in the fact that the obtained results are of practical value for teachers of pedagogical universities, methodologists and students studying in the direction of “Pedagogy and Methodology of Elementary Education”. Recommendations on the development of students’ skills of integrated project teaching should allow improving the quality of training of future teachers, and increase their professional competence and readiness to work in modern conditions. In addition, the results of the study can be used to improve educational programs and used for further research.

Materials and Methods. When conducting research on the topic “Project-based learning as a tool for integrating innovations and traditions in teacher training” it is advisable to use a set of methods, including both theoretical analysis and empirical research. Literary contextual and comparative analysis. During this analysis, literary sources (scientific publications, textbooks, articles, and methodological developments) on the topic of project-based learning and the features of integrating traditional and innovative methods of project-based learning in elementary school were reviewed. A total of 19 contemporary sources published by Kazakhstani and foreign authors over the past five years were examined. The literary contextual analysis was aimed at identifying developed approaches and existing practices, and establishing possible problems in them that require further research. A comparative analysis of the obtained information was conducted to compare existing models of project-based learning in schools, to establish best practices and possibilities for their adaptation to the conditions of Kazakhstani elementary schools.

At the second stage, empirical methods were used, which include surveys conducted in the form of questionnaires and the organization and implementation of a pedagogical experiment. The questionnaire survey was aimed at obtaining information about the current state in the field of project-based learning, identifying needs and expectations from new methods.

For this purpose, an original questionnaire was compiled (the questionnaire was previously tested in their own group and among teachers). Respondents had to answer the following mixed questions of the questionnaire: about participation, use, or development of project-based learning; about the frequency of participation, use, and development of project-based learning; about the most important aspects of project-based learning; about the main problems in participating, using, or developing project-based learning. Literature analysis, in the course of which the literature sources (scientific publications, textbooks, articles and methodological developments) on the topic of project-based learning and the peculiarities of integration of traditional and innovative methods of project-based learning in elementary school were reviewed. Literature analysis is aimed at identifying the developed approaches and existing practices, and identifying possible problems in them that require further research. Comparative analysis is used to compare available models of project-based learning at school, to establish the best experience of their practices and the possibilities of their adaptation to the conditions of Kazakhstani elementary school. Empirical methods include surveys, in the form of questionnaires and pedagogical experiment.

The first survey was conducted among students of the educational program “Pedagogy and Methodology of Elementary Education” (48 students) and teachers (30 people). The survey was aimed at obtaining information about the current state in the field of project-based learning, identifying the needs and expectations of new methods. They were to answer the following questions: About the participation, use or design of project-based learning; about the frequency of participation, use and design of project-based learning; about the most important aspects of project-based learning; about the main problems in participation, use or design of project-based learning.

The experiment was conducted within the framework of approbation of the developed model of project-based learning into the educational process in higher education

institution. At the initial stage diagnostics of the level of knowledge and skills in the field of project-based learning was carried out. For this purpose two groups were used: experimental group (24 people), which will be trained according to the new program and control group (24 people) trained traditionally. At the control stage, the results are compared to assess the effectiveness of the proposed training model.

These questions will provide an opportunity to assess the level of students' readiness to use project-based learning as a tool for integrating innovations and traditions in their future pedagogical activities.

Statistical analysis techniques are used to process the data obtained, which also helps to establish the effectiveness.

Modeling techniques are used to create a model of project-based learning that integrates innovation and tradition.

Analytical analysis is used to summarize the obtained material and formulate conclusions and recommendations to improve the quality of training of future elementary school teachers.

Results. The results of analyzing the existing concepts, methods and practices of project-based learning in the education system. The essence of the concept of "project-based learning" is related to such scientific categories as "project", "learning", "project activity" and "creativity", which from the point of view of different branches of scientific knowledge and methodology have a diverse nature (Chen, 2021). The concept of "project learning" in pedagogy can be considered from two sides: from the point of view of pedagogical and psychological science. Since the training of project activity requires taking into account both the key principles of the pedagogical process and its psychological aspects (Lewis, 2019). "Project" as a separate term comes from the Latin word "projectio", which means throwing forward. It is usually characterized by "project", defined by C. Martinez as a model or ideal representation of a future object, state or plan of action. A project in training usually contains general ideas, concepts, as well as specific tables, schemes, drawings and so on (Martinez, 2022).

Teaching in pedagogy, including project activities, is defined as a process aimed at the formation of knowledge, skills and abilities taking into account certain requirements (Molina-Torres, 2022). Training is usually aimed at assimilation and development of the required intellectual knowledge, potential abilities, as well as at formation and consolidation of a person's outlook and self-education skills. Project activity in teaching is a complex type of special activity, which formed by synthesizing elements of play, cognition, value orientation, learning, transformation, communication and most importantly – creativity (Tyunnikov, 2024).

Modern methodology of project-based learning in the education system in the Republic of Kazakhstan is based on the fact that innovations in the educational sphere determine the need to expand the professional activities of teachers and school administration. A teacher should be able to form an interest in cognition in his students, and for this purpose it is necessary to prepare a practical situation in which students will independently extract new knowledge and teach them to visually demonstrate the results obtained. Such knowledge and skills are usually obtained through organized project activities (Kurmanbekova, 2019). The following important stages should be emphasized in the methodology of project-based learning in the system of teacher education:

- formulation of an actual problem or task, which the instructor proposes to students for a comprehensive solution. The problem or task should correspond to the objectives of the educational course and stimulate students' interest in searching for standard and non-standard solutions;
- team formation, in which students are organized into groups in order to work together on the project. It is important to ensure effective interaction within the team and to take into account the individual characteristics of the team member;
- project planning, according to the action plan that the team develops (goals, objectives, deadlines and responsibilities);
- data collection and research, which is carried out by the project participants. At

this stage, the research skills of working with different information are formed;

- development of a project solution, which the team creates on the basis of the collected data (methodological development, program, training material, etc.). In this case, it is important that the solution complies with the requirements of the GCSE;

- realization of the developed project, on the condition that it can be used in further practical activity as a teacher; reflection, in which the participants of the project activity discuss their results.

Thus, project activity in higher education can be presented as a separate form of educational process, which is aimed at the development of students, future teachers, the required professional competencies (Nguyen, 2020). For this purpose, different forms of practical solution of specific pedagogical tasks, which are related their future professional activities, are used in the learning process. It should be noted that it is in the framework of specially organized project activities that future teachers acquire project learning skills (research, planning, analysis, creative thinking and teamwork), as well as learn to apply theoretical and applied knowledge and skills to create real educational products (Naida, 2024).

Examples of the main methods of project-based learning used in higher education: educational project, used to create various teaching materials; research project, implemented in the framework of thematic scientific research; social project, aimed at organizing social actions and other activities; creative project, in the form of developing interactive textbooks or workbooks; multimedia thematic presentations for lessons; didactic games and tasks for different age groups (Grossman, 2019).

At the same time, according to the materials of other researchers, it was found that at present more actively begin to use the practices of project-based learning in the education system integrate innovation and tradition. Thus a group of African researchers led by S. Nxasana (2023) showed the importance of such indicator as creativity or art for students and teachers. Since

recently in higher education system to improve the necessary 21st century skills for students' achievement in learning, it is necessary to use STEAM as a popular technology for new pedagogy. As creativity in STEAM is to improve student learning, develop creativity and potential for success. The authors analyze different approaches to integrate innovations and traditions to implement project-based learning in educational programs (Rahmawati, 2020). Barak (2021) explores in her work innovative approaches to project-based learning in teacher training. The author shares examples of successful practice and offers recommendations for integrating traditional methods with modern technologies. Rodriguez (2024) considering the integration of traditional and innovative teaching through the synthesis of two models, emphasizes the importance of integrating technology and traditional teaching methods in teacher education. Haatainen (2021) investigating the experience of digital educational technology development in higher education, emphasizes the need to integrate traditional methods and innovative approaches in project-based learning and suggests using them more actively in teacher education. Liu (2019) revealing the role of innovation in the modern education system, analyzes the latest research in the field of project-based learning in higher education, including its impact on teacher education regarding the training of future teachers.

The obtained results help to understand modern approaches to project-based learning and its integration into pedagogical practice in more detail and depth. Since they consider modern methods of project-based learning in the educational system. It is analyzed how the integration of innovative technologies into traditional teaching to improve not only the quality of education, but also the training of future teachers (Hero, 2019). It is important to realize that in practice it is necessary to consider the balance between traditional teaching methods and modern innovations, taking into account the importance of project-based learning as a means of achieving this balance (Poonputta, 2023; Alrajeh, 2020).

The results of the questionnaire survey to analyze the current state of affairs in the field of project-based learning, to identify the needs and expectations of the participants of the

educational process of pedagogical universities and to develop proposals for improving the system of training future teachers of primary grades are shown in Table 1.

Table 1. *Results of the survey of students and teachers*

Question	Answer options	Students in %	Teachers in %
Do you participate in project-based learning	Yes	44	61
	No	36	19
	Occasionally	20	20
Do you often participate in (use) project-based learning	Regularly	17	33
	Periodically	34	43
	Infrequently	49	24
What aspects of project-based learning do you find most important?	Development of critical thinking	19	14
	Formation of practical skills	22	18
	Integration of theory and	17	30
	Interdisciplinary	17	14
	Teamwork	25	24
What are the main challenges you face when using project-based learning?	Lack of	61	47
	Lack of resources	22	24
	Difficulty in coordinating group work	11	16
	Difficulties in evaluating project results	6	14

Based on the obtained data, the following conclusions can be drawn. In order to analyze

the first two questions, let us denote the obtained results additionally and for clarity in Figure 1.

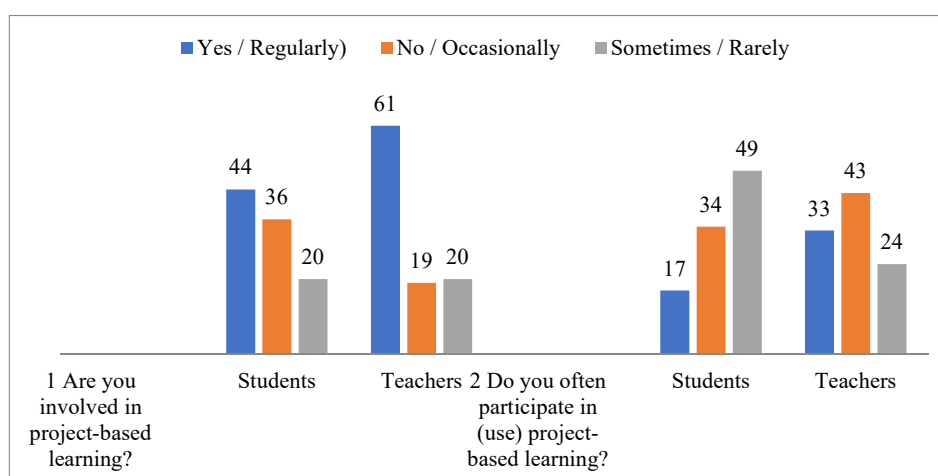


Figure 1: Comparison of results obtained from students and teachers

About half of surveyed students (44%) and more than half of teachers (61%) participate in project-based learning. Periodically: 20% each. Do not participate: 36% of students and 20% of faculty. The obtained data indicates

that project-based learning is not badly used in the educational environment. At the same time, the high level of involvement of teachers in project-based learning is higher than that of students.

Only 17% of students and 33% of teachers use project-based learning regularly. In occasionally use 34% of students and 43% of faculty members. While a significant proportion of students (49%) and 24% of faculty members rarely participated in project-based learning. But in general, the results indicate a low level of frequency of using project-based learning and the need to increase the frequency of using project-based learning in educational pedagogical practice.

In response to the third question, students indicate the most important aspects of project-based learning as the development of critical thinking (19%) and the formation of practical skills (22%). While teachers emphasize the importance of interdisciplinary approach (17%) and integration of theory and practice (30%). Such data indicate the importance of different aspects of project-based learning for each group.

The main problem faced by the participants of the educational process is related to the lack of time (61% of students and 47% of teachers). Difficulties in coordinating group work (11% of students and 16% of teachers) and evaluating project results (6% of students and 14% of teachers) are also noted. The obtained data indicate that both students and teachers have both different and common problems when using project-based learning. And their presence indicates that it is necessary to develop more active forms and methods of project-based learning in higher education institution.

Thus, the conclusions obtained in the course of the survey indicate the need to improve the system of project-based learning support. Since it is necessary to increase the effectiveness of using project-based learning in the educational process of future elementary school teachers.

The results of the pedagogical experiment at the initial stage are shown in Table 2.

Table 2. *Results of initial diagnostics of the level of knowledge and skills in the field of project-based learning*

Questions	Options	Answers	
		EG	KG
How do you understand the essence of project-based learning	Traditional	42	42
	Innovative	25	23
	Comprehensive	23	25
What are the steps involved in project-based learning	Setting goals and objectives (traditionally	70	67
	Information gathering and analysis (innovative	20	23
	Presentation of results (comprehensive	10	10
What is the role of the teacher in project-based learning	Project management in the traditional	70	67
	Mentoring and support for innovation	20	20
	Combining traditional and innovative methods	10	13
Do you know how to plan and organize learning projects	I don't know how	50	54
	I can	50	46
Do you have experience working as part of a team	Yes	62	62
	No	38	38
Do you use modern technology and digital tools in your teaching and learning process?	I've never	25	29
	I'm using	75	71
How interested are you in using project-based learning in your future teaching career?	Not all	50	50
	Very	50	50
Do you believe that project-based learning fosters students' creativity?	Yes	50	54
	No	50	46

Would you like to be involved in the further development and refinement of project-based learning methods	Yes	38	41
	No	62	59

According to the results of initial diagnostics, the following conclusions can be drawn: the majority of students perceive project-based learning as traditional, as well as innovative integrated. Such data indicates that students begin to realize the importance of both traditional and other approaches in project-based learning, although to a lesser extent. The main stages of project-based learning are identified as traditional (setting goals and objectives): 70% (EG) and 67% (CG), 20 and 23% - innovative, based on information gathering and analysis (innovative) and slightly complex (10% each). The role of the teacher in project-based learning the majority (70 and 60%), defined as leading the project in the traditional method, slightly mentoring and supporting innovation, and as combining traditional and innovative methods. Only half and slightly more than half of the students in both groups (50% and 54%) know how to plan and organize learning projects.

This indicates that students have basic preparation for project-based learning. 38% of both groups have no experience in teamwork. The majority of EG (75%) and CG (71%) students actively use modern technologies and digital tools in the learning process. This indicates the importance of introducing innovations in the educational process. Half of KG and EG students show high interest in using project-based learning in their future pedagogical activities, which indicates the important role of project-based learning in the formation of professional pedagogical skills. About 40% of EG students and 41% of CG students express a desire to participate in the further development and improvement of project-based learning methods, which indicates the importance of new initiatives to improve educational programs in the field of project-based learning at the university level

The obtained data allow us to note that students from both groups (experimental and control) have a similar idea of project-based

learning, demonstrated approximately the same attitude to the skills of designing and organizing projects, all students actively use modern technologies and digital tools, which shows their readiness to introduce innovations in education. Such data allow us to consider that both groups have the same level of development regarding project-based learning and gives the opportunity, which allows us to start the experiment. At the formative stage, students of the educational program "Pedagogy and Methodology of Elementary Education" (EG) were offered a model of project-based learning, which includes elements of innovation and tradition, taking into account the specifics of elementary education. Its goal is that project-based learning should help students to develop and implement projects aimed at solving current problems of primary education, using a variety of methods and modern technologies

Students are familiarized with the main components of the model. The main component is considered to be learning to identify a problem or challenge that is relevant to primary education - as a result, they formulate project goals and objectives based on analyzing the situation and exploring available resources. Students are also taught to gather information about the problem and investigate possible solutions. They conduct experiments and observations using available tools and resources. Research helps students gain a deeper understanding of the problem and find optimal solutions.

During project implementation: students create and execute projects using both traditional methods such as handwriting, drawing soft materials, making toys, and modeling children's behavior; apply innovative methods such as using multimedia, digital tools, and software to create interactive presentations and virtual models; upon completion of the project, students evaluate the results achieved, discuss successes and failures, and engage in reflective discussions aimed at improving the quality of

the project; and conduct reflective discussions aimed at improving the quality of the project.

The module of direct project-based learning is based on the integration of innovations and traditions, as it combines traditional methods, such as individual assignments and group work, with the use of modern technologies and tools. Project-based learning also involves interaction with other disciplines such as psychology, pedagogy, physiology, etc., which contributes to the formation of a future teacher's holistic view of the problems and challenges in the chosen profession. Students work in teams, assigning responsibilities and coordinating efforts to achieve common goals. Teachers support students with advice, counseling and monitoring of project implementation. The pedagogical workshop established at the university provides students with resources and space to experiment and develop ideas.

Projects are evaluated through discussion, testing and experimentation. Self-assessment is also used, as students are obliged to evaluate their achievements and identify ways to improve them. The best projects should be included in the student's portfolio or used in further research, as they can then become part of the future teacher's professional portfolio. In the course of the experiment the following projects of integration of tradition and innovation, important for the training of students, future teachers of elementary school, were realized in EG:

1. Cultural Heritage in the Classroom Project. Students explore traditions and customs of different cultures, presenting them in the classroom through exhibitions, presentations and workshops. Objectives: to learn how to introduce children to cultural diversity; to develop teamwork and public speaking skills; to integrate traditional knowledge with modern approaches to learning.

2. Project "Innovative Technologies in Teaching". Students develop lessons for grades 1-3, using modern technologies (interactive whiteboards, educational applications) and traditional teaching methods (reading books,

games). Objectives: to teach future teachers to use technology to increase interest in the learning process; to compare the effectiveness of different teaching methods in reading, math and other subjects.

3. Project "Environmental Education through Traditions". Description: Students research traditional practices of sustainable farming in different cultures and develop educational activities for children on Cognition of the World. Objectives: to foster children's respect for nature and understanding of the importance of environmental traditions; to integrate knowledge of contemporary environmental issues with traditional approaches to solving them.

4. Grandparents' Stories Project. Students collect stories and memories of older people about their childhood and traditions and then create an interactive book or multimedia presentation for children. Goals: to preserve and pass on cultural heritage through personal stories; to develop children's listening skills and respect for the older generation.

5. Project "Creative workshop: from tradition to innovation". Students organize workshops on traditional crafts (pottery, embroidery and others) using modern materials and technologies (e.g. 3D printing). Objectives: to familiarize children with traditional crafts and their meaning; to develop creativity and skills in working with different materials.

6. Virtual excursions to historical places" project. Students create virtual excursions to places of historical or cultural value using traditional and modern technologies. Objectives: to introduce children to history and culture through modern means; to develop critical thinking skills and analyze information.

All of these projects should help future elementary school teachers learn how to integrate innovative approaches into traditional teaching while maintaining respect for tradition and cultural heritage. Table 3 shows the results of comparative analysis of students' diagnostics at the control stage.

Table 3. *Results of comparative analysis of the control diagnostics of the level of knowledge and skills of students in the field of project-based learning*

Questions	Options	EG		Difference	KG		Difference
		commen- cement	end		commen- cement	end	
How do you understand the essence of project-based learning	Traditional	42	25	-17	42	40	-2
	Innovative	25	35	+10	23	25	-3
	Comprehensive	23	40	+17	25	25	0
What are the steps involved in project-based learning	Setting goals and objectives (traditionally	70	23	-47	67	62	-5
	Information gathering and analysis (innovative	20	42	+12	23	25	+2
	Presentation of results (comprehensive	10	25	+15	10	10	0
What is the role of the teacher in project-based learning	Project management in the traditional	70	35	-35	67	62	-5
	Mentoring and support for innovation	20	23	+3	20	20	0
	Combining traditional and innovative methods	10	42	+22	13	18	+5
Do you know how to plan and organize learning projects	I don't know how	50	30	-20	54	54	0
	I can	50	70	+20	46	46	
Do you have experience working as part of a team	Yes	62	100	+38	62	67	+5
	No	38	0	-38	38	33	-5
Do you use modern technology and digital tools in your teaching and learning process?	I've never	25	0	+25	29	33	+4
	I'm using	75	100	-25	71	67	-4
How interested are you in using project-based learning in your future teaching career?	Not all	50	82	+32	50	50	0
	Very	50	18	-32	50	50	0
Do you believe that project-based learning fosters students' creativity?	Yes	50	100	+50	54	54	0
	No	50	0	-50	46	46	0
Would you like to be involved in the further development and improvement of project-based learning methods	Yes	38	100	+62	41	46	+5
	No	62	0	-62	59	54	-5

The data of the comparative analysis allow us to draw the following conclusions.

In the experimental group (EG) there is a significant improvement in the understanding of project-based learning as an innovative (by 10%) and integrated process (by 17%), while in the control group (CG) the majority continues to perceive it traditionally. Such data indicate the influence of the conducted activities on the positive change in the EG students' perception of the essence of project-based learning. EG students became more aware of the importance of innovative project stages, such as information gathering and analysis (+22%), as well as presentation of results (+15%). The traditional perception of project learning stages prevails in the CG, as they still emphasize more on setting goals and objectives characteristic of traditional learning. In EG there was a significant increase in the number of students (by 22%) who believed that the teacher's role in project-based learning should be based on combining traditional and innovative methods, while in CG the majority still held the opinion of project guidance by traditional method. In EG there is an increase in the number of students confident in their skills of planning and organizing educational projects (by 20%), while in CG the indicator of these skills remained the same.

Teamwork experience: All EG students gained experience in teamwork (38% increase), in contrast to CG, where the number of students who gained such experience increased by only 5%. In EG all students started to use modern technologies and digital tools in the learning process (25% increase), while in CG the increase was only +4%, but still a significant part of CG students continue to ignore them. Interest in using project-based learning increased among EG students by 32% and reached the majority (82%), while interest among CG students remained the same.

The development of students' creative abilities through project-based learning increased: in EG students by 50% and now all 100% are sure that project-based learning contributes to the development of students' creative abilities, while in CG the opinions remained the same (50-50%). The desire to improve project-based

learning methods among EG students increased by 62% and as a result all 100% of students expressed their desire to participate in the further development and improvement of project-based learning methods, while in CG the number of those willing to participate was only 46% (with an increase of 5%), the rest of the students did not have a desire to participate. Thus, the results of comparative diagnostics show the positive influence of the conducted work, within the framework of the new model, on the level of knowledge and skills of EG students in the field of project-based learning.

Discussions. The results of this study, which examined the integration of innovations and traditions through project-based learning (PBL) in teacher training, are consistent with and expand upon findings in recent international research. A comparative analysis reveals both overlaps and distinctions in pedagogical objectives, methodologies, and observed outcomes. A major similarity lies in the emphasis on developing 21st-century competencies-critical thinking, creativity, collaboration, and digital literacy-through PBL. Nxasana et al. (2023) stressed that the integration of creativity and traditional elements in South African teacher education enhanced student engagement and helped preserve cultural identity while embracing innovation. This resonates with the current study, which also highlighted projects like "Grandparents' Stories" and "Cultural Heritage in the Classroom" as successful fusions of tradition and innovation.

Furthermore, Barak and Yuan (2021) confirmed that culturally contextualized PBL fosters innovative thinking among preservice teachers. Similarly, our findings showed a 50% increase in experimental group (EG) students acknowledging the role of PBL in enhancing creativity. This validates the assertion that PBL not only fosters skill acquisition but also supports cultural and intellectual synthesis. Rodriguez et al. (2024) emphasized that effective teacher education programs combine STEM disciplines with pedagogical practice through PBL to strengthen interdisciplinary integration. In our study, the implemented model involved cross-disciplinary connections

(e.g., linking environmental education with traditional knowledge), mirroring Rodriguez's recommendations. Despite these parallels, some differences were found in implementation strategies. While studies such as Rahmawati et al. (2020) and Haatainen & Aksela (2021) prioritized digital integration and technological fluency within PBL frameworks, the present study placed equal emphasis on traditional forms of expression (e.g., storytelling, crafts, oral histories). Thus, while technology was used (e.g., digital presentations, virtual tours), it served to augment-not replace-traditional pedagogical modes. This difference reflects regional educational goals that prioritize cultural preservation alongside innovation, particularly in Kazakhstani elementary education. Moreover, Alrajeh (2020) found that in many teacher Education Programs, PBL is often implemented without explicit cultural context, which may reduce its relevance for preservice teachers. In contrast, this study embedded cultural relevance into each project module, thereby increasing engagement and the applicability of content to local educational settings.

This study produced several scientifically valuable results:

1. **Enhanced Conceptual Understanding of PBL:** EG students showed a statistically significant shift from viewing PBL as a traditional method (−17%) to understanding it as innovative (+10%) and integrative (+17%). This indicates a conceptual transformation facilitated by the blended learning model, supporting the findings of Molina-Torres (2022) that properly structured PBL promotes reflective teaching and learning practices.

2. **Increased Readiness for Team-Based, Technology-Enhanced Pedagogy:** All students in the experimental group reported teamwork experience and 100% adoption of digital tools, compared to 67% and 67% respectively in the control group. This reinforces the conclusions of Liu et al. (2019), who linked PBL to improved technological and collaborative competence in teacher education.

3. **Positive Change in Motivation and Engagement:** Interest in using PBL in future careers rose by 32% among EG students.

The same group showed a 62% increase in willingness to further develop PBL practices. These motivational shifts reflect conclusions drawn by Hero and Lindfors (2019), who associated PBL with improved student agency and engagement in teacher training programs.

It is important to acknowledge that while this study demonstrated the successful integration of tradition and innovation, the long-term impact on classroom performance remains to be assessed. Future research should examine how these competencies translate into real-world primary education contexts. Additionally, while the current model proved effective in a Kazakhstani setting, cultural adaptation might be necessary before applying it in more digitally advanced or culturally diverse environments, as suggested by Lewis et al. (2019).

Conclusion. The mentioned project-based learning methodologies and successful integration practices indicate that it is necessary to help future teachers to develop professional competencies more actively at the university level. At the same time, more attention should be paid to the integration of tradition and innovation, as comprehensive integration skills of project-based learning will be necessary for their successful work as teachers. They are especially important for future elementary school teachers, as at this age modern children should be educated in an integrated approach. The results obtained during the questionnaire survey of the current state in the field of project-based learning to identify the needs and expectations of all participants in the educational process of universities (students and teachers) indicate the need to improve the support system of project-based learning to reduce the frequency of difficulties and increase the effectiveness of the use of project-based learning in the educational process of future elementary school teachers.

The proposed model of project-based learning is an important tool for the training of future elementary school teachers, allowing them to develop professionally and master the skills necessary for effective work in the educational environment. The projects developed within its framework are tools for integrating innovations

and traditions in the process of training students, future teachers of primary grades. The effectiveness of the model is confirmed by the results of comparative diagnostics, which show the positive impact of the conducted work in the field of project-based learning. Since the level of knowledge and skills of EG students in the

field of project-based learning has significantly increased. In addition, it should be noted that this model includes elements of innovation and tradition, taking into account the specifics of primary education, which indicates that it is possible and necessary to take into account the peculiarities of the age of students.

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