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DEVELOPING RESEARCH SKILLS IN FUTURE COMPUTER SCIENCE TEACHERS

Abstract

The purpose of this study is to identify the need to develop pedagogical research skills among future computer science teachers. The objectives of the study include the analysis of modern methods and approaches to the development of these skills, as well as assessment of their impact on the quality of the educational process. The research methodology is based on the use of qualitative and quantitative methods, including surveys, interviews and analysis of teaching practice. The results of the study show that the development of research skills among future computer science teachers helps improve their professional competence, improve the quality of teaching and introduce innovative teaching methods. This study is significant for science, as it highlights the need to integrate research methods into the teacher training process, which in turn contributes to more effective and high-quality education in the field of information technology.

Keywords: skill development, research skills, teacher training, research skills, information technology, educational process, Action Research, professional competence

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БОЛАШАҚ ИНФОРМАТИКА МҰҒАЛІМДЕРІНІҢ ЗЕРТТЕУ ДАҒДЫЛАРЫН ДАМЫТУДЫҢ

Аңдатпа

Бұл зерттеудің мақсаты – болашақ информатика мұғалімдерінің педагогикалық зерттеу дағдыларын дамыту қажеттілігін анықтау. Зерттеудің міндеттеріне осы дағдыларды дамытудың заманауи әдістері мен тәсілдерін талдау, сонымен қатар олардың білім беру үдерісінің сапасына әсерін бағалау кіреді. Зерттеу әдістемесі сауалнамалар, сұхбаттар және педагогикалық тәжірибені талдауды қамтитын сапалық және сандық әдістерді қолдануға негізделген. Зерттеу нәтижелері болашақ информатика мұғалімдерінің зерттеу дағдыларын дамыту олардың кәсіби құзыреттілігін арттыруға, оқыту сапасын арттыруға және оқытудың инновациялық әдістерін енгізуге ықпал ететінін көрсетті. Бұл зерттеудің ғылым үшін маңызы зор, мұғалімдердің біліктілігін арттыру үдерісіне зерттеу әдістерін енгізу қажеттілігін білдіреді, бұл өз кезегінде ақпараттық технологиялар саласында тиімді және сапалы білім беруге ықпал етеді.

Түйін сөздер: дағдыны дамыту, зерттеу дағдылары, зерттеу дағдылары, ақпараттық технология, оқу үдерісі, Action Research, кәсіби құзыреттілік.

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РАЗВИТИЕ ИССЛЕДОВАТЕЛЬСКИХ НАВЫКОВ БУДУЩИХ УЧИТЕЛЕЙ ИНФОРМАТИКИ

Аннотация

Целью данного исследования является выявление необходимости формирования педагогических исследовательских навыков у будущих учителей информатики. Задачи исследования включают анализ современных методов и подходов к развитию данных навыков, а также оценку их влияния на качество образовательного процесса. Методология исследования основана на использовании качественных и количественных методов, включая опросы, интервью и анализ педагогической практики. Результаты исследования показывают, что развитие исследовательских навыков у будущих учителей информатики способствует улучшению их профессиональной компетентности, повышению качества преподавания и внедрению инновационных методов обучения. Данное исследование имеет значимость для науки, так как оно подчеркивает необходимость интеграции исследовательских методов в процесс подготовки педагогов, что в свою очередь способствует более эффективному и качественному образованию в сфере информационных технологий.

Ключевые слова: развитие навыков, исследовательские навыки, информационные технологии, образовательный процесс, Action Research, профессиональная компетентность.

Introduction

The modern education system is rapidly developing in the context of digital transformation, which sets new requirements for the training of future teachers. In the era of information technology and a rapidly changing technological landscape, special attention should be paid to training educators who can effectively use IT tools and methods. At the current stage of society's development, the development of personal qualities and professional competence of future specialists is the main task of the higher education system [1]. One of the main aspects of training future computer science teachers is the formation of their pedagogical research skills.

Modern education and the challenges of the teaching profession have led to an increased demand for professional development and practical research. Action research is a method that encourages teachers to manage and monitor their work [2]. This article, *The Role of Action Research in Teachers' Professional Development*, discusses the pedagogical research skills teachers need to successfully implement action research. It is stated that a teacher-researcher should possess certain theoretical, pedagogical, and methodological skills, appreciate rigorous methodological procedures, receive appropriate research training, and be creative. This highlights the importance of education in methodology for both teaching practice and educational theory and the need for collaboration between theorist and practitioner to make meaningful changes in education.

Action Research is a broader and more flexible approach used to solve various educational problems and improve practice, allowing teachers to directly participate in the process of improving their pedagogical practice by responding to the real needs of students. It helps teachers adapt to real-life situations and challenges faced by teachers in the educational system. Action Research and teacher collaboration, aimed at in-depth analysis and improvement of specific lessons, require them to master Lesson Study methods and apply them in their own practice. Both of these methods are aimed at improving the quality of education and improving the qualifications of teachers. Action Research provides flexibility in an exploratory approach to problem-solving, while Lesson Study explores the details of lesson planning and delivery, encouraging sharing and reflection among teachers.

Action Research and Lesson Study methods contribute to the development of professional competence of teachers and improvement of educational results. However, teachers need to develop pedagogical research skills before using Action Research methods. Pedagogical research skills

include the ability to critically analyze learning situations, design and evaluate learning activities, and use scientific methods to solve practical problems. Such skills are an important step in the effective use of the mentioned system of methods in one's practice. This not only helps to improve the qualifications of teachers and the learning experience but also contributes to the professional growth of teachers, making them competent and confident in their professional activities.

In the traditional teaching process, students' research culture, enthusiasm, and energy are mainly focused on the subject content of education, and the theoretical and cognitive side of acquiring scientific knowledge is neglected. As a result, students do not master it sufficiently [3]. Research skills are the main element of personality development in modern society. It not only contributes to a deep understanding of the world around us but also allows us to think critically, solve problems independently, and innovate. Scientific research allows a person to develop the ability to analyze information, highlight important aspects, create hypotheses, and test them in practice. Thus, research skills are an important tool for achieving personal and professional goals in a rapidly changing world.

The main direction of modernization of higher pedagogical education is determined by the training of qualified, competitive professors and the development of modern high-tech technologies, which meet the modern requirements for the quality of specialists, both from the side of employers and the social demands of society. Therefore, it is necessary to take into account these groups of interrelated factors in the formation of research skills of future physics teachers at a pedagogical university [4]. The teacher's pedagogical research skills play a crucial role in his professional activities, especially in the field of pedagogical science and practice. It allows the use of innovative teaching methods based on modern scientific achievements. The formation of research skills plays a key role in training qualified teachers who can successfully adapt to the dynamically changing conditions of the educational environment and cope with the challenges of modern times. Pedagogical research allows teachers to analyze the content of their work, experiment with various teaching and educational methods, and adapt and apply advanced pedagogical practice to their own experience. Research skills help teachers effectively solve current educational problems, as well as improve their professional competence. Thus, the development of pedagogical research skills is an important aspect of preparing a modern teacher for professional activity.

From this comes the need to develop pedagogical research skills of future computer science teachers. The need to develop such skills depends on several factors. First, computer science teachers play an important role in preparing students for the challenges of the digital world, and for this, they need not only technical knowledge but also the ability to conduct pedagogical research. The rapid development of information technologies and the constant updating of educational methods require future informatics teachers not only to have in-depth knowledge of the subject but also to find new teaching methods adapted to the rapidly changing educational context, as well as to improve students' competencies, functional literacy, critical thinking, etc. in the teaching of informatics. This requires that they study their own pedagogical activities to be able to rationally choose innovative methods that contribute to the development of their skills. Second, current educational standards require teachers to have critical thinking and analytical skills, which is not possible without developed research skills. In conclusion, the development of research competencies contributes to the personal and professional growth of teachers, which positively affects the quality of education.

The purpose of this article is to justify the need and relevance of research and development of the concept of pedagogical research skills of future computer science teachers.

Forecast. The formation of pedagogical research skills of future informatics teachers contributes to increasing their professional competence, increasing the quality of teaching, and effective use of information technologies in the educational process. Developing these skills enables future teachers to critically evaluate and implement innovative teaching methods, thereby preparing students who can meet the demands of the digital world."

Research methodology

From September 2022 to February 2024, a study was conducted at the Kazakh National Pedagogical University named after Abai on the topic 'The need to develop pedagogical research skills of future computer science teachers.' Research results were presented. Qualitative and quantitative methods were used to collect data. Qualitative methods included semi-structured interviews and focus groups conducted with research participants. Interviews and focus groups aimed to determine students' perceptions of the importance of research skills and their level of mastery of these skills.

Quantitative methods included surveys and testing. The questionnaires were designed to assess the level of research skills and included questions about the ability to visualize problems, ask questions, generate hypotheses, conduct experiments, and draw conclusions. Testing was conducted to objectively assess students' research competencies. As a result of the application of these methods, a comprehensive picture of the level of development of research skills of future IT teachers was obtained, which made it possible to formulate recommendations for their further development and introduction into the educational process. The study showed that the development of research skills of future computer science teachers contributes to increasing their professional competence, improving the quality of teaching, and introducing innovative teaching methods. In addition, it helps future teachers adapt to rapidly changing technologies and the requirements of the modern educational process. As a result, the development of research skills is a key element in training qualified and competitive teachers.

Lei Zhang and Jing Wang (2024) explain how action research in education can not only improve teaching practice but also contribute to the development of teachers' reflective thinking. This process also aims to improve teachers' pedagogical skills and abilities, which in turn enhances the quality of education. Additionally, conducting action research helps develop teachers' research abilities, which is important for the continuous improvement of the educational process and achieving good results in student learning [5]. For teachers to effectively use such innovative methods in their practice, pedagogical research skills must first be developed. These skills include seeing and formulating problems, asking research questions, formulating hypotheses, defining concepts, classifying data, conducting observations and experiments, drawing conclusions, structuring material, working with text, and proving and defending ideas. Only with these skills can teachers use action research to improve the learning process and achieve meaningful results in student learning.

Let's focus on the concepts of 'skill,' 'research,' 'research skill,' and 'pedagogical research skill.' Skills are actions that are practiced as a result of long-term repetition [6]. A.I. Savenkov [7] describes research skills as the ability to perform a number of intellectual tasks. This includes being able to see the problem, ask questions, create a hypothesis, define concepts, classify data, control, conduct experiments, summarize and draw conclusions, structure material, work with text, and prove and defend ideas. P.V. Seredenko defines research skills as the ability to perform a complex of operations and their implementation. These operations are related to intellectual and practical actions that constitute research activity and lead to new knowledge [8].

Research skills reflect the main characteristics of the professional development process as the main basic elements of the personality. They show the universality of one's interaction with the outside world, contribute to the development of creative abilities, and determine the effectiveness of cognitive activity. These skills make it possible to use knowledge and research skills in any field of cognitive and practical activity. Therefore, the educational process aimed at raising the professional level of an individual, and one of the indicators of the effectiveness of a cognitive-creative school based on a scientific-creative approach, is the level of development of research skills [9].

According to the law on the status of a teacher, a teacher in his position must:
- acquire relevant professional competences;
- observe the pedagogical principles of education and training and ensure the quality of education and training at a level not lower than the requirements stipulated in the state universal education standards;

- continuously improve their professional skills, research, intellectual and creative level, including increasing the level of the qualification category at least once every five years [10].

To perform these tasks according to the requirements, the teacher should be able to recognize and know each student sitting in front of them, understand students' participation in the lesson, determine how much they learned, identify what prevented them from learning, who actively participated in the lesson, and who did not. They should be able to search for answers to these questions and find solutions.

One of the main abilities that a teacher should have is research abilities, which are manifested in the ability to understand and objectively evaluate pedagogical situations and processes [11]. The professional activity of a teacher requires special general and specific abilities. The success of professional pedagogical activity is directly related to special pedagogical abilities, one of which is the pedagogical research skills of the future teacher.

The research component of pedagogical activity [12] includes:
- updating professional knowledge;
- looking at pedagogical phenomena from a scientific point of view;
- learning pedagogical research methods;
- analyzing personal experience;
- analyzing the experience of other teachers.

The need to develop pedagogical research skills of future computer science teachers is considered important for several reasons. First, the rapid development of information technologies and their impact on education require computer science teachers to constantly improve their methods and adapt to new requirements. Second, the development of pedagogical research skills allows teachers to effectively use innovative pedagogical methods and conduct scientifically based analyses and evaluations of their pedagogical practice. It also provides an opportunity to create and implement new educational technologies that meet the needs of modern education in the information society. Third, it contributes to the professional growth of computer science teachers and improves the quality of general education. Various research methods were used to investigate and prove the need for future computer science teachers to develop pedagogical research skills. Analysis of current trends in education, especially in the field of information technologies, helps determine the need to update pedagogical methods and prepare teachers for new requirements. Surveys of students, teachers, and employers can help determine the expected competencies of computer science teachers, including pedagogical research skills. Analysis of existing scientific publications, studies, and expert opinions is also important to understand the role of pedagogical research skills in the professional activities of computer science teachers. Conducting pilot projects or courses aimed at developing the pedagogical research skills of future computer science teachers, as well as subsequent evaluation of their effectiveness and their impact on professional development and student success, can also provide evidence of the need for this area in teacher training. Expert interviews with teachers and students, as well as focus groups with experts in the field of education and information technology, help to obtain opinions and assessments regarding the importance of pedagogical research skills for computer science teachers."

Results of the study

The results of a small study on the need for the formation of pedagogical research skills of future teachers are as follows:

Hypothesis. If the work aimed at forming the pedagogical research skills of the future informatics teacher is not properly organized, it will significantly lead to insufficient professional level of the teacher. If it is said that it affects the significant decrease in the learning efficiency of the students, then by normalizing the pedagogical research skills of the future teachers, they will have a specialist with high professional training.

Research method. A questionnaire was collected from computer science teachers and future computer science teachers about their pedagogical research skills using qualitative and descriptive

comparative analysis methods using Google Forms and analyzed using the R program.

Participants. 43 computer science teachers and future computer science teachers participated in the survey. Due to the small number of participants in the survey, the results of the research are limited, so the obtained results may not give the exact nature of the mentioned matter. Also, the confidentiality of the names and answers of the responding teachers and prospective computer science teachers in the survey was preserved.

Data collection. In order to collect data, teachers and future teachers thought about the topic of the survey, and in order to get a clear answer to the main question, other additional questions were asked and prepared in consultation with the scientific supervisor several times. The survey included a total of 10 questions.

Implementation. The research took two weeks. Because the questions in the survey are directly related to computer science teachers and future computer science teachers, it took time to clarify their thoughts on the link sent. In addition, we also met colleagues who were indifferent to the sent link. Therefore, the number of respondents to the survey in the link sent was 43.

Research result: It can be seen that the teachers who responded to the research question have different methods used in the classroom. If 20% of teachers use the empirical method, another 20% use the theoretical method, and 35% use the methodological method, the remaining 25% of teachers use the question-answer method using this percentage scale (Figure 1).
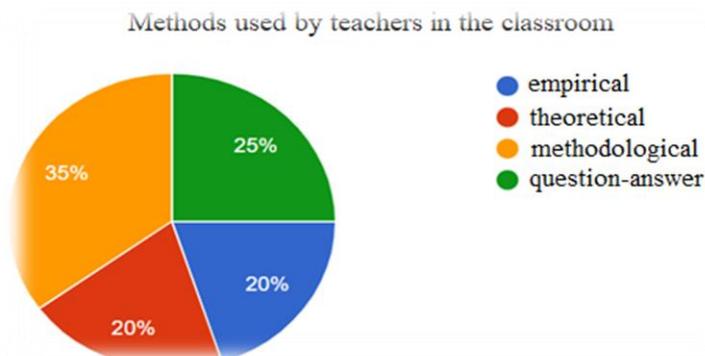

Figure 1. Is an indicator of methods used by teachers in the classroom

The result of the research is primarily to determine whether teachers' understanding of pedagogical research skills has been developed, as well as to determine whether they have an understanding of the importance of learning in the subject of informatics, "Is it important for a teacher to develop pedagogical research skills for the subject of informatics?" , "Does building research skills require years of experience? ", "Do you support the need to improve the training of future computer science teachers?" questions were asked. When the answers were analyzed in the R programming environment, the result was as follows (Figure 2).
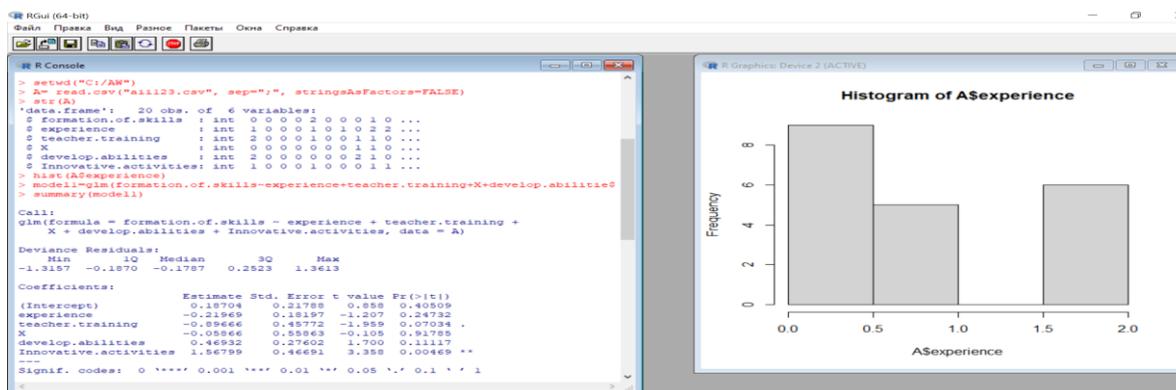

Figure 2. Information on teachers' perceptions of pedagogical research skills

If the information is presented in tabular form (Table 1).

Table 1. Information on teachers' perceptions of pedagogical research skills

Question/answer	yes	no	a little
Is it important that a computer science teacher has developed pedagogical research skills?	*80%*	*15%*	*5%*
Does building research skills require years of experience?	*45%*	*25%*	*30%*
Do you support the need to improve the training of future computer science teachers?	*80%*	*15%*	*5%*

In addition, among teachers, "After the lesson, do you analyze the students according to your previous method?", "Is computer science important in education?" questions were asked and the answers were analyzed. Although 65% of the survey participants say "I definitely do it", 20% of them do it occasionally, i.e. "sometimes". Among the teachers, there were even those who "do not do analysis at all". This shows that some of our teachers are indifferent to their work (Figure 3).
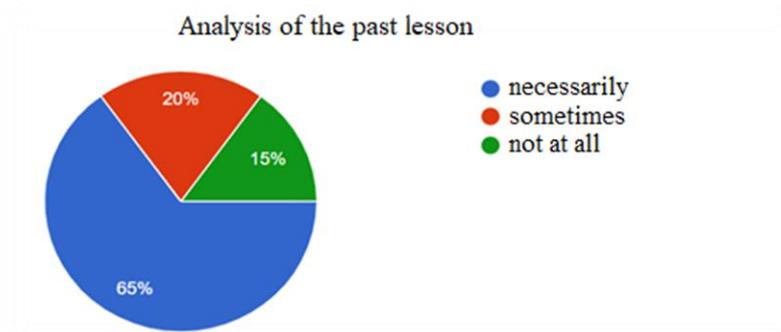

Figure 3. "After your lesson, do you analyze the students according to your previous method?"
The share of respondents to the question

Next "Is computer science important in education?" 90% of teachers said that it is important, and 10% decided that it is not important.

To the teachers, "Does the teacher's use of his skills during teaching enable the development of students' learning abilities?", "Do you think that it is necessary to improve the skills of the teacher in order to implement innovative activities?" questions were also asked. It can be seen that 75% of them responded that the use of their skills during teaching "enables" the development of students' learning abilities, while 10% of teachers chose the answer "does not allow". At the same time, 15% believe that it "gives a little opportunity" (Figure 4).

Figure 4. "Does the use of the teacher's skills during teaching enable the development of students' learning abilities?" percentage scale of the question

In the questionnaire "Are you familiar with the courses for training teachers in pedagogical skills?", "Do you think that formation of pedagogical research skills is effective and necessary?" questions were also encountered. Are you familiar with the courses for training teachers in pedagogical skills ? 55% answered "yes, I'm familiar with it", 25% answered " no, I'm not familiar with it ", 15% said "passing the course is not important", and 5% came to the conclusion that "courses do not help" (Figure 5).
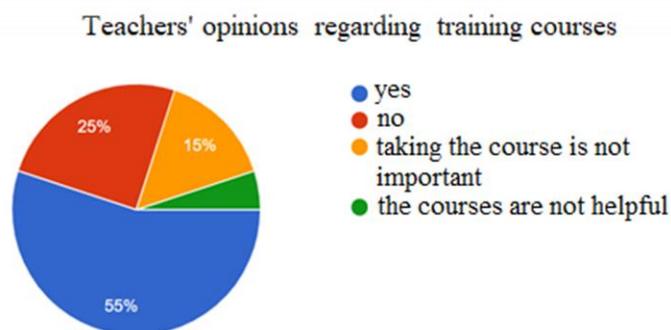

Figure 5. M teachers' "Are you familiar with the courses for training teachers in pedagogical skills?" answers to the question

Next "Do you think that the formation of pedagogical research skills is effective and necessary? 35% answered "effective but not necessary", 25% answered "not effective but necessary", the remaining 35% answered "yes, necessary and effective" and 5% answered "no, not necessary". and not effective" (Figure 6).
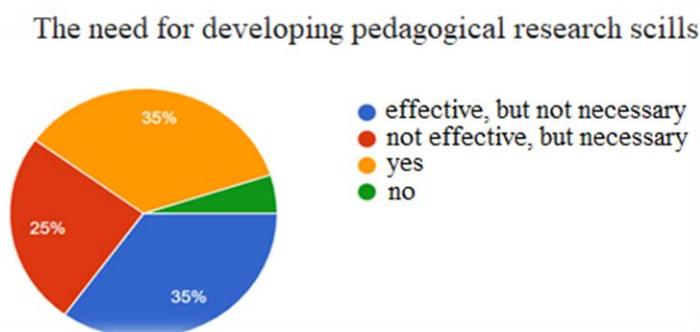

Figure 6. "Formation of pedagogical research skills is effective and do you think it is necessary?" answers to the question

Discussion

From the results of the research, a questionnaire was collected from 43 teachers of informatics and future teachers of informatics about the formation of pedagogical research skills of future informatics teachers and analyzed using the R program. Based on the results of the research , teachers' views on the formation of pedagogical research skills of the future computer science teacher were determined. During the research, it became known that all teachers (100%) use the methods during the lesson. However, it uses a different method. For example, 20% of teachers use the empirical method, another 20% use the theoretical method, and 35% use the methodological method, and the remaining 25% use the question-and-answer method. According to the methods used, it was found that some teachers (20%) only sometimes analyze for themselves after the lesson, and some teachers (15%) do not analyze at all. In this way, if the teacher does not report to himself for a long time and does not analyze, it leads to insufficient pedagogical professional competence and skills. And it, in turn, affects the significant decrease in the efficiency of teaching students. For this reason, the vast majority of

teachers (80%) believe that it is important for a teacher to develop pedagogical research skills for computer science. In addition, according to the results of the survey, the teacher's use of his skills during teaching allows students to develop their learning abilities (75%). In addition, it was concluded that only after improving the education of teachers in special courses, they will learn the formation of pedagogical research skills at a sufficient level, and the interest and responsibility of the teacher will increase .

Conclusion

Summarizing the conducted experiment, the need to develop pedagogical research skills of future computer science teachers was determined. These skills allow teachers to effectively adapt to changes in the educational environment, develop innovative methods of teaching and assessment, and contribute to the development of the educational and scientific community. The development of pedagogical research skills helps to increase the professional competence of computer science teachers and provides quality education in accordance with modern requirements and requirements of students. Therefore, focusing on the development of these skills in the process of training future computer science teachers is an important step in improving the education system and preparing qualified teachers for the digital age.

Comparing our results with previous studies, our findings are consistent with international trends. Research on teacher action research and lesson research also emphasizes the importance of incorporating research into teacher education curricula. However, our approach to teaching research skills has its own peculiarities depending on the context of the Kazakhstan education system. These features can serve as a basis for further comparative research and exchange of experience.

Prospects for further research:

- in the future, it is necessary to study in depth the impact of various teaching methods and technologies on the development of research skills of pedagogical students;

- it is important to study the long-term impact of these skills on the professional activity of teachers, which allows for a more accurate assessment of the effectiveness of current educational methods;

- additional attention should be paid to the development and implementation of innovative methods and tools that help to acquire research skills more effectively in a rapidly changing technological environment.

Thus, our study confirms the importance of developing the pedagogical research skills of future computer science teachers and indicates the need for further efforts to improve educational programs.

Пайдаланылған әдебиеттер тізімі

[1] Сәлғожа И.Т. (2021). Болашақ информатика пәнінің мұғалімдерін сыныптан тыс жұмыстарға әдістемелік дайындау. Абай атындағы ҚазҰПУ-нің Хабаршысы, «Физика-математика ғылымдары» сериясы, No4(76), 2021. 210-218 б. DOI: https: https://doi.org/10.51889/2021-4.1728-7901.29

[2] Zajić J.O., Mamutović A., Maksimović J. (2021). The Role of Action Research in Teachers' Professional Development (2021) International Journal of Cognitive Research in Science, Engineering and Education, 9 (3), pp. 301 - 317, Cited 1 times. DOI: https://doi.org/10.23947/2334-8496-2021-9-3-301-317. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85127502279&doi=10.23947%2f2334-8496-2021-9-3-301-317&partnerID=40&md5=8a90b006e4dbcae3e54a9918f47e795a

[3] Әлімбекова Г.Б., Тұрғанова М.М. (2021). Жоғары оқу орындарында физика курсын оқытуда студенттердің зерттеушілік мәдениетін қалыптастыру. Абай атындағы ҚазҰПУ-нің ХАБАРШЫСЫ, «Физика-математика ғылымдары» сериясы, No1(73), 2021 ж. DOI: https://doi.org/10.51889/2021-1.1728-7901.10

[4] Молдабекова С., Битибаева Ж.М. (2020). Некоторые особенности формирования исследовательских умений студентов в контексте практико-ориентированного подхода. ВЕСТНИК

КазНПУ им. Абая, серия «Физико-математические науки», No1(69). DOI: *https://doi.org/10.51889/2020-1.1728-7901.44*

[5] Zhang L., Wang J. (2024). "Curriculum-based or ideology-based": An action research on China's curriculum-based ideology and virtuous awareness education in second language writing teaching: An activity theory perspective. Heliyon, Volume 10, Issue 11, ISSN 2405-8440. https://doi.org/10.1016/j.heliyon.2024.e32631

[6] Sozdikqor.kz порталы *https://sozdikqor.kz/soz?id=147336&a=Da%C7%B5dy* *(дата обращения: 02.04.2024).*

[7] Савенко, А. И. (2024). Педагогика. Исследовательский подход : учебник и практикум для вузов / А. И. Савенков. – 2-е изд., испр. и доп. – Москва : Издательство Юрайт, – 400 с. – (Высшее образование). – ISBN 978-5-534-17019-1. – Текст : электронный // Образовательная платформа Юрайт [сайт]. – URL: *https://urait.ru/bcode/532199* *(дата обращения: 02.05.2024).*

[8] Середенко П.В. (2014). Развитие исследовательских умений и навыков младших школьников в условиях перехода к образовательным стандартам нового поколения: монография. Южно-Сахалинск: Изд-во СахГУ. - 208 с. *https://clck.ru/3BeFY5* *(дата обращения: 02.04.2024).*

[9] Лубинская Т.Н. (2009). Исследовательские умения и навыки как базовые компоненты профессионального становления личности // Вестник ВятГУ. №2. URL: *https://cyberleninka.ru/article/n/issledovatelskie-umeniya-i-navyki-kak-bazovye-komponenty-professionalnogo-stanovleniya-lichnosti* *(дата обращения: 24.06.2024).*

[10] Педагог мәртебесі туралы Қазақстан Республикасының Заңы 2019 жылғы 27 желтоқсандағы № 293-VI ҚРЗ.

[11] Адамова, У. К. (2016). Педагогические способности преподавателя и методы их развития / У. К. Адамова, Н. Р. Кутлимуротова, М. А. Каландарова. – Текст : непосредственный // Молодой ученый. – № 13 (117). – С. 760-763. – URL: *https://moluch.ru/archive/117/31209/* *(дата обращения: 24.06.2024).*

[12] Жусупова Ж.А. (2011). Педагогикалық шеберлік: Оқулық. Алматы.- 316 бет. *http://rmebrk.kz/bilim/association/jusipova-pedagogikalyk-sheber.pdf*

References

[1] Salgozha I.T. (2021). Bolashak informatika pәninin mugalimderin synyptan tys zhumystarga әdistemelik dajyndau [Methodological preparation of future computer science teachers for extracurricular work.]. Abaj atyndagy KazUPU-nin HABARShYSY, «Fizika-matematika gylymdary» serijasy, No4(76),. 210-218 b. DOI: *https://doi.org/10.51889/2021-4.1728-7901.29* *(in Kazakh)*

[2] Zajić J.O., Mamutović A., Maksimović J. (2021). The Role of Action Research in Teachers' Professional Development International Journal of Cognitive Research in Science, Engineering and Education, 9 (3), pp. 301 - 317, Cited 1 times. DOI: *https://doi.org/10.23947/2334-8496-2021-9-3-301-317.* *https://www.scopus.com/inward/record.uri?eid=2-s2.0-85127502279&doi=10.23947%2f2334-8496-2021-9-3-301-317&partnerID=40&md5=8a90b006e4dbcae3e54a9918f47e795a* *`(in English)*

[3] Alimbekova G.B., Turganova M.M. (2021). Zhogary oku oryndarynda fizika kursyn oқytuda studentterdin zertteushilik mәdenietin kalyptastyru [Formation of a research culture among students in teaching physics courses in higher education institutions]. Abaj atyndagy ҚazUPU-niң HABARShYSY, «Fizika-matematika gylymdary» serijasy, No1(73), zh. DOI: *https://doi.org/10.51889/2021-1.1728-7901.10* *(in Kazakh)*

[4] Moldabekova S., Bitibaeva Zh. M. (2020). Nekotorye osobennosti formirovanija issledovatel'skih umenij studentov v kontekste praktiko-orientirovannogo podhoda [Some features of the development of students' research skills in the context of a practice-oriented approach]. VESTNIK KazNPU im. Abaja, serija «Fiziko-matematicheskie nauki», No1(69), DOI: *https://doi.org/10.51889/2020-1.1728-7901.44* *(in Russian)*

[5] Zhang L., Wang J. (2024). "Curriculum-based or ideology-based": An action research on China's curriculum-based ideology and virtuous awareness education in second language writing teaching: An activity theory perspective. Heliyon, Volume 10, Issue 11, ISSN 2405-8440. *https://doi.org/10.1016/j.heliyon.2024.e32631*

[6] Sozdikqor.kz порталы https://sozdikqor.kz/soz?id=147336&a=Da%C7%B5dy [Электронный ресурс] // Sozdikqor.kz (date of request: 02.04.2024).

[7] Savenkov, A. I. (2024) Pedagogika. Issledovatel'skij podhod [Pedagogy. Research approach]: uchebnik i praktikum dlja vuzov / A. I. Savenkov. – 2-e izd., ispr. i dop. – Moskva : Izdatel'stvo Jurajt. – 400 s. – (Vysshee

obrazovanie). – ISBN 978-5-534-17019-1. – Tekst: jelektronnyj // Obrazovatel'naja platforma Jurajt [sajt]. –
URL: https://urait.ru/bcode/532199 (date of request: 02.05.2024). (in Russian)

[8] Seredenko P.V. (2014). Razvitie issledovatel'skih umenij i navykov mladshih shkol'nikov v uslovijah
perehoda k obrazovatel'nym standartam novogo pokolenija [Developing research skills and abilities in
primary school students in the context of the transition to new generation educational standards]:
monografija. Juzhno-Sahalinsk: Izd-vo SahGU. - 208 s. https://clck.ru/3BeFY5 (date of request: 02.04.2024).
(in Russian)

[9] Lubinskaja T.N. (2009). Issledovatel'skie umenija i navyki kak bazovye komponenty professional'nogo
stanovlenija lichnosti [Research skills and abilities as basic components of professional development of an
individual]. Vestnik VjatGU. №2. URL: https://cyberleninka.ru/article/n/issledovatelskie-umeniya-i-navyki-
kak-bazovye-komponenty-professionalnogo-stanovleniya-lichnosti (data obrashhenija: 24.06.2024). (in
Russian)

[10] Pedagog martebesi turaly Kazakstan Respublikasynyn Zany [Law of the Republic of Kazakhstan on
the status of a teacher] 2019 zhylgy 27 zheltoksandagy № 293-VI KRZ.

[11] Adamova, U. K. (2016). Pedagogicheskie sposobnosti prepodavatelja i metody ih razvitija
[Pedagogical abilities of a teacher and methods of their development]. U. K. Adamova, N. R. Kutlimurotova,
M. A. Kalandarova. – Tekst : neposredstvennyj // Molodoj uchenyj. № 13 (117). – S. 760-763. – URL:
https://moluch.ru/archive/117/31209/ (date of request: 24.06.2024). (in Russian)

[12] Zhusupova Zh.A. (2011). Pedagogikalyk sheberlik [Pedagogical Sheberlik]: Okulyk. Almaty,- 316 bet.
http://rmebrk.kz/bilim/association/jusipova-pedagogikalyk-sheber.pdf (in Kazakh)