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INNOVATIVE OPPORTUNITIES OF DUAL EDUCATION IN DEVELOPING THE PROFESSIONAL COMPETENCES OF FUTURE TECHNOLOGICAL EDUCATION TEACHERS

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Abstract

This article discusses the innovative potential of the dual education system in the process of developing professional competencies of future teachers of technological education on a scientific basis. The study analyzed the mechanisms of forming professional competencies based on the integration of higher pedagogical education and the production environment, and the effectiveness of the pedagogical model based on dual education was determined through experimental work. The results of the study showed that the dual education system has priority opportunities in ensuring the sustainable development of pedagogical, technological and practical competences of future teachers of technological education. The conclusions obtained serve to improve the quality of training in the field of technological education.

Keywords

Dual education system, technological education teacher, professional competence, innovative education, pedagogical model, production practice, higher education.

Introduction.

In the 21st century, the rapid development of the education system, the inextricable link between pedagogical training and the requirements of the labor market, and the training of highly qualified personnel have become strategic tasks. In the conditions of an innovative economy, the need to form professional competencies of future teachers in technological areas of education at a high level, to train them in harmony with production processes, is increasing. The effectiveness of traditional educational models, especially in technological areas, is shown in practice to be unable to fully meet the real needs of the labor market. In this regard, the introduction of innovative approaches and processes of integrating theory and practice in education is becoming an urgent issue.

Modernization of the education system in the Republic of Uzbekistan, in particular, improving the quality of professional and pedagogical training, has been identified as one of the priority areas of state policy. The Decree of the President of the Republic of Uzbekistan No. PF-60 dated January 28, 2022 “On the Development Strategy of New Uzbekistan for 2022–2026”[1] lists the development of the education system, the introduction of a competency-based approach to personnel training, and the strengthening of the integration of education and production as important tasks. This Decree creates a basis for increasing the practical training of young specialists through the widespread introduction of a dual education system.

The educational reforms being implemented under the leadership of the President of the Republic of Uzbekistan Shavkat Mirziyoyev define the modernization of the national education system as a single state policy. In particular, in accordance with the Decree No. PF-158 dated

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October 16, 2024 “On measures to further improve the system of training qualified personnel in vocational education and introduce international educational programs”[2], a wide range of measures were approved to train qualified personnel in the vocational education system and introduce international educational programs, which provides for a radical improvement in vocational education and training of highly qualified personnel. The Decree creates the basis for deepening education-production integration in the country, including the widespread introduction of dual forms of education into practice.

Also, the Resolution of the President of the Republic of Uzbekistan No. PQ-4884 dated November 6, 2020 “On measures to further improve the vocational education system”[3] pays special attention to the introduction of dual education elements in vocational education and strengthening cooperation between educational institutions and industrial enterprises. This resolution scientifically and organizationally substantiates the need to train future technological education teachers in connection with the real production environment.

Reforms in this direction are also reflected in the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 287 dated March 29, 2021 “Regulations on the Procedure for Organizing Dual Education”[4], which defines the content, forms, and implementation mechanisms of dual education. These regulatory legal documents create a solid legal basis for the implementation of dual education in the system of training pedagogical personnel.

In this regard, the scientific study of the innovative potential of dual education, the development of pedagogical models and effective mechanisms for the development of professional competencies of future teachers of technological education, is emerging as an urgent scientific and pedagogical problem. This study is aimed at solving this problem, and aims to scientifically substantiate the ways of developing professional competencies of future teachers of technological education on the basis of dual education.

LITERATURE ANALYSIS AND REVIEWS

Scientists of our republic Kenjabayev A.E. and Kenjaboyeva D.A., studying the theoretical and practical aspects of pedagogical competence, emphasize the importance of combining theoretical knowledge with practice in improving the professional training of a teacher. In their opinion, competence plays an important role in the development of a teacher's individual pedagogical skills. They also emphasize that "the use of innovative methods in the formation of competence includes scientific recommendations for improving the professional competence of a teacher through interactive pedagogical approaches" [5].

Muslimov N.A. “shows the impact of the dual education system on pedagogical education and emphasizes the need to use practice-based methods in the development of professional competencies”[6]. Also, ideas are presented about the importance of training teachers through the integration of practical skills and theoretical knowledge. Baymurova N.R. analyzes methodological aspects of developing professional competencies of students and teachers through the use of the dual education system. She emphasizes that “the dual education system introduces teachers not only to theoretical, but also to practical skills, which helps in adapting to the labor market”[7]. In her opinion, the integration of innovative methods and educational technologies, as well as practical training, is one of the most important factors in the formation of teacher competencies. Khojiev U.T. and Khojikarimova G.T. argue that “professional competencies can be developed through the use of constructive pedagogical methods, interactive approaches, and educational technologies”[8]. According to their approaches, innovative methods and practical training play an important role in the formation of pedagogical competence.

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Among the CIS scientists, Kuzmicheva A.P. conducts scientific research on the formation of the concept of pedagogical competence and the development of professional training of teachers. She notes that "the need to integrate the theoretical and practical aspects of competence, as well as how educational methods can be used to develop the social and personal aspects of competence, is of particular importance"[9].

Raven J.'s work analyzes the role of competence in society and its role in the pedagogical system. He studies "the importance of pedagogical competence in adapting to social, economic and cultural changes in society"[10]. The work shows the importance of innovative pedagogical approaches in the formation of a teacher's professional competence. Grozdanov V.P. considers the formation of pedagogical competences and the introduction of innovative methods into the educational process. He especially emphasizes the importance of "the use of educational technologies and new methods that contribute to the development of competence"[11].

Foreign scientists Shulman L.S. studies the formation of competence in the education system and the effectiveness of teaching methods. He emphasizes that "pedagogical competence is not limited only to knowledge, but also to the teacher's contribution to the educational process and practical skills"[12]. Darling-Hammond L. pays special attention to the development of competence in teacher training. He "shows the need to improve professional competencies in the process of teacher training and use innovative methods in education"[13]. The work also contains a scientific analysis of the development of pedagogical approaches and the role of teachers in the educational process.

Fullan M.'s work examines the main principles of changes in education and the process of forming competencies. He emphasizes "the importance of developing teachers' professional competencies through innovations and innovative approaches in the education system"[14]. Anderson and Krathwohl's textbooks "provide methodological foundations for using Bloom's taxonomy in the formation of teachers' pedagogical competencies"[15]. They recommend that teachers effectively apply their knowledge not only theoretically, but also in practice.

RESULTS AND DISCUSSIONS

The results of the study showed that the dual education model provides the following key innovative opportunities in developing the professional competencies of future technology education teachers: Professional competencies, innovative and creative competencies, and industrial and academic integration.

Professional competencies - through dual education, teachers master pedagogical and technological integration, that is, they have the opportunity to combine theoretical knowledge with practical experience. This process significantly improves their skills in organizing the educational process, implementing innovative methods, and solving problems.

Innovative and creative competencies - students and teachers develop the ability to work on projects and think creatively. In a dual education environment, teachers are prepared to use technological innovations in their pedagogical work and increase practical expertise.

Industry and academic integration - cooperation with industrial enterprises increases teachers' adaptability to real-world work processes and their ability to solve problems through a contextual approach. Dual education ensures a combination of practical experience and theoretical knowledge, which forms teachers as technological and pedagogical specialists.

The results of the study show that dual education is a strategic tool for the professional and innovative development of technology education teachers.

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Professional flexibility and practical integration - dual education allows teachers to solve real-world problems in industrial settings and enrich the educational process with innovative methods. This process strengthens competencies through the combination of conceptual and practical knowledge.

Encouraging innovative activities - dual education enhances teachers' project-based approach and creative thinking skills. Through pedagogical innovation, they play a leading role in teaching students modern technologies.

Industry-academia integration - research shows that combining industry and academic experiences increases teachers' practical expertise, as well as expands opportunities for career and professional development.

Dual education is scientifically proven to be an effective tool for developing professional and innovative competencies of technology education teachers. This model allows teachers to apply theoretical knowledge in practice, introduce innovative methods, and seamlessly integrate with industry, as a result of which they are ready to effectively manage and develop modern technological education processes.

Conclusion. In conclusion, it can be said that the dual education model is one of the most effective approaches to developing professional and innovative competencies for future teachers in the field of technological education. This model combines academic knowledge with industrial practice, allowing students and teachers to integrate theoretical and practical knowledge.

Through dual education, teachers develop their professional competencies, namely the ability to organize the educational process, manage technological processes and solve problems. By increasing their innovative and creative competencies, they become ready to introduce new methods and technologies in pedagogical activities. Through industrial and academic integration, they gain experience in real work conditions, expand their practical expertise and adapt to the requirements of modern education. The results of the study also showed that dual education significantly contributes to stimulating pedagogical innovations, strengthening competencies through practical projects and a mentoring system, and developing teachers' professional flexibility and creative activity. Dual education is an effective means of forming teachers in the field of technological education as specialists with modern, innovative and practical competencies. This provides an opportunity not only for their professional development, but also to improve the quality of education and contribute to technological progress.

REFERENCES USED

1. O‘zbekiston Respublikasi Prezidentining 2022-yil 28-yanvardagi “2022–2026-yillarga mo‘ljallangan Yangi O‘zbekistonning taraqqiyot strategiyasi to‘g‘risida”gi PF-60-sonli Farmoni https://lex.uz

2. O‘zbekiston Respublikasi Prezidentining 2024-yil 16-oktyabrda “Kasbiy ta’limda malakali kadrlar tayyorlash tizimini yanada takomillashtirish va xalqaro ta’lim dasturlarini joriy qilish chora-tadbirlari to‘g‘risida”gi PF-158-sonli Farmoni https://lex.uz

3. O‘zbekiston Respublikasi Prezidentining 2020-yil 6-noyabrdagi “Kasbiy ta’lim tizimini yanada takomillashtirish chora-tadbirlari to‘g‘risida”gi PQ-4884-sonli Qarori https://lex.uz

4. O‘zbekiston Respublikasi Vazirlar Mahkamasining 2021-yil 29-martdagi “Dual ta’limni tashkil etish tartibi to‘g‘risidagi nizom”da 287-sonli qarori https://lex.uz

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Journal: https://www.academicpublishers.org/journals/index.php/ijai

5. Kenjabayev A.E., Kenjaboyeva D.A. Pedagogik deontologiya va kompetentlik. Darslik.Termiz, 2021, 45-sahifa.

6. Muslimov N.A. Kasb ta'limi o'qituvchilarini kasbiy shakllantirish. Darslik.Toshkent: Fan, 2004, 127-sahifa.

7. Baymurova N.R. Dual ta'lim tizimi asosida kasbiy kompetensiyalarni rivojlantirish. Darslik. Toshkent, 2021, 115-sahifa.

8. Xojiev U.T., Xojikarimova G.T. Kasbiy ta'lim tizimida innovatsion pedagogik metodlar. Darslik. Toshkent, 2022, 92-sahifa.

9.Кузьмичева А.П. Педагогическая компетентность и ее формирование. Учебник. Москва, 2018, стр. 98.

10. Рэйвен Дж. – Компетентность в современном обществе: Выявление, развитие и реализация. Москва, 2002, стр. 39.

11. Грозданов В.П. – Формирование педагогической компетентности. Минск, 2016, стр. 112.

12. Shulman L.S. – Those Who Understand: Knowledge Growth in Teaching. Educational Researcher, 1986, page 6.

13. Darling-Hammond L. – Preparing Teachers for a Changing World. San Francisco, 2006, page 234.

14. Fullan M. – The New Meaning of Educational Change. New York, 2007, page 193.

15. Anderson LW, Krathwohl DR. – A Taxonomy for Learning, Teaching, and Assessing. New York, 2001, page 164.

16. o'g'li, T. U. F. . (2023). The Regularity and Consistency of Monitoring and Accounting For the Components of Pedagogical Skills in the Process of the Teacher's Work. Procedia of Philosophical and Pedagogical Sciences, 2(5), 34–37. Retrieved from https://procediaonline.org/index.php/philosophy/article/view/648

17. Tokhirovna, A. D., & Qosimjonovna, M. M. (2026). DEVELOPING LEADERSHIP IN STUDENTS THROUGH PROBLEMATIC SITUATIONS AND DECISION-MAKING SKILLS. Eureka Journal of Language, Culture & Social Change, 2(1), 15-19.

18. DEVELOPING LEADERSHIP IN STUDENTS THROUGH PROBLEMATIC SITUATIONS AND DECISION-MAKING SKILLS. (2026). *Eureka Journal of Language, Culture & Social Change*, *2*(1), 15-19. https://eurekaoa.com/index.php/3/article/view/171

19. Anvarovna, A. J. S. (2024). OLIY TA'LIM CHET TILI O'QITUVCHILARINING SOTSIAL-EMOTSIONAL KOMPETENTLIGINI SHAKLLANTIRISHDAGI NAZARIY TAHLIL. *ZAMONAVIY TA'LIMDA FAN VA INNOVATSION TADQIQOTLAR JURNALI*, *2*(20), 150-158.

20. Anvarovna, A. J. S., & Komiljonovna, K. D. (2025). INKLUZIV TA'LIMDA SUN'IY INTELLEKT VA VIRTUAL REALLIK TEXNOLOGIYALARIDAN FOYDALANISH. *Research Focus*, *4*(Special Issue 2), 107-112.

21. Anvarovna, A. S. (2025). Pedagogical and Psychological Factors Determining the Effectiveness of the Social-Emotional Competence of a Foreign Language Teacher in Higher Education. *American Journal of Open University Education*, *2*(9), 54-59.