



PROFESSIONAL AND PEDAGOGICAL TRAINING OF FUTURE TECHNOLOGY AND LABOR EDUCATION TEACHERS

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Abstract

This article explores the professional and pedagogical training of future teachers specializing in technology and labor education within the context of higher pedagogical institutions in Uzbekistan. It emphasizes the importance of integrating theoretical knowledge with practical competencies to prepare future educators capable of addressing contemporary educational and technological challenges. The study analyzes the current state of teacher training programs, highlights gaps between curriculum content and labor market requirements, and suggests innovative strategies for enhancing professional preparedness. By examining national standards, pedagogical frameworks, and international best practices, the article provides a comprehensive perspective on the development of professional and pedagogical competencies among students pursuing careers in technology and labor education.

Keywords: Professional training, pedagogical competencies, teacher education, labor education, technology teaching, vocational skills, higher pedagogical education, curriculum development, educational innovation.

Introduction

The professional and pedagogical training of future teachers of technology and labor education has gained significant relevance in light of the rapid transformation of educational systems and the increasing demand for skilled labor. In Uzbekistan, where reforms in vocational and technical education are actively progressing, the preparation of competent educators capable of teaching both theoretical foundations and practical skills is a priority. Technology and labor education play a critical role in shaping students' work culture, technical literacy, and entrepreneurial thinking. Thus, the effectiveness of such education largely depends on the preparedness of the teaching staff.



Traditionally, teacher training in this field has focused on craftsmanship and manual skills, but the emergence of digital technologies, automation, and interdisciplinary educational models demands a shift towards integrated pedagogical frameworks. Today's teacher of technology and labor is expected not only to demonstrate proficiency in practical tasks but also to be capable of designing project-based learning environments, applying digital tools, and fostering 21st-century skills in students.

In this regard, pedagogical universities are tasked with developing curricula that cultivate both subject-specific knowledge and teaching competencies. These include lesson planning, classroom management, educational psychology, curriculum adaptation, and the use of assessment techniques tailored to skill-based instruction. Additionally, the integration of research-based learning and pedagogical innovations remains essential in aligning teacher training with modern educational demands. This article seeks to examine the structure and effectiveness of professional-pedagogical preparation programs in Uzbekistan, highlighting their strengths, weaknesses, and prospects for development in light of international standards.

Literature Review

The topic of professional and pedagogical training for future teachers of technology and labor education has been addressed in various national and international studies. Scholars emphasize that teacher competence in this domain is multidimensional, combining technical expertise, pedagogical skills, and psychological readiness. According to Shulman's theory of pedagogical content knowledge, effective teaching in technical disciplines requires not only mastery of subject matter but also the ability to present it in pedagogically sound ways.

In the context of vocational and technical education, researchers such as Pavlova (2009) and Rauner (2017) have highlighted the need for a holistic approach that includes practical workshops, simulation-based learning, and student-centered pedagogies. Several studies also underscore the importance of aligning teacher training programs with industry standards to ensure relevance and responsiveness to labor market needs.

In Uzbekistan, existing research by local educators points to the ongoing reforms in higher education aimed at strengthening practice-oriented training and



introducing modular curricula in pedagogical universities. However, studies also reveal challenges such as outdated teaching materials, limited digital infrastructure, and insufficient opportunities for hands-on practice. Overall, the literature suggests that there is a growing recognition of the need to modernize teacher education in the field of technology and labor, but practical implementation often lags behind strategic intentions.

Methodology

This study employs a qualitative research methodology based on a combination of document analysis, expert interviews, and institutional case studies. The primary focus is placed on pedagogical universities in Uzbekistan that offer teacher training programs in the field of technology and labor education. Curriculum documents, national education standards, and university-level syllabi were analyzed to identify the core components and objectives of current training models.

Additionally, semi-structured interviews were conducted with university faculty members, teacher trainers, and educational administrators to gain insights into the implementation of training strategies, instructional challenges, and institutional support mechanisms. These interviews provided valuable contextual understanding of the teaching environment and revealed practical limitations that future teachers face in acquiring professional and pedagogical skills.

Moreover, case studies of three selected higher education institutions were conducted to compare how different universities approach professional preparation. These cases were examined for variations in teaching methodology, integration of practical work, use of digital tools, and the presence of school-based internships or partnerships. The data collected were analyzed using thematic coding and comparative analysis techniques to extract patterns and best practices. The chosen methodological approach allows for an in-depth understanding of the strengths and weaknesses of the current training system, while also offering recommendations for its future enhancement.

Discussion

The findings of the study reveal that while there is a formal framework for professional and pedagogical training of future teachers of technology and labor education in Uzbekistan, significant gaps remain in its implementation. One of the



most noticeable challenges is the disconnect between theoretical instruction and practical application. Many universities continue to rely on outdated teaching methods, where lectures dominate over workshops and project-based learning. As a result, students often graduate with limited experience in managing real-world classroom scenarios or applying modern educational technologies.

Another critical issue is the lack of adequate facilities and equipment for hands-on training. Laboratories and workshops in several pedagogical institutions are insufficiently equipped to meet the demands of current technological advancements. This restricts students from gaining the necessary competencies in emerging areas such as robotics, computer-aided design (CAD), or digital fabrication. Moreover, instructors themselves sometimes lack training in new methodologies, which limits their ability to effectively prepare future educators.

Despite these limitations, there are also promising developments. Some institutions have begun to pilot blended learning models that combine theoretical instruction with digital simulations and school-based practice. The involvement of partner schools in training programs allows students to observe experienced teachers, conduct micro-teaching sessions, and receive feedback in authentic classroom settings. These practices contribute to the development of classroom management skills, adaptability, and pedagogical creativity.

Furthermore, professional standards in Uzbekistan are gradually being updated to reflect international trends in vocational education. This includes the incorporation of soft skills such as collaboration, leadership, and innovation into teacher training curricula. Collaboration with foreign universities and participation in international educational projects are also helping to transfer best practices into the local context. The discussion suggests that while reform efforts are underway, a more integrated and innovation-driven approach is needed to ensure the professional readiness of future technology and labor teachers. This involves not only updating curriculum content but also rethinking teacher roles, introducing competency-based assessments, and providing continuous professional development opportunities for teacher educators.

Main Part

The professional and pedagogical preparation of future teachers in technology and labor education involves the development of a complex set of competencies that



encompass technical proficiency, didactic strategies, communication skills, and a deep understanding of educational psychology. In Uzbekistan's pedagogical universities, this preparation is structured through a combination of academic coursework, methodological training, and practical experiences, aiming to create well-rounded professionals ready for the demands of modern classrooms.

One of the fundamental components of the training program is subject-specific knowledge in areas such as materials processing, mechanical operations, woodworking, technical drawing, and computer technologies. However, this technical foundation must be harmonized with courses on pedagogy, curriculum design, child development, and educational psychology to form a holistic professional identity. Pedagogical training often includes modules on instructional methods, inclusive education, classroom management, and reflective teaching practices, all of which are critical for the effective transfer of knowledge and skills. Practical training is a vital element in the curriculum. Students are expected to complete laboratory-based coursework and participate in field practice at general education schools. These internships provide a valuable platform for applying theoretical concepts in real educational environments, engaging with diverse student needs, and receiving mentorship from experienced teachers. The practical phase also includes micro-teaching sessions and lesson planning exercises, which help students refine their instructional approaches and learn to evaluate their own teaching critically.

Despite these efforts, the system faces several persistent challenges. Many programs suffer from an overload of theoretical subjects with limited time allocated for field-based learning. There is also a shortage of up-to-date teaching resources and technical equipment in workshops, which negatively affects the quality of student preparation. Furthermore, the transition to digital education has been uneven, with only a few institutions fully integrating ICT tools into the teaching and learning process.

To improve the quality of professional-pedagogical training, universities need to invest in modernizing infrastructure, enhancing collaboration with industry and schools, and encouraging the use of active learning strategies such as problem-based learning and design thinking. Equally important is the need for faculty development programs that help teacher educators stay updated on pedagogical innovations and technological trends.



The cultivation of a reflective teaching mindset is also crucial. Students should be encouraged to engage in research projects, peer discussions, and self-assessment to build professional autonomy and a commitment to lifelong learning. By embedding these elements into the structure of teacher education, pedagogical institutions can better prepare graduates who are competent, innovative, and capable of responding to the evolving needs of technology and labor education.

Conclusion

The professional and pedagogical training of future teachers of technology and labor education in Uzbekistan represents a critical area for educational development, particularly in the context of national modernization efforts and global trends in vocational learning. While the current system includes essential elements such as theoretical instruction, pedagogical coursework, and school-based practice, the quality and integration of these components remain inconsistent. Many universities still operate within outdated paradigms that fail to fully equip graduates with the skills required for modern, dynamic classroom environments.

To bridge the gap between policy and practice, it is necessary to promote a more practice-oriented, competency-based, and innovation-driven approach to teacher training. This includes upgrading laboratory facilities, expanding access to digital tools, fostering partnerships with schools and industries, and continuously updating curricula to reflect both local needs and international standards.

Furthermore, the development of reflective, research-minded educators who are committed to professional growth and pedagogical excellence should be a strategic focus of pedagogical institutions. Supporting teacher educators through professional development and encouraging experimentation with active learning strategies will also strengthen the overall system.

Ultimately, the success of technology and labor education in schools depends largely on the preparedness of teachers who can inspire students, nurture practical skills, and contribute to the formation of a skilled, creative, and adaptable workforce. Strengthening the professional-pedagogical preparation of future teachers is therefore not only a matter of educational quality but also a strategic investment in the country's socio-economic development.



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