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Formation of students' construction competence in the field of hydraulic engineering

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Abstract---The article deals with the formation of professional competence in the types of professional activities of future bachelors in the field of training - direction of construction of hydraulic structures. Training of qualified, competent and competitive specialists in the construction industry is an urgent task of higher education systems, due to the introduction of the State educational standard of higher education and the Professional standard in the urban planning area, aimed at the formation of professional competencies for bachelors of construction profile, contributing to the productivity of professional activities of graduates. We present professional competencies that correspond to the types of professional activities that the developed bachelor's program "Hydraulic engineering structures in the use of pumping stations" is aimed at forming within the framework of the educational process. The

introduction of programs is due to the fact that bachelors of construction profile, having sufficient theoretical knowledge, are not sufficiently prepared to solve professional problems in the field of urban planning in the context of the introduction of new construction technologies and structural materials.

Keywords---professional activity, professional competence, professional standart, construction technologies, professional education.

Introduction

The emergence and introduction of new construction technologies, machinery and construction materials in the field of urban planning. the use and use of which in production activities is limited as noted by experts in the construction industry, the insufficient level of modern professional training of future engineers-teachers, including bachelors in the field of training "Professional education" - direction of construction of hydraulic structures (Ivanenko, Petrov, 2016; Odarich,2015; Azhaman,2014).

According to the modern construction industry. having a high versatility due to the internal multiplicity of different specialties (betonshiki. kamenshiki. installers, etc.). highly qualified specialists are required. capable of independent inclusion in complex production processes and in the practical plane quickly and adequately solve the professional tasks that arise in front of them. that requires the appropriate training of future bachelors of construction profile not so much on knowledge, but on the basis of competence, as the most consistent with the requirements of the state educational standard of higher education (GOS in) in the direction of training "Professional education" - direction of construction of hydraulic structures. Professional standard in the field of "Professional education"and the modern labor market in the urban area. In these conditions, the transition to a competency-based system for training future bachelors in construction. within the framework of professional training, it requires an appropriate update of the content of the educational process (Putilova,2013; Pecina,2014).

Therefore, training of highly qualified, competent and competitive specialists in the construction industry. meeting the modern requirements of the labor market is an urgent task of the higher education system. due to the introduction of the State educational Standard of higher education and the Professional standard in the urban planning area, aimed at. within the framework of the competence approach, the formation of various competencies for bachelors of construction profile. I contribute to their successful adaptation in the production sphere. the use of new technologies and increase the productivity of professional activities of graduates.

Materials and Methods

Unfortunately, as the current practice shows, bachelors in construction, having sufficient theoretical knowledge, they are not sufficiently prepared to solve professional problems in the field of urban construction in the context of the introduction of new construction technologies and structural materials. Understanding of the current training of future bachelors of construction profile for the implementation of professional activities in the conditions of innovative changes in the urban planning area testifies, that this direction belongs to an actual problem in the development of the theory and methodology of professional education. The research carried out in recent years considers the development of analytical abilities as the basis of organizational and managerial skills of future engineers-teachers (Kosenkova, 2010). The formation of professionalism competence of students of construction College (Bareeva, 2011) and students in the course practice based learning (Petrova, 2010) improving the efficiency and quality of educational services for the enterprises of investment-building complex (Prihodko, 2012) ensuring the readiness of future builders for independent educational cognitive activity in the process of professional training, the use of competence-oriented situations as factors of self-realization of future bachelors in the specialty "Professional education" - direction of construction of hydraulic structures (Elizarova, 2013; Karabaevna, & Raximovich, 2019), etc.

The study of the conducted research on the problem under study has shown that the formation of professional competencies for future engineers-teachers (Kosenkova, 2010; Elizarova, 2013) in the higher education system is considered taking into account the specialty, while their formation within the framework of the bachelor's degree in the direction of "Professional education" has not yet been the subject of targeted pedagogical consideration. At the same time, a theoretical analysis of the scientific and pedagogical literature on the training of civil engineers allowed us to identify a number of shortcomings that limit the formation of professional competencies for future bachelors of construction profile:

- in the context of the implementation of the competence approach in the implementation of two-level professional training of construction specialists, the mechanism of practice-oriented formation of professional competencies for future bachelors in the field of Professional education "concerning reinforced concrete and stone structures" has not been fully worked out;
- the need to correlate the Professional standard of the organizer of construction production with the state educational standard of higher education (STATE educational institution) in the direction of training "Professional education" - direction of construction of hydraulic structures in ensuring continuity and interrelation of the theory and practice of training bachelors of construction profile on the formation of professional competencies;
- limited application of modern educational technologies and methods for the formation of professional competence in the theory and practice of studying new technologies and construction materials in the current professional training of future engineers. The analysis of problems of formation of professional competences of future bachelors in the field of training "

Professional education" - direction of construction of hydraulic structures within the competence approach allowed to reveal a number of contradictions between (Karabaevna, Riskulova, Ubaydullaevich, Turaevna, & Ravshanovna, 2020; Ismailova, & Ergashev, 2019).

- social order for the training of future engineers-teachers with formed professional competencies, in accordance with the Federal state educational standard of higher education (STATE education) in the direction of training "Professional education" - direction of construction of hydraulic structures and the lack of practice-oriented support for the educational process in the conditions of the emergence of new construction technologies and construction materials in the field of urban construction;
- the need to develop:
 - a) professional competencies of future engineers-teachers in accordance with the state educational SYSTEM in the field of training "Professional education" and direction of construction of hydraulic structures.
 - b) obobshennyh labor functions according to the functional map of the type of professional activity of the Professional standard of the organizer of construction production;
- the objective need to improve the content and technological support of the process of forming professional competencies for future bachelors of construction profile and the insufficient level of scientific and methodological support for their training based on the use of modern educational technologies and methods in the study of new urban planning technologies and construction materials.

Results and Discussions

In accordance with the state educational standard of higher education in the field of "Professional education " - direction of construction of hydraulic structures (bachelor's level), a graduate who has mastered the bachelor's program must have professional competencies that correspond to the type (types) of professional activity that the bachelor's program is focused on:

A. in the field of research and design activities (IIPC):

- knowledge of the regulatory framework in the field of engineering, building design principles, structures, engineering systems and equipment, planning and development of populated areas;
- possession of methods of engineering research, technology for designing parts and structures in accordance with the technical task with the use of universal and specialized software and computer-aided design systems;
- ability to conduct a preliminary feasibility study of design solutions, develop design and working technical documentation, execute completed design and development work, monitor compliance of developed projects and technical documentation with the task, standards, technical conditions and other regulatory documents (Ismailova, 2019; Ismailova, 2008; Karabaevna, Riskulova, Ubaydullaevich, Turaevna, & Ravshanovna, 2020)

B. in the field of production technology and production management (PType):

- the ability to participate in the design and development of objects of professional activity; - knowledge of the requirements of labor protection,

life safety and protection of the environment when performing construction, repair and reconstruction of construction objects;

- the ability to dehumidify and organize the technical operation of buildings, structures of housing and communal services, to ensure the reliability, safety and efficiency of their work;
 - the ability to analyze the technical and economic efficiency of the production unit and develop measures to improve it;
 - possession of technology, methods of finishing and mastering technological processes of construction production, operation, maintenance of buildings, structures, engineering systems, production of building materials, products and structures, machines and equipment;
 - ability to prepare documentation on quality management and standard methods of quality control of technological processes at production sites, organization of workplaces, ability to implement technical equipment, mixing and maintenance of technological equipment, to implement control of compliance with technological discipline, labor protection and environmental safety requirements;
 - knowledge of the organizational and legal bases of management and business activities in the field of construction and housing and communal services, the basics of planning the work of personnel and payroll funds;
 - knowledge of methods for implementing innovative ideas, organizing production and effectively managing the work of people, preparing documentation for creating a quality management system for the production unit;
 - ability to develop operational work plans for primary production units, analyze costs and results of production activities, prepare technical documentation, as well as established reporting on approved forms; in the field of experimental research (EI):
 - knowledge of scientific and technical information, domestic and foreign experience in the field of activity;
 - knowledge of methods and means of physical and mathematical (computer) modeling, including using universal and specialized software and computing systems, automated design systems, standard research automation packages, knowledge of methods of testing construction structures and products, methods of setting and conducting experiments on specified methods;
 - ability to make a report on completed works, participate in the implementation of research results and practical developments;
- C. D) in the field of installation and commissioning and service and maintenance activities (Mnisi):
- knowledge of the rules and technology of installation, commissioning, testing and commissioning of structures, engineering systems and equipment of construction facilities, housing and communal services, rules for acceptance of samples of products manufactured by the company;
 - possession of methods of opt verification of equipment and means of technological support;
 - possession of methods for monitoring and evaluating the technical condition and residual resource of construction facilities and housing and communal services, construction and housing and communal services;

- ability to organize preventive inspection, repair, acceptance and development of the entered equipment, make requests for equipment and spare parts, prepare technical documentation and instructions for operation and repair of equipment, engineering systems;
 - the ability to implement the organization and planning of technical operation of buildings and structures, housing and communal services in order to ensure the reliability, efficiency and safety of their operation;
- D. in the field of business activity (PD):
- knowledge of the basics of pricing and estimated rationing in construction and housing and communal services, the ability to develop measures to reduce the technical and economic efficiency of construction organizations and organizations of housing and communal services; - ability to develop measures to reduce the investment attractiveness of construction projects and housing and communal services (Ismailova, 2019; Ismailova, 2008)

Conclusion

Analysis of the normative documentation for the requirements of bachelor's training in the field direction of construction of hydraulic structures for the formation of professional competencies by type of professional activity (research and design (Iipk), production and technological and production management (Ptipu), experimentally- research (EI), installation and commissioning, service and maintenance (MIS), business (PD), the study of scientific, pedagogical and methodological literature on the manifestation of pedagogical conditions, the design of structural and functional models, the definition of the content of training and the development of a technological approach in the educational process for the course "Hydraulic structures in the use of pumping stations" future engineers-teachers allowed in practical terms, within the educational process, to ensure their formation. - ability to develop measures to reduce the investment attractiveness of construction projects and housing and communal services (Ismailova, & Ergashev, 2019; Karabaevna, & Raximovich, 2019)

References

- Ivanenko L.V., Petrov S.M. (2016). Cluster organization as an innovative approach to small and medium-sized Baltic humanitarian journal. T 5. No. 2 (15) to the construction business // Bulletin of the Volga State University of Service. Series: Economics. 2014. No. 4 (36). 97 P.-102.
- Odarich I.N. (2015). The effectiveness of teaching technology for the formation of professional competencies among undergraduate students in the direction 270800 construction // Azimuth of scientific research: pedagogy and psychology. No. 4 (13). P.p. 81-85.
- Azhaman I.A. (2014). Marketing support for the development of construction in rural areas // Azimuth of scientific research: economics and management.. No. 2. P.p. 5-8.
- Federal State Educational Standard of Higher Education (FSSES of HE) in the direction of training 08.03.01 Construction (undergraduate level), approved by order of the Ministry of Education and Science of the Russian Federation of March 12, 2015 No. 201p.

- Professional standard. Organizer of construction production / Approved by order of the Ministry of Labor and Social to sew up the Russian Federation of November 21, 2014 No. 930n.
- Putilova A.V. (2013). Competence approach in the design of the educational process as a mechanism to improve the quality of education // *Azimuth of scientific research: pedagogy and psychology*. No. 4. P.p. 53-56.
- Androsova L.A., Manannikova Yu.V. (2013). The competency-based approach in the system of higher professional education // *XXI century: results of the past and the problems of the present plus*. No. 7 (11). P.p. 46-51.
- Voronin V.N., Korostelev A.A. (2008). A systematic approach to managing the quality of training for future specialists // *Bulletin of the Samara Scientific Center of the Russian Academy of Sciences*. No. 810. P. 25-32.
- Sysoeva Yu. (2015). Competency-based approach in the formation of foreign competence among students of non-viscous universities in the conditions of the third-generation federal state educational standards // *Karelian Scientific Journal*. No 3 (12). P.p. 36-40.
- Zubkov A.F., Ponomareva N.V., Zakharova T.V. (2014). The role and importance of the professional competencies of a specialist with higher education in his successful professional activity // *XXI Century: the results of the past and the problems of the present plus*. No. 4. P.p. 127-132.
- Korostelev A.A., Pchelnikov A.A., Yargin A.N. (2006). Modeling of an innovation-oriented educational research environment that ensures the quality of formation of innovative readiness of future specialists // *Bulletin of the Samara Scientific Center of the Russian Academy of Sciences*. No. 82-2. Pp. 44-47.
- Pecina I.A. A modern approach to the definition of the term "professional competence" in psychological and pedagogical research // *Volga Pedagogical Bulletin*. 2014. No. 3 (4). – 95 p.
- Kosenkova, I.V. (2010). The development of analytical abilities as the basis of organizational and managerial skills of future civil engineers: an example of the study of mathematical disciplines at a university: diss. ... cand. ped sciences / I.V. Kosenkova - Tambov-- 192 p.
- Bareeva E.A. (2011). Formation of professional competencies of students of a construction college: Diss. ... cand. ped sciences / E.R. Bareeva - Saratov, -- 177 p.
- Petrova I.V. (2010). The formation of professional competencies among university students in the course of practice-oriented training: on the example of construction specialties: abstract of thesis. ... cand. ped sciences / Petrova I.V. - Ulyanovsk, – 255p.
- Prikhodko A.N. (2012). Improving the efficiency and quality of educational services for enterprises of the investment and construction complex: abstract of thesis. ... cand. economy Sciences: 08.00.05 / A.N. Prikhodko - St. Petersburg, -- 154 p.
- Elizarova V.A. Formation of readiness of future builders for independent educational-cognitive -175 pp
- Preparations: the dissertation ... of the candidate of pedagogical sciences: 13.00.08 / V.A. Elizarova - Kazan. 2013.- 195 p.
- Rahimov O.N. (2015). Competence-oriented situation as a factor in the self-realization of future bachelors in the direction of preparation "Construction": the dissertation ... cand. ped sciences / O.N. Rakhimova - Orenburg. - 236 p.

- Ismailova Z. (2019) et al. The use of innovation technologies in the formation of students' professional competences. *International journal of engineering and advanced technology (tm)* Volume-9 Issue-1. October. 1175 p.
- Ismailova Z. (2008). Pedagogy. -T., Moliya, -153 p.
- Karabaevna, I. Z., Riskulova, K., Ubaydullaevich, A. M., Turaevna, I. Y., & Ravshanovna, P. N. **(2020)**. The role of electronic pedagogical tools in higher education. *Journal of Critical Reviews*. Innovare Academics Sciences Pvt. Ltd. <https://doi.org/10.31838/jcr.07.05.80>
- Ismailova, Z., & Ergashev, B. **(2019)**. New information and communication technologies in education system. In *E3S Web of Conferences* (Vol.135).EDP Sciences. <https://doi.org/10.1051/e3sconf/201913504077>
- Karabaevna, Z., & Raximovich, B. **(2019)**. The use of innovation technologies in the formation of students' professional competences. *International Journal of Engineering and Advanced Technology*, 9(1), 6898–6902. <https://doi.org/10.35940/ijeat.A2996.109119>
- Karabaevna, Z., Musurmanova, A., & Xamroevich, R. **(2019)**. Improving the competence of future vocational education teachers based on modular-rating education. *International Journal of Engineering and Advanced Technology*, 9(1), 6903–6906. <https://doi.org/10.35940/ijeat.A2997.109119>
- Khasanov B, Vatin N, Z Ismailova and T Mirzaev. Physical modification of concrete mix and concrete. IOP Conference Series: Materials Science and Engineering, Volume 883, International Scientific Conference Construction Mechanics, Hydraulics and Water Resources Engineering (CONMECHYDRO – 2020) 23-25 April 2020,