

## PROFESSIONAL TRAINING OF APPLICANTS FOR HIGHER EDUCATION IN UKRAINE IN TERMS OF DIGITALIZATION



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**Abstract.** The article is devoted to the problem of professional training of sea and river transport future managers in the conditions of digitalization of education. It is proved that the use of digital technology Digital Twin (DT) in the training of managers of sea and river transport will significantly improve the quality of their practical and theoretical training. It is established that DT includes such powerful components as large data about the object under study, in particular: geometric and structural model, a set of data calculated, mathematical models that describe all physical processes, information about the technological processes of the object, a product life cycle management system and artificial intelligence are also an important component.

It is determined that the use of the eduScrum method helps to improve the quality of sea and river transport future managers professional training in higher education. It is specified that eduScrum is a framework within which teachers and students learn to solve complex practice-oriented tasks of high complexity and strive to achieve the most meaningful educational goals.

**Keywords:** *manager, competence, digitalization of education, professional training, Digital Twin technology, eduScrum method.*

### **Introduction**

Digitization is possible in case when all spheres of society are digitized. According to the UNO, the introduction of digital technologies in the world is faster than the adaptation of any other innovation in human history. Just in two decades, digital technologies have managed to reach about 50% of the population of developing countries and transform the societies of these countries through digital technologies.

Taking into account the fact that the main component and driving force of the digital economy are the knowledge, skills, abilities and experience of people, the "digitalization of education" is one of the main trends in the labor market. Unfortunately, the realities of today, which could not but be affected by the coronavirus pandemic, show that in the field of education the outdated teaching methods are mostly used, the vast majority of teachers do not have sufficient digital competencies, and the material and technical base of higher education institutions does not allow to embody digital transformations fully. The key solution in the digitalization of education, according to the Digital Agenda of Ukraine 2020 (Digital Agenda of Ukraine, 2020), is a combined strategy, which includes long-term measures and scale inherent in the state education system, and short-term rapid measures that are more relevant for implementation in the segment of commercial education. The authors of the project could not know about the coronavirus epidemic of 2020 that not only accelerated the pace of digitalization of education, but caused the so-called digital leap. The lockdown introduced in March 2020 testified to the unwillingness of Ukrainian secondary schools, vocational schools and higher education institutions to work remotely, except in isolated cases.

This focused on the analysis of scientific achievements in the field of training future managers in the field of sea and river transport, to identify the benefits of applying the eduScrum methodology in their practical training in the context of digitalization of education.

**Literature review.** Various aspects of training managers are widely covered in modern research. They cover the study of criterion characteristics that allow modeling the structure of professional competence of the future manager (N. Bakhmat (Bakhmat, 2020), T. Burlaenko (Dubinina, Burlaenko, Dobrovolskyi, 2020), O. Vykhansky, G. Dmitrenko, O. Dubinina (Dubinina, Burlaenko, Dobrovolskyi, 2020), A. Zhilina, A. Kazachinsky, L. Korneeva, V. Lyubarets (Liubarets, 2019), V. Shepel and others).

Important research in the theory of e-learning, globalization and informatization and the use of ICT in educational activities was carried out by Ukrainian scientists (N. Bakhmat (Bakhmat, 2017), V. Bykov (Bykov & Leshchenko, 2016), , T. Dudka

(Bakhmat, Dudka, Liubarets, 2018), V. Lyubarets, L. Kartashova (Hurzhii, Bakhmat, Zaychuk, Kartashova, Rozman, & Sorochan, 2021), O. Spirin (Bykov, Vernygora, Hurzhii, Novohatko, Spirin, & Shyshkina, 2019), etc.).

Редакція EV

Various aspects of training managers are widely covered in modern research. They cover the study of criterion characteristics that allow modeling the structure of professional competence of the future manager – N. Bakhmat (2020), T. Burlaenko, O. Dubinina & V. Dobrovolskyi (2020), O. Vykhansky, G. Dmitrenko, O. Dubinina (2020), A. Zhilina, A. Kazachinsky, L. Korneeva, V. Lyubarets (2019), V. Shepel and others).

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The research of scientists was permeated with the problems of transformational reforms in the digitalization of education and the economy of Ukraine. The analysis of the works revealed a rather critical attitude to the issues of professional training of future managers of various sectors of the Ukrainian economy. Analysis of the research related to the development, exchange and reuse of educational tools has allowed us to offer digital tools that can be used by educators in the training of future professionals.

**Research methodology.** The theoretical basis of the study is the analysis of works devoted to the problem of training future managers in the field of maritime and river transport, and the generalization of the scientific research on the problem of the study. Among the methodological approaches to the study of the problem of training of higher education in Ukraine in the context of digitalization as a fundamental basis, general scientific basis, we highlight the systematic approach; as a theoretical and methodological strategy – personality-oriented approach; as a practice-oriented tactic – competency and technological approaches.

**Research results.** The purpose of education digitalization is to design a single

information and educational environment and expand the set of tools and methods in everyday use. The importance of this type of research due to the growing role of digitalization of education influenced the choice of the purpose of the study. The digital transformation of the future sea and river transport managers training into the European educational space will provide opportunities for the advanced scientific ideas, participation in interdisciplinary projects focused on promising ideas, technologies and innovations.

Taking into account the peculiarities of European integration requirements in the process of professional training of future maritime specialists, in addition to the canons of educational programs, domestic educational institutions should focus on international standards set out in the International Convention on Training and Certification of Seafarers and Watchmaking 1978 (International Convention, 1978), that declare some minimum requirements for the certification of marine professionals. This level can be achieved in modern conditions of future maritime specialists training intensification, in particular the managers of the maritime industry, thanks to the improvement of digital education, modern distance learning and the introduction of effective e-learning technologies.

Today the system of seafarers certification is simplified, the "Regulations on the rank of the ship commanders and the procedure for their assignment" (dated 07.08.2013 №567) and the Ministry of Infrastructure of Ukraine developed and approved a new order "On amendments to regulations of the Ministry of Transport and Communications of Ukraine and the Ministry of Infrastructure of Ukraine" (Order № 201 of 06.04.2021), in accordance with the order, an automated testing system for seafarers without the participation of a human examiner was introduced.

As it was noted by the former Minister of Infrastructure of Ukraine V. Krykliy,..." simplification of the procedure for certification of seafarers involves:

- the possibility of confirming the existing rank on the basis of the relevant length of service on the ship (without passing the mandatory qualifying examinations);
- the possibility of assigning the next rank to a person of the command staff or confirmation of an existing rank (in the absence of sufficient experience on board)

by passing a computer test, which is developed on the basis of the international system CES 6.0;

- a simplified mechanism for certification of specialists of the port, service and technical fleet operated under the State Flag of Ukraine in sabotage;
- cancellation of the compulsory advanced training courses for persons who confirm their rank "(Krykliy, 2021).

Thus, an important aspect in the training of managers of maritime industry is the application of digital training technologies in the theoretical and practical training of the specialists.

The main purpose of digitalization of education at the present stage of education, in our opinion, is the formation of a single digital educational environment, where the boundaries between university, teachers, graduates and business are blurred, where there is a common system of knowledge Manufacturing ge exchange for free using by both teachers and those who study (Industry 4.0, 2017).

To improve the practical training of future managers of the maritime industry, we suggest the use of digital technology, called Digital Twin – Digital Twin technology (DT-technology) (Gartner, 2019). The Digital Twin concept is the convergence of the physical and virtual worlds, where each object receives its own dynamic digital representation (imprint). DT's tools include powerful components such as big data, the Internet of Things, machine learning, and artificial intelligence, which are widely used in industry. Wide access and use of these tools have made DT more cost-effective and accessible to the business world, including, in our view, the education industry (Kartashova, Gurzhiy & Zaychuk, 2021).

According to L. Kartashova, A. Gurzhiy, V. Zaichuk, the digital twin of an educational institution, as an integral Web-resource, should include all its real components in electronic format: means of organizing the educational process; structure of the institution (classrooms, studying laboratories, electronic library, administration offices for teachers, methodologists, psychologists, etc.); teams (groups) of participants in the educational process; the total amount of training load and expected learning outcomes of students; list, content, duration and relationship of subjects, disciplines, etc.; description and tools of the internal quality

assurance system of education; teaching aids; means of technological and technical equipment; nomenclature and technologies used; system of collecting and storing educational and methodical information – Web-library; other educational components (by decision of the educational institution).

The more technological systems and resources are included in the construction of an educational institution's DT, the more functional the educational Web environment becomes, creating digital streams that add opportunities for the educational institution.

According to L. Kartashova's research, "it is assumed that in the Web-environment of the digital twin of an educational institution it is possible to: implement managerial, organizational, educational, training processes online; to adjust the logistics of the institution; configure virtual learning modules for educational tasks; to carry out remote analysis and diagnostics of processes occurring in each classroom" (Kartashova, Gurzhiy & Zaychuk, 2021).

We believe that in the context of the COVID-19 pandemic, the use of Digital Twin technology will significantly improve the quality of practical training of future maritime managers in the context of digitalization of education.

Also, taking into account the above, to improve the quality of practical training of future managers of the maritime industry, we propose to use one of the modern methods – eduScrum. EduScrum is a modern method of joint active learning. The main idea of the eduScrum methodology is that students gain new knowledge (hard skills) through project activities and at the same time develop 4K skills (soft skills) in team interaction (EduScrum in pedagogical activity, 2021).

The eduScrum methodology is not just a system of organizing project work of student teams, but also an approach focused on the development of flexible skills in both students and teachers themselves. After all, in order to work in a new format and maintain the interaction of teams in a productive way, it is important to develop qualities related not only to teaching the subject, but also to project management, moderation, facilitation, management and more.

The main thing in eduScrum is independent or joint assimilation of the new: "study yourself, improve interaction with others". This approach contributes to the development

of the level of responsibility of students, charges them with energy and motivates them to learn. They are interested, they are actively involved in the educational process, which leads to increasing the results in a shorter period of study, which in turn contributes to increased self-confidence and improved learning outcomes. Applicants are given the freedom to shape the educational process within the marked boundaries and goals.

Restructuring the educational process, we propose to replace assessment with *points and rewards*. This reward system allows you to go beyond the assessment of only the acquisition of knowledge.

Applicants for higher education receive: points for the effort – it is a reward that evaluates the effort (for example, helping another student), not the result; points for success – students also earn points for the certain tasks. The better they do it, the more points they get; points for outstanding work – it evaluates the behavior, the ability to negotiate, the level of communication of the student, etc. For example teamwork and communication.

In our opinion, additional *incentives* that are not directly related to the educational process, but promote cooperation between the team and the whole group, are also useful. If all members of the team reach the goal of the sprint, applicants for higher education are invited to a themed evening, a tour or just an evening of movies and pizza.

EduScrum assumes that the teacher plays not only the role of the manager of the educational process, but also of the owner of the product (or customer). Applicants for higher education are divided into teams. In each team, one of the applicants plays the role of a Scrum master, who is chosen at the beginning of each individual sprint (for example, a seminar). Thus, eduScrum is a framework in which teachers and students learn to solve complex practical problems of high complexity and strive to achieve the most meaningful educational goals.

**Discussion of research results.** It is established that the main purpose of education digitalization at the present stage of education is to form a single digital educational environment, where the boundaries between the university, teachers, graduates and business are blurred, where there is a common system of knowledge

exchange, freely used by teachers and those who study.

In our opinion, the use of Digital Twin technology (DT) in the training of managers in the maritime industry will significantly improve the quality of their practical and theoretical training. It is established that DT includes such powerful components as large data about the object studied, in particular: geometric and structural model, a set of calculated data, mathematical models that describe all physical processes, information about technological processes of the object, an important component, as well there is a product life cycle management system and artificial intelligence. Digital Twin technology

allows future managers of the maritime industry to model offshore platforms, explore the life cycle of the products of the maritime industry, in particular to model the logistics management system for enterprises.

Also, we have found that to improve the quality of practical training of future managers of the maritime industry in the high educational institution is possible through the use of such modern techniques as eduScrum. We have clarified that eduScrum is a framework in which teachers and students learn to solve complex practical problems of high complexity and strive to achieve the most meaningful educational goals.

## Conclusions

The professional training of future managers in the field of sea and river transport in the context of digitalization of education should include the use of such modern methods as the eduScrum method and digital technologies Digital Twin (digital duplicates) in the educational process. The application of these leading methods (technologies) will qualitatively increase the level of their professional training and form the following competencies at a high level: the ability to use information and communication technologies; ability to generate new ideas (creativity); ability to abstract thinking, analysis and synthesis, etc.

A promising area for research is the development of a model of practical training of future maritime industry managers in the context of digitalization of education, which reflects the effectiveness of modern educational methods and digital learning technologies, including eduScrum, Digital Twin.

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