Digital Economy and Digital Logistics as New Area of Study in Higher Education

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Abstract—Among innovative e-learning approaches in the sphere of digital economy and logistics, there is a special focus on artificial intelligence technologies (AI), which, due to their capacity and efficiency in usage, have a significant potential for the development and to some extent are optimal IT tools. The objective of a study is to define an optimum IT software for the organization of massive open online courses (MOOC) in digital economy and digital logistics in the framework of training economics students. Authors have conducted a survey in terms of Internet use for education and self-education. The sampling volume makes up 1 600 respondents in at least 80 regions of the Russian Federation. The respondents are divided into four age groups: 18-24 years old, 25-39 years old, 40-54 years old, 55 years old and older. The study uses data from the survey conducted by KMDA.PRO related to digital transformation of 700 representatives from more than 300 Russian companies out of 15 industries and the results of in-depth interviews of four categories of employees: top managers, heads of units, mid-level managers and other employees. The study results testify to the need for transforming e-learning approaches, taking into account the new labor market requirements for training specialists in digital logistics and gaining respective skills such as an active training, coordination, negotiation skills, teaching others, information literacy, customer focus, oral communication, ability to solve complex issues, operational literacy, time management. The use of the research results in practice is possible in case of the organization of online training courses for economics students in the framework of the higher educational system.

Keywords—Artificial intelligence technologies, digitization, economy, e-learning.

1 Introduction

Nowadays digitization and digital logistics are becoming important elements for sustainable growth of economic indicators and a competitive development of each country and company. It means a high need in such knowledge, specific education and new requirements in training of certain categories of specialists, including economic specialties [1-2].

The digital breakthrough is capable to reinforce global economic growth and improve lives of people, as well as their wealth that, if it is equitably distributed all over the world, can lead to well-being for all [3].

Software coordinates labor. Logistics governs movement. These pillars of contemporary capitalism correspond with materiality of digital communication systems [4]. Due to the fundamental changes in both the economy and society caused by the so-called Fourth Industrial Revolution (Industry 4.0), it is necessary to consider the logistics as a discipline and science because it is a key element and impetus to the development. The logistics has transformed from purely service activity such as delivering of the necessary products to the right place at the right time into the trigger of digital and social changes [5]. Such trends as "Internet of Things", "Big Data" or autonomous driving are today inextricably linked to the logistics. In this context the logistics as science and economic sector stimulates not only the application, but also the increasing development of basic methods, algorithms and technologies [6].

Digital network revolution has led to the emergence of a number of various economic models, which have been proposed to cope with new opportunities and the reality [6]. Thus, the principles that should take digital economic models into account are the transition from scarcity to abundance, which has nothing to do with digital products; the change that consumers will pay for; instant delivery and access, as well as social networks and online communities as distribution channels [6].

The development of the digital economy is accompanied by the widespread implementation of information and communication technologies, which enhance the effectiveness of any activities and extremely transform them. For example, a full use of the digitization technologies in the logistics allows ensuring the most efficient delivery of goods and services by lowering down transportation costs.

Digital logistics is the digitization of freight transportation, which includes intelligent management systems and cargoes' tracking at all transportation stages, unmanned technologies, full automation of document flow (electronic goods and transport documents), fast customs clearance in cross-border traffic [7]. In the logistics industry and supply chains there are many changes as regards the development of artificial intelligence. This powerful technology creates innovations such as predictive analytics, autonomous vehicles, and smart roads [8].

Today, at most enterprises there is a digitization process associated with the Fourth Industrial Revolution (Industry 4.0). The digital transformation takes place in production, so such terms as "Factory of the Future" or "Smart Factory" are an important component of this concept [9].

The latest trends in the information technology that have impact on the logistics and supply chains' management are blockchain transactions' processing, artificial

intelligence (AI), Internet of things (IoT), autonomous machines and drone aircrafts, and predictive analytics [10]. The rapid development of the digital economy in recent years has revealed that the labor market should be adapted to new challenges as well as the lack of necessary competencies and skills among employees and managers. Nowadays the employees and managers should have a set of specific competencies, which would contribute to work efficiency within the environment of fast extension of information technologies and thus new training approaches are required.

The digitization has caused an additional technological complexity and the disappearance of a number of traditional professions due to the automation of relevant manmade activities and at the same time appearance of new professions as well as a growing demand for the work that is not strictly regulated by any standards or rules but creativity [11]. A large share of labor relations and entire segments of employment have been concentrated in the virtual environment. The various forms of the employment are extended in the virtual environment (the share of non-standard, part-time, one-time employment and others has been increasing). The digitization requires the formation of new competencies in the labor market, which entails the reengineering of the entire educational system [11].

Educational institutions, especially those that ensure a higher education, should use digital technologies in teaching and learning, allowing students to acquire those digital skills, which are necessary to stimulate innovation and employment [12].

In higher educational institutions there is no due attention paid to the issue that leads to the lack of proper competitive skills among specialists in the labor market. At the same time companies have to spend additional funds on retraining and training of the staff to new competencies in the digital economy and digital logistics.

The traditional model of education is a model for the dissemination of knowledge in which an experienced teacher provides training for a group of students. The way of communication is "one-to-many". As it can be seen, digital networks offer other options to the "one-to-many" education model; at the same time, they also expand and strengthen it [13].

The paradigm of higher education is based on mutual cooperation between teacher and student, which requires a personalized attitude towards students, greater cooperation and the best relationship between formal and non-formal education, which can be largely implemented by school education using digital technologies [14].

Universities should not try to "catch up" technological trends initiated in other areas. Rather, universities should play a key role in shaping new socio-technological realities in order to remain relevant and useful. Digital technologies allow one to get new information and make one to reconsider the understanding of human abilities. Thus, universities are responsible not only for providing, but also for transforming higher education. A university with a sophisticated technical expertise should launch training of graduates with the flexibility and independence that allow them to review their skills, as well as anticipate and help to shape their own future, rather than to adapt to current working environment [15].

In modern society and knowledge-based economy, e-learning has become an economical and viable tool for educating people [16]. Its success depends on the development of virtual platforms, which, on the one hand, display the advantages of tradi-

tional teaching means, and on the other hand, surpass it with the help of technologies. To achieve it in e-learning based on cloud computing technologies a solution is used that covers the need for endless computing resources [17].

Today, it is important to effectively use the opportunities of e-learning based on digital technologies to ensure the dissemination of knowledge among students. This topic has become a regular item for discussion about higher education for last years [18].

E-learning is a way of organizing the process of independent study of educational materials using an educational environment based on Internet technologies, and learning using the Internet and multimedia [19]. With e-learning digital logistics, information technologies offer many opportunities for the efficient acquiring of knowledge and new skills, which can then be easily applied in practice. Moreover, the use of innovative teaching methods would enhance the rapid knowledge acquisition among students that study the basics of digital logistics, their adaptation to current environment and information technologies and thus is important for the educational process.

Virtualization of production environment will be more common in the development of future logistics systems. It is a key element of digital logistics. Virtualization of production environment provides many opportunities for improving control technology, reducing the production time and extending testing opportunities [20].

The factors specified above suppose that skills need to be formed on the basis of a set of innovative convergent educational solutions, including:

— A thorough design and maintenance of tools that help forming the necessary fundamental skills [21]
— Application of technologies of integrated educational programs to increase efficiency and reduce training time
— A widespread use of online teaching methods, e-learning and m-learning methods;
— The choice of flexible curriculum templates that provide ample opportunities for their diversification, as well as diversified forms of additional education and self-education
— Methods and means of supporting control measurement and certification processes [21]

Vocational education in accordance with the requirements identified by digital economy development is now an important area for research and improvement [22].

2 Materials and Methods

2.1 Research design and sample

The research is based on the concept of necessary alignment of the online learning with individual needs of the student. The use of the artificial intelligence for online training in the sphere of digital economy and logistics is considered a crucial tool for the further implementation and promotion of these technologies in domestic business. The research is conducted taking into account the following:

— Current educational standards for training economics students (bachelors and masters) [1]
— Regulatory acts of the Russian Federation [2]
— Survey data of the representatives of small, medium-sized and large businesses of the Russian Federation. The survey was conducted on 12 Dec 2019 by Russian Public Opinion Research Center (RPORC) together with the Project Office on the implementation of the national program "Digital Economy" of the Analytical Center under the Government of the Russian Federation regarding the awareness and readiness of business representatives to launch and use artificial intelligence technology [23]
— Data of the survey conducted by RPORC on April 1, 2018 related to the use of Internet for training, self-education

The study uses the research results of KMDA.PRO. KMDA.PRO collected survey data on digital transformation from 700 representatives from more than 300 Russian companies from 15 industries and interviewed four categories of employees [24]: top managers, heads of departments, mid-level managers and other employees. While assessing certain interrelated indicators of digital economy and logistics development in the Russian Federation, the data of the Federal State Statistics Service for the period 2010-2018 were used [25].

The survey was conducted regarding awareness and readiness of business representatives to the implementation and use of artificial intelligence technology. A formalized interview was conducted on the phone via Computer Aided Telephone Interviewing (CATI) under random sample of legal entities and individuals – entrepreneurs registered on the territory of the Russian Federation. Sampling volume: 800 respondents. Sampling error does not exceed 3.5% with probability of 95%.

The survey as regards the usage of the Internet for training and self-education consisted of closed-ended questions. Sampling volume: 1600 respondents from not less than 80 regions of the Russian Federation. The respondents were split into four age groups: 18-24 years old, 25-39 years old, 40-54 years old, 55 years old and older. Sampling error did not exceed 2.5% with probability of 95%.

2.2 Research limitations

Bearing in mind stated research objectives, the main focus was on the study of items related to optimum IT software of MOOC on digital economy and digital logistics within the training system for economics students.

2.3 Statistical analysis

Relative statistical ratios were used for the analysis in dynamics of the share change of researched phenomenon within the digital transformation of the economy and development of digital logistics.

3   Results

The data obtained as a result of conducted studies indicate the profound changes that have occurred in the development of the digital economy and logistics in the Russian Federation during the study period of 2010-2018. Such changes require the customization of the training system upon respective specialists' categories, primarily economics students, considering the search for optimal MOOC implementation models by using innovative IT software solutions.

The necessity to acquire knowledge in digital economy and digital logistics within contemporary training of economists is a mandatory term for the acquisition of competitive skills during their study for working with up-to-date information systems. Thus, future specialists will be able to plan and manage all data flows, production processes, and logistics in the enterprise.

The authors analyzed the dynamics of changes of the digital economy and logistics development indicators in the Russian Federation. The authors considered a separate trend among companies in the integration of internal information systems and shared information access. The proportion of organizations using enterprise resource planning (ERP) systems, in the total number of organizations examined for this period, increased from 5.1% to 13.8%, and the share of organizations using customer relationship management (CRM) systems, respectively, from 4.1% to 13.2%. In addition, the share of organizations that use electronic data exchange between their and external counterparty information systems, in the total number of organizations examined in 2018, increased to 64.9%, and the percentage of organizations using supply chain management (SCM) systems increased, respectively, to 6.4%.

More significant changes that have taken place within e-commerce development are directly related to digital logistics technologies. In 2010 the share of organizations placing orders on goods (works, services) in the Internet, in the total number of examined organizations, made up only 35%, while in 2018 – 42.2%. However, the share of organizations, which received orders on goods (works, services) via the Internet, in the total number of examined organizations, made up 16.9% and 22.5%, respectively (Table 1).

Table 1. Dynamics of separate interrelated indicators of digital economy and logistics development in the Russian Federation for 2010-2018

Indicator title	2010	2011	2012	2013	2014	2015	2016	2017	2018
Integration of internal information systems (IS) and shared access to the information inside the organization, %									
Share of organizations that have specific software for managing the purchase of goods (works, services), in the total number of organizations examined	-	36.1	36.2	38.6	36.3	38.4	37.8	36.2	38.3
Share of organizations that have specific software for managing the sale of goods (works, services), in the total number of organizations examined	-	24.3	22.8	22.9	20.3	21.9	21.8	22.0	25.9
Share of organizations that have used ERP systems, in the total number of organizations examined	5.1	6.2	6.5	7.5	10.1	9.3	10.7	12.2	13.8
Share of organizations that have used CRM systems, in the total number of organizations examined	4.1	4.6	5.0	5.7	7.2	9.9	9.4	10.3	13.2
Share of organizations that have used documents' flow systems, in the total number of organizations examined	-	61.9	60.4	61.7	58.9	62.7	66.1	66.1	68.6
Integration of organization's IS with IS of counterparties, %									
Share of organizations that have used electronic data exchange between their and external information systems, in the total number of organizations examined	-	31.3	24.3	25.7	52.7	59.6	62.4	63.1	64.9
Share of organizations that have used SCM systems, in the total number of organizations examined	-	3.7	2.5	2.6	4.1	4.3	4.4	4.7	6.4
E-commerce, %									
Share of organizations that have placed orders on goods (works, services) in the Internet, in the total number of organizations examined	35.0	39.2	41.1	43.4	41.7	41.3	41.6	41,2	42.2
Share of organizations that have received orders on goods (works, services) via Internet, in the total number of organizations examined	16.9	17.1	18.0	18.9	17.6	18.2	19.3	20.1	22.5

Source. The table is prepared by the authors independently based on analysis of data of Information Community Development Control in the Russian Federation [25]

Influenced by these changes, the labor market is to be aligned with new requirements of the digital time, which makes it necessary to implement innovative approaches to training specialists, especially future economists, to fully familiarize them with modern skills and competencies in the field of digital economy and logistics. The current Federal State Educational Standard of higher education, in the part of "38.03.01 Economics program (four-year degree)" and 38.04.01 "Economics program (master's level)", sets the paramount tasks of forming students' necessary competencies in mastering modern skills for working with ICTs in digital logistics area.

The results of 2018 Russian labor market analysis on digital transformation confirmed the need in such training (Fig.1).
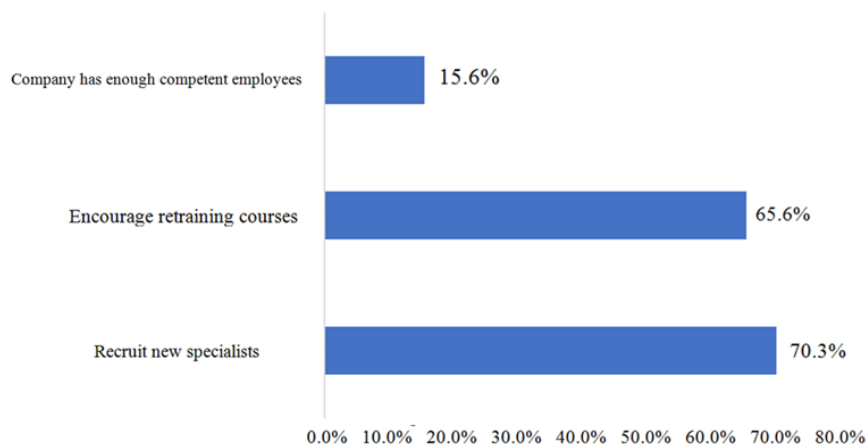

Fig. 1. How does the company solve the lack of new competencies required by digital transformation?

Source. Digital transformation in Russia: analytical report based on survey results of Russian companies 2018. kmda.pro [24]

The process of transition to digital logistics demands the involvement of specialists, who have the appropriate level of qualification and possess the proper competencies. The analysis of Russian companies' survey shows that among the answers to the question about possible solutions to the issue of the lack of competencies required by digital transformation, 70% of respondents say that they are looking for new specialists to improve the situation. Though a significant part of the respondents (65%) state that they seek to improve the qualifications of working employees, as they are confident in their ability to work and being loyal to the company. While only 15% of respondents think that they will not need to take any essential actions therein, since their company already has enough competent employees.

Thus, the presence of a labor market demand and the lack of relevant competencies require a revision of approaches to organizing digital logistics training for economists in domestic higher education institutions as within traditional educational there is no due attention paid to the process. This is especially true for the e-learning system, which is stipulated in chapter 2, article 16 "Implementation of educational programs

using e-learning and remote learning technologies" of the Federal Law "On Education in the Russian Federation" dated December 29, 2012 [26].

In recent years the learning process via Internet has made an educational content rather more transparent and immediately available for students who can download notes and pass a training course in a click. Based on results of a survey carried out in 2018 by RPORC, 86% of respondents at the age 18-24 years old use Internet for study, self-education. At the same time, a majority of higher educational institutions consider e-learning as a common process of the transition of traditional educational process, with the help of ICTs, into virtual environment. However, in practice, it is not always possible to make an optimal solution for students' training in digital economy and logistics because there is no properly adapted education system, no software for testing technology or IT tools for skills' retention and teacher's control of the educational process quality.

It is important to build the educational process of teaching digital logistics to economics students on the basis of MOOC in the way that in future the knowledge acquired during the educational process will be useful in their career.

To ensure the efficient formation and retention of the professional competence of a future specialist within digital logistics, the student should be trained in the conditions, which are as similar as possible to his/her future professional activities, enabling him/her to apply the acquired knowledge and skills for solving definite practical issues. All the tools of an online learning system, including special software products and simulators in practice teach relevant skills and abilities that are necessary and in demand in a particular profession.

The issue of formalized domestic higher education largely refers to the lack of adequate understanding of real environment and requirements as well as fast obsolescence of those skills and knowledge that students acquire during the educational process. To cope with these issues it is needed to apply contemporary practices and approaches towards students' training with the help of digital technologies. One needs to use MOOC, autonomous learning management system (LMS), social networks Facebook, VKontakte and others for these purposes as well as various cloud technologies and services (Coursera, Udemy, Logistics Courses MIT) in the educational process.

At the modern development stage of e-learning the use of artificial intelligence technologies in practice is becoming more interesting than ever before.

There are programs of artificial intelligence (AI) that have been elaborated for e-learning development. Their advantage is that they have an educational platform, which is easily customized pursuant to different needs and requests of students.

As an example there is Century Tech. The technology can replace a standard educational model. Teachers try to convey the knowledge to students of different levels, but often fail, while the artificial intelligence helps to adapt lessons to the individual characteristics of each student.

The use of AI technologies in the educational process will contribute to students' interest in studying such an upcoming trend as the digital technologies' development and its application in practice in companies where they will work.

The data of a survey carried out by RPORC in 2019 demonstrate that among business representatives the majority of them has already known about artificial intelli-

gence technologies (91%), at the same time 77% could explain the context of AI and 67% identified AI application areas.

More than a quarter of companies have intended to develop professional skills in the field of artificial intelligence technologies in the next two-three years, while 68% say they are not going to be involved in it. What professional skills do you need to have in the field of artificial intelligence technologies? The authors try to answer this question.

According to the information indicated in the "Atlas of New Professions" created by the Agency for Strategic Initiatives and Moscow School of Management "Skolkovo", which consists of 100+ new professions, most of them will appear just after 2020 [27]. For example, "Designer of neural interfaces" (specialist, engaged in the development of interfaces compatible with the human nervous system for managing computers, home and industrial robots, taking into account the psychology and physiology of users) should have the following skills and abilities:

— Operational mindset
— Cross-industry communication
— Project management
— Multi-language and multiculturality
— Computer programming/robotics technology/artificial intelligence

AI control systems architect (develops software for remotely piloted vehicles and traffic control systems, controls AI management systems; today there are various solutions that monitor complex shipments, but people manage these shipments; in future, the development of automated transport management systems will be necessary) must have the following skills and abilities:

— Operational mindset
— Cross-industry communication
— Project management
— Lean production
— Computer programming/robotics technology/artificial intelligence

Cross-logistics operator (a professional, whose competence includes the selection of the optimal way for the delivery of goods and the movement of people by various means of transport, monitoring and debugging the movement through a network of different modes of transport, monitoring the patency of transportation hubs, redistribution of the flows of transport networks; profession appeared before 2020) should have the following skills:

— Operational mindset
— Project management
— Lean production;
— Cross-industry communication
— Client focus
— Work with people
— Work within non strictly identified conditions

Returning to the survey data, the authors pay attention to the fact that those companies, which have full-time or freelance employees with AI competencies (67% and 49% among such companies), are more oriented towards the staff development, and companies where there are no such employees are less interested in their development (18%).

The companies that are linked with information technologies and marketing/PR are mostly interested in enhancement of their employees' professional knowledge in AI area.

The highly demanded type of AI technologies is virtual assistants for customers (54% of respondents among those who use or are planning to use such technologies). At the second place there is e-learning for analytical work with a large data volume (33%). At the third place there are recommendation systems for customers (23%).

Thus, in the framework of e-learning, the familiarization of future economists with AI technologies allow strengthening skills and competencies needed by them, for example:

— Information literacy
— Teaching others
— Being able to solve complex issues

In future, they will be useful in practice, considering other areas directly linked to digital logistics.

The authors have compared skills that are valued by Russian and foreign employers (Table 2).

Table 2. Comparing skills that are valued by Russian and foreign employers

Other countries	Russia
1. Ability to solve complex tasks	1. Active learning
2. Critical thinking	2. Coordination
3. Creativity	3. Negotiations' skills
4. Personnel management	4. Teaching others
5. Coordination	5. Information literacy
6. Emotional intelligence	6. Client focus
7. Decision making	7. Oral communication
8. Client focus	8. Ability to solve complex tasks
9. Negotiations' skills	9. Operational literacy
10. Cognitive flexibility	10. Time management

Source. The table above is drawn up based on researches conducted and data analysis [28]

Russian employers wish their employees to have relevant skills such as active learning, coordination and ability to come to an agreement (negotiation skills).

Summarizing the research results and analysis of trends in the market of digital educational services, the authors affirm that young professionals for successful employment should master, first of all, 6 most important skills out of 10 generally recognized ones: knowledge about economic performance; knowledge about the movement of people, services and goods; active learning; teamwork skills; commitment; cognitive flexibility.

The rest 4 skills are divided into 2 trends: in teachers' opinion they are critical thinking and ability to search the information, and in employers' opinion they are time management and a very important competence – negotiation skills (Fig. 2).
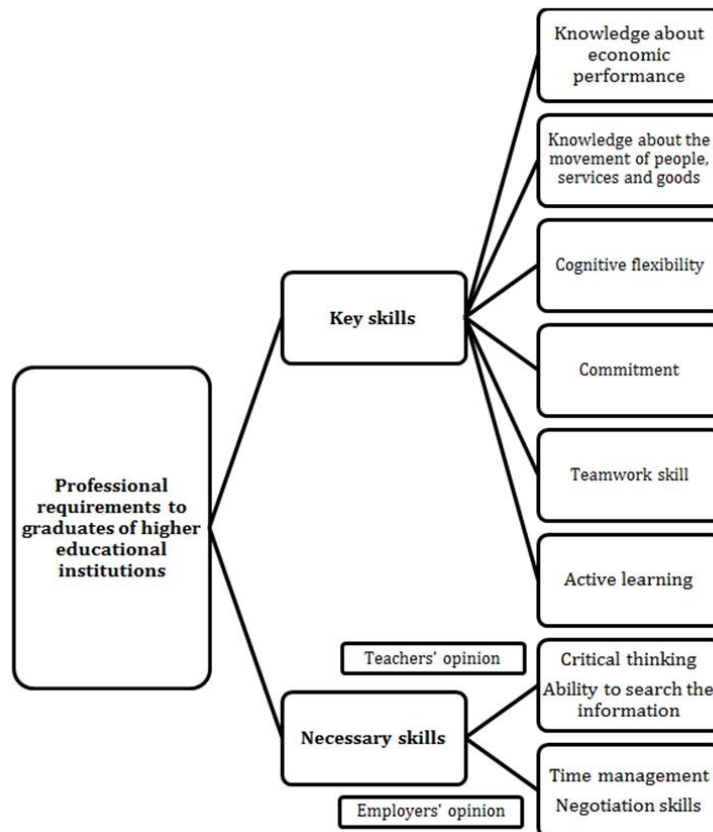

Fig. 2. Main professional competences for successful employment of graduates of higher educational institutions in the field of digital economy and logistics

Source: Authors' own development based on [6,7,11,27]

Despite the rapid development of information technologies, certain skills related to personal and interpersonal abilities will retain their relevance and be in demand in the labor market. For example, such a skill as negotiability will remain in demand in the field of digital logistics, where it is necessary to be able to conduct not only negotiations, but also find out the best options for solving business tasks and issues that will be beneficial to all interested parties.

An important skill is also the ability to work in a team, which allows one to more effectively use one's potential and professional competencies in collaboration with other employees.

This is important to be able to learn actively, which allows acquiring new skills already during the work, thereby increasing the professional level. However, this is important to highlight the presence of competencies in the field of knowledge about the economic performance and knowledge about the movement of people, services and goods. Therefore, modern training programs for specialists in the field of digital economy and logistics should be focused on the development and consolidation of the above-mentioned skills. On the whole, the authors can conclude that in the coming years, in the e-learning, certain skills directly referred to digital literacy will be extended. Innovative learning technologies that are based on the blockchain, virtual reality, artificial intelligence will be also particularly in demand.

4   Discussion

The research results show that the labor market is not ready for new challenges due to a shortage of necessary competencies and skills among both employees and employers. They should have a set of specific competencies that would advance an efficient activity in the framework of the rapid extension of new information technologies, as well as optimally use them in their work. The latter also requires a change in training approaches.

The authors agree with the opinion [19] that e-learning should not be considered as a transfer of traditional forms into a virtual environment, but as a new educational paradigm, an e-learning strategy of the institution. The educational process management of a higher educational institution should cover the use of contemporary methods, active and interactive teaching methods, new ICTs (social media, cloud services, massive open e-learning courses, mobile technologies) and means of assessment. The future demand in using curriculum approach [21] as one of the basic paradigms of the educational system does not evoke any objections. This approach aims at designing and continuously updating the codes of professional knowledge and skills' training goals, which has determined the methodological grounds of the international IT educational system for half a century.

In some cases the authors also agree with some researchers [22], who state that in the digital economy professional qualities and competencies will be directed to the development of human creativity. The skills used for physical and intellectual routine will not be relevant for procedures. Learning methods and tools will get closer to the approaches used for personnel from creative industries. Thus, the entire system of vocational education will be forced to meet new expectations.

Considering the current issues of adapting the educational environment to the conditions that have arisen in connection with global trends in the development of the digital economy, one should pay attention to different approaches towards the understanding of its essence. Some authors state [14] that the paradigm of higher education of the 21st century is based on the mutual cooperation of the teacher and student, as well as on direct communication between them.

It is not reasonable to fully agree with the opinion [15] that universities tackled with some uncertainty in the future (arisen due to the processes of jobs' automation in

the economy) must reject the model of "ready to work" graduates. Instead, they should provide their students with the opportunity to flexibly review their skills in new realities; involve students in the transformation process of their education. At the same time, the authors can ascertain that with the development of e-learning digital technologies, a new paradigm of higher education will arise, which will be aimed at adapting it to the individual characteristics of each student. Unlike other researchers [6, 10, 12, 20], the authors have proposed the use of MOOC IT software for the digital economy and digital logistics in the training system of economics students based on artificial intelligence systems. The latter effectively solves such issues traditionally typical for MOOC like testing, IT tools to consolidate the skills and teacher's control of the quality of the educational process.

Researchers around the world are investigating new means to spread digital literacy. Many templates go far beyond the typical form, including a variety of teaching methods and learning environments [29]. In general, distance learning systems have several advantages [30], they provide an access to various educational resources based on the traditional learning mode and store various educational resources in the network.

The experience of foreign countries, where special attention is paid to this issue, is also important. Alternatively to the current study, in the work of scientists of Malaysia, 12 skills have been identified that students of state and private universities think as very important in the employment [31]. There is a significant relationship between such skills as organizational, problem solving, teamwork and a good time management. In addition to teamwork, as a rule, in a public university there are higher rates for other simple skills, such as communication, problem solving, decision making, creative and innovative thinking and leadership. While most students from private educational institutions indicate the knowledge of the English language, other foreign languages and analytical abilities as important professional skills that students should possess while looking for a job [31].

An interesting approach can be found in the work [32], where a three-level functional map of the theoretical model of professional competencies is considered upon entry into a new position. In fact, it aims to develop competency-based training to improve student's employment opportunities. Except for this more general function, in the functional map there are two more main functions that correspond to two blocks of competencies that will be developed by students and future employees: interpersonal competencies and personal competencies proposed in the models mentioned above. In the framework of both categories and key functions the functional map allows creating a third level of classification. At this level 5 items of competencies are added, which are more concise in the employment process and, therefore, are more subject to the implementation and assessment. Finally, these five items are split into 19 competency components in order to obtain the most concise and applied functional map [32].

Based on the results of the discussion, the authors agree and affirm that in the digital economy and logistics, the specialists who do their best in applying interpersonal and personal competencies for solving the specified tasks will be in demand.

5 Conclusion

The MOOC has fundamentally altered the teaching process of many disciplines, along with their pre-existing approaches to e-learning. According to the analysis of survey results in 2018, 86% of respondents aged 18-24 years old have used the Internet for learning, self-education. However, currently, within the development of e-learning, the use in the teaching practice of AI is becoming more in demand. The application of AI technologies in the teaching process to the basics of the digital economy and logistics under the training of economists will further contribute to students' interest in studying such a promising area of information technology development, and upon completion of training, it will be used by some of them in practice in companies where they will work. Survey estimates demonstrate that more than a quarter of companies intend to develop professional skills in the field of AI in the next two - three years, while 68% say they are not going to do this. Those companies that have full-time or freelance employees with AI competencies (67% and 49% among such companies) are more interested in staff development, and those companies that do not have such specialists are less interested (18%). The most popular type of AI technology is virtual assistants for clients (54% of the answers from those who are using or planning to use such technologies). At the second place there is e-learning for analytical work with a large volume of data (33%). At the third place there are recommendation systems for clients (23%). Therefore, these areas of AI development are to be taken into account when organizing MOOC for economists' training in the field of digital logistics.

The research results obtained indicate the need to transform approaches to e-learning, bearing in mind new labor market requirements for training specialists in digital logistics and gaining by them the relevant skills - active training, coordination, negotiation skills, teaching others, information literacy, customer focus, oral communication, ability to solve complex tasks, operational literacy, time management.

Young professionals for successful employment in the field of digital economy and logistics should master, first of all, 6 most important skills out of 10 universally recognized ones: knowledge about economic performance; knowledge about the movement of people, services and goods; active learning; teamwork skills; commitment; cognitive flexibility. The rest 4 skills are divided into 2 areas: in teachers' opinion they are critical thinking and the ability to search for information, and in addition, in employers' opinion they are also time management and negotiation skills.

The proposed approaches towards the organization of e-learning for economics students in digital economy and logistics are of a universal nature and can be further integrated into international training practice of these specialists.

6 References

[1] Ministry of Education and Science of the Russian Federation (2013). Federal State Educational Standard of higher education on training 38.03.01 Economics (Bachelor's degree). https://studfile.net/preview/5702426/

[2] Ministry of Education and Science of the Russian Federation (2015). Federal State Educational Standard of higher education on training 38.04.01 Economics (magistrature). http://base.garant.ru/70989622/

[3] Solodikhina, M. V., & Solodikhina, A. A. (2019). Development of critical thinking of master's degree students using STEM cases. The Education and science journal, 21(3): 125-153. https://doi.org/10.17853/1994-5639-2019-3-125-153

[4] Rossiter, N. (2016). Software, Infrastructure, Labor. A Media Theory of Logistical Nightmares. 1st Edition. New York: Routledge.

[5] Delfmann, W., Hompel, M., Kersten, W., Schmidt, T., Stölzle, W. (2018). Logistics as a science: Central research questions in the era of the fourth industrial revolution. Logistics Research, Bundesvereinigung Logistik (BVL), Bremen, 11(9): 1-13.

[6] Weller, M. (2016). The Open Flip – a digital economic model for education. Journal of Learning for Development, 3(2): 26-34.

[7] Koroliova, A.A. (2019). Economic impact of digital logistics. Journal of the Belorusian State University, Economics, 1: 68-76.

[8] Kuprenko, V. (2019). How AI Changes the Logistic Industry. Towards Data Science. https://towardsdatascience.com/how-ai-changes-the-logistic-industry-3d55401778d

[9] Kayikci, Y. (2018). Sustainability impact of digitization in logistics. Procedia Manufacturing, 21: 782-789. https://doi.org/10.1016/j.promfg.2018.02.184

[10] Eyob, E., Eyob, S. (2019). Trends in blockchain and newer technologies uses in logistics and supply chain management. Issue in Information Systems, 20(2): 47-55.

[11] Romanov, E.V. (2019). The phenomenon of tacit knowledge loss in high school: Causes and consequences. Part II. The Education and science journal, 21(5): 61-85. (In Russian). https://doi.org/10.17853/1994-5639-2019-5-62-86

[12] Fleaca, E., Stanciu, R.D. (2019). Digital-age Learning and Business Engineering Education – a Pilot Study on Students' E-skills. Procedia Manufacturing, 32: 1051-1057. https://doi.org/10.1016/j.promfg.2019.02.320

[13] Balkin, J.M., Sonnevend, J. (2016). The Digital Transformation of Education. In C. Greenhow, J. Sonnevend, C. Agur (Eds.), Education and Social Media: Toward a Digital Future. Cambridge, MA: MIT Press (Forthcoming); Yale Law School, Public Law Research Paper No. 564. https://ssrn.com/abstract=2759022. https://doi.org/10.7551/mitpress/9780262034470.001.0001

[14] Ratniece, D., Cakula, S. (2015). Digital Opportunities for Student's Motivational Enhancement. Procedia Computer Science, 65: 754-760. https://doi.org/10.1016/j.procs.2015.09.020

[15] Nguyen, D. (2018). The university in a world of digital technologies: Tensions and challenges. Australasian Marketing Journal (AMJ), 26(2): 79-82. https://doi.org/10.1016/j.ausmj.2018.05.012

[16] Sandkuhl, K., Lehmann, H. (2017). Digital Transformation in Higher Education – The Role of Enterprise Architectures and Portals. In A. Rossmann, A. Zimmermann (Eds.), Digital Enterprise Computing Lecture Notes in Informatics (LNI). Bonn: Gesellschaft für Informatik, pp. 49-60.

[17] Naveed, Q.N., Ahmad, N. (2019). Critical success factors (CSFs) for cloud-based e-learning. International Journal of Emerging Technologies in Learning, 14(01): 140-149. https://doi.org/10.3991/ijet.v14i01.9170

[18] Tagiltseva, N.G., Matveyeva, L.V., Byzova, M.A. (2019). Personally-oriented models of development of musically gifted children. The Education and science journal, 21(3): 106-124. (In Russian). https://doi.org/10.17853/1994-5639-2019-3-106-124

[19] Fomina, A.S. (2016). E-learning in higher educational institution: methods, content, technologies. Society: social studies, psychology, pedagogics, 1: 101-106.

[20] Hofmann, W., Langer, S., Lang, S., Reggelin, T. (2017). Integrating virtual commissioning based on high level emulation into logistics education. Procedia Engineering, 178: 24-32. https://doi.org/10.1016/j.proeng.2017.01.055

[21] Kupriyanovsky, V., Sukhomlin, V., Dobrynin, A., Raikov, A., Shkurov, F., Drozhzhinov, V., Fedorova, N., Namiot, D. (2017). Skills in the digital economy and the challenges of the education system. International Journal of Open Information Technologies, 5(1): 19-25.

[22] Barsukov, D., Kuzmina, S., Morozova, N., Pimenova, A. (2018). Professional education for digital economy: trends and prospects. In MATEC Web of Conferences (Vol. 170, p. 01063). EDP Sciences. https://doi.org/10.1051/matecconf/201817001063

[23] WCIOM (2019). Artificial intelligence and business: is there contact? Surveys' database WCIOM. https://wciom.ru/index.php?id=236&uid=10068

[24] KMDA (2018). Digital transformation in Russia. Analysis report based on survey results of Russian companies. https://komanda-a.pro/blog/dtr_2018

[25] Federal State Statistics Service (2018). Monitoring of the development of information society in the Russian Federation (as of 03.10.2018). http://www.gks.ru/free_doc/new_site/business/it/monitor_rf.xls

[26] Federal Act "On education in the Russian Federation" dated 29.12.2012 N 273-ФЗ. https://www.consultant.ru/document/cons_doc_LAW_140174/

[27] Kolodina, A. (2019). The most sought-after professions for admission in 2020. Receiver Navigator. https://propostuplenie.ru/article/samye-vostrebovannye-professii-dlya-postupleniya-v-2020-godu/

[28] Rylova, A. (2019). Soft skills — skills of XXI century: what do employer drivers most value in Russia and the Perm Territory? Higher School of Economics. https://perm.hse.ru/news/243254110.html

[29] Starcic, A.I., Turk, Z., Zajc, M. (2015). Transforming Pedagogical Approaches Using Tangible User Interface Enabled Computer Assisted Learning. International Journal of Emerging Technologies in Learning, 10(6): 52. https://doi.org/10.3991/ijet.v10i6.4865

[30] Congwei, L.I. (2015). E-Commerce Curriculum Design Based on Distance Learning System. International Journal of Emerging Technologies in Learning, 10(3): 52-57.

[31] Azmi, I.A.G., Hashim, R.C., Yusoff, Y.M. (2018). The Employability Skills of Malaysian University Students. International Journal of Modern Trends in Social Sciences, 1(3): 1-14.

[32] Martínez-Clares, P., González-Lorente, C. (2019). Personal and Interpersonal Competencies of University Students Entering the Workforce: Validation of a Scale. Relieve, 25(1): 6. https://doi.org/10.7203/relieve.25.1.13164

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