

LEVEL ENTREPRENEURSHIP-ROLE IN THE DIGITAL ECONOMY, TENDENCIES OF IMPROVEMENT OF THE INFORMATION SUPPORT SYSTEM

Marina Vinogradova, Russian State Social University

Victor Konstantinov, Orel State University named after I.S. Turgenev

Valeriy Prasolov, Financial University under the Government of the Russian Federation

Anna Lukyanova, Financial University under the Government of the Russian Federation (Financial University)

Irina Grebenkina, Moscow State Law University named after O.E. Kutafin (MSAL); Russian Presidential Academy of National Economy and Public Administration under the President of the Russian Federation

ABSTRACT

The article considers the influence of transformation processes in the economy under the influence of digitalization on entrepreneurial education. Digitalization of education is already changing the traditional education system. It is manifested in the following: the number of virtual educational platforms is increasing; one electronic resource can be used many times to provide educational services of various content; new technologies are being introduced into education and digital educational platforms that provide services; there is a widespread use of online courses, simulators, interactive whiteboards, projectors, 3D printers, etc.

In order to determine the vision of entrepreneurial education, 62 students of the Faculty of Economics of the Financial University under the Government of the Russian Federation were interviewed. At the same time 45 entrepreneurs with experience in business for more than 5 years were also interviewed. The following questions were included in the questionnaire: requirements for the learning outcomes and the educational process; implementation methods, desired forms of training, interactive tools, methods of conducting classes; barriers to implementing interactive learning tools.

It has been established that the most popular requirement is to increase the level of practical skills in the specialty. At the same time, students report a lack of communication between universities and potential employers. According to the results of the survey and taking into account the opinion of entrepreneurs, for the formation and development of partnerships between business and universities, it is necessary to reform such a model of cooperation as university-state-business.

Based on the results of the survey, it can be concluded about the public request for the introduction of SMART education. It provides for the implementation of educational activities on the global Internet based on common standards, technologies and relations established between the university, entrepreneurs and students.

Keywords: Digitalization, Entrepreneurial Activity, Entrepreneurial Education, Smart-Education.

INTRODUCTION

The main trend of modern development is the transition from industrial to post-industrial society. The digital economy is a characteristic component it. The term “*digital economy*” first appeared in 1995 in connection with the development of economic relations, which were based on the use of digital information and communication technologies.

According to Researchers, three main components of the “*Digital Economy*” concept can be identified:

- e-business infrastructure (hardware, software, telecoms, networks, human capital, etc.),
- e-business (how business is conducted, any process that an organization conducts over computer-mediated networks),
- e-commerce (transfer of goods, for example when a book is sold online) (The Concept of a “*Digital Economy*”, 2001).

The digital economy determines the digital transformation of all spheres of life, providing them with significant economic and social opportunities. It, in turn, opens up new opportunities for the development of entrepreneurship. Digital technologies are developing rapidly. They penetrate into traditional business, causing the emergence of new types of digital products and services. The constant use of online channels leads to the restructuring of business processes, the transformation of business models, marketing management systems and changes in consumer behavior.

Among the main problems of entrepreneurship should be highlighted:

- Difficulties with access to borrowed capital, and often the inaccessibility of loans due to high interest rates.
- Low level of informing entrepreneurs about the adopted regulatory legal acts, poor information support for business.
- Lack of legal regulation of public relations demanded by the practice of the digital economy from outsourcing agreements, outstaffing, timeshare, smart contracts, etc.
- Burdensome high tax rates that exceed the real financial capabilities of entrepreneurs.
- Insufficient material and technical support for medium and small businesses.

Entrepreneurship in the modern world is impossible without a sufficient level of knowledge and the ability to navigate all the means and tools of doing business. The development of an innovative economy is ensured primarily through knowledge, information, and the latest technologies. The source of knowledge itself, and not raw materials and/or cheap labor, makes the economy competitive, ensures the creation of high-tech jobs in industry and entrepreneurship. All this is necessary to meet the economic and social needs of citizens. Knowledge is turning into one of the main factors of production. Such a resource is manifested in the joint effect of the most efficient use of resources land, capital, labor.

Bridging the gap between dominant production, which is mainly based on the extractive industries, and the knowledge-based economy, strengthens the innovative model of socio-economic development. Economic growth is possible with the transition to a knowledge economy. The comparative advantages of countries are less and less determined by the wealth of natural resources and more and more by technological innovations and the competitive application of knowledge or a combination thereof.

New characteristics of the economic space require openness, democratization, socialization, the creativity of organizational processes, the disequilibrium and non-linearity of management hierarchical chains, the unpredictability and diversity of enterprise development strategies.

The success of the digital transformation of the economy depends on the joint concerted efforts of the state, entrepreneurs and entrepreneurial education (the ecosystems that support it). This difficult path involves changing business models, development strategies, revising the business environment and business rules.

The formation of a national innovative economy requires solving the urgent problem of adaptation of youth and the population as a whole to the conditions of socio-economic life. Undoubtedly, one of the directions for solving this problem is the development of entrepreneurial abilities among young people. Such abilities will help them achieve real success in any field of their chosen professional activity.

LITERATURE REVIEW

The key topic of discussion at the 46th World Economic Forum in Davos in 2016 was the Fourth Industrial Revolution, which could lead to global changes in all areas of public life. It should be noted that “*industrial revolution 4.0*” has been spoken about since 2011 (the German “*Hi-Tech Strategy 2020*”). Since then, this issue is only gaining economic popularity. At the same time, the effective functioning of a business in a digital economy requires fundamental changes in the organization of entrepreneurial activity.

Digitalization was recognized by the EU countries as the main driver of competitiveness and economic development. As a result, this issue appears in a number of initiatives, in particular:

- Industrial policy for the globalization era, Digital Agenda for Europe, the Innovation Union (OECD, 2017).
- The Entrepreneurship 2020 Action Plan (2013).
- The Small Business Act for Europe (2008) (The Entrepreneurship 2020 Action Plan, 2013).
- Adapting e-business policies in a changing environment: the lessons of the Go Digital initiative and the challenges ahead (OECD Digital Economy Papers, 2013).

According to the OECD Digital Economy Outlook 2017 report, the most obvious interpretation of the concept of “*digitalization*” is its understanding as a synthetic category. It refers to all the socio-economic processes that are based on the use of digital technologies. These processes include:

- New navigation capabilities (in particular, autonomous transport controlled by autopilot).
- Automation of production (construction of industrial enterprises with minimal use of manual human labor).
- New principles of labor market organization (a large number of self-employed, the phenomenon of freelance).
- High-quality performance of production processes.
- “*Lean production*”.
- Trade in services, intellectual property rights.

Today, the Digital Single Market Strategy (DSM) is being successfully implemented in Europe. According to European experts, DSM could bring united Europe an additional 41.5 billion euros annually and ensure the creation of hundreds of thousands of jobs. DSM is considered as the main asset of Europe, aimed at adapting the European community to new conditions for conducting business in the international arena.

Europeans are striving to ensure the effective development of various sectors of the economy that use digital technology for innovation so that they remain competitive globally.

Digitalization is not a choice, but a necessity for European business and the economy as a whole. It provides many opportunities and creates new changes: some old jobs will be replaced, new jobs will be created, and many jobs will be transformed (Bock et al., 2015).

These transformations could not but affect the sphere of entrepreneurial education. Today, various programs for doing business (for example, CRM, accounting, warehouse programs, programs for working in HoReC-business, travel programs) are studied both at university courses and within individual master classes, trainings, seminars, etc.

Modern entrepreneurial education is characterized by a comprehensive approach - design thinking (Val et al., 2017; Linton & Klinton, 2019), which provides a cross-cutting approach to training and increased attention to practical skills.

The digitalization of education is already changing the traditional education system, which is manifested in the following:

- The number of virtual educational platforms is increasing.
- One electronic resource can be used many times to provide educational services of various content.
- New technologies are being introduced in education systems and digital educational platforms that provide services.
- Widespread use of online courses, simulators, interactive whiteboards, projectors, 3D printers, etc. (OECD, 2009; Kozlinska, 2011; Bae et al., 2014; Blenker et al., 2014; Maresch et al. 2016).

One of the directions of modern information and communication technologies development is the concept of BYOD (Bring Your Own Device). It appeared in the corporate culture of foreign organizations, but was rethought and accepted for use in the educational process (Rheingold, 2002).

At first, BYOD meant the use by employees of an organization of their own mobile devices (smartphones, tablets, laptops). Employees gain access to the company's databases and applications in order to optimize the solution of working issues. In the educational process, BYOD means the use of a mobile phone as an additional source of information when performing various kinds of tasks. The simplest and most common way to use your own mobile device is to play an electronic version of the teaching aid, which is in the public domain, using a distance course.

Lately, distance learning has become increasingly popular: back in 2014, Google published the most common queries regarding higher education. It turned out that people are more interested in online courses than in visiting university campuses. The main product of educational platforms is content that can be developed by the platform or adapted on it.

The use of Internet technologies has led to the emergence of a new form of the educational process, which is called e-learning. The development of technologies of e-learning, mobile learning (m-learning), ubiquitous learning (u-learning), "*flipped*" learning (f-learning) that fit into the traditional learning system based on a mixed model (blended learning) found in

universities is widely used. These technologies provide the opportunity for flexible training with widespread use of audio, video graphics and other technologies.

The aim of this work is to identify the changes that enterprises undergo in connection with the digitalization of all spheres of public life, as well as identification of the impact of these processes on entrepreneurial education.

RESEARCH METHODS

Today, entrepreneurial education should be accessible to all segments of the population, which is advisable to implement through the expansion of possible methods of training.

To assess the vision of entrepreneurial education, 62 students of the Faculty of Economics of the Financial University under the Government of the Russian Federation and 45 entrepreneurs of the city were interviewed.

The following questions were included in the questionnaire:

- Requirements for the learning outcomes and the educational process.
- The desired forms of training, interactive tools, methods for conducting classes.
- Barriers to the introduction of interactive learning tools.

Research methods: interviewing a sample of respondents, processing the data by the STATISTICA program.

RESEARCH RESULTS

In general, the answers of the respondent can be represented as follows (Table 1 and Figures 1-4)

Table 1 GENERALIZED ANSWERS OF RESPONDENTS		
Indicator/Category of respondents	Student	Entrepreneur
learning outcome requirements		
Ability to use modern programs and devices	9	11
Improving the level of practical skills in the specialty	20	30
Improving communication and teamwork skills	8	4
Improving communication with employers	25	0
Educational requirements		
Increasing personification, flexibility and reducing the bureaucratization of the educational process	17	2
Increasing part of practical courses and disciplines	14	27
An increase in real-life examples in the educational process	28	16
Other	3	0
Desired Forms Of Training, Interactive Tools, Teaching Methods		
Introduction of distance learning courses;	4	5
Increased use of interactive tools (e.g. projectors, interactive whiteboards, QR-codes, virtual libraries, online testing, etc.)	18	14
Implementation of project training	29	18

The introduction of modern means of consultation with the teacher via e-mail, social networks, etc.	11	8
Barriers to implementing interactive learning tools		
Not enough devices/equipment, slow Wi-Fi	15	18
Teacher's lack of awareness in the use of educational technology	21	11
Not enough time for in-depth study	13	4
The difficulty of integrating digital learning material with current learning content	7	5
University administration does not support the use of educational technologies	6	7

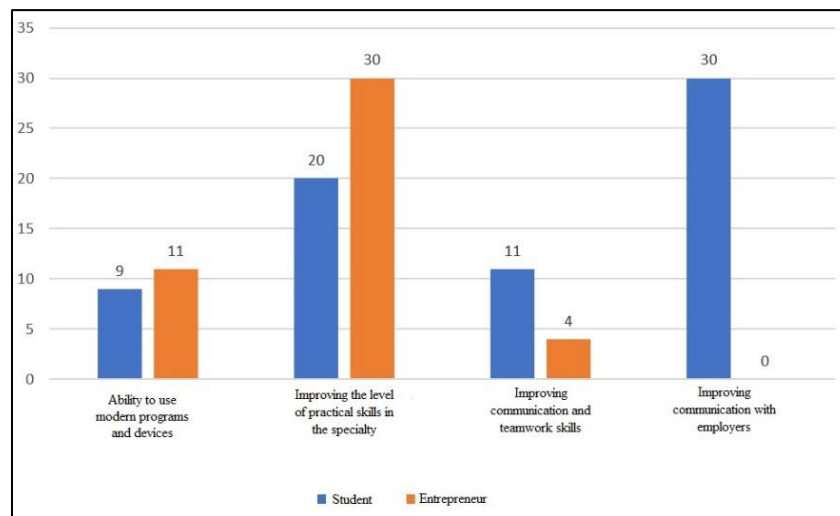


FIGURE 1
DISTRIBUTION OF GENERALIZED ANSWERS ACCORDING TO THE CRITERION
“REQUIREMENTS TO THE LEARNING OUTCOME”

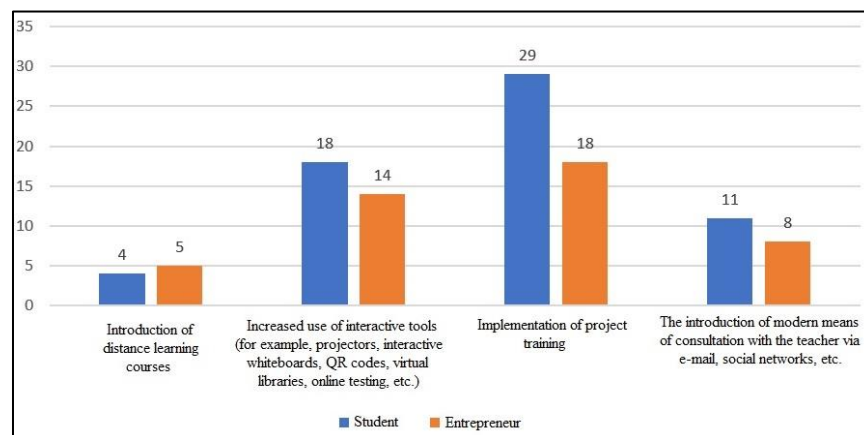


FIGURE 2
DISTRIBUTION OF ANSWERS ACCORDING TO THE CRITERION *“DESIRED*
FORMS OF TRAINING, INTERACTIVE TOOLS, METHODS OF CONDUCTING
CLASSES”

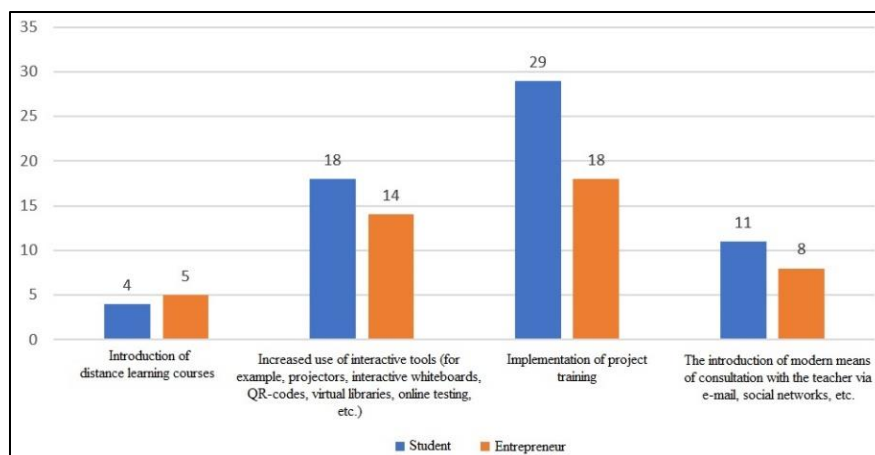


FIGURE 3
DISTRIBUTION OF ANSWERS ACCORDING TO THE CRITERION “*DESIRED FORMS OF TRAINING, INTERACTIVE TOOLS, METHODS OF CONDUCTING CLASSES*”

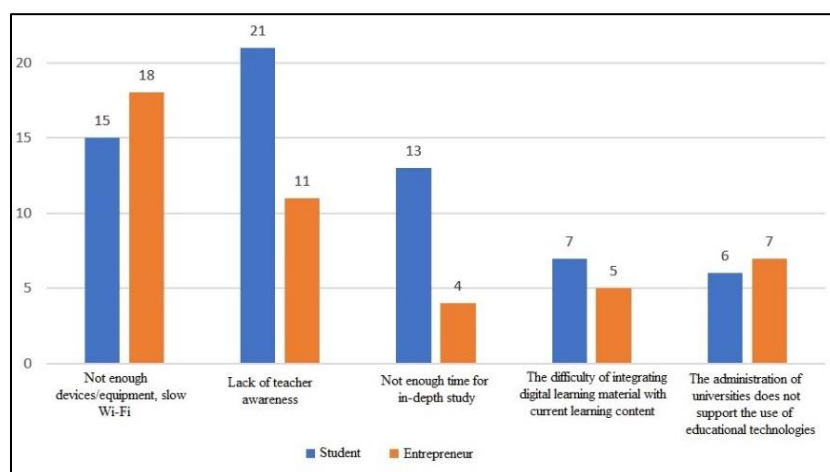


FIGURE 4
DISTRIBUTION OF ANSWERS ACCORDING TO THE CRITERION “*BARRIERS TO THE INTRODUCTION OF INTERACTIVE LEARNING TOOLS*”

In general, the most popular requirement is to increase the level of practical skills in the specialty. At the same time, students report a lack of communication between universities and potential employers.

In addition, it should be noted that some entrepreneurs do not want to cooperate with universities, because they do not see the opportunities for the latter to prepare a highly qualified specialist. Therefore, they take on this function when they hire a graduate. The reasons for the impossibility of universities to provide a student with the necessary level of knowledge, entrepreneurs include:

- Lack of time for student practice.

- Irrelevant knowledge from teachers.
- Obsolete condition of machinery and equipment.

To establish cooperation, it is necessary:

Develop and adopt documents that clearly define partnership policies (these documents should be accessible to the general public);

- Appoint an individual who will be responsible for contacts with the business;
- Reform the work of employment centers that today do not fulfill their functions (for example, creating a group with HR managers);
- Involve business representatives in educational institution management bodies;
- Increase the volume of practical training providing the practical implementation of academic freedom.

In turn, modern employers expect that graduates-candidates for positions in their companies, will have dozens of diverse skills, including: the ability to think creatively and manage time, communication skills, networking, project management, team building tools; knowledge of website development tools, computer graphics and the like. The most sought-after quality indicated in the vacancies is stress resistance. As for soft-skills in the context of professional spheres, retail employers more often count on teamwork and stress resistance. Multitasking is equally demanded in such industries as IT, marketing, personnel management and sales.

Both students and entrepreneurs note the need to increase the practical orientation of education. This orientation is characterized primarily by the direct relationship between theory and practice using various workshops and interactive activities:

- Case studies.
- Group projects and presentations.
- Compulsory and optional internships.
- Hands-on training.
- Invitation of freelance teaching practitioners and guest-lecturers to transfer specific professional experience to students.
- The provision of educational services in a convenient manner, for example, evening classes, on weekends or in summer.

A high percentage of modern students are not inclined to such working on themselves, though it would allow them to form cognitive abilities that would lay the *"foundation"* for further self-education, self-development, creative solutions to professional problems, and projective activities. The accessibility of the Internet and various gadgets fills in the students' minds the illusory opinion that the learning process comes down to just searching the Internet for answers to the questions posed to them in a particular situation of the educational process.

Confidence that you can always find all the answers to all your questions in your smartphone or gadget will lead to a loss of reading culture. This entails the fact that modern young people cannot work with large arrays of text, select structural blocks in it, track the logic of content development, analyze the text, and also form the students' inability to formulate problems and look for ways to solve them.

Particular attention, according to both students and entrepreneurs, should be given to the management of educational content and learning resources that need constant use, supplementing from professional sites, blogs, blog quests. Students should be able to independently study educational disciplines in electronic courses, attend virtual seminars, participate in webinars, telecommunication projects. E-learning opportunities are especially valuable for people with disabilities and those living in remote regions.

Approaching the real conditions is ensured by the use of interactive technologies in the process of conducting most practical and laboratory exercises. Therefore, to organize the educational process, it is worth generating positions to create a platform for designing business ideas and work processes.

All these trends determine and actualize new challenges for higher education, which should provide for students:

- Synthesis of formal and non-formal education.
- Multidisciplinary specialties.
- Constant updating of the academic disciplines content, implementation of new tools and approaches to improve the teaching quality.
- The formation of systemic knowledge, “*soft skills*”, research skills, development of one’s own career.
- Disclosure of cognitive learning abilities.
- Attracting famous mentors to the educational process, which are students’ opinion leaders.

DISCUSSION

Based on the results of the survey, it can be concluded about the public request for the introduction of SMART education (Smart Technology based Education and Training, 2014).

The advantages of SMART-education is that it contributes to the development of creative abilities, the formation of professional knowledge, communication skills, literacy in the field of information and communication technologies; forms critical thinking, innovative approaches to solving economic problems; contributes to the improvement of the skills of effective cooperation and mutual understanding, leadership, career development.

Its conceptual basis is the use of a large number of scientific sources, educational materials and multimedia resources that can be easily and quickly designed, assembled to a specific set, customized individually for each student with his needs, characteristics of educational activities and level of knowledge.

SMART education provides for the possibility of attracting employers to the educational process. They can develop proposals for the requirements for future specialists to adjust the content of their professional training in higher education institutions. Thereby the process of employing young specialists and adapting them to the professional environment facilitating.

The points of growth of the scientific and educational potential within the framework of mastering the disciplines are formed by presenting the material using SMART means:

- Interactive whiteboards with special markers that allow you to focus and outline important points at the stage of identification of business processes;
- Network and information applications that fill the educational content with the necessary regulatory and technological requirements for the organization of activities and project implementation;

- Mobile applications that complement and expand the boundaries of electronic sales.

According to the results of the survey and taking into account the opinion of entrepreneurs, for the formation and development of partnerships between business and universities, it is necessary to reform such a model of cooperation as university-state-business.

Thus, at the state level, it is necessary to amend the legislation in part:

- Providing greater autonomy of universities in management and financing.
- Simplification of the procedure for receiving charitable assistance by a university.
- Simplification of the procedure for making changes to the curriculum and plans of universities, the possibility of entrepreneurs' participation in this process.
- Providing opportunities for entrepreneurs to participate in the development of curricula for certain specialties and skills cards for them.
- Settlement of investment protection and intellectual property rights in the development of partnerships.
- Introduction of tax benefits and measures of non-material incentives for entrepreneurs who start partnership programs with universities (including, when providing practice to students, teachers, etc.).
- Introduction at the first stages of additional financing from the state of joint research projects of universities and business.
- The possibility of creating and operating innovative enterprises by combining the efforts and resources of companies and universities for the implementation of projects and programs in the field of research and development.
- Creating an Internet resource on which universities and entrepreneurs will be able to post their suggestions and requests (for example, the bases of theses, columns on career planning in various industries, information about company projects for students, vacancies for students, etc.).
- Ensuring events (exhibitions, fairs, etc.), where representatives of universities and business could meet to establish and improve partnerships.
- Providing the opportunity for universities to attract business to their own advisory bodies or governing bodies.

At the same time, the psychological and pedagogical features of the modern generation should be taken into account in the formation of the digital educational environment. The flexibility of the educational system due to the digitalization of the educational space allows expanding the traditional framework of education, ensuring the continuous improvement of the educational route. The global education market is at the junction of two trends-personalization of education and new technologies. Under these circumstances, the fusion of formal and non-formal education becomes an essential condition for improving the model of education with a high level of compliance with the needs of the individual, society and the state.

An increasing number of countries are currently shifting to SMART education-they are creating their own programs to keep the line with the economic and technological growth. In many countries, educational institutions have Wi-Fi networks and give students an access to laptops. The next step will be the creation of a robust SMART classrooms infrastructure. Smart classrooms allow the engagement of digital students, innovations in teaching, and strengthening the digital teacher education (Pi, 2015). In Russia, SMART classrooms are not yet in a broad use. However, the situation is changing for the better, as Russia attempts to catch up with other technologically advanced countries, such as South Korea and China, who overtake Russia in the field of education (Leem & Sung, 2019). This area is an excellent field for research, since the

effectiveness of above methods has not been disclosed within the framework of domestic education, entrepreneurship education in particular.

A good example is the OBS Business School in Spain. This online education provider is actively using the e-learning tools and in-house developments as part of marketing and business strategies (Shvetsova, 2017). The fact that the OBS Business School cooperates with the business sector allows the School to update education programs on a constant basis. Accordingly, Russian entrepreneurial universities and business schools should exchange the experience in SMART education with foreign institutions like OBS.

CONCLUSIONS

To digitalize entrepreneurship education:

- Create educational resources and digital platforms with support for interactive and multimedia content for universal access of educational institutions and students.
- Develop and implement innovative computer, multimedia and computer-oriented teaching aids and equipment for creating a digital learning environment (multimedia classes, laboratory STEM research centers, inclusive classes, blended learning classes).
- Ensure broadband Internet access for students in institutions classrooms at all levels.
- Make it remote using cognitive and multimedia technologies.

Redefining the traditional entrepreneurship education with SMART technologies is a good solution here because they allow flexible learning in an interactive educational environment using available content from around the world. The key to SMART education is access to knowledge. A significant role in this process is played by the Internet and technologies that are aimed at creating new knowledge. Interactive teaching technologies facilitate the interaction of teachers with students, as well as students among themselves.

The use of information technology in the educational process contributes to the dynamism and intensification of the learning process, ensures its differentiation taking into account the individual characteristics of students, makes it possible to provide complex information in the form of visual images, and opens up access to new sources of information.

In connection with these features in the organization of the educational process, the following recommendations are considered appropriate:

- Maximum visualization of information at lectures, using graphs, statistics, figures.
- The use of a large number of slides, their switching to maintain students' attention.
- The use of video materials in lectures.
- The use of storytelling to explain lecture topics.
- Testing on computers with instant results.
- Conducting interactive games in the classroom with the definition of the role and responsibility of each team member.

A new generation of entrepreneurs in the digital economy has very different expectations. In our opinion, it is entrepreneurs who should play a significant role in making changes to the learning process and the educational services provided to students. The basis for successful work

with students of the new generation is a common creative research activity. Briefly speaking, it is necessary to attract entrepreneurs to upgrade services to meet the needs of a real business.

Education, determined by market requirements, moves within the framework of abandoning the classical model of teaching as a process of human formation. The market does not require a holistic personality, but only the “skills” and “competencies” that are currently required.

REFERENCES

- Bae, T.J., Qian, S., Miao, C., & Fiet, J.O. (2014). The relationship between entrepreneurship education and entrepreneurial intentions: A meta-analytic review. *Entrepreneurship Theory and Practice*, 38(2), 217-254.
- Blenker, P., Trolle Elmholdt, S., Hedeboe Frederiksen, S., Korsgaard, S., & Wagner, K. (2014). Methods in entrepreneurship education research: a review and integrative framework. *Education+ Training*, 56(8/9), 697-715.
- Bock, W., Vasishth, N., Wilms, M., & Mohan, M. (2015). The infrastructure needs of the digital economy. Retrieved from https://www.bcgperspectives.com/content/articles/telecommunications_public_sector_infrastructure_needs_digital_economy/
- Kozlinska, I. (2011). Contemporary approaches to entrepreneurship education. *Journal of Business Management*, 4(1), 205-220.
- Leem, J., & Sung, E. (2019). Teachers' beliefs and technology acceptance concerning smart mobile devices for SMART education in South Korea. *British Journal of Educational Technology*, 50(2), 601-613.
- Linton, G., & Klinton, M. (2019). University entrepreneurship education: a design thinking approach to learning. *Journal of Innovation and Entrepreneurship*, 8(1), 3.
- Maresch, D., Harms, R., Kailer, N., & Wimmer-Wurm, B. (2016). The impact of entrepreneurship education on the entrepreneurial intention of students in science and engineering versus business studies university programs. *Technological Forecasting and Social Change*, 104, 172-179.
- OECD Digital Economy Papers. (2013). Retrieved from http://www.oecd-ilibrary.org/science-and-technology/oecd-digital-economy-papers_20716826
- OECD. (2009). *Evaluation of programmes concerning education for entrepreneurship*. OECD Working Party on SME's and Entrepreneurship, Paris. Retrieved from <https://www.oecd.org/cfe/smes/42890085.pdf>
- OECD. (2017). *OECD Digital Economy Outlook 2017*. OECD Publishing, Paris. Retrieved from <http://dx.doi.org/10.1787/9789264276284-en>
- Pi, S.Y. (2015). Educational utilization of smart devices in the convergence education era. *Journal of digital Convergence*, 13(6), 29-37.
- Rheingold, H. (2002). *Smart mobs: The new social revolution*. Perseus Publishing.
- Shvetsova, O.A. (2017). Smart education in high school: New perspectives in global world. In *2017 International Conference "Quality Management, Transport and Information Security, Information Technologies"(IT&QM&IS)*. 688-691.
- Smart Technology based Education and Training. (2014). *Smart Digital Futures*. Amsterdam: IOS Press BV
- The Concept of a "Digital Economy". (2001). Retrieved from <https://www.alrc.gov.au/publications/3-policy-context-inquiry/concept-digital-economy>
- The Entrepreneurship 2020 Action Plan. (2013). Retrieved from https://ec.europa.eu/growth/smes/promoting-entrepreneurship/action-plan_en
- Val, E., Gonzalez, I., Iriarte, I., Beitia, A., Lasa, G., & Elkoro, M. (2017). A Design Thinking approach to introduce entrepreneurship education in European school curricula. *The Design Journal*, 20(sup1), S754-S766.