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THE INFLUENCE OF THE INFORMATISATION ON THE AGRICULTURAL EDUCATION SYSTEM DEVELOPMENT IN UKRAINE

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ВПЛИВ ІНФОРМАТИЗАЦІЇ НА РОЗВИТОК СИСТЕМИ АГРАРНОЇ ОСВІТИ В УКРАЇНІ

The main challenges of the modern digital world have been proved as well as the factors that determine the content of new education paradigms, such as: the transforming of education system from memorizing and storing of large amount of information to the methods of continuously obtaining new knowledge and self-education; transition to the formation of an independent way of thinking, ability to work with different kind of information and different data; form not only professional knowledge and skills but also professional competence. It creates the necessity to improve the education system and particularly the agricultural education system.

As the results of the research, the place and role of the agricultural sector of Ukrainian economy as well as in the world economy were presented in the article. Moreover, the features of the agricultural education system in Ukraine have been defined. The key skills and competitiveness that shall be developed for the efficient agricultural students and future leaders have been proved, among them: flexible logic, the ability to navigate the situation quickly, the strategic thinking, the ability to acquire new knowledge and technologies in a quick way, ability to work in a team and an innovative and creative approach to production, motivation to self-education; ability to carry out creative and research activities. On the basis of the identified needs, a system of methods is offered that can provide the training of the relevant specialists.

У статті визначено основні виклики, що постають перед сучасним суспільством в епоху інформатизації, а також фактори, що визначають зміст нових парадигм освіти таких як: зміна мети освіти з запам'ятовування та зберігання великої кількості інформації на методи постійного отримання нових знань і самоосвіти; переорієнтація освіти на формування незалежного способу мислення, вміння працювати з різними видами інформації; формування не тільки професійних знань та навичок, але й професійних компетентностей. Це створює необхідність вдосконалення системи освіти в цілому та системи аграрної освіти зокрема.

За результатами дослідження було визначено провідне місце і роль аграрного сектору в економіці України, а також у світовій економіці. Крім того, визначено особливості системи аграрної освіти в Україні. Визначено основні навички та знання, які необхідні для підготовки майбутніх лідерів аграрного сектору, серед них: гнучка логіка, можливість швидкого реагування на зміну ситуації, стратегічне мислення, здатність до самоосвіти та отримання нових знань, вміння працювати в команді та інноваційний та креативний підхід до виробництва, вміння проводити творчу та дослідницьку діяльність та інші. На основі визначених потреб запропоновано систему методів, здатних забезпечити підготовку відповідних фахівців.

Key words: agriculture, globalisation, education system, competencies, digital era.

Ключові слова: аграрний сектор, глобалізація, система освіти, компетенції, ера цифрових технологій.

THE PROBLEM STATEMENT

The new age is characterised by the dynamic development with rapid changes, technological progress and global datafication and informatisation process, it

creates the need to adapt all economic entities and society in general to new challenges. Particular important is to adapt and improve the knowledge, skills and abilities of the workers in the conditions of techniques development

and global information systems, that needs the reconsideration of approaches to education and determines formation of a new, comprehensive education component as the basic element of a highly efficient, competitive economy. The development of the system of the agricultural education that prioritised in the era of information society as agriculture is one of the main branches of Ukrainian economy. We absolutely agree with the opinion of some reserchers [1] that there is widespread recognition that skills and human capital have become the backbone of economic prosperity and social well-being in the 21st century. In contemporary economies and societies, individual and societal progress is increasingly driven by technological advances. Prosperity requires nations to retain their competitive edge by developing and sustaining a skilled workforce, maintaining a globally competitive research base, and improving the dissemination of knowledge for the benefit of society at large.

The main questions, that were analysed during the research: identify the current state and the quality of education in Ukraine; analyse the role and place of agricultural sector in economy of Ukraine; investigate the features of agricultural education system in Ukraine; determinate the efficient tools for the improvement of agricultural education system in Ukraine with the use of the best international experience in the education sphere.

The objective of the research is to find out both the useful and efficient ways to improve the agricultural education system in Ukraine in general and new methods of forming required modern skills of the students and future leaders of agriculture in particular. To achieve the objective of the research the following methods: analysis, synthesis, induction, deduction and formalization have been used. The description and surveillance were used to characterize different aspects of agricultural educational system development. Some comparative methods helped to investigate the actual data from the certain periods of time and various graphics have been used to illustrate the dynamics of the current period.

PREVIOUS RESEARCHES AND PUBLICATIONS

The concept of modernasition of agricultural education system and new technologies development have been studied by foreign and national scientists, including Tremblay K., Lalancette D., Roseveare D. [1], Iovcheva A. [2], Petrukhnо Yu. [3] and others. H. Kaletnik [8], M. Malik, O. Prutska, P. Sabluk have paid considerable attention to the problems of the agricultural sector and ways of enhancing the efficiency of agricultural producers.

The Purpose of the Article is to present the complex of the tools, which have to be used on the deferent levels (governmental, university level), in the reason to develop and improve the agricultural education system.

THE ESSENCE OF THE ARTICLE

For the first time, theoretical substantiation of the definition of "information society" was given in 1959, when Daniel Bell, the Professor of Harvard University, making a speech at the international sociological seminar in Salzburg (Austria) used the term "post-industrial society". Having analysed the transformation in the areas of employment and production, D. Bell stated the increase in the share of the services sector in developed countries (primarily the US) in terms of quantitative involvement of human resources and the segment of GDP in the overall structure of the economy. Among the consequences: technologization of knowledge and its transformation into a direct productive force, the increasing importance of professional differentiation, the transition to "service economy".

According to the research provided by the national economists [2] further development and understanding the term "information society" has received in works of American scientist A. Toffler, who identified three waves in the development of society: the first wave is the result of the agricultural revolution, which changed the culture of hunters and gatherers; the second one is the result of industrial revolution, which is characterized by nuclear family type, conveyor system of education and corporatism; the third — is the result of intellectual revolution, that is, postindustrial society (information society), in which there is a huge variety of subcultures and styles of life.

One could not but agree with some of the researchers [3], that note the achievements of a representative of the Asian school Y. Hayashi, who defines the concept of the information society in the following postulates: the key role of information in social, economic and political spheres; communicative component comes to the fore in society's interaction; wide public access to information.

Equal attention to the concept of "information society" is given in international documents. One of the first conceptual documents which has defined the strategy of building the information society is a document entitled "Information society for all" adopted at the 29th session of the UNESCO General Conference in 1996. According to it, the main direction of international cooperation is building a global information society with a special role of UNESCO. Among the main European legal acts regulating public relations in the sphere of building the information society is Ocean Charter on global information society of 22 July 2000 [4]. In the preamble to this international treaty it is stated that "...the information society allows people to widely use their potential and realize their aspirations...".

Furthermore we fully agree with the opinion that: "Europeans who were born after 1980 can be labelled as "digital natives" since they do not normally remember a world without digital technologies" [5].

To prove the role of the information and new technology in the modern world we have to analyse the structure of the world GDP. The most powerful countries of the world are the USA and Chinese. United States boasts the largest share of the world's economy at 23.32%, followed by China at 13.9%. Interestingly, the US economy is mainly composed of companies engaged in providing services (79.7% compared to the global average of 63.6%), while agriculture and industry make up smaller-than-average of portions of the economy (1.12% and 19.1%) (World economy map, 2015).

In general, the increasing role and importance of information technology and non-material production in the world is proved also by the structure of the world GDP, thus, in 2015 services sector accounted for 63.6 per cent, while agriculture accounts for only 5.9% and industry — 30.5%.

Rapid pace of informatisation and entry into the era of "information society" determines the necessity for the development of new approaches in all spheres of public life and in education in particular. As noted by scientists [6], factors determining the contents of new educational paradigm are: the transition from memorization and the accumulation of a significant amount of information to mastering the methods of continuous acquisition of new knowledge and self-education; the transition to independent, but not reproductive thinking, ability to work with various information and various data; formation of not only professional knowledge, abilities and skills, but of professional competence.

We absolutely agree with the opinion [8], that it is education and science that are among those sectors, additional investment in which provides a synergistic effect. Higher school has never faced such transformations and such challenges, has never attracted such a

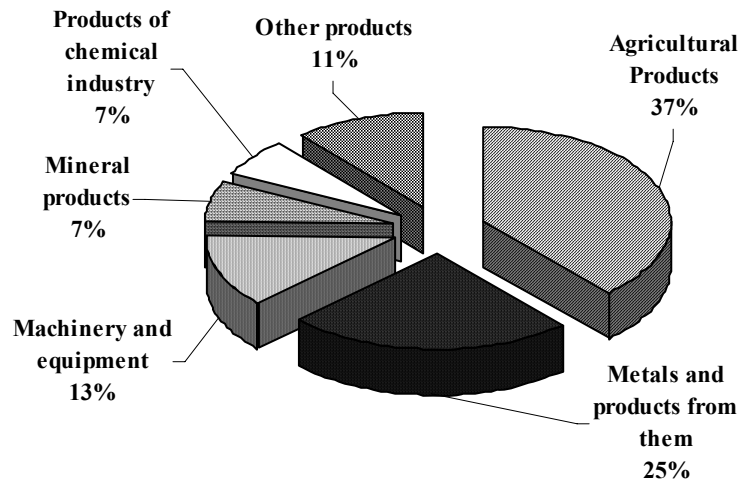


Fig. 1. The structure of the Ukrainians export by sectors, 2015

Source: designed by author with the use of resource [9].

close attention. Ukraine needs not just educated people, but creative, well-rounded, highly skilled specialists, which possess deep up-to-date knowledge, methods and techniques for creating new varieties, breeds and materials, modern information technologies and are able to ensure their implementation.

Thus, information society and new technologies put before the educational system a number of tasks, the most important of which are: formation of professional competence and mobility of students — the future leaders of the agricultural sector; transition to independent, critical thinking; a shift from memorization and accumulation of information to mastering the methods of continuous acquisition of new knowledge and self-education.

One of the priorities is the modernisation of the agricultural education system as far as the agriculture is one of the basic sectors of the economic in Ukraine. Agricultural sector provide the biggest part of Ukraine exports. The structure of the export by sectors is presented in the figure 1.

In 2015 Ukrainian export included more than \$14,8 billions of agricultural and food products. The food products and agricultural products in general, occupied a share of 38.2%, and among certain goods led the way, sunflower oil (7.9%), corn (7.9%), wheat (5.9%), soybean (2, 1%). As we can conclude, future growth of the country's economy depends a lot from the successful agriculture development. The ways to achieve higher efficient of agriculture production is one of the most important questions all over the world. In modern conditions one of

the most important resources in agriculture and in any other sectors of economy is human resources. Highly qualified and motivated people can provide the growth of the company and the sector in long-term outlook. To sum up, the base of the successful agricultural development is agricultural education that is the main resources of the future agricultural leaders.

Education System in Ukraine is presented by 287 Universities, and 1369,4 thousand of students study there (Figure 2). The number of Post Graduate students is 28487 (PhD degree students), 1821 (Doctor Degree Students). The System of the Agricultural Education in Ukraine today is presented by 17 Agricultural Universities, 2 Agricultural Academies, there are 111,1 thousand students and 7,4 thousand teaches.

As the figure 2 presented the number of the Universities and the number of the students in the Universities in Ukraine is not stable. The highest number of the Universities was in 2006 as well as the highest number of the students. Unfortunately, the number of the Universities cannot present a sufficient quality of the education. To determinate the quality aspects of the education system in Ukraine we can analyse the International Reports and Indexes.

The result of the research provided by The World Economic Forum shows that Ukraine occupied the 29th place between 140 countries in the position of availability of scientists and engineers labour resources and the 43th place between 140 countries in the position of the quality of the educational and scientific institutions.

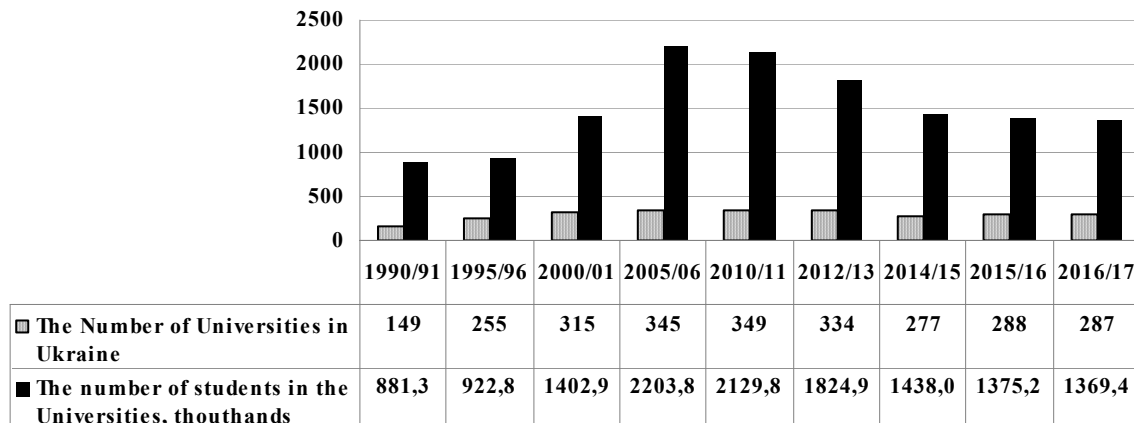


Fig. 2. The number of the Universities and number of the students in Ukraine in 1990–2017

Source: designed by author with the use of the official website of Ukrainian Statistic Service.

Despite, the positive aspects and high quality of education system in Ukraine in general, there are a lot of weak points of the education process, such as: gap between education and real business sector, low level of innovations that are using in education sphere etc. The Unified Comprehensive Strategy and Plan of the Development of the Agriculture and Rural Areas in Ukraine for 2015—2020 years is determined that today the general level of education in Ukraine is high enough, but there is a gap between the results of educational services and the needs of the agricultural sector.

To solve the problems and provide the modernisation of educational system possible only when the integrated approach to the restructuring of the system of education at all levels will be applied. Furthermore, the international experience can be useful for Ukraine and some parts of it may be implemented into the agricultural education system in Ukraine.

To investigate the best international experience in the education system modernisation will analyse such countries as: Spain, Estonia, Ireland, Slovene and German. In Spain, Strategy University 2015 is a government initiative to modernise universities through the coordination of the autonomous regional university systems and the development of a modern Spanish University System. One of its priorities is quality assurance in teaching, through the assessment, certification and accreditation of institutions, teachers and programmes, carried out by the Quality Assurance and Accreditation Agency (ANECA).

For example, in Estonia, the Higher Education Strategy 2006—2015 includes several action lines focusing on the development of teaching skills. Thus, the transition to competence-based study programmes are supported by training for teaching staff, focusing on modern teaching and assessment methods.

In Ireland a National Forum for the Enhancement of Teaching and Learning was established in 2012 to work structurally on improving teaching and learning. The National Forum uses different instruments for doing that, such as academic professional development tools and awards, a national digital platform and e-learning capacity development, and grants and fellowships.

Excellence in teaching is one aim of the Slovene National Higher Education Programme 2011—2020. To achieve teaching excellence, the programme requires higher education institutions to develop activities of continuing pedagogical training and to provide support for their teaching staff. Mechanisms for promoting excellence in teaching shall include the development of centers for teaching competences.

In Germany, more than 250 projects aim to improve study conditions and the quality of teaching, using a wide spectrum of measures, implementation strategies and interim goals. The quality pact for teaching foresees EUR 2 billion until 2020. At the same time, the Lander governments and a private donor funded 10 selected higher education institutions that jointly elaborated a Charter for good teaching which systematically deals with the different aspects of an institutional approach to the topic [10].

As the international experience presents, that the first step to the improvement of agricultural education system in Ukraine is the governmental policy and regional strategy for the modernisation of education system. The governmental policy has to be oriented on: the promotion of the cooperation between Universities and private sector to produce highly qualified professionals in the future; to achieve the integration between agricultural universities and agricultural enterprises based on agrarian business hanging out sessions, round tables., etc. formation of students' value-oriented approach for learning by adopting the

code of honor for students of teaching staff; the development of agricultural education for children and youth (programme 4H); providing the financial support of the agricultural education system through the direct and indirect subsidies, grants and programmes; organize the governmental control and evaluation of the education system through the special agencies; the orientation for the European principals and cooperation with Universities from the EU and other countries.

The most important for Ukraine today is to create in the country the Youth Development Programmes such as 4H and FFA. 4-H is the nation's largest youth development organisation in the USA, empowering six million young people throughout the United States. 4-H reaches every corner of the nation — from urban neighborhoods to suburban schoolyards to rural farming communities. With a network of more than 6 million youth, 611,800 volunteers, 3,500 professionals, and more than 25 million alumni. 4-H helps shape youth to move the country and the world forward in ways that no other youth organisation can. Head, Heart, Hands, and Health are the four — Hs in 4-H, and they are the four values of work: Head — Managing, Thinking; Heart — Relating, Caring; Hands — Giving, Working [11].

Implementation of international experience of creating programs for the pupils as FFA can help the country to become more efficient. Such programmes can be provided on the local levels through the cooperation between local government structures and Agriculture Universities. Overall, the youth development is the important way to create new generation of future farmers who are able to use new technologies and promote the growth of agriculture in Ukraine. And the last but not the least, is the necessity to develop the efficient relationships between agricultural education and business sector (farmers) through the Extension Services and the Youth development Programmes.

As important as efficient governmental policy is modernisation of the agricultural education system on the Universities level. Using of the modern methods of teaching, latest multimedia technologies and distance education are the main priorities of the new age. The most useful methods are; guest invitation; scientific clubs and new technologies such as clicker system etc.

As example using of the clicker system and case studies helps to: attract students to actively participate in the learning process; reducing the number of theoretical lectures and emphasis on practical aspects and experiments; development creative thinking in students; maximum focus on future changes in the world; monitoring the knowledge and opinions of the students in real time; simplification of procedures for assessment of students using clickers and computers.

Guest invitation and the scientific clubs in the education process emphasis to the practical training component those methods help to investigate current trends and problems "at first hand"; develop flexibility of thinking and creativity and create the environment for the formation of new acquaintances, business, contacts etc; provides less formal learning environment for the students; attracting students to the public activity and forming of active life position.

CONCLUSIONS, PROPOSALS, RECOMMENDATIONS

Education system in the modern world is one of the key of the efficient economic development and competitiveness of the countries. In the digital era conditions new skills and knowledge are necessary for the future leaders and effective workers. The main

contents of new educational paradigm have to be: the transition from memorization and the accumulation of a significant amount of information to master the methods of continuous acquisition of new knowledge and self-education; the transition to independent, but not reproductive thinking, the ability to work with various information and various data, etc. The improvement of the agricultural education system is one of the priorities for Ukraine the reason is that agricultural sector is the dominant in Ukraine economics. During the research the current state and quality of education in Ukraine have been determined as well as the role and place of agricultural sector in economy of Ukraine and features of agricultural education system in Ukraine have been investigated. The result of research shows the necessity of the providing future research and sociological interview aimed to find the most efficient education tools and teaching methods.

Moreover, the investigation shows that improvement of the agricultural education system and education system in general should be provided on the governmental level and universities level as well. The governmental policy level should provide: the promotion of the cooperation between Universities and private sector, the integration between agricultural universities and agricultural enterprises, the formation of students' value-oriented approach to learning, the development of agricultural education for children and youth (programme 4H), etc. On the universities level such methods as: guest invitation, case studies, scientific clubs and clicker system are useful. Future research going to determine opinions of the students about the most useful education methods and suggest governmental strategy for the agricultural education system improvement.

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