



DIGITALIZATION AS A TREND IN THE DEVELOPMENT OF AGRICULTURE IN THE CONDITIONS OF A NEW TECHNOLOGICAL WAY

Murodjon Berdimurodov Baxodir o'g'li

4th grade student of Termiz Institute of Agrotechnologies and Innovative Development

Article history:	Abstract:
<p>Received: 20th August 2022 Accepted: 20th September 2022 Published: 26th October 2022</p>	<p>Digitalization allows expanding the capabilities of the agricultural sector (including agricultural production), increasing the efficiency of resource use. With its help, the efficiency of agricultural production is increased due to the optimal planning of the structure of crops, automation of irrigation and non-fodder feeding of plants, digital modeling of crop yields, and optimization of the feed ration of farm animals. However, domestic agriculture, which is in dire need of new sources of labor productivity growth, has so far made little use of these opportunities. The main reasons are the high cost of introducing digital technologies into production and the lack of skills and competencies for workers to work with digital technologies. The analysis of the level of digitalization of agriculture in Uzbekistan has been carried out. The main problems hindering the development of digital agriculture in our country are identified, one of which is human capital. Based on a survey of students from different faculties of the branch university, the main competencies were identified, which, in their opinion, will be in demand in farms using digital technologies. A list of skills and competencies that will become the main ones for the implementation of production in the conditions of digital agriculture is proposed</p>

Keywords: Digitalization, agriculture, human capital, competencies, skills, professional digital competencies, "flexible" competencies.

INTRODUCTION. In modern conditions, the digitalization of agriculture is becoming one of the necessary conditions for solving the problem of food security in Russia. The country has a significant reserve of agricultural production and the potential for growth in the trade turnover of the industry through the introduction of digital processes and technologies in crop and livestock production. However, the use of this reserve based on digital technologies requires: firstly, the acquisition of expensive machinery, technologies and equipment and secondly, changes in the management system in the economy; thirdly, training employees with new knowledge, competencies and skills.

The problem of digitalization of agriculture is mainly considered from the standpoint of providing agricultural production with new equipment and technologies and their effective use. However, in our opinion, in the digitalization of the industry, it is not technology that is most important, but a person. In this regard, it is necessary to identify those skills and competencies for workers that will significantly increase productivity and improve their working conditions (3).

The purpose of the study is to identify the problems and prospects for the digitalization of agriculture in Uzbekistan. In this connection, the analysis of the level of digitalization of agriculture in Uzbekistan was carried out, the problems of digitalization of the industry were identified and promising directions for increasing the level of digitalization of agriculture in Russia were proposed. The object of research is the process of digitalization of agriculture. The subject of the study was the ways and directions of increasing the level of digitalization of agriculture. Methodologies and research methodology.

The following methods were used in the work: analysis, synthesis, comparison, monographic method, questioning. Results of researches and scope of their application. Digital agriculture is called agriculture, based on integrated automation and robotization of production, the use of automated decision-making systems, modern technologies for modeling and designing ecosystems.

Digital technologies in agriculture are used to collect, store and process data on yield, soil condition, feed composition, etc. At the same time, it is very important to process the data correctly and draw reliable conclusions for making managerial decisions.



The scope of digital technologies in agriculture is limitless: from financial management to monitoring the conditions of farm animals.

Uzbekistan ranks 15th in the world in the digitalization of agriculture, as only 10% of arable land is cultivated using digital technologies.

3% of farms use precision farming technologies. According to the Ministry of Agriculture of the Uzbekistan, the ICT market in agriculture is 360 billion.

Analysts say Goldman Sachs Group", digital technologies are able to increase the productivity of world agriculture by 70% by 2050. At the same time, costs are reduced by 20 ... one of the driving forces for economic growth and increased competitiveness of enterprises (14).

Digital technologies will solve the following problems of the industry:

- 1) increase in the gross harvest of agricultural crops and its quality;
- 2) optimization of capital investments.
- 3) reducing labor intensity and increasing labor productivity;
- 4) greening of production.
- 5) reducing the impact of the human factor on the performance of production.

However, despite the huge positive impact of digitalization on the efficiency of agricultural production, there are barriers that hinder its development. The main ones among them are: significant dependence on imported equipment and technologies; the high cost of acquiring and introducing digital technologies into production, the insufficient level of development of digital

infrastructure, including the lack of mobile communications in some villages and villages; lack of •digital competencies* among the management and workers of farms; shortage of highly qualified personnel. If the first three problems can be solved through state support mechanisms aimed at subsidizing the acquisition of technologies, import substitution, etc., then the last two are systemic problems, the solution of which will lead to a radical transformation of the system of agricultural education (8; 17).

Human capital is one of the main factors influencing the level of digitalization of agriculture. How quickly agriculture will be able to switch to a new technological order depends on its quality.

The formation of human capital for the agricultural production of the future takes place mainly in secondary and higher industrial educational institutions, where students should already have the skills and competencies necessary to work in companies using digital technologies.

In order to assess the level of preparedness of students for digital agriculture, a survey was conducted among various faculties of the Novosibirsk State Agrarian University, within which the following questions were answered:

1. What skills do you think will be in demand in the context of digitalization in 5 years?
2. What are the "flexible" competencies (soft sfcAMs) are necessary when working with digital technologies?
3. How often do you use information and computer technologies?

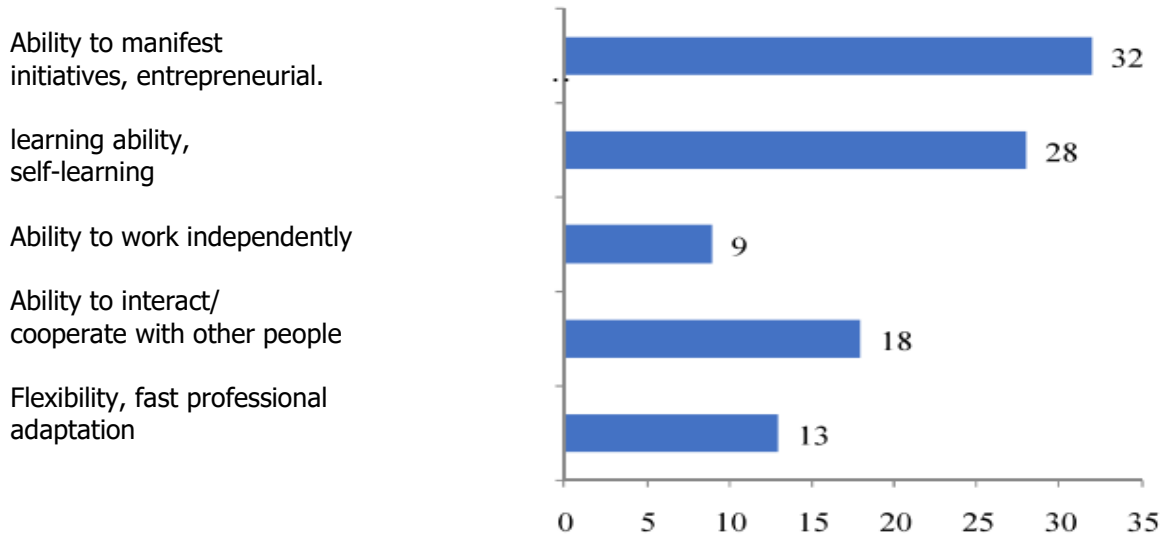


Fig. 1. Distribution of answers to the question: "What skills do you think will be in demand in the digitalization in 5 years?"; %/

Fig. 1. Distribution of answers to the question: "What skills do you think will be in demand in the conditions of digitalization in 5 years?"; %

According to students, the most demanded in digital agriculture will be workers who have both professional (hard skills), and "flexible" competencies (soft skills). This is the opinion of 42% of the respondents (Fig. 1). It should be noted that in hard

skills includes a set of professional skills and abilities related to the technical side of the activity, in soft skills - skills related not to a specific type of activity, but to communications for effective interaction with colleagues, clients and partners



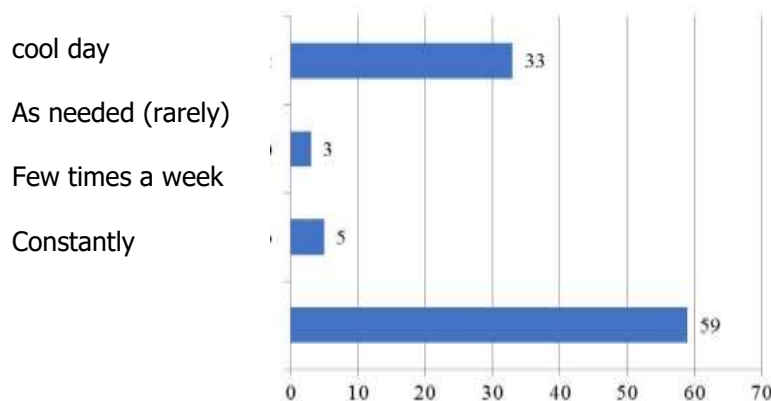
Pic. 2. Distribution of answers to the question: "What "soft" competencies (soft skills) are needed when working with digital technologies?"; % /

Fig. 2. Distribution of answers to the question: "What 'flexible' competencies (soft skills) are required when working with digital technologies?"; %

The answers to the next question showed that the most demanded soft skills respondents consider: the ability to show initiative, entrepreneurial qualities (32%) and the ability to learn and self-learn (28%) (Fig. 2). These competencies are indeed the main ones when working in companies using digital technologies, since their constant updating and improvement

requires employees to regularly improve their skills and initiative allows them to apply new methods to solve complex problems.

To the next question, about the frequency of use of information and computer technologies, 59% of respondents answered, "constantly"; 33% - "around the clock" (Fig. 3).



Rice. 3. Distribution of answers to the question: "How often do you use information and computer technologies?"; %/

Fig. 3. Distribution of answers to the question: "How often do you use information and computer technologies?"1, %

Despite the fact that the majority of students constantly use ICT. the level of use of various specialized programs and applications that are used in the provision of agricultural production is rather low. The reason is that when studying in higher and secondary educational institutions, little time is devoted to studying these programs. However, the

advantage of constant use of ICT allows graduates who have come to work on farms to quickly learn modern technologies.

Thus, the survey results showed. With regard to the skills necessary for digital agriculture, the opinions of the students surveyed coincided with the opinions of specialists who believe that in the near future, those



workers who have both professional and "flexible" competencies will be the most effective. The latter include constant learning and initiative. A positive moment for the development of digitalization of agriculture is that most students of the branch university are well acquainted with information and communication technologies and constantly use them. This greatly facilitates the process of training with specialized software when applying for a job.

In our opinion, the digitalization of agriculture requires the following skills and competencies from workers:

- 1) the ability to manage projects and processes;
- 2) systems thinking.
- 3) the ability to identify complex systems and work with them, including engineering systems;
- 4) knowledge of the basics of agro- and biotechnologies;
- 5) programming of IT solutions;
- 6) management of automated complexes;
- 7) ecological thinking;
- 8) work with artificial intelligence.

CONCLUSION. Digitalization of world agriculture by 2025 will lead to a 1.5-fold increase in agricultural production, improve its quality, reduce labor intensity and increase productivity, reduce unit costs, increase crop yields and productivity of farm animals.

The main problems of digitalization of agriculture include: the dependence of production on foreign equipment and technologies; the high cost of acquiring and introducing digital technologies into production; insufficient level of development of digital infrastructure, including the lack of mobile communications in some villages and villages; the lack of "digital competencies" among the management and workers of farms, the lack of highly qualified personnel.

The successful digitalization of agricultural production is based on the development of human capital, the formation of which, as a rule, takes place in secondary and higher industrial educational institutions, where students should already have the skills and competencies necessary to work in companies using digital technologies.

A survey of students from the Novosibirsk State Agrarian University showed that, according to students, the most in demand in digital agriculture will be workers with professional and universal competencies, among which the most important should be the ability to take initiative, entrepreneurial qualities and the ability to learn and self-learn.

REFERENCES

1. Dadahonovna, A. N. (2021). The Need To Develop A Model For The Professional Development Of Future Doctors. *European Journal of Molecular & Clinical Medicine*, 7(11), 2020.
2. Ахмедова, Н. Д., Мамаджанова, М. Р., & Буранова, Н. Ш. (2018). Профессиональное общение и этикет будущего врача. *Достижения науки и образования*, (16 (38)), 38-40.
3. Ахмедова, Н. Д. (2021). РОЛЬ ЭТИЧЕСКОЙ КУЛЬТУРЫ В ПРОФЕССИОНАЛЬНОЙ ДЕЯТЕЛЬНОСТИ ВРАЧА. *Universum: психология и образование*, (6 (84)), 12-14.
4. Ахмедова, Н. (2020). DEONTOLOGICAL AND PEDAGOGICAL FEATURES OF THE FORMATION OF THE SPIRIT OF A YOUNG DOCTOR. *Архив исследований*, 6-6.
5. Ахмедова, Н. (2020). РОЛЬ АВТОРИТЕТА ЛИЧНОСТИ ПРИ ФОРМИРОВАНИИ ДУХОВНО-НРАВСТВЕННЫХ КАЧЕСТВ БУДУЩИХ ВРАЧЕЙ. *Архив исследований*, 13-13.
6. Ахмедова, Н. (2020). ИЗУЧЕНИЕ ТЕРМИНОЛОГИЧЕСКОЙ ЛЕКСИКИ В ОБУЧЕНИИ РУССКОМУ ЯЗЫКУ. *Архив исследований*, 5-5.
7. Ахмедова, Н. (2020). К ВОПРОСАМ ПОВЫШЕНИЯ КАЧЕСТВА ОБУЧЕНИЯ В ВУЗЕ. *Архив исследований*, 5-5.
8. Ахмедова, Н. Д. (2020). СИСТЕМА ПРОФЕССИОНАЛЬНО-ДУХОВНЫХ КАЧЕСТВ ВРАЧА-КАК ПЕДАГОГИЧЕСКИЙ КЛАСТЕР. In *ПЕДАГОГИКА И ПСИХОЛОГИЯ В СОВРЕМЕННОМ МИРЕ: ТЕОРЕТИЧЕСКИЕ И ПРАКТИЧЕСКИЕ ИССЛЕДОВАНИЯ* (pp. 48-52).
9. Ахмедова, Н. Д. (2020). Педагогические условия развития нравственной культуры у студентов медицинских колледжей. *European science*, (4 (53)), 52-54.
10. Ахмедова, Н. Д., & Абдуллаева, К. А. (2019). АКТИВНЫЕ МЕТОДЫ ОБУЧЕНИЯ АРИТМИИ. *НАУЧНЫЙ ЭЛЕКТРОННЫЙ ЖУРНАЛ «АКАДЕМИЧЕСКАЯ ПУБЛИЦИСТИКА»*, 290.
11. Ахмедова, Н. Д., & Ойбекова, Г. С. (2019). The use of elements of educational technology in the teaching disciplines at" Optional therapy" and" Cardiology" for the formation of clinical thinking of the future doctors. *Молодой ученый*, (18), 143-145.
12. Ахмедова, Н. Д., & Юлдашева, С. (2018). Использование элементов педагогической



- технологии при преподавании дисциплин "Факультативная терапия" и "Кардиология" для формирования клинического мышления будущих врачей. *Молодой ученый*, (19), 179-181.
13. Ахмедова, Н. Д., & Пулатов, М. Д. (2019). СПЕЦИФИКА ПРОФЕССИОНАЛЬНОГО ОБЩЕНИЯ БУДУЩЕГО ВРАЧА. In *ИННОВАЦИОННЫЕ ТЕХНОЛОГИИ В МЕДИЦИНСКОМ ОБРАЗОВАНИИ* (pp. 251-253).
 14. Ахмедова, Н. Д., & Юлдашева, С. (2018). Современные технологии игровых методов обучения студентов на кафедре кардиологии. *Молодой ученый*, (19), 181-183.
 15. Гофурова, Ю. К., & Ахмедова, Н. (2018). ИЗУЧЕНИЕ ТЕРМИНОЛОГИЧЕСКОЙ ЛЕКСИКИ В ОБУЧЕНИИ РУССКОМУ ЯЗЫКУ. *Мировая наука*, (10), 151-154.
 16. Мамаджанова, М. Р., Ахмедова, Н. Д., & Хаитбаева, Г. И. (2018). К ВОПРОСАМ ПОВЫШЕНИЯ КАЧЕСТВА ОБУЧЕНИЯ В ВУЗЕ. *Мировая наука*, (4), 189-192.
 17. Ахмедова, Н. Д., Гафурова, Ю. К., & Хаитбаева, Г. И. (2018). Инновационные процессы в науке и в образовании. *Достижения науки и образования*, (16 (38)), 46-49.