KAPITEL 2 / *CHAPTER 2* [2]
INSEPARABILITY TEACHING, RESEARCH AND RURAL EXTENSION FOR THE SUSTAINABLE DEVELOPMENT OF AGRICULTURAL HIGHER EDUCATION

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Introduction

According to the Law of Ukraine "On Higher Education" [1], the main tasks of a higher education institution include the following: i) ensuring an organic combination of educational, scientific and innovative activities in the educational process and ii) creating necessary conditions for the participants of the educational process to realise their abilities and talents. As in the global scientific and pedagogical activities, the issue of innovative teaching methods is also very relevant in Ukraine. To achieve success, national higher education institutions use various innovative methods, most of which are based on legislative documents, national programmes on higher education, which, in turn, are formulated in accordance with international directives on higher education [2; 3]. Such methods contribute to improving the quality of education, increasing the level of knowledge, and the moral renewal of teaching methods and techniques

2.1. The importance of innovative processes in teaching practice

An important change in national education was the introduction of student-centred learning. According to the Law of Ukraine [1], this approach to the organisation of the educational process involves:

- encouragement of higher education students to play the role of autonomous and responsible subjects of the educational process;
- creation of an educational environment focused on meeting the needs and interests of higher education students, including providing opportunities for the formation of an individual educational trajectory;

[2]***Authors:*** *Kovtun Olena Volodymyrivna*

- building the educational process on the basis of mutual respect and partnership between participants in the educational process.

This approach is based on a personality-oriented teaching methodology, i.e. the student is the main subject, the goal, not the means to achieve the goal. It also contributes to the formation of such general competencies as the ability to think abstractly, analyse, synthesise, identify, pose and solve problems, work in an international context, develop and manage projects, during mutual communication between the teacher and students.

But recently, other methodologies, such as integration, collective action, information, distance, creative, modular and developmental, have become important and are being implemented in higher education institutions of Ukraine. According to the researchers, they should become the basis for effective didactic and methodological, psychological, and communicative interaction between students and teachers and contribute to the formation and manifestation of important professional and cross-cutting competences in students upon graduation [9].

One of the targets of the Sustainable Development Goals (SDGs) 4 – "quality education" - is to improve the quality of higher education and ensure its close connection with science, as well as to promote the formation of education and science cities in the country. The indicator used to monitor the implementation of this task is the number of Ukrainian cities that have become members of the UNESCO Global Network of Learning Cities. The practice of Ukrainian cities joining the UNESCO Global Network was launched in 2015, and in 2016-2020, the following cities were registered in Ukraine 4 [3].

Achieving the goals and priorities of sustainable development is impossible without quality education, which would be based on providing students with knowledge related to sustainable development in general and the implementation of the Sustainable Development Goals, which have been identified as priorities by Ukraine, in particular [14]. Sustainability is an inevitable path for the development of a society that seeks to leave a legacy of a healthy planet for its descendants. Therefore, to understand the general trends in economic development in general and agriculture,

which has a significant impact on the environment, in particular, educational programmes in all fields of study and specialities should provide students with basic knowledge of sustainable development of the economy and society. This is especially true for educational programmes in the fields of study 10 "Natural Sciences" and 20 "Agricultural Sciences and Food", which train specialists who determine the future vector of agricultural development in the country and the preservation of environmental safety and balance [13].

Ukraine's transition to a market economy has created the need to develop a new generation of specialists oriented to the new labour market conditions. This, to some extent, also gave rise to the restructuring of higher education. Innovation processes and the introduction of new teaching methods have become the subject of national and international research [4; 7; 8; 10].

Today, the issues related to the research of innovative technologies and teaching methods in higher education institutions and their correlation with such characteristics as useful, progressive, positive, modern, advanced remain relevant [5; 6; 10]. Thus, Jakubik in his research, he offers to contribute to the formation of students for the future professional life with the help of wisdom pedagogy [10; 11; 12].

After Ukraine joined the Bologna process in May 2005, the country implemented the 6 principles of the Bologna Convention in the educational process [16]. The Bologna Process, launched with the Bologna Declaration of 1999, is one of the main voluntary processes at European level, as it is nowadays implemented in 49 States, which define the European Higher Education Area (EHEA) (Fig. 1).

Expanding the mobility of teachers and students allows them to share their own experience and enrich themselves with European experience. Teachers and students bring with them new teaching methods and forms of education that they have learned in other countries. This enriches the national system of higher and secondary education and makes it more attractive not only for domestic students, but also for foreign teachers and students who choose Ukraine as a destination for mobility programmes.

Figure 1 - Map of the countries participating in the Bologna process

Note: As of the BFUG Meeting LXXX, held in Strasbourg on the 11th and 12th of April 2022, it was decided by the BFUG members to suspend the rights of representation of the Russian Federation and Belarus in the EHEA.

Source: [16]

2.2. Innovative teaching methods in higher education as guarantors of sustainable development of Ukraine

Education in Ukraine is currently undergoing reforms against the backdrop of a full-scale war, which has resulted in fully or partially destroyed, relocated educational institutions with destroyed material and technical facilities. However, the challenges posed by the Covid-19 pandemic have allowed education in Ukraine to adapt to the new conditions of the educational process, which could not but affect the adaptation to martial law. Digitalisation, virtual learning platforms, and distance learning make it possible to overcome the challenges posed by the uncertainty and unpredictability of the conditions in Ukraine [13]. Modern higher education is based on the acquisition by students of both “hard skills” that form the professionalism of the future professional and “soft skills” that determine the ability of the student to communicate, gain

knowledge, demonstrate leadership qualities, etc. A significant part of the educational components for obtaining both Bachelor's and Master's degrees in any speciality is focused on the acquisition of social and communication skills.

Training specialists with a clear understanding of the Goals and objectives of the Sustainable Development Strategy and the European Union's (EU) sustainable rural development policy is an important challenge for modern higher education in Ukraine. Ukraine is an agrarian country. Today, despite the war, Ukraine can feed, in addition to its own population, another 400 million people in the world [14]. According to the State Statistics Service of Ukraine, out of 23.404 million hectares under crops in Ukraine in 2022, 3.855 million hectares, or 16.5%, were used by farms and 6.971 million hectares, or 29.8%, by households. That is, almost half (46.3%) of the area under crops is used by farmers and households. Therefore, it is extremely important to raise awareness of the principles of sustainable rural development among farmers and members of local communities [13].

One of the priorities of the EU's Common Agricultural Policy for 2023-2027 is to create an effective model for supporting and promoting knowledge and innovation in agriculture and interrelated areas: rural areas, value chains, environmental protection, climate change, biodiversity conservation, sustainable development of society, etc. [15].

Ukraine is an active participant in implementation of the Agricultural Knowledge and Innovation System (AKIS) at the regional level, as the rural population needs to raise their own awareness of the opportunities and potential risks for doing business and understand the rational use of resources. Dissemination of knowledge and practical skills on modern approaches to agricultural production and information support for agricultural innovations are important for small farmers to ensure competitiveness and sustainable development of their activities. Establishing an AKIS at the national and regional levels by generating and strengthening knowledge flows, disseminating innovations and information, and strengthening the links between research and application and practice is necessary to achieve this goal [14].

Higher education in Ukraine, renewed and improved by the Bologna Process, is

developing in three areas - teaching, research and university training or extension. Teachers combine teaching and research activities, encouraging students to do the same, by developing, completing and defending course, diploma and thesis projects. This combination forms the basis of the scientific competence of research and teaching staff in higher education (Fig. 2).

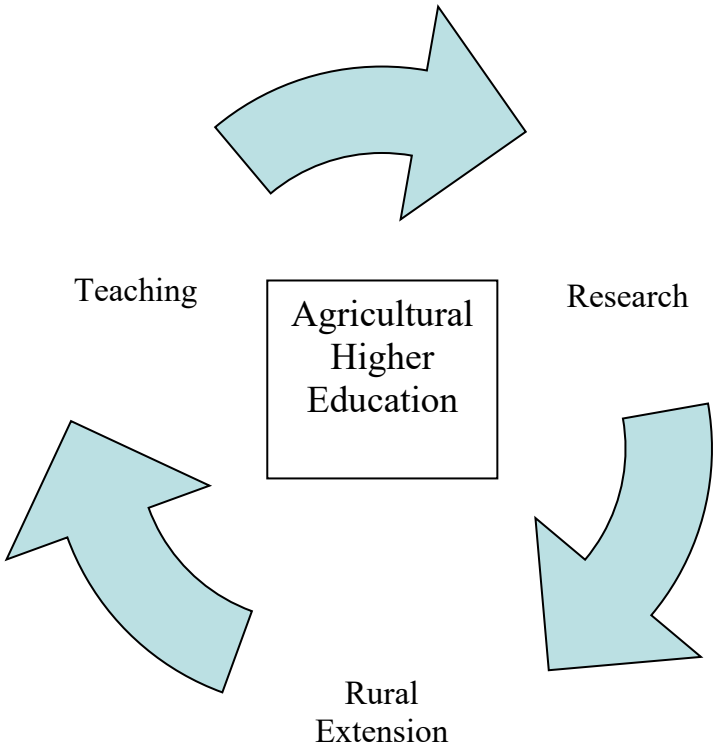

Figure 3 - Diagram of the academic process of the three-vector type: «Teaching – Research – Extension»

Source: Author's elaboration

Extension programs are created to engage local communities outside the academy, study their development and traditions, organise and conduct trainings, webinars and various workshops, depending on the area of research and teaching activity. In the opinion of Campos (2020) [17], policies to support and finance research and extension activities in fair higher education institutions serve as motivation to increase academic intention to promote broader social development and participation.

Local communities are encouraged and engaged during the research process, through formal surveys and informal conversations with citizens. In this way, the problem is identified and the object of research is defined. Therefore, the research

process is of great importance in the teaching process, with the direction of research being aligned with theoretical and methodological advances in various fields of knowledge, to develop strategies that are consistent with the epistemological traditions of a particular discipline, and to gradually integrate students into research and practice communities that are relevant to their areas of study. In order to organise and successfully implement such a three-vector academic process, it is necessary that the teacher and his/her students already have formed and harmonious teams, which can be formed through participation of students in various academic circles. For this purpose, teachers use various pedagogical technologies in their work. Bystrova (2015) [9] suggests classifying them as follows (Table 1).

Table 1 – Classification of pedagogical technologies

Pedagogical technologies	**Organisational approach**
Structural and logical	Stage-by-stage organisation of the learning system, which ensures a logical sequence of setting and solving didactic tasks based on a step-by-step selection of their content, forms, methods and means, taking into account the diagnosis of results
Integration	Didactic systems that ensure the integration of interdisciplinary knowledge and skills, various activities at the level of integrated courses (including e-learning)
Professional and business games	Didactic systems of using various "games", during which the ability to solve problems on the basis of a compromise choice is formed (business and role-playing games, simulation exercises, individual training, computer programmes)
Training	A system of activities to develop certain algorithms for solving typical practical problems with the help of a computer (psychological training in intellectual development, communication, solving managerial problems)
Information and computer	Technologies implemented in didactic computer learning systems based on human-machine dialogue with the help of various educational programmes (training, controlling, informational)
Dialogue and communication	A set of forms and methods of teaching based on dialogue thinking in interacting didactic systems of the subject-subject level.

Source: prepared by the author based on [9]

Conclusions and recommendations

The teacher of an educational institution in Ukraine always strives to select, design and use shared resources as much as possible, adapt them to pedagogical teaching tools and use them in multimedia presentations, using support of equipment and materials in the classrooms that would help and facilitate the learning process. The choice of resources to be used assumes that they are adequate, simple, accurate and relevant to the profile of the students, but it is planned from the outset to ensure that they meet the objectives set at the beginning of each session.

The planning of teaching activities in most cases involves many difficulties, given that a successful learning process depends on the preparation of theoretical and practical lessons and the desire to combine different pedagogical methods, active and passive, such as active and demonstrative, the use of question and answer techniques, independent and individual work. The demonstration method proved to be very useful, especially in practical classes, with the advantages of developing "how to" knowledge and at the same time transferring theoretical and practical knowledge.

Along with active methods, passive, explanatory and questionnaire methods are also used. The use of a combination of these two methods proved to be very positive, as students gained knowledge of the most important aspects of the large amount of theoretical material to be conveyed, and then supplemented the topics by performing research, independent and individual work, presenting the work done in the classroom, discussing and debating with colleagues.

In other words, the purpose of the educational process is to ensure that students, in addition to theoretical knowledge, acquire skills of interaction with the audience, develop reasoning and critical thinking, and are not shy or afraid when asked something or when criticism, both positive and negative, is expressed to them.