

Report on new concepts for practical education and student mobility

Sustainable Livestock Production and Animal Welfare

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Lead by

University name – PSAU

Pavlo Vashchenko

University name – NUBiP

Nataliia Hryshchenko

University name – LNUVBM

Nadiia Magrelo



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Prepared by

Poltava State Agrarian University

Larysa Kuzmenko,

Pavlo Vashchenko, Developer

National University of life and
environmental sciences of Ukraine

Andriy Getya

Nataliia Hryshchenko

Stepan Gzhytskyi National University of
Veterinary Medicine and Biotechnologies
of Lviv

Ihor Dvylyuk

Nadiia Magrelo

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Acronyms and abbreviations

PSAU	Poltava State Agrarian University
NUBiP	National University of life and environmental sciences of Ukraine
LNUVBM	Stepan Gzhytskyi National University of Veterinary Medicine and Biotechnologies of Lviv
V.Dahl EUNU	Volodymyr Dahl East Ukrainian National University
RISE	Response-Inducing Sustainability Evaluation
SLU	Swedish University of Agricultural Sciences
UL	University of Ljubljana
NGU	University of Nürtingen-Geislingen

1 Introduction and Background

Modern higher education includes direct study at a particular university (both in the classroom and on the farm) combined with visits to other universities during the study period, which ensures the formation of professional and personal competences of the student and prepares him or her for modern challenges. Practical education enables students to apply theoretical knowledge in real-life situations. This contributes to the development of key skills such as the ability to solve real production problems, project management and teamwork.

In this way, trained graduates are not only better able to meet the needs of employers, but are also better able to adapt to their work environment. Practical training is an important part of education. In the current environment, it is necessary to apply new methodological approaches to practical training. Even the methodology of teaching theoretical material should be reviewed. After all, it is becoming much more difficult to organise practical training in a modern farm for a number of reasons. Therefore, new methodological approaches to teaching theoretical material are extremely important. At the same time, students who have completed work experience or additional practical training have a significant advantage, as employers are increasingly looking for candidates with practical experience.

Opportunities for access to internships and practical experience, especially abroad, are expanded through the proposed mobility programme, in particular international mobility. Students can gain experience of living and learning in different environments, broadening their horizons and promoting global thinking. This is particularly important in a world where more and more companies are operating in an international environment.

Obviously, leaving one's comfort zone and moving to a new place of practice/study, which is often a new cultural environment, is a significant challenge for any student and requires students to be independent, adaptable and able to solve everyday problems. However, it is these skills that will be useful for personal and professional development.

Modern universities can exchange information and teaching methods through mobility programmes. This allows them to improve the quality of education in the country and around the world. Universities that actively participate in international exchange programmes often bring their educational programmes more in line with global standards. Practical education and student mobility are important factors for the growth and development of young professionals in Ukraine, where the national education system is actively approaching European and global standards.

Exchange programmes, including Erasmus+, not only contribute to academic development, but also lay the foundations for international connections.

2 Current State of Education at Partner Universities

An important component of improving the educational process at Ukrainian universities is the introduction of the latest methods of teaching theoretical and practical material. Providing the educational process with electronic textbooks, manuals, reference books and dictionaries is an important component of increasing the competitiveness of national higher education. Modern information and computer technologies are being actively introduced into the educational process, laboratories for the preparation and use of e-courses are being set up, and classrooms for remote lectures and teleconferences are being equipped.

The **National University of Life and Environmental Sciences of Ukraine (NUBiP)**, in particular the Faculty of Animal Husbandry and Aquatic Bioresources, strictly monitors the quality of the educational process. The development of methodological materials for each discipline is carried out in accordance with the regulations of the National University of Life and Environmental Sciences of Ukraine [<https://nubip.edu.ua/node/12654>]. Before the start of the course, the student is familiarised with the list of topics to be studied, the teaching programme and the evaluation criteria.

Teaching practices at NUBiP include classical lectures for students, which in times of challenges and external threats can be delivered in a hybrid form (where some students can attend online and some in person). Lectures are proposed using modern multimedia equipment to visualise the material. The practical training of the students will be carried out in four stages. The first stage is laboratory and practical work (carried out in the University's teaching and research laboratories and research farms). *Laboratory work* is a form of training in which students (trainees), under the guidance of a teacher, personally carry out full-scale or simulation experiments or experiments in order to practically confirm certain theoretical knowledge in this discipline, acquire practical skills in working with laboratory equipment, facilities, computers, measuring instruments and methods of experimental research in a particular subject area. *Practical work* is a form of training in which the teacher organises a detailed analysis by the students of certain theoretical provisions of the discipline and develops the skills and abilities of their practical application through the individual performance of appropriately formulated tasks by the student. The second stage – educational practice - is carried out in the initial (first, second) courses of bachelor's degree programmes in educational, research and production laboratories, clinics, workshops, in the educational and research farms of NUBiP of Ukraine, as well as in leading enterprises, organisations and institutions of Ukraine and abroad. The third stage of practical training is the industrial practice (technological, pedagogical, etc.), which is carried out in the latest years of study of the Bachelor's and Master's programmes. The fourth stage is the diploma project, which is carried out in the final year of study to consolidate and improve the knowledge, practical skills and abilities acquired and to gain experience and readiness for independent work. All stages of educational practice are accompanied by modern teaching methods, and the mobility of both teachers and students opens up opportunities for wider access to the capabilities of different educational institutions in terms of professional development, study of problematic issues and the establishment of scientific collaborations. Today's challenges in practical education include the lack of high-quality equipment and precursors for laboratories, as well as limited access to living organisms and animals in

scientific research. One of the tasks of higher education is to deepen practical links with the production sector in order to find common themes in animal feeding, housing, genetics, veterinary medicine, animal welfare, biosecurity and bioethics for the sustainable development of animal husbandry. A number of educational issues (access to modern breeding technologies, high-tech equipment) that cannot be addressed by educational institutions will be solved by private companies using their material and technical base.

Nowadays, the mobility of teachers and students is one of the most important components of professional development and a tool for improving professional skills and communication. As part of the SuLAWe project, 10 academic staff from the Faculty of Animal Husbandry and Aquatic Bioresources took part in the international academic mobility programme at the University of Ljubljana (Slovenia), the University of Nürtingen-Geislingen (Germany) and the Swedish University of Agricultural Sciences in 2024. However, several gaps in the structure can be identified: discrepancies in teaching schedules, differences in the number of credits, and difficulties in travelling abroad due to martial law in Ukraine. Despite the external obstacles, the Faculty of Animal Husbandry and Aquatic Bioresources of NUBiP is actively involved in international activities that systematically include academic mobility of students and teachers.

Ensuring the quality of education at the **Stepan Gzhytskyi National University of Veterinary Medicine and Biotechnologies Lviv (LNUVBM)** is a priority goal to meet educational needs. In order to ensure quality, the university has developed and implemented an internal quality assurance system based on the requirements of the Laws of Ukraine “On Education”(1), “On Higher Education” (2), Standards and Recommendations for Quality Assurance in the European Higher Education Area (ESG 2015), the international standard "Quality Management Systems" ISO 9001:2015 and other documents (https://lvet.edu.ua/images/step/2022/04/04/Polozhennia_pro_orhanizatsiiu_osvitnoho_protsesu_LNUVMB_z_01_09_2022.pdf).

The system of internal quality assurance of education at the university is regulated by the Regulations on the System of Internal Quality Assurance of Education at the Stepan Gzhytskyi National University of Veterinary Medicine and Biotechnologies Lviv.

The right to academic mobility is granted on the basis of: international agreements on cooperation in the field of education and science, as well as international grants, projects, programmes and agreements between the university and partner institutions or their structural units (<https://lvet.edu.ua/images/step/2021/09/16/PAM.pdf>). Mobility takes place on the basis of invitations from foreign partner institutions. At the same time, it is possible to organise mobility on the initiative of teachers and students, supported by the university management on the basis of individual invitations.

Students of the university for the period of study at the partner institution in Ukraine or abroad shall, in accordance with the Academic Mobility Agreement, retain their place of study and scholarship in accordance with the law during the period of study, internship or research, unless the scholarship is provided by the Academic Mobility Programme.

Recognition of educational attainment is based on the European Credit Transfer and Accumulation System. The comparison of the academic workload during the academic

mobility programme is based on a comparison of the learning outcomes achieved by the student at the partner institution and the learning outcomes foreseen by the educational programme at the university. The university guarantees the student full recognition (enrolment) of the courses specified in the agreement upon their successful completion, as confirmed by an academic transcript issued by the partner institution.

Continuing education of academic staff of the Stepan Gzhytskyi National University of Veterinary Medicine and Biotechnologies Lviv is an important component of professional development, which contributes to updating knowledge, improving skills and adapting to modern educational standards, and enables qualifications to meet modern requirements of education and science, both national and European. Thanks to the SuLAWe project, 8 teachers from the Faculty of Veterinary Medicine and the Faculty of Biology and Technology took part in the international academic mobility programme at the University of Ljubljana (Slovenia), the University of Nürtingen-Geislingen (Germany) and the Swedish University of Agricultural Sciences in 2024, where they had the opportunity to update their theoretical knowledge, learn about innovative teaching methods, expand their professional competences, improve existing and develop new curricula and methods, and improve the results of the educational process.

The educational process at the **Poltava State Agricultural University (PSAU)** is carried out in the following forms: teaching, individual work, practical training and measures to control the level of knowledge. The main types of teaching are lectures, laboratory, practical, seminar and consultation. The main methods of learning and teaching are: organisation and implementation, stimulation and motivation of educational and cognitive activities and innovative methods. Educational activities and internal quality assurance of higher education at the University are carried out in accordance with the regulations in force. (<https://www.pdau.edu.ua/content/polozhennya-pro-osvitnyu-diyalnist>).

Internal and external mobility of students and lecturers at Poltava State Agrarian University at the Faculty of Animal Production and Food Technology (TTP) and the Faculty of Veterinary Medicine is a regular practice. For example, lecturers regularly upgrade their qualifications and improve their teaching skills by studying the best practices of Ukrainian and foreign universities. For example, in February 2024, more than 10 teachers of the TTP-faculty were trained to introduce the “flipped classroom” method (3) into the educational process. In addition, one teacher (Oksana Kravchenko) is on a one-year internship at the Swedish University of Agricultural Sciences (SLU), where she is studying new teaching methods in detail and putting them into practice. In particular, she has taken part in lectures for Masters students in the Animal Food Science course at the Swedish University of Agricultural Sciences. As part of this course, Oksana Kravchenko gave lectures on 'Comparison of fish and mammalian muscle', 'Poultry meat', 'Quality of fish and shellfish products', 'Quality of eggs and egg products', where she introduced new teaching methods.

In 2024, eight academic staff from the Faculty of Animal Production and Food Technology took part in the international academic mobility programme at the University of Ljubljana (Slovenia), the University of Nürtingen-Geislingen (Germany) and the Swedish University of Agricultural Sciences. The main tasks of the teachers during the academic mobility were to study new effective teaching methods, raise the level of theoretical and practical training,

improve professional skills, gain international experience in teaching and research, and strengthen intercultural and interdisciplinary communication.

Every year students of Poltava State Agrarian University participate in short- and long-term academic mobility programmes to European educational institutions. However, the current drawbacks in this area are some discrepancies in the timing of the educational process between partner institutions and the limited number of male students travelling outside Ukraine due to the war in Ukraine. It is also important that students have a good knowledge of English in order to participate successfully in international mobility programmes.

3 New Concepts of Practical Education

3.1 Innovative Teaching Methods

The three modules developed in the frame of the SuLAWe project involve the use of several innovative teaching methodologies to develop the education at the HEI's, including:

1. Group work - promotes cooperation and improves teamwork skills.
2. RISE software - supports learning with a focus on sustainable livestock management.
3. Problem-based learning (PBL) - engages students in solving real-world problems.
4. Project-based learning (PjBL) - allows you to gain practical experience through specific, focused projects.
5. Live broadcasts from farms - provides direct access to the practice of farming, combining theory and practice. Also, the educational program "Technology of production and processing of livestock products" stipulates that part of the developed modules (1.5 ECTS) will be mastered by students during the production (integrated technological) practice (PSAU).
6. Use of case studies, use of data from real farms, presentation of practical experience of management.

3.2 Integration of Technology

The SuLAWe project provides an opportunity to learn how to apply the latest technologies to practical education by organising online simulations to model real-life herd management scenarios. One element of this approach is 'live farm streaming', which gives students direct access to real-world practice. These methods enhance learning by allowing students to interact with real farm conditions and apply theoretical knowledge in a practical way.

Some of the theoretical material is delivered to students in a "flipped classroom" format. Teachers use pre-recorded video lectures and electronic teaching materials that students can use to study outside of class. Training is provided to faculty on how to use "Camtasia" software to develop textbooks.

3.3 Collaboration with Industry and Associations

Receiving factual professional information directly from industry representatives is an important element of the educational process. The SuLAWe project consortium includes three professional associations, whose representatives often attend lectures as guest speakers.

Experts from other Ukrainian and foreign universities with unique expertise in their respective regions of Ukraine and other countries are also invited to open lectures.

The international forums organised as part of the project were a good complement to the theoretical material provided in the classroom.

As part of the SuLAWe project, it is planned to hold a series of open lectures (one in each of the developed disciplines) at each university, to which representatives of the associations will be invited as listeners and reviewers. Three lectures have already been given to NULES teachers.

In agreement with the associations, 6 courses on selected topics will be organised for students and representatives of livestock farms during the project period. Lists of invitees will be drawn up together with the associations. In addition, experts from the associations will be invited to these events as guest speakers.

Two training courses were held at Poltava State Agrarian University as part of the project organised by the Innovation Sector of Excellence for Lifelong Learning: Sustainable Poultry Production: “Innovative Poultry Farming: MHP Experience” and “Biosafety and Sustainable Poultry Farming: MHP Experience”. During the course “Innovative Poultry Farming: MHP Experience”, the following topics were covered: organisation of industrial poultry farming based on the principles of sustainability; technology for incubating eggs of the parent flock of chickens; current legislation on animal welfare in Ukraine; technology for rearing parent flocks of chickens; biological safety and feed hygiene; technology for the production of mixed fodder; compliance with the principles of welfare in the rearing of broiler chickens; technology for the production of broiler chicken meat; MHP biogas complexes: implementation experience and development prospects; interaction of education and practice in the system of training qualified specialists.

The course “Biosafety and Sustainable Poultry Farming: MHP Experience” covered the following topics: Ensuring epizootic welfare and prevention of infectious diseases in poultry farms; sanitary and hygienic requirements for premises for laying hens and broilers; biosafety as a key factor in sustainable poultry development; biosafety and sanitary and hygienic requirements of premises for the production of young poultry; poultry slaughter and veterinary inspection; poultry housing systems in modern industrial poultry farming and compliance with welfare requirements; management of the poultry industry according to the principles of sustainability; current legislation on animal welfare in Ukraine.. Legal aspect of state support for the poultry industry; interaction of education and practice in the system of training qualified specialists.

An important element of cooperation with associations is the organisation of professional forums. Two such events took place on 23.11.2023 (International Forum ‘Policy - Business -

Science - Education. Sustainable Cattle Farming and Milk Production in Ukraine") and 17.10.2024 (International Forum 'Policy - Business - Science - Education. Sustainable Poultry Farming in Ukraine"). Two more are planned for 2025. The associations were actively involved in the preparation of the forums, the formation of the list of speakers, contacting the authorities and disseminating information about the forum / inviting producers.

3.4 Transdisciplinary collaboration

The transdisciplinary collaboration within the SuLAWe project acts as a catalyst for innovation and practical solutions in the field of sustainable livestock production and animal welfare and will be continued even after the project end.

The key elements of this collaboration are as follows:

1. Teacher mobility to EU countries is a key aspect of the project. Teachers have an invaluable opportunity to gain direct insight into the latest technologies, methodologies and approaches to animal welfare and sustainable livestock production by participating in leading European university courses. This not only contributes to the expansion of knowledge, but also facilitates the formation of strong international links and networks.

The study visit programmes is oriented towards practical applications. The SuLAWe project offers participants the opportunity to apply their theoretical knowledge in a practical setting. By interacting with local foreign farmers, veterinarians and other industry representatives, teachers will be able to design and develop specific teaching modules that will directly contribute to improving education on animal welfare and sustainable development.

The result of this collaboration is an enhanced quality of education. The introduction of interactive teaching methods, practical assignments and mobility allows teachers and students to receive an education that meets the modern demands of the labour market.

2. Collaboration with colleagues from different fields of study. In this context, it is worth mentioning the experience gained in the use of the farm sustainability assessment programme - RISE. As the programme assesses the farm on the basis of a wide range of data, it is necessary to involve specialists in different fields (crop production, animal husbandry, economists, agricultural engineering, etc.). This requires close cooperation. By solving applied problems in the assessment of a real farm, students learn to apply a transdisciplinary approach and thus develop transdisciplinary cooperation.

Bringing together experts from different disciplines facilitates the formulation of comprehensive and pioneering solutions that address the multiple dimensions of animal welfare and sustainable production. This approach encourages creativity and facilitates the search for new solutions.

4 Student Mobility Initiatives: Exchange Programs and regional collaboration

1. Exchange programs

Participants in academic mobility are subject to all the rules laid down in current legislation. Namely, they are not expelled from the university for the period of mobility and are registered in the Unified State Electronic Database on Education, except for foreign citizens. Academic mobility of students/teachers is carried out during their studies/work in the academic or calendar year or during holidays or academic holidays. If academic mobility takes place during studies, the applicant is provided with an individual study plan with the possible use of distance learning technologies. Participation in academic mobility programmes is based on the principles of voluntariness, competition, transparency and expediency in the process of competitive selection of applicants for academic mobility and in its implementation. After the positive decision of the selection committee, the host university sends an invitation and a package of documents, which is the basis for the preparation of a draft order to send the student/teacher to a partner institution for academic mobility.

The SuLAWe project is designed to facilitate student/teacher mobility and regional cooperation, with the aim of enabling Ukrainian partner universities to improve the quality of the educational process in animal husbandry and veterinary medicine. Student mobility enables the acquisition of diverse skills and knowledge, thereby enhancing their ability to address issues related to sustainable livestock production and animal welfare. The project provides a platform for the exchange of experience and knowledge among students even after the project end.

The project will include visits by students to partner universities (in 2025) to gain additional experience in sustainability, animal welfare and the use of IT technologies in animal husbandry. Candidates will be selected on the basis of the requirements developed and their stay at the partner university will be secured. These first exchanges lead to future cooperation and exchange possibilities for the students.

2. Regional collaboration

The exchange of knowledge is a fundamental aspect of academic discourse. Regular workshops, seminars and conferences provide a forum for the exchange of knowledge and best practice between researchers and practitioners.

Capacity building is a key objective of the project. The project will contribute to the capacity building of partner universities and enterprises, particularly in the context of post-war Ukraine. It is expected that this will facilitate Ukraine's integration into the European space at a faster pace.

By forging links with European universities, the project encourages collaboration and knowledge sharing, strengthening regional links and promoting best practice in animal welfare and sustainable agriculture.

The project facilitates the implementation of sustainable practices. The novel pedagogical techniques and digital skills developed during the project will be further developed by the participating universities, ensuring continuous improvement of teaching and research standards.

Long-term partnerships are a key aspect of the project, with the intention of fostering ongoing collaboration between the various parties involved. It is expected that the collaboration between European and Ukrainian institutions will continue, facilitating further joint initiatives and research projects. On the basis of signed Memoranda of Understanding with European university partners, long-term cooperation will be supported.

There are a number of prerequisites for this.

The encouragement of innovative thinking: Familiarising teaching staff and students with a variety of approaches and research methodologies has contributed to the emergence of innovative ideas that can be addressed in collaboration with foreign colleagues.

Networking: The contacts established during the project realisation contribute to the establishment of long-term professional relationships between students and teachers from different higher education institutions, thus creating the basis for future cooperation.

Curriculum modernization: The project has helped to improve the curricula, which meet international standards and industry requirements. Their future development will require further cooperation.

The process of digitizing education: The inclusion of digital resources and online platforms increases the accessibility and flexibility of educational opportunities. As a result, during the implementation of the project, teachers from different universities gained access to the content of the educational programmes. It is expected that further content updates will be developed in cooperation between the universities.

The fostering of research collaboration and the sharing of knowledge are key objectives: the scientific contacts acquired during the project can be developed into further research projects. The project may facilitate collaboration on joint research projects, leading to the development of innovative approaches and joint publications.

Qualified specialists in the field of animal husbandry: The project contributes to the development of a highly skilled workforce in the livestock sector. The adult education courses, developed in collaboration with partner universities and associations, will help identify problematic issues in livestock production, which will stimulate scientific collaboration between countries to find optimal solutions.

By focusing on these key areas, the SuLAWe project will have a lasting and significant impact on the future of the livestock sector and sustainable agriculture.

Annexes



1. Study visit to UL, Slovenia (11-20.08.2024)



2. Study visit to NGU, Germany (01-09.07.2024)



3. Study visit to SLU, Sweden (10-19.03.2024)



4. Study visit to NGU, Germany (06-18.04.2024)

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