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Modern Requirements for the Training of Scientific Personnel in Environmental Specialties Within the National Academy of Agrarian Sciences of Ukraine

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Abstract

The article presents an analysis of the current state of training scientific and academic staff by Ukrainian higher education institutions and research establishments during the special period of Ukraine's gaining independence, in particular at the Institute of Agroecology and Environmental Management of NAAS.

It is emphasized that as early as 1999 the Cabinet of Ministers of Ukraine approved the Regulation on the training of academic and scientific staff, and starting from 2016 the training of academic and scientific personnel in Ukraine has been reformed in accordance with the requirements of the Bologna Agreement.

The authors emphasize that ensuring a healthy lifestyle and quality education is one of the key goals of the UN Sustainable Development Summit and requires an integrated approach and the provision of quality education that will foster the development of life competencies, strengthen health, and improve the quality of life of all members of society.

The functions of quality assurance in education are performed by the National Agency for Higher Education Quality Assurance, which has gone through its own path of formation and reform and has incorporated in its activities the best practices of Western agencies, including lessons learned from correcting previous mistakes.

Keywords: European integration of Ukraine in the field of education, by joining the Bologna Process, practices for improving the system of training academic and teaching staff, modernization of the conditions for the development of science in Ukraine

Introduction

An important prerequisite for the development of science is the improvement of the system for training scientific and academic staff. In Ukraine, a system for training such personnel has been created and is functioning successfully. This work is carried out by academies, higher education institutions, research institutes, and in industry (Kyslyi, 2009).

On 1 March 1999, the Cabinet of Ministers of Ukraine, by Resolution No. 309, approved the Regulation on the training of academic and scientific staff, which regulates activities in the field of training academic and scientific personnel and is mandatory for all higher education institutions and research establishments of Ukraine, regardless of their subordination and form of ownership (Regulation, 1999).

The training of scientific and academic staff is the process of obtaining a higher scientific qualification (scientific degree) and developing skills for conducting scientific, scientific-technical, teaching, and organizational activities, which usually takes place in postgraduate and doctoral studies. It involves educating individuals who already have higher education to carry out independent scientific research and to teach in higher education institutions (Tonkha, Mehbaliyeva, Nagorniuk, 2019). The main aspects of the training of scientific and academic staff include professional training, teaching activities, scientific activities, and the system of attestation of academic personnel.

Table 1. Main aspects of the training of scientific and academic staff

Professional training	It is the process of developing in an individual the knowledge, skills, abilities, and qualities necessary for successful work in a chosen profession. For scientific and academic staff, this means deep mastery of knowledge in a specific field, the methodology of scientific research, and pedagogical excellence.
Scientific activity	It includes the ability to conduct research, write scientific papers, publish them, participate in conferences to present and validate obtained scientific results, and defend a dissertation.
Teaching activity	This is teaching in higher education institutions, which includes instructional, methodological, and organizational work with students.
Attestation system	After completing the training and successfully defending the dissertation, the applicant is awarded a scientific degree (for example, Candidate or Doctor of Sciences) and conferred an academic title (for example, Associate Professor or Professor).

Since the beginning of Ukraine's independence, the authorities of our state have consistently declared their intention to introduce European principles in all spheres of public life. An important component of Ukraine's European integration aspirations is integration and deepening cooperation with European countries, especially in the field of higher education and scientific activity.

In 2005, Ukraine signed the Bologna Declaration, thereby officially joining the Bologna Process and undertaking the commitment to introduce European educational standards into the higher education system in the course of reforming the national educational system. For many years, our country has been moving along the path of change, reform, and transformation, striving to join the European educational area (Khan, 2017).

The main final document of the 2015 World Summit on Sustainable Development (the UN Sustainable Development Summit) is **"Transforming our world: the 2030 Agenda for Sustainable Development".**

Ensuring a healthy lifestyle and quality education is one of the key goals of the Summit and requires an integrated approach that includes developing in children and adults the skills of a healthy way of life, rational nutrition, physical activity, adherence to hygiene and daily routines, and, to provide this knowledge and these skills, the provision of quality education that will promote the development of life competencies and the strengthening of health.

In Ukraine, the functions of quality assurance in education are performed by the National Agency for Higher Education Quality Assurance, which has incorporated in its activities the best practices of Western agencies, including lessons learned from mistakes.

The National Agency for Higher Education Quality Assurance is an important stage in the reform of Ukrainian higher education. However, it is obvious that it is impossible to achieve qualitative changes solely through properly formulated requirements for educational activities, and also without adequate funding, which is linked to the capabilities of the national economy and the expectations of society. Nevertheless, clearly defined tasks and the rhetoric itself create a framework for an adequate understanding of the situation and movement in the right direction (New Accreditation System, 2020).

In the context of the increasing globalization of higher education, cross-border quality assurance plays a key role in strengthening international cooperation, raising academic standards, and ensuring the mutual recognition of qualifications (Stukalo, Kovalska, 2025).

Subject of the research

The subject of the research is the training of scientific personnel in environmental protection specialties, which includes obtaining higher education in environmental, economic, agronomic, geographical, and other related specialties and fields of knowledge, as well as conducting scientific research. It encompasses various levels (from bachelor's to postgraduate studies) and is aimed at forming specialists who can assess, monitor, and solve problems related to environmental pollution, the rational use of natural resources, and the preservation of biodiversity.

Methodology and subject of the research

The methodology of training scientific personnel is a theory of cognition that encompasses the principles, forms, and methods of scientific inquiry within the educational process. The subject of the research includes the study of the process of training specialists, their scientific activity, scientific knowledge, as well as the formation of their competencies and professionalism.

The methodology of training scientific and academic staff includes:

a) Theoretical research methods: analysis, synthesis, abstraction, generalization, induction, deduction, classification, etc.;

b) Empirical research methods: experiment, observation, description, methods of data collection and processing;

c) System research methods: systemic, functional, and concrete-sociological approaches.

d) The subject of scientific research includes:

e) Training process – the study of the stages of scientific activity and the formation of skills and knowledge of postgraduate students;

f) Scientific knowledge – the study of cognitive processes taking place in science;

g) Competence formation – the development of professional, analytical, creative, and communication skills in future researchers;

h) Professional development – the study of ways to obtain scientific degrees and academic titles.

Development (analysis of research results)

Ensuring the quality of higher education is a process that consists of **internal** (the quality assurance system within the educational institution) and **external** (state regulation, standardization, accreditation, licensing) mechanisms. It involves the evaluation and improvement of educational and managerial processes, resources, as well as the alignment of learning outcomes with the requirements of students and society (Bekh, Malinovskyi, Andrushchenko, 2004; Babyn, 2011).

The internal quality assurance system includes:

1. Quality of personnel.
2. Educational, methodological and didactic support of educational programs.
3. Information and library resources.
4. Satisfaction of students and employees with social conditions.
5. Material and technical support.

The components that should ensure the effectiveness of external quality assessment processes and the independence of relevant institutions include:

1. Standardization.
2. Licensing of educational activities.
3. Accreditation of educational programs and institutional accreditation.
4. External independent assessment of learning outcomes.

5. Institutional audit.
6. Monitoring of educational quality.
7. Public accreditation of educational institutions.

In addition, ensuring the quality of education means the development of life and communication competencies, as well as the formation of health-preserving competence among teachers themselves, the intellectual and moral development of those who teach, and the ability to acquire and use modern scientific knowledge, etc. (Environmental Education, 2013).

International cooperation between European quality assurance agencies is constantly expanding and improving. It includes such forms of collaboration as: involving foreign specialists in specific disciplines in the evaluation process and including them in accreditation commissions; including foreign colleagues or experts in the governing body or steering committee of an agency in another country; using existing international standards and criteria in evaluation and accreditation; and applying internationally developed indicators (descriptors) of learning outcomes for bachelor's and master's degrees (Babyn, 2011).

Gradually, national qualification criteria are being integrated into a single framework of qualification requirements within the European Higher Education Area, which is formed on the basis of a common understanding of learning outcomes and competencies acquired by graduates of higher education institutions and research establishments (Finikova, Sharova, 2014).

At the Institute of Agroecology and Environmental Management of NAAS, the training of highly qualified scientific personnel is carried out through postgraduate studies, which were established in 1994, and doctoral studies, which have been operating since 1995, in the following specialties::

a) 03.00.16 – ecology (biological and agricultural sciences);

b) 08.00.06 – economics of environmental management and environmental protection (economic sciences).

Figure 1. Department of Scientific Personnel Training and Methodological-Information Support of the Institute of Agroecology and Environmental Management of NAAS

In 2016, in order to carry out educational activities at the third (educational and scientific) level of higher education, an appropriate license was obtained, granting the right to train Doctors of Philosophy and Doctors of Sciences in the following specialties:

a) 051 – Economics (05 Social and Behavioral Sciences);
b) 101 – Ecology (10 Natural Sciences);
c) 201 – Agronomy (20 Agricultural Sciences and Food).

In 2020, the Department of Scientific Personnel Training and Methodological--Information Support of the Institute of Agroecology and Environmental Management of NAAS successfully passed the attestation procedure and received the relevant certificates valid until 01.07.2026.

Figure 2. Accreditation certificates of educational and scientific programs of the third educational and scientific level at the Institute of Agroecology and Environmental Management of NAAS

In 2025, the specialty codes were changed in accordance with the new classification system, which replaces the old numerical codes with alphanumeric ones to make the classification more convenient and concise. This change reflects the update approved by the Ministry of Education and Science of Ukraine.

According to the updated codes, the Institute provides training of specialists in the following specialties and fields of knowledge:

C1 – Economics (C – Social Sciences, Journalism and Information);

E2 – Ecology (E – Natural Sciences, Mathematics and Statistics);

H1 – Agronomy (H – Agriculture, Forestry, Fisheries and Veterinary Medicine).

Currently, the Institute of Agroecology and Environmental Management of NAAS has 2 doctoral candidates and 34 postgraduate students (including 11 in full-time (day) study; 22 in full-time (evening) study; and 1 in part-time study). Scientific supervision of postgraduate and doctoral students is carried out by 3 Candidates of Sciences and 23 Doctors of Sciences, among whom are: 3 Academicians, 2 Corresponding Members, and 14 Professors.

Regulatory and legal support, material and technical resources, and educational and scientific activities are presented on the Institute's website, which is again preparing to undergo re-attestation, taking into account all previous shortcomings and comments (Institute, website).

These include:

1. Development of the technical assignment to define the goals, objectives, and object of the research.
2. Selection of the research direction in order to learn how to define topics and substantiate the relevance of the research.
3. Theoretical and experimental studies, which involve the collection of scientific data, their analysis, processing, and interpretation.
4. Generalization and evaluation of the results: formulation of conclusions and assessment of their significance.
5. Organizational aspects: drawing up a research plan and distributing roles if it is a team project (Nagorniuk, Ridei, Sobchyk, 2017).

However, it is not only formal aspects that require improvement of the system for training scientific and academic staff.

To improve the system of professional development for academic staff based on modern educational technologies, it is necessary to maintain key factors for the successful defense of dissertation research, individualization of study programs, and flexible forms of learning (Walat, Kuzin, 2020; Mudrak, Sobchyk, Nahorniuk, Yashnik, Tarasenko, 2019; Zabelin, Kubitskyi, 2024).

The individualization of study programs is a key element of the professional development system for academic staff. The need for this approach lies in the fact that each lecturer has their own unique needs, interests, and professional motivations, which should be taken into account to ensure the maximum effectiveness of the educational process.

Digital learning management technologies make it possible to use such tools as electronic portfolios and analytical platforms, which enable more effective tracking of professional development. It is also important to introduce online courses and webinars for convenient and flexible learning (Zabelin, Kubitskyi, 2024).

The introduction of hybrid learning makes it possible to combine distance and in-person formats, creating conditions for flexibility and accessibility of education both for academic staff and for learners, taking into account different learning styles and working conditions, as well as saving time and resources (Zabelin, Kubitskyi, 2024).

Conclusions

Thus, modern requirements for the training of scientific personnel include in-depth knowledge in the specialty, critical thinking skills, the ability to conduct research, analyze and present results, as well as adherence to academic integrity and the formal requirements for scientific works. It is important to ensure the high quality of scientific output, in particular articles, which must be logically structured and comply with established standards.

These requirements for knowledge and skills imply deep and rigorous expertise of the candidate (specialist) in their field, enabling them to engage in scientific activity professionally. A researcher's skills require the ability to formulate the aim and objectives of the study, develop a methodology, carry out theoretical and empirical research, and analyze the results obtained. Analytical and critical thinking provide the capacity to critically evaluate existing knowledge and formulate one's own scientific conclusions. At the same time, academic integrity is the fundamental basis of a scientist's moral profile, requiring compliance with ethical standards and including the avoidance of plagiarism and other forms of academic misconduct.

In terms of requirements for scientific works, the logical and clear structure is assessed, including an introduction, the main body (divided into sections and subsections), conclusions, and a list of references. It is important to be able to substantiate the relevance of the topic, clearly formulate the aim and objectives, and define the object and subject of the research. High-quality content is determined by the scientific novelty of the work, which should contain new knowledge and results that have theoretical or practical value.

Equally important is the ability to comply with the technical requirements for formatting texts, such as layout, margins, indents, font size, and spacing, which may differ depending on the publication.

Other important aspects of effective training of scientific and academic staff include lifelong learning, continuous professional development, and deepening of knowledge in one's own and related fields, as well as practical training. The system of professional development should be oriented toward international standards, introduce modern approaches to teaching and management in the educational sphere, which will contribute to the globalization of the educational process and increase the competitiveness of academic staff. Such approaches would not only enhance the level of professional training, but also help create conditions for the individual development of personnel.

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