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MONITORING IN HIGHER EDUCATION: HIGH-QUALITY TRAINING OF FUTURE SPECIALISTS

SEGUIMIENTO EN LA EDUCACIÓN SUPERIOR: FORMACIÓN DE ALTA CALIDAD DE FUTUROS ESPECIALISTAS

Olga Oseredchuk [1*]
E-mail: oseredchuk.ola@gmail.com
ORCID: https://orcid.org/0000-0002-3192-3129
Ren Guoyuan [2]
E-mail: 523218954@qq.com
ORCID: https://orcid.org/0009-0000-9868-5711
Nataliia Hrechanyk [2]
E-mail: grechanikn@nudip.edu.ua
ORCID: https://orcid.org/0000-0003-3300-3198
Liubomyra Iliichuk [3]
E-mail: liubomyra.iliichuk@pnu.edu.ua
ORCID: https://orcid.org/0000-0003-4274-6903
Ivan Nyshchak [4]
E-mail: nyshchak@gmail.com
ORCID: https://orcid.org/0000-0002-1750-6708
Olha Komar [5]
E-mail: komar__olga@ukr.net
ORCID: https://orcid.org/0000-0003-0289-2359
[1] Ivan Franko National University of Lviv. Ukraine.
[2] National University of Life and Environmental Sciences of Ukraine. Ukraine.
[3] Vasyl Stefanyk Precarpathian National University. Ukraine.
[4] Drohobych Ivan Franko State Pedagogical University. Ukraine.
[5] Pavlo Tychyna Uman State Pedagogical University. Ukraine.
*Corresponding autor

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RESUMEN

Se fundamenta el sistema de garantía de la calidad de la educación en la educación superior, se identifican las tareas principales del seguimiento de la calidad de la educación, los principios básicos del seguimiento en la formación de la preparación de los futuros especialistas para la actividad profesional, que utilizamos en el estudio experimental. El experimento declarativo permitió identificar los problemas de organización del seguimiento en la educación superior con el fin de mejorar la calidad de la educación para formar la preparación de futuros especialistas para la actividad profesional y realizar una búsqueda detallada de formas efectivas para resolver estos problemas. El objetivo de la etapa formativa del experimento fue verificar la eficacia del sistema de seguimiento desarrollado en la educación superior con el fin de mejorar la calidad de la educación para preparar a los futuros especialistas para la actividad profesional. Al final del experimento pedagógico, los resultados obtenidos en los grupos experimentales indican una tendencia hacia cambios significativos hacia la mejora de los resultados. Esto se observa debido a un aumento en los indicadores de calidad de la educación de alto nivel para la preparación para la actividad profesional de los solicitantes de educación superior y una disminución en el indicador de bajo nivel a través de la organización del seguimiento en la educación superior para mejorar la calidad de la educación, lo que demuestra la eficacia del sistema de seguimiento en la educación superior para mejorar la calidad de la educación para la formación de la preparación de futuros especialistas para la actividad profesional.

Palabras clave:

Calidad de la educación, Preparación profesional, Educación superior

ABSTRACT

The system of ensuring the quality of education in higher education is substantiated, the leading tasks of monitoring

the quality of education are identified, and the basic principles of monitoring in forming the readiness of future specialists for professional activity, which we used in the experimental study. The ascertaining experiment made it possible to identify the problems of organizing monitoring in higher education to improve the quality of education for the formation of the readiness of future specialists for professional activity and to carry out a detailed search for effective ways to solve these problems. The purpose of the formative stage of the experiment was to verify the effectiveness of the developed monitoring system in higher education to improve the quality of education for the formation of the readiness of future specialists for professional activity. At the end of the pedagogical experiment, the results obtained in the experimental groups indicate a trend towards significant shifts towards improving results. This is observed due to an increase in the quality of high-level education indicators for the readiness for professional activity of higher education applicants and a decrease in the low-level indicator through the organization of monitoring in higher education to improve the quality of education, which proves the effectiveness of the monitoring system in higher education to improve the quality of education for the formation of the readiness of future specialists for professional activity.

Keywords:

Quality of education, Professional preparation, Higher education

INTRODUCTION

Modern higher education institutions are faced with new tasks that, in managing all links of the education system, require the search for optimal indicators of efficiency and qualitative changes in the educational process. Currently, there is a need to implement and develop a system of analysis, study, and pedagogical forecasting corresponding to the social order, with the help of which it is possible to obtain information about the course of the objective educational process. Monitoring can solve this problem and the essence of monitoring on this basis is to synchronize the processes of measurement, observation, and obtaining new knowledge about the state of the object with subsequent forecasting, modeling, and making a management decision (Mytnyk et al., 2024).

To a large extent, the quality of monitoring organization determines the improvement of the educational process of higher education, which would be characterized by mobility, democracy, flexibility, and the ability to self-organize (Popova et al., 2021).

The quality of education is determined not only by the strength and depth of knowledge, but much depends on the level of spiritual, civic, and personal development and upbringing of future specialists, their readiness to make independent decisions, intelligence, and culture when certain life and professional complications occur, and the degree of formation of key professional competencies (Karamyshev et al., 2020).

The quality assurance system in higher education institutions occupies a significant place among the main components of the professional component of students (Knysh et al., 2024). This is an internal system that includes in its concept a set of measures and methods carried out to implement and guarantee qualitative and quantitative indicators of the quality of education. Therefore, the organization of monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity is a relevant topic for research.

Literature review

Within the chosen direction of research, we have highlighted the works of scientists who focused on the current issues of monitoring the quality of higher education to improve the quality of professional training of specialists.

The relevance of the problem of monitoring the quality of education in higher education institutions has been proven by such scientists as: Popova et al. (2021). Educational monitoring is considered in three areas: as a process; as a technology; and as an information system that is constantly updated and supplemented based on continuous monitoring of the set of defined criteria and the dynamics and state of development of all components of the quality of education to correct undesirable imbalances and make management decisions based on the analysis of the forecast of the collected information for further development of the studied processes.

“The quality of higher education as a subject of philosophical analysis” is formulated by Kyrylenko (2010) and as an integral product of culture and science, he investigates the specified phenomenon, proves that the integral product of culture and science is characterized by attributive features that are consistent with the existing modern needs of society. The formed competencies of specialists testify to the quality of the acquired higher education and it is these professionally formed competencies that are declared in the educational state standards of any country. In the context of the total energy-informational potential of a person, the scientist justifies the quality of higher education and the potential that a student accumulates during his studies.

Valuable for education is the research of Annienkova (2012), revealed the features of the work of scientific and pedagogical workers in higher education, in particular, the foundations of monitoring the quality of professional activity (theoretical and methodological); a model of

professional activity of scientific and pedagogical workers in higher education was developed. In foreign advanced countries of the world, the main trends in the development of monitoring the quality of their professional activity for professors and teaching staff were studied and outlined; The principles of the system for monitoring the quality of education and the regularities of the professional activity of scientific and pedagogical workers were clarified. An innovative toolkit was created to monitor the quality of professional activity of scientific and pedagogical workers. But Baidatska (2007) focuses her research on examining the essence of monitoring the quality of students' academic achievements; experimental verification and theoretical substantiation of the effectiveness of pedagogical conditions for monitoring the quality of students' academic achievements in higher education; description of the features of implementing monitoring the quality of students' academic achievements.

Hyrylovska (2020) focuses on the training of future skilled workers, therefore she concentrates her research on revealing the theoretical and methodological principles of monitoring the quality of professional training of specialists; offers such specialists a theoretical justification of the concept of monitoring the quality of professional training; reveals the integration processes of internal monitoring and external evaluation; proves the feasibility of the procedural model of monitoring the quality of professional training of specialists; identifies organizational and pedagogical conditions that must be observed during monitoring: maintaining an approximate sequence of actions; developing positive motivation in students, which allows them to actively participate in external evaluation; didactic support for professionally oriented self-training of students for external monitoring of the quality of professional training of skilled workers.

Tools and models for expert assessment of knowledge quality are described in Muradova's (2021) research in distance learning systems. In particular, for higher education students to master an innovative knowledge system during distance learning, tools and models have been developed through subject-oriented technologies to increase the efficiency of expert assessment of knowledge quality.

Thus, in the scientific discourse of recent years, scientists have presented a significant achievement, within the framework of which the problems of the quality of higher education have been corrected. Educational monitoring is considered in three areas: as a process; as a technology; and as an information system, the peculiarities of the work of scientific and pedagogical workers are revealed, in particular, the foundations of monitoring the quality of professional activity (theoretical and methodological); the theoretical and methodological principles of monitoring the quality of professional training of specialists are revealed; the theoretical justification of the concept of monitoring the quality of professional training of specialists is presented. However, the organizational aspects of monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity are not sufficiently covered.

Purpose of the research – verification of the effectiveness of the developed monitoring system in higher education to improve the quality of education to form the readiness of future specialists for professional activity.

MATERIALS AND METHODS

To achieve the goal, the following research methods were used: theoretical methods – comparison, comparison, synthesis, and analysis, which made it possible to characterize the state of development of the identified problem in the scientific and pedagogical literature, to identify the specifics of monitoring the quality of higher education; empirical methods – diagnostic (observation, questionnaires, interviews, surveys, self-analysis); to verify the effectiveness of the developed pedagogical conditions – pedagogical experiment; statistical methods – qualitative and quantitative analysis of experimental data and to evaluate and verify the reliability of the results of the pedagogical experiment – methods of mathematical statistics (non-parametric Pearson $\chi 2$ criterion).

The formed general hypothesis of the study suggests that it is necessary to carry out a holistic systematic analysis of the methodological and theoretical foundations of the organization of monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity and to develop and substantiate the pedagogical conditions for organizing monitoring of the quality of higher education and show their significance and experimentally verify their effectiveness.

In our study, the goal of conducting monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity involves:

assessment of the effectiveness of training future specialists for professional activity,

dynamics of changes in readiness levels,

verification of the developed pedagogical conditions for improving the quality of education to form the readiness of future specialists for professional activity;

determination of the components, indicators, and levels of formation of high-quality professional training of specialists in higher education.

In the process of experimental work during monitoring studies, we have identified the following stages: pilot, ascertaining, formative, and comparative.

The pilot study, which took place back in 2020, involved an analysis of the state of the organization of monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity.

At the ascertaining stage, which took place in 2020-2021, the term and object of monitoring were determined, the tasks and objectives of the study were set, a toolkit for monitoring was developed, the main criteria for the quality of education were formed, organizational measures were taken to study the composition and selection of the control and experimental groups; a toolkit was created for research and experimental work.

At the ascertaining stage, indicators, and components of the quality of education were determined by the level of readiness of future specialists for professional activity. An excessive number of methods and diagnostic pedagogical methods of mathematical and statistical analysis were used simultaneously to increase the variability of the diagnostic complex.

During the formative stage of the experiment, which took place in 2021-2023, using the developed indicators and components of the quality of education by the level of readiness for professional activity, the results obtained were analyzed, compared, and summarized; the dynamics and patterns of the development of the monitoring system in higher education to improve the quality of education to form the readiness of future specialists for professional activity were identified.

At the comparative stage of the experiment during 2023-2024, we assessed the proposed pedagogical conditions for monitoring the quality of education through the training of future specialists and corrected them. Therefore, the share of the sample population is 5% of the general population of applicants, of which 156 applicants for higher education in various specialties are the control group (CG), and 152 people are the experimental group (EG).

At the initial stage of the experiment, the homogeneous indicators of the experimental and control groups are quite close, as evidenced by comparative data on the composition of the experimental and control groups. This indicates the correctness of the group composition and ensures the reliability of the data obtained and the necessary purity of the experiment.

The sample method allows you to transfer the results of sample processing to the entire general population. The size of the sampling error was considered the difference between the sample population and the general.

We were able to apply the method of stratifying the regression graph into correlation constellations using the Student's t-test to check the reliability and significance of the parameters.

The study of the initial state of assessing the quality of higher education, the organization of monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity revealed an ineffective monitoring system and insufficient readiness of teachers and students for assessment activities.

The study provided grounds for identifying the criteria for higher education, which were divided into main groups.

In the structure of the readiness of future specialists for professional activity, the following components are proposed: motivational, cognitive, and activity, and their indicators are outlined.

The levels of monitoring organization in higher education to improve the quality of education to form the readiness of future specialists for professional activity (high, medium, low) are highlighted and their qualitative characteristics are described.

Thus, the ascertaining experiment made it possible to identify the problems of organizing monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity and to carry out a detailed search for effective ways to solve these problems.

The purpose of the formative stage of the experiment is to verify the effectiveness of the developed monitoring system in higher education to improve the quality of education to form the readiness of future specialists for professional activity.

During the formative stage of the experiment, it was proposed to make adjustments to the system of monitoring the quality of higher education in the EG for the successful monitoring of the quality of professional training of specialists in HEIs and pedagogical conditions were proposed for effective monitoring of the quality of higher education to form the readiness of future specialists for professional activity. CG students studied according to the standard methodology.

The results of the study allow applicants to note quantitative and qualitative changes in the level of formation of professional skills using the system of organizing monitoring in higher education to improve the quality of education. The number of applicants for socio-economic specialties of the EG with a high level of professional skills increased by 50% after the experiment, and future specialists in the exact sciences – by 51%. Among applicants for the CG,

we observe significantly lower indicators, 19%, and 17%, respectively.

The validity and reliability of all results were assessed using mathematical statistics methods. We used the Pearson $\chi 2$ criterion to compare the data obtained in the CG and EG for all specialties.

As a result of the experimental work, higher indicators of the quality of education (by improving the organization of monitoring in higher education) were found in EG applicants for the levels of readiness for professional activity.

Thus, in EG applicants, compared to the ascertaining stage of the study, the high level at the end of the formative stage of the study increased in socio-economic specialties by 37%, the low level decreased by 29%, and in exact sciences specialties, respectively – 39%, 30%.

In CG applicants, compared to the ascertaining stage of the study, the high level at the end of the formative stage of the study increased in socio-economic specialties by 5%, the low level decreased by 13%, and in exact sciences specialties, respectively – by 7%, 14%.

In the form of generalized indicators of the quality of education, the results of the study (by the levels of readiness for professional activity of CG and EG students) were checked for reliability in the process of implementing the system for monitoring the quality of education in higher education. This was done using the K. Pearson $\chi 2$ agreement criterion. We note that the results of the experimental study turned out to be reliable.

At the end of the pedagogical experiment, the results obtained in the experimental groups indicate a trend towards significant shifts towards improving results. This is observed due to an increase in the quality of education indicators of high-level readiness for professional activity of higher education applicants and a decrease in the low-level indicator through the organization of monitoring in higher education to improve the quality of education, which proves the effectiveness of the monitoring system in higher education to improve the quality of education for the formation of the readiness of future specialists for professional activity.

Thus, the positive dynamics identified during the study give reason to believe that the hypothesis put forward is confirmed, and the goals have been achieved.

RESULTS AND DISCUSSION

Substantiation of the system for ensuring the quality of education in higher education, the leading tasks of monitoring the quality of education, and the basic principles of monitoring in forming the readiness of future specialists for professional activity.

In the modern world, the quality of education is the subject of wide scientific and public discussions and is a key factor that enables the modernization of the educational sector. Given the insufficient development of ways to form the readiness of future specialists for professional activity by organizing monitoring in higher education to improve the quality of education, the need for scientific substantiation of the system of ensuring the quality of education in higher education, the leading tasks of monitoring the quality of education, the basic principles of monitoring, which is "one of the promising tools for managing the quality of education" has become urgent (Oseredchuk et al., 2022b).

In higher education institutions, the quality assurance system (internal system) is a set of measures and methods implemented to implement and guarantee qualitative and quantitative indicators of the quality of education. The quality assurance system in higher education institutions occupies a prominent place among the main components of the quality assurance system of higher education (Millar, 2006).

When improving the quality of education to form the readiness of future specialists for professional activity, monitoring is one of the main elements of ensuring the internal system of quality education. Monitoring is a comprehensive systematic diagnosis of qualitative and quantitative characteristics of the content of education, goals, technical and didactic means, results of the educational process, methods, and forms of personality development, and effectiveness of the functioning and development of the educational system. The main role of monitoring is not simply to state facts or data, but in the analytical comparison of these assessment data in dynamics (Karamyshev et al., 2020).

When organizing monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity, we consider the following to be the leading tasks in higher education institutions:

systematization of collected information on the development of the educational process and its state in higher education institutions (Kuchai et al., 2022);

development of a set of indicators and criteria to provide a holistic picture of the state of the educational process in higher education institutions, quantitative and qualitative changes in the specified process;

ensuring transparent and regular provision of information about the processes that constantly occur in the educational environment of a higher education institution;

making management decisions based on the analysis of the information received on the state of the educational

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process and forecasting its development (Popova et al., 2021).

When organizing monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity, we consider the following as the basic principles in higher education institutions:

student-centeredness: the process of organizing monitoring in higher education to improve the quality of education, involves an emphasis on the development of the personality and learning of each student; to receive personalized education by each future specialist, it involves an assessment of the set of conditions that fully ensure the disclosure of creative potential and internal resources in future specialists (Puhach et al., 2021);

comprehensiveness and systematicity: the process of organizing monitoring in higher education to improve the quality of education, involves an assessment of the teacher's activities, which is aimed at considering the academic achievements of higher education students in a socio-economic context; to develop a system of indicators of the quality of education to provide the opportunity to take into account changes in all elements of the object under study, which makes it possible to carry out a more versatile and objective analysis of the level of educational achievements in higher education of future specialists (Moroz et al., 2021);

operational efficiency: the results of the monitoring study on improving the educational process of higher education should stimulate measures aimed at forming the readiness of future specialists for professional activity;

efficiency: in the process of monitoring, it is necessary to show generalized results, highlight the personal and professional growth of each higher education seeker against the background of all students of the educational institution, the importance of the developed organizational and pedagogical conditions of study for a specified period, individual progressive changes in each education seeker, which is the basis for determining (for a specified period) the effectiveness of the activities of the teacher, the academic group of the higher education (Lyashenko, 2005);

assessment for learning, not assessment of learning: the system of indicators of the quality of education should be a tool for ensuring the quality of education in higher education, improving the educational process, and the leading tasks of monitoring the quality of education should ensure the overall dynamics of the parameters of the educational process and each higher education seeker in particular, to carry out comprehensive forecasting and diagnostics; revealing modern trends in the spread of the competency paradigm of higher education (Shuliak et al., 2022);

mutual responsibility and interaction: to carry out objective monitoring of the quality of education, it is necessary to involve all units of higher education in its implementation and organization – higher education seekers, teachers, observers (experts, public organizations, etc.), because it is in collective activity based on solidarity and cooperation that certain difficulties can be overcome, the set goals can be optimally achieved, etc. (Kuchai et al., 2017);

openness: taking into account the information needs of all participants in the educational process of higher education, adherence to a transparent approach to higher education applicants, heads of structural units of higher education, the public, and parents;

integration: monitoring the quality of education involves strengthening the links between self-assessment, control, and improvement of the educational process; the basis for improving the work of higher education and monitoring its implementation should be the results of external evaluation and internal self-monitoring of higher education (Harkivska, 2013);

innovativeness: monitoring the quality of education requires maximum use of ICT capabilities and adherence to new methodological approaches to ensure the effectiveness of monitoring the quality of education;

promising: monitoring the quality of education in higher education should be focused on long-term, scale, goals that can lead to fundamental changes in the quality of the educational process in higher education (Popova et al., 2021).

It is these leading tasks of monitoring the quality of education, the basic principles of monitoring in the formation of the readiness of future specialists for professional activity that we used in the experimental study.

Methodology of conducting the experimental study.

The general hypothesis of the study suggests that it is necessary to carry out a holistic systematic analysis of the methodological and theoretical foundations of the organization of monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity and to develop and substantiate the pedagogical conditions for organizing the monitoring of the quality of higher education and to show their significance and experimentally verify their effectiveness.

In the course of experimental work in the process of studying the problem of organizing monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity, it

is necessary to obtain reliable empirical information that reflects the structure of organizing monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity, organizing monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity and effective ways to track its quality, adhere to the logic of experimenting.

We believe that the main purpose of monitoring the quality of higher education is that it:

is a means of studying the dynamics of the applicant's training and the effects that the educational process has on him;

is organized to draw attention to the identified shortcomings of the educational process, study the state of training of future specialists, and identify areas (which are promising) for improving the internal system of quality assurance of higher education.

Monitoring of scientific and research support of the organization of monitoring in higher education includes the study and assessment of the directions, status, and results of scientific and research work of applicants for the educational space and teaching staff to improve the quality of education to form the readiness of future specialists for professional activity, which is carried out in the interests of improving the quality of higher education.

In our study, the purpose of monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity involves:

assessment of the effectiveness of training future specialists for professional activity,

dynamics of changes in readiness levels,

verification of developed pedagogical conditions for improving the quality of education to form the readiness of future specialists for professional activity;

determination of components, indicators, and levels of formation of high-quality professional training of specialists in higher education.

The experiment was characterized by the formation of experimental and control groups, intuitive selection of the object of study, when describing the object of study – orientation on statistical methods.

The introduction of control groups allows for to reduction of the list of "threats" to external and internal validity and also allows to conducting of realistic measurements in the natural environment for a long time (longitudinal experiment).

We used different types of sampling methods, creating experimental and control groups, which, taking into account unaccounted factors, consist in ensuring a random order of research implementation, and also act as a device for randomizing the elements of the experiment.

In the process of experimental work during monitoring studies, we distinguished the following stages: pilot, ascertaining, formative, and comparative.

The pilot study, which took place back in 2020, provided an analysis of the state of monitoring organizations in higher education to improve the quality of education to form the readiness of future specialists for professional activity.

At the ascertaining stage, which took place in 2020-2021, the term and object of monitoring were determined, the tasks and objectives of the study were set, a toolkit for monitoring was developed, the main criteria for the quality of education were formed, organizational measures were taken to study the composition and selection of the control and experimental groups; a toolkit was created for research and experimental work.

At the ascertaining stage, indicators, and components of the quality of education were determined by the level of readiness of future specialists for professional activity. An excessive number of methods and diagnostic pedagogical methods of mathematical and statistical analysis were used simultaneously to increase the variability of the diagnostic complex.

During the formative stage of the experiment, which took place in 2021-2023, a sequence of monitoring actions was determined to implement the created pedagogical conditions at the stage of theoretical research, taking into account the results of their initial testing: development of the content of the experimental work; clear setting of the goal; by the logic of the research and target settings – construction of the technological process of monitoring actions; availability of tools and indicators for assessing the quality of components of the readiness of future specialists for professional activity, the process and results of professional training of higher education applicants; guaranteed achievement of results.

At the formative stage, using the developed indicators and components of the quality of education by the level of readiness for professional activity, the results obtained were analyzed, compared, and summarized; revealing the dynamics and patterns of development of the monitoring system in higher education to improve the quality of education to form the readiness of future specialists for professional activity.

At the comparative stage of the experiment during 2023–2024, we assessed the proposed pedagogical conditions

for monitoring the quality of education through the training of future specialists and corrected them. At the comparative stage of the experiment, the available data were analyzed, the results obtained were verified, generalized, and systematized, and the information obtained was systematized.

The organizational and diagnostic study of monitoring was carried out from 2020 to 2024.

Using mathematical statistics methods, qualitative and quantitative processing of the systematized collected information was carried out.

As a result of processing the results of the study, we clarified the significance of the main areas of increasing the effectiveness of the organization of monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity. Obtaining verbal data from participants in the experimental work allowed the use of pedagogical research conditions and their verification by research methods.

When conducting monitoring procedures in higher education to improve the quality of education, the problem of obtaining generalized indicators characterizing the sample arises. We proposed using the cluster analysis method and the random sampling method to form a sample set of objects for monitoring research. Taking into account the representative sample, the random sampling method allowed quantitative measurements of pedagogical phenomena. It allowed us to identify homogeneous groups, among which the problem of organizing monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity was analyzed or investigated.

The object of statistical study was elements characterized by homogeneity, mass, integrity, the presence of variation (variability), and interdependence of the states of individual elements. The contingent of higher education applicants was one of the objects of the statistical study of the problem. The general population is the contingent of applicants for higher education institutions in terms of statistical analysis.

We consider it inappropriate to consider the entire population since the general population differs in significant volume. Therefore, it is possible to extend the obtained results to the entire general population and limit ourselves to studying only some of its parts regarding a certain pedagogical phenomenon. The sample of the general population is the experimental data obtained from a limited contingent of applicants who participated in the study. Since any applicant for higher education could participate in our testing at their own request, this sample was formed randomly.

Among the methods of mathematical statistics, the method of random selection of elements of the general population guarantees sufficient representativeness of the sample. Therefore, the nature of their obtaining ensures the representativeness of the sample.

Since any sample has a given volume, determining the sample volume in the sampling method is the initial task. The rule is that with random selection, each unit of the general population can be included in the sample with a certain probability. Therefore, the main advantage of random sampling is realized when this rule is observed: elements of the general population that approach the distribution in the general population are represented in the sample with probabilities. The larger the volume of the sample population and the smaller the dispersion sign in the general population, the smaller the representativeness error. A manifestation of the law of large numbers is such a result that allows you to calculate the required volume of the sample population according to fixed characteristics, having previously determined the permissible representativeness error.

A sample population was formed using the quota sampling method, which is based on the following properties of the general population (education, initial level of training, age, availability of practical work experience).

The number of applicants in the experimental and control groups was determined according to the following principle: the more statistically homogeneous the general population, the smaller the sample size can be. The percentage distribution turned out to be statistically reliable, which includes at least 18 respondents according to the results of the calculations.

Therefore, the share of the sample population is 5% of the general population of applicants, of which 156 applicants for higher education in various specialties are the control group (CG), and 152 people are the experimental group (EG).

At the initial stage of the experiment, the homogeneous indicators of the experimental and control groups are quite close, as evidenced by comparative data on the composition of the experimental and control groups. This indicates the correctness of the group composition and ensures the reliability of the data obtained and the necessary purity of the experiment.

The sampling method allows us to transfer the results of sampling processing to the entire general population. Some error occurs in this, and the effectiveness of the sampling method lies in the fact that it allows us to assess it. Errors, in the study, showed us how well the characteristics of the sample represent the corresponding characteristics of the general population, which are called

representativeness errors that arise when using sample data.

The magnitude of the sampling error was considered the difference between the sample population and the general.

We were able to apply the method of stratifying the regression graph into correlation constellations using the Student's t-test to check the reliability and significance of the parameters.

Declarative survey.

In a survey of teachers about the content of the quality of education, the principles of monitoring showed that:

75% of respondents associated it with the quality of knowledge. The same number of teachers involve applicants in joint assessment;

5% do not involve students in monitoring the quality of education at all;

28% do it irregularly.

And a survey of teachers on the reasons for involving higher education applicants in assessing the quality of higher education revealed the following reasons: "to substantiate the assessment", "to generate interest"; "to develop the skills to argue a position", "to develop the skills to analyze the results of one's activities".

As a result of the ascertaining stage of the experiment, the reason for the insufficient quality of education and the development of the educational institution was revealed, which consists in belittling the place and role of independent cognitive activity of higher education applicants.

When surveyed, 77% of teachers noted that the most important condition for students to obtain high-quality higher education is their ability to independently defend their own views, acquire knowledge, and form, and identify current problems of modern social and professional life. But, unfortunately, the time allocated to form the readiness of future specialists for professional activity by state educational standards for independent study of academic disciplines (up to 50%) is used inefficiently.

The study shows that higher education has not yet developed a perfect system for the development of an educational institution, control and organization of independent work of students, tasks for independent work, for self-control of knowledge are given in the form of answers to questions. Only:

19% of teachers involved in the ascertaining experiment noted that as homework, students were instructed to solve problems and complete exercises;

7% to compile tables and graphs;

9% to analyze journal articles.

So, we conclude that the development of education, the methodology for organizing independent cognitive activity of applicants in forming the readiness of future specialists for professional activity, is mainly focused on the transmission of ready-made knowledge to future specialists.

Significantly reduces the quality of education, to form the readiness of future specialists for professional activity, the insufficient level of educational and methodological support of the educational process of a higher education institution. The survey showed that 72% of higher education teachers were not ready to design reflective and problem-based methods of conducting classes, develop author's courses, and create multimedia and electronic manuals.

Analysis of the response to the question of the readiness of applicants to participate in the assessment together with the teacher to improve the quality of education to form their readiness for professional activity indicates the readiness of students to improve the quality of education to be competitive in professional activity was shown by only 11% of respondents.

31% of higher education applicants are involved in discussing assessment criteria during their studies at a higher school;

27% of higher education applicants are involved in discussing forms of control;

29% of higher education applicants participated in discussing what can and how can be changed in the educational process to improve the results of improving the quality of education to form the readiness of future specialists for professional activity.

A survey of students after the questionnaire showed that higher education applicants want to participate in

assessment procedures, but their level of readiness for this type of assessment is low.

The final direction of monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity was the personal assessment by higher education students of the organization of the educational process in a higher education institution in individual areas.

Studies of the satisfaction of higher education students and teaching staff with the quality of the educational process in higher education indicate that:

34% of higher education students are satisfied with the quality of teaching of academic disciplines, the quality of educational activities, and the development of the higher education institution.

75% of teachers (more, unlike students) are satisfied with the quality of the educational process, the quality of their activities, and the development of the higher education institution.

We associate such a discrepancy in assessments with the lag of teachers from the educational interests of young people, the conservatism of individual teachers, and the practice of professional activity of specialists.

The results of a targeted study of the activities of the teaching staff indicate that 75% of applicants and 72.1% of teachers do not fully use their opportunities to organize monitoring in higher education to improve the quality of education to prepare future specialists for professional activity.

The study of the initial state of assessing the quality of higher education, the organization of monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity revealed an ineffective monitoring system and insufficient readiness of teachers and students for assessment activities.

The study provided a basis for identifying criteria for higher education, which were divided into main groups: professionalism of management and scientific and pedagogical personnel of higher education; quality of education and training of future specialists; economic efficiency; information security of activity; effectiveness of organizing external activities; effectiveness of organizing internal activities.

In the structure of its readiness of future specialists for professional activity, the following components are proposed: motivational, cognitive, and activity, and their indicators are outlined.

Indicators of the motivational component are motivational activity in discussing the problems of organizing monitoring in higher education related to training, improving the quality of education, professional activity, a positive attitude to self-development, reflection, and the formation of the student's personal and professional qualities.

The indicators of the cognitive component were: the formation of competencies and a system of practical and theoretical knowledge necessary for the formation of the readiness of future specialists for professional activity.

The indicators of the activity component are: the creative nature of the manifestation of the skills of organizing monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity, an objective and critical attitude to one's activities, the use of adequate methods of interaction, the ability to find ways to solve professional problems.

The levels of organizing monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity (high, medium, low) are highlighted and their qualitative characteristics are described.

The high level reflects the formation of skills for organizing monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity, the ability to independently solve standard tasks and with a little help from a teacher nonstandard tasks; the creative process when the applicant understands the method of solving problems to solve the task; combining known methods of activity into new ones; transfer of acquired knowledge to a new situation; vision of a new problem, a holistic structure and new functions of an object in a familiar situation; the ability to solve a problem in fundamentally new ways; personal attitude to acquiring knowledge.

The average level corresponds to the ability to perform an action according to a model, act in a familiar situation, solve relevant typical educational tasks with the help of a teacher; the ability to operate with various scientific categories and concepts; the desire to increase the amount of knowledge when organizing monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity.

The low level characterizes the formation of the skills to solve standard tasks with the help of a teacher; mastering the experience of working with models; mastering specific skills and abilities; and familiarization with the organization of monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity and the necessary techniques for working with various sources of knowledge.

At the ascertaining stage, when analyzing the results of experimental research, it was revealed that the students had a low level of organization of monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity, and therefore the corresponding quality of their education.

Thus, the ascertaining experiment made it possible to identify the problems of organizing monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity and to carry out a detailed search for effective ways to solve these problems.

Results of the formative stage of experimental work.

The purpose of the formative stage of the experiment is to verify the effectiveness of the developed monitoring system in higher education to improve the quality of education to form the readiness of future specialists for professional activity.

In terms of ensuring the quality of higher education of applicants, a training program for EG students has been developed to improve the quality of education to form the readiness of future specialists for professional activity. Its development was carried out based on pedagogical conditions for monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity.

Effective monitoring of the quality of higher education to form the readiness of future EG specialists for professional activity is facilitated by the pedagogical conditions developed by us:

during monitoring the quality of higher education, the organization of a partnership between students and teachers;

based on the results of monitoring the quality of higher education, the application of scientific approaches (qualimetric, benchmarking, systemic, program-targeted, competency-based, activity-based, personal, problem-oriented) for making effective management decisions;

to modernize the monitoring of higher education – involving information technologies;

setting students up for independent monitoring of educational achievements for self-improvement (Oseredchuk et al., 2022a).

The program of the formative stage of the experiment in terms of content included: work on studying the abilities and individual characteristics of higher education applicants; updating curricula, optimizing, and updating the content of professional educational programs; improving the organization of the educational process; providing applicants with the opportunity to choose an individual trajectory for obtaining higher education; ensuring the variability of the content of education at the university; improving the stimulation of students' educational activities; introducing support for independent cognitive activities of applicants; using modern educational technologies in the educational process; expanding multimedia programs; supporting a creative and favorable environment in teaching teams and student groups; creating a bank of information software for educational classes (Oseredchuk et al., 2022).

During the formative stage of the experiment, it was proposed to make adjustments to the system for monitoring the quality of higher education in the EG for the successful monitoring of the quality of professional training of specialists in HEIs and proposed pedagogical conditions for effective monitoring of the quality of higher education to form the readiness of future specialists for professional activity. CG students studied according to the standard methodology.

When studying the identified components and identifying the features of building the personal sphere of future specialists in the EG, we traced the impact of innovative learning technologies on the organization of monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity, the formation of students' thinking, the level of development of creative abilities of applicants during the implementation of the monitoring system in higher education to improve the quality of education to form the readiness of future specialists for professional activity.

We involved applicants for higher education in two areas of specialization – specialists in socionomic specialties and future specialists in exact sciences.

The difficulty of the tasks offered to EG students is the same for both areas of specialization, they were put in equal conditions.

A comparative analysis in EG and CG between applicants of the two specialties showed that the difference in conceptual thinking in organizing monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity between all indicators is 30%, the difference between EG of both specialties was 4%. Therefore, the level of conceptual thinking does not differ in EG of both areas of specialization.

Processing the results for theoretical figurative thinking regarding the organization of monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity allowed us to draw the following conclusion: the indicator of theoretical figurative thinking in organizing monitoring in higher education to improve the quality of education to form the

readiness of future specialists for professional activity in EG is 80% of specialists in socionomic specialties, 79% of future specialists in exact sciences.

Processing of results for identifying practical visual-figurative thinking when organizing monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity showed that the indicator in the EG is 79% of specialists in socionomic specialties and 80% of future specialists in exact sciences.

Processing of results for visual-figurative thinking when organizing monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity showed that the indicator in the EG is 73% of specialists in socionomic specialties, 76% of future specialists in exact sciences.

Thus, among applicants of different specialties, the indicators of practical visual-active thinking and conceptual thinking when organizing monitoring in higher education to improve the quality of education to form the readiness of future specialists for professional activity are practically the same, and the indicators of the development of practical visual-figurative thinking and theoretical figurative thinking have a difference of 1.1% in applicants of socionomic specialties, 1.2% in future specialists of exact sciences.

At the beginning and the end of the experiment, we conducted a questionnaire to determine the degree of formation of professional skills in applicants of higher education using the system of organizing monitoring in higher education to improve the quality of education. We obtained data results where 3 levels of formation of professional skills in respondents and awareness of students of their own professional position are conditionally distinguished:

low level of mastery of skills, knowledge, practical lack of independence of students;

average level of mastery of the system of organization of monitoring in higher education to improve the quality of education, in which higher education students make small mistakes that require correction;

high level of mastery of the above indicators by students.

Summary data on the degree of formation of professional skills of the system of organization of monitoring in higher education to improve the quality of education are shown in Table 1.

Table 1. Levels of formation of professional skills of higher education students using the system of organization of monitoring in higher education to improve the quality of education (%)

Levels	Experiment	Specialties			
		Socioeconomic specialties		Exact sciences	
		EG	CG	EG	CG
High	Before	-	-	-	-
	After	50	19	51	17
Medium	Before	45	35	46	48
	After	38	53	37	54
Low	Before	55	65	54	52
	After	12	28	12	29

Fuente: Elaboración de autores

The results of the study allow applicants to note quantitative and qualitative changes in the level of formation of professional skills using the monitoring system in higher education to improve the quality of education. The number of applicants for socio-economic specialties of the EG with a high level of formation of professional skills increased by 50% after the experiment, and future specialists in the exact sciences – by 51%. In applicants for the CG, we observe significantly lower indicators, 19%, and 17%, respectively.

The validity and reliability of all results were assessed using mathematical statistics methods. We used the Pearson $\chi 2$ criterion to compare the data obtained in the CG and EG for all specialties.

It was established that according to the results of calculating the criterion K. Pearson:

for the motivational-personal component for socionomic specialties, it is – 98,

for the intellectual-cognitive component, it is – 126,

for the practical-activity component, it is – 64.

For the exact sciences specialties: respectively:

for the motivational-personal component it is – 88;

for the intellectual-cognitive component it is – 103;

for the practical-activity component, it is – 25.

Since it fell into the uncertainty zone $\chi 2>9.49$, then at the 5% level of significance it is possible to reject hypothesis H0 about similarity and accept the alternative hypothesis about the difference in indicators.

According to the results of the ascertaining and formative stages of the experimental work, a change in the quality of education was established by the levels of readiness for the organization of monitoring in higher education to improve the quality of education for professional activity of EG applicants from low to high, in CG from low to medium.

The difference in the high level of readiness of future specialists for professional activity by organizing monitoring in higher education to improve the quality of education of CG and EG was, according to the results of the experiment, 31% for socio-economic specialties, 14% for medium – 16%, and 33%, 11%, and 21% for exact sciences specialties, respectively.

EG applicants, as a result of the experimental work, showed higher indicators of the quality of education (by improving the organization of monitoring in higher education) by the levels of readiness for professional activity.

Thus, in EG applicants, compared to the ascertaining stage of the study, the high level at the end of the formative stage of the study increased in socio-economic specialties by 37%, the low level decreased by 29%, and in exact sciences specialties, respectively – 39%, 30%.

In CG applicants, compared to the ascertaining stage of the study, the high level at the end of the formative stage of the study increased in socio-economic specialties by 5%, the low level decreased by 13%, and in exact sciences specialties, respectively – by 7%, 14%.

In the form of generalized indicators of the quality of education, the results of the study (by the levels of readiness for professional activity of CG and EG students) were checked for reliability in the process of implementing the system for monitoring the quality of education in higher education. This was done using the K. Pearson $\chi 2$ agreement criterion. We note that the results of the experimental study turned out to be reliable.

At the end of the pedagogical experiment, the results obtained in the experimental groups indicate a trend towards significant shifts towards improving results. This is observed due to an increase in the quality of high-level education indicators for the readiness for professional activity of higher education applicants and a decrease in the low-level indicator through the organization of monitoring in higher education to improve the quality of education, which proves the effectiveness of the monitoring system in higher education to improve the quality of education for the formation of the readiness of future specialists for professional activity.

Thus, the positive dynamics identified in the study give reason to believe that the hypothesis put forward is confirmed, and the goal has been achieved.

CONCLUSIONS

The system of ensuring the quality of education in higher education is substantiated, the leading tasks of monitoring the quality of education are identified, and the basic principles of monitoring in forming the readiness of future specialists for professional activity, which we used in the experimental study.

The ascertaining experiment made it possible to identify the problems of organizing monitoring in higher education to improve the quality of education for the formation of the readiness of future specialists for professional activity and to carry out a detailed search for effective ways to solve these problems.

The purpose of the formative stage of the experiment was to verify the effectiveness of the developed monitoring system in higher education to improve the quality of education for the formation of the readiness of future specialists for professional activity.

At the end of the pedagogical experiment, the results obtained in the experimental groups indicate a trend towards significant shifts towards improving results. This is observed due to an increase in the quality of high-level education indicators for the readiness for professional activity of higher education applicants and a decrease in the low-level indicator through the organization of monitoring in higher education to improve the quality of education, which proves the effectiveness of the monitoring system in higher education to improve the quality of education for the formation of the readiness of future specialists for professional activity.

Further research is required to correct undesirable imbalances and make management decisions based on the analysis of the forecasting of the collected information to further develop the studied processes.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest for the publication of this scientific article.