SCIENTIFIC ACTIVITY OF STUDENTS AS A COMPONENT OF THE EDUCATIONAL PROCESS

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Abstract: Relevance. In vocational education, the main aim of the scientific work of the student is to increase the level of his/her professional and creative training, use of creative potential in the interests of scientific development, involvement of youth in scientific activity. At the same time, for the student himself/herself, the research activity is an important condition for self-development and self-realization. The aim. To investigate the importance of the scientific component of the educational process of HEIs students and its basic elements. In this research were used theoretical and empirical levels, applied a closed-ended questionnaire aimed at the construction of thoughts about the scientific activity. The practical value of the study was to provide recommendations on how to improve the level of scientific training of students.

Keywords: HEIs, scientific work, students' research, scientific and educational paradigm, science in the educational environment.

1 Introduction

At the present stage of socio-economic development of society, which is characterized by the gradual and steady integration of Ukraine into the European political, economic, and cultural structures, of exceptional importance is to increase the educational level of training of highly qualified specialists for all sectors of activity, enriching the intellectual and scientific potential in professional activities.

The socio-economic development of the state is determined by the level of education and skills of the younger generation. In higher education the emphasis has shifted to the quality training of specialists, effective processes of their professional formation and development, so the search for innovative learning systems has become more relevant, and the importance of the scientific activity of students has increased.

The main purpose of the organization and development of scientific work is to increase the level of scientific training of specialists with higher professional education and identifying talented young people for further training and replenishment of scientific and pedagogical staff HEIs.

The legislation of Ukraine concerning higher professional education states that scientific and scientific-technical activity in higher educational institutions is an integral part of the educational process and is carried out to integrate scientific, educational, and production activities in the system of higher education. Integration of students' research activities in the system of higher education involves the orientation of education for the formation and development of students' research skills by engaging them in research work under the guidance of a teacher, as well as independently.

Relevance. In professional education, the main purpose of the scientific work of the student is to increase the level of his/her professional and creative training, use of creative potential in the interests of scientific development, involvement of young people in scientific activities. At the same time, for the student himself/herself, the research activity is an important condition for self-development and self-realization. At the same time, practice and research results convince us that the level of knowledge, skills, and abilities of students and graduates of higher education institutions are not enough to meet the growing needs of both professional and personal nature. The presence of contradictions between the amount of knowledge intended for study and the possibility of their assimilation and application, efforts to develop students' mental abilities, the formation of their desire to self-regulate the process of mastering new knowledge and improve learning efficiency, and insufficient availability of methods of their formation.

Now methods, forms, and means of scientific activity of students are not enough, thus, it is necessary to introduce interactive pedagogical technologies in the educational process to equip future specialists with skills to use their knowledge in future practical activities. The urgent problem is the application of scientific activity at an early stage of training, taking into account the specifics of the future professional activity of a specialist.

On this basis, therefore, students' scientific activity as a component of the educational process requires detailed study.

2 Literature review

The articles by Minhalova (2019); Aprian (2021); Zeng (2020); Haryono (2021); Borodina & Yershova (2021) indicate that creating better conditions and resources for learning, mastering innovative technologies, information systems, and modern ICT is necessary to ensure HEIs competitiveness in the international market of educational services. The author examines the content of the current problem associated with the use of information and communication technologies to support and accompany the research work of students of higher educational institutions. The author notes the feasibility of using Google services to support the organization of students' scientific communities given a certain commonality in the scientific circles and problem groups organization. To intensify the research work of students' youth, the package of cloud services Google Suite for Education is defined, which will help to create an information environment for the student scientific community. University libraries should maintain traditional and digital access to academic, research, and information resources, as well as maintain a modern information and library space. Due to the growth of forms of distance learning, students must have access to a wide range of digital resources. Thus, along with subscriptions to external digital library systems and databases, the university's digital library system must be maintained. Vtyurina (2019) Arizen & Suhartini, (2020) discuss new approaches and solutions for creating repositories and organizing information resources, methods, and tools for users to access them. Membership in an intercollegiate digital library allows universities to support educational programs with electronic resources. It allows students, post-graduate students, and faculty to track the digital publications of member universities provides a platform for faculty to post and promote their work.

The basic phenomenon of the modern educational-scientific paradigm of the student is competencies, as well as their structural content and the system of different approaches to understanding them as a pedagogical phenomenon. The authors Khoroshikh & Sazonova, (2020). Pay special attention to the discussion of competence in the sphere of scientific activity of undergraduate students as an important component through which professional activity is formed. Based on the integrated approach, Telemtaev et al., (2014) formulate the principle of the integrity of student's technological research activity and create a general model of the complex technology of research activity, starting from the formation of technological design and ending with the techniques of useful benefits formation for its creators. According to Medvedieva (2019), students' scientific activity will be successful only if students can be accustomed to the technology of working in science from their junior years. The bibliometric indicators and analytical tools of the Elsevier Scopus scientometric platform are the basis for expert evaluation of scientific results. Analysis of bibliometric indicators: the Worse Index, journal rankings and source impact indicators on publication will allow students to apply all the possibilities of using experts in analytical scientometric tools: the SCImago Journal and Country Rank portal and the Spotlight database.

According to Ryabovol (2019), Dilmukhamedov & Yarulov (2021), Daher et al. (2020), Barceló-Oliver & et al. (2020), scientific research is an indicator of the quality of processes in a university environment, so it should be increased as a result of the increased scientific work done by faculty and students. As the importance of students' scientific creativity has received increasing attention, there are now three types of problem-solving for scientific creativity: collaborative learning, conceptual construction, and scientific reasoning. Problem-solving has a large effect on students' scientific creativity, as does scientific reasoning, while cooperative learning has a medium effect and conceptual construction has a small effect (Shuaishuai, 2020).

Tereshchenko & Shcherbakov (2021), looking at important socio-economic characteristics of student research activities, find that student publications indexed in lists and databases, as well as publications in regional research organizations that contribute to the innovative development of the region.

Sukhodolov et al. (2019) review the statistics of scientific research, summarizing the experience of the organization of research activities and proposing a model of its systematic provision. It is noted that there is a "customer crisis" in university science: the demand of the business sector does not provide the necessary volume of large and long-term orders for scientific research and research, which depend mainly on the state budget. The authors propose organizational measures for a gradual transition from teaching to research with step-by-step proof of productivity: the creation of a new academic subject to the university-"scientific unit" consisting of two or more employees, regardless of their academic rank, with administrative rights and corresponding responsibilities.

Chatwirakom (2016) is working on a pilot research project that aims to explore and develop the use of science activities as learning tools to improve learning behavior.

To achieve the actual scientific and technological ability of students in the context of innovation and cognition, the analysis of the students' cultural ability development to innovation, thoughts, and measures to develop students' scientific and technological ability to innovation is proposed in Zhanjun (2010).

Despite the mentioned topical developments, still unexplored is the issue of enhancing students' scientific activity in HEIs.

Aims. The aim of the research: to explore the scientific component importance of the HEIs students' learning process and its basic elements.

Research tasks:

- to conduct a sociological survey of 427 HEIs students (list the HEIs where the author works);
- to make recommendations on how to raise the level of scientific training of students.

3 Materials and research methods

To carry out this research and to obtain percentage results, sociological and statistical methods were chosen as the methodological basis. In this research, the theoretical and empirical levels were used. The questionnaire with the closed questions directed on the construction of thoughts about the scientific activity was applied.

The study was conducted among 427 applicants for higher education Kharkiv National University of Internal Affairs, (Ukraine) through a closed questionnaire by e-mail roll-call polling.

During two months of continuing survey and data processing, the authors investigated the importance of the scientific component of the educational process of HEIs students and its basic elements.

4 Results

In the introductory part of the questionnaire, respondents were asked to rank the tasks that require automation to improve the efficiency of scientific activities of students. The list of tasks: management of experiments, activities of scientists and dissertation councils, preparation of scientific events, editorial and publishing activities, expert evaluation of scientific projects, work of postgraduate and doctoral studies. The results are presented in Figure 1. The percentage distribution is presented in the table 1.

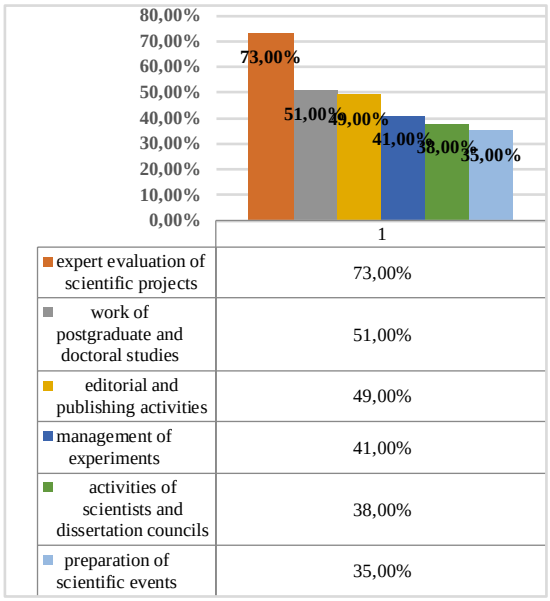

Figure 1 – Tasks that require automatization to improve the efficiency of scientific activities of students
(Source: respondents' answers.)

In the second question, the authors asked respondents to fill out the table 1 "Factors that encourage students to pursue science" from the scattered data. In the first block "Factor" the following items were presented:

1. Personal interest
2. Rewards for hard work
3. Acquisition of new knowledge
4. Employment prospects
5. Additional bonuses for admission to graduate school
6. The desire to contribute to society
7. Recognition, desire to become famous
8. Respect of teachers
9. Compulsion (from parents, teachers)
10. Making connections in the academic field
11. Formal encouragement from teachers

In the second block "Type of factor" the following options were presented:

1. Self-actualization factor
2. Financial factor
3. Career factor
4. Ideology factor
5. Complex factor
6. Leadership factor

The results are presented in Table 1.

Table 1 – Factors that contribute to the encouragement of students to scientific activities.

Factor	Factor's type	The number of students who have chosen the factor
Personal interest	Self-actualization factor	26,5%
Reward for work	Financial factor	21,4%
Acquisition of new	Self-actualization factor	16,5%

knowledge		
Job prospects	Career factor	14%
Additional bonuses for enrollment in MBA programs	Career factor	9,6%
The desire to be of use to the society	Ideological factor	9,2%
Recognition, desire to become famous	Financial factor	6,7%
Respect of teachers	Complex factor	5,5%
Compulsion (from parents, teachers)	Ideological factor	4,5%
Academic affiliation	Complex factor	2,8%
Formal encouragement from teachers	Leadership factor	0,2%

Source: respondents' answers

Third question: Demotivational factors.

The first place among reasons that prevent the involvement of students in research activities is the lack of interest in the topic of research Table 2. Every second student is not interested in the projects offered by the university (49.5%). The following reasons constitute a whole complex of reasons such as lack of experience, lack of confidence, and high demands for scientific work (36.6%). Lack of time is the main complex factor found during the survey – 33.6. Other factors in one way or another indicate a generally low interest in participating in scientific activities, whether it is irrelevant research topics or laziness. Strange was the response of some students about public disapproval of engaging in scholarly activities. Such fear was experienced by 1.4% of respondents.

Table 2 –"Demotivating" factors for scientific activity

Factor	Factor's type	The number of students who have chosen the factor
Lack of interest in the topic	Demotivational	49,5%
Lack of self-confidence, high demands for scientific research	Complex	36.6%
Lack of time	Complex	33,6%
Laziness	Demotivational	31,5%
Irrelevance of research	Demotivational	13,6%
Preference for a different subject	Demotivational	11,5%
Low level of knowledge	Demotivational	8,5%
"Others will do"	Demotivational	5,1%
Personal reasons	Complex	3,7%
Lack of encouragement	Complex	2,7%
Lack of supervisor	Complex	1,7%
Public condemnation	Demotivational	1,4%

Source: respondents' answers

The results obtained are the basis for the description of the ways to raise the level of students scientific training.

5 Discussion

In the 21st century, scientific literacy is an important competency that students should have. However, the scientific literacy of Indonesian students is recognized as low (Nainggolan, 2021).

In recent years, universities have promoted educational activities to spread science into society. The Faculty of Sciences of the University of Granada has developed various proposals that participate in both international and national frameworks, such as "La Noche de los Investigadores", "Semana de la Ciencia", "Aula Científica Permanente", "Café con Ciencia", " Ciencia y Sociedad "and others. These measures are proposed and guided by university professors from different fields of study. In these activities, undergraduate and graduate students of the university are offered the opportunity to participate voluntarily (Rufino et al., 2017).

Student impact in science would be an effective tool for gaining scientific and communication skills, as well as other abilities. These include developing short science protocols to learn how to organize lab assignments in a set amount of time. Students also realize the ability to synthesize basic ideas to convey essential scientific concepts in accessible language for non-specialists. In addition, public speaking skills are improved. Students acquire other abilities, such as the ability to confront doubts arising on scientific aspects, increase self-confidence, foster student-professor relationships, and take on the role of teacher.

Vasiljeva & et al. (2020), in Russian universities, calculate factor values and an integral measure of scholar performance, show that the individual rates of graduation of young faculty members exceeded those of senior faculty members. The disruptive factors associated with the scientific activity of teachers and researchers in Russian universities (divided into two groups of young scientists and senior scientists) were identified and systematized based on the level of dominant influence. The peculiarities of the influence of the emotional burnout factor on the scientific performance of university teachers were revealed.

Kurmalieva et al. (2020), based on the methods of C. Cameron and R. Quinn, analyzes the modern organizational culture of the management of research activities of students at Adygeya State University and point out the gap between the actual and desired views of the heads of structural units, as well as between them and the development strategy of the university.

According to the definition of Solovyev & Tumanova (2020), some tasks require automation to improve the efficiency of scientific activities of students. These tasks include management of experiments, activities of scientists and dissertation councils, preparation of scientific events, editorial and publishing activities, peer review of scientific projects, the work of graduate and doctoral schools, and several other tasks. For each type of automated activity, an approximate composition of functionality and software structure is defined.

Attendance of student scientific meetings and national and international conferences, and the publication of scientific results through the development and implementation of the WordPress digital platform make it possible to meet the information needs related to the scientific activities of students, although such needs should be evaluated throughout the years of various majors. The dissemination of the platform to other institutions of higher education can contribute to the training of research students in Cuba (Hernández-García & et. al., 2020).

Thus, the world academic science offers different options for the implementation of students' research activities as part of the educational process, and it is relevant to discuss their semantic components.

6 Conclusions

Improving the level of scientific training of students should be addressed in the following ways:

- revealing the potential of the most gifted students at an early stage of training;
- organizing favorable conditions for development and implementation of various forms of scientific creativity of students and young scientists; assisting in acquiring the skills of independent work and work in creative teams;
- ensuring the participation of students in scientific conferences, seminars.

Each method should correspond to one of the above-mentioned stages. At the first stage (the phase of initial adaptation), the development of students' understanding of the degree of professional education about the role of personal and professional qualities as future specialists in the framework of research competencies (diagnosis of natural inclinations, the direction of personality is determined).

At the second stage (the phase of complete adaptation), students form a set of ideas about themselves as future specialists, determining their potential capabilities. The personal position is formed in the process of activity, determines the socio-psychological aspect. At this stage, the bases of conceptual thinking are formed as a result of the comparison of individual values with others, including educational and professional ones.

At the third stage (the initial stage of individualization of the student's personality), the objective reality is cognized based on the logic of cognition, self-knowledge of the personality is carried out

with the help of communicative communication with other subjects. The personality forms its disposition and determines personal-professional orientation. A set of future specialist's ideas about the value of the educational process is formed.

At the fourth stage (the phase of full individualization), the logic of building individual learning routes is developed. A personality-oriented developmental space is designed through the use of value-humanistic thinking. Students' problems are included in the socio-historical context through awareness of the significance of research value.

At the fifth stage (complex) – the phase of integration of students' experience at the individual level in dialogue and polylogue - research skills and abilities are formed, competence in the process of scientific organization of work acts as an integrator, which determines the level of the social significance of the future specialist. There is an intensive enrichment of the individual experience of students in the framework of joint activities. Also, realism in the research plan is formed.

At the sixth stage (complex) – the phase of personification of future specialist's values - students determine the vision of their future, including a career in the process of continuous professional education. At this stage, the values' set formation takes place, both on the individual, professional and universal level. The last stage, as a rule, is transitional.

An important direction for further research will be the identification of additional components of improving the scientific training of students.

The practical value of the study was to provide recommendations on how to improve the level of scientific training of students.

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Primary Paper Section: A

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