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Pavliuk Roman – Candidate of Pedagogical Sciences, Associate Professor, Deputy Director on Academic Affairs of Institute of Human Sciences of Borys Grinchenko Kyiv University

ORCID ID 0000-0002-8957-6158

E-mail: r.pavliuk@kubd.edu.ua

DISCOVERING OF RESEARCH-BASED TRAINING SYSTEM EFFECTIVENESS IN UKRAINE

Summary. *The research is devoted to the study of research-based training features in the system of higher education in Ukraine. On the basis of electronic survey it was summarized the features of research-based training understanding, its methods, forms, characteristics by teachers and scientists of various universities of Ukraine. It was compared the understanding of Ukrainian scientists and international scientists in the field of research-based training and singled out some gaps in Ukrainian experience of its usage. It was found that Ukrainian educators classified research-based training as a technology of training and a form of organization of training. Ukrainian educators determine objectives/goals of research-based training as an integrated system: research-*

based training is aimed for development of research skills, critical and analytical thinking, and forming of professional competencies. The forms of application of research-based training and its form of organization is mostly match with the general understanding of the world scientific community: practice oriented education (with an analysis of the data) and the drafting of a research project together with problem-search study are now occasionally used in the practice of higher educational institutions. And in the end, it was found absence of substantiated methodological framework of research-based training and the replacement of it by the system of research and scientific activities of students.

Key words: *research-based training, methodological framework, research and scientific activities, higher education, research skills.*

Павлюк Роман Олександрович – кандидат педагогічних наук, доцент, заступник директора з науково-методичної та навчальної роботи Інституту людини Київського університету імені Бориса Грінченка

ORCID ID 0000-0002-8957-6158

E-mail: r.pavliuk@kubd.edu.ua

ДОСЛІДЖЕННЯ ЕКТИВНОСТІ СИСТЕМИ НАВЧАННЯ НА ДОСЛІДНИЦЬКІЙ ОСНОВІ В УКРАЇНІ

Анотація. На основі електронного опитування з-поміж викладачів і науковців різних закладів вищої освіти і наукових установ України визначено розуміння особливостей навчання на дослідницькій основі, його форми, методи, характеристики. Виявлено, що українські науковці класифікують навчання на дослідницькій основі як технологію навчання та як форму організації навчання. Цілями навчання на дослідницькій основі українські вчені визначають: розвиток дослідницьких умінь, критичного та аналітичного мислення та формування професійних компетентностей. Форми реалізації та застосування дослідницького навчання майже повністю збігаються із визначенням зарубіжних дослідників. У ході аналізу були визначено відсутність методологічного базису системи навчання на дослідницькій основі та заміщення цього поняття науково-дослідною роботою студентів.

Ключові слова: навчання на дослідницькій основі, методологічна основа, науково-дослідна робота, вища освіта, дослідницькі уміння.

Павлюк Роман Александрович – кандидат педагогических наук, доцент, заместитель директора по научно-методической и учебной работе Института человека Киевского университета имени Бориса Гринченко

ORCID ID 0000-0002-8957-6158

E-mail: r.pavliuk@kubd.edu.ua

ИССЛЕДОВАНИЕ ЭФФЕКТИВНОСТИ СИСТЕМЫ ОБУЧЕНИЯ НА ИССЛЕДОВАТЕЛЬСКОЙ ОСНОВЕ В УКРАИНЕ

Аннотация. На основе электронного опроса среди преподавателей и ученых разных высших учебных заведений и научных учреждений Украины определено понимание особенностей обучения на исследовательской основе, его формы, методы, свойства. Определено, что украинские ученые классифицируют обучение на исследовательской основе как технологию обучения и как форму организации обучения. Целями обучения на исследовательской основе украинские ученые определяют: развитие исследовательских умений, критического и аналитического мышления и формирования профессиональных компетенций. Формы реализации и применения исследовательского обучения почти полностью совпадают с определением зарубежных исследователей. В ходе анализа были определены отсутствие методологического базиса системы обучения на исследовательской основе и замещение этого понятия научно-исследовательской работой студентов.

Ключевые слова: обучение на исследовательской основе, методологическая основа, научно-исследовательская работа, высшее образование, исследовательские умения.

The current issue of the modern educational environment in Ukraine is in the process of transition to a new system of quality assurance of education with an understanding of the transformational processes taking place in the political, economic, educational, scientific and scientific and technical fields. The changes include training of specialists in terms of higher education and life-long education, primarily through research techniques, using research-based learning.

Modernization of the system of training of specialists of different specialties abroad takes place in the context of improving of educational services to meet the needs of the new society. These trends currently observed in Ukraine. They gain special importance in connection with the active introduction of the best European and world experience in the system of higher education and common European integration processes.

The system of research-based training has gained wide elaboration among foreign universities, but, unfortunately, in Ukraine this question is sufficiently little paid attention. Research-based training is seen as fragmental form of training though it has long time ago been stated as the type of active learning [24; 17], which is realized through specific forms, has its features and characteristics. Besides, research-based training is an «umbrella term covering a range of pedagogical approaches that are united by the central place they

give to students» in investigative work (addressing and solving problems)» [7, p.1239].

From the history of science and education is known that the first and classical example of introducing of a system of education research-based training were the views and activities of the German scientist Wilhelm von Humboldt [11]. His ideas about the unity of science and education go back to the early nineteenth century. American scientist John Dewey more than a century ago has expressed a similar opinion – learning through action, checking [8]. The current understanding of research-based training has received its definition from the 70s of the twentieth century [23]. Thanks to this today we have a considerable arsenal of developments in research-based training methodology. It is proved that research-based training promotes student centred training and aimed to implementing of students' needs [15; 20], facilitates the realization of scientific potential of the teaching staff of the university [10], research-based training can be realized as a way of cognition of science and a teaching method [23].

Verification of effectiveness of research-based training by scientists has shown that this type of training is the most effective for students of natural and technical areas [13]. However, there are also other researches which convince that research-based training is effective for higher education and for students of other specialties [14; 19; 22].

Although in foreign studies research-based training has its methodological framework, implementation practices and positive experimental results. In Ukraine it is considered as part of research work of university students. Some aspects of research-based training as part of research work can be found in the study of models of higher education teacher training in terms of Magistracy [1; 6]; designing of systems of open education [4], systems of the research activities of students (bachelor/master) [2]; development of student research activities as part of professional training [3; 5]. Thus, we can confidently say that the system of research-based training has not received its development, implementation and verification of the effectiveness neither theoretically nor in practice in Ukraine.

So now we can talk about the serious contradictions between increased interest in the implementation of research-based training system in the practice of modern higher education and the lack of justification of the methodological principles of this process; social order on the level of scientific skills, skills on monitoring and evaluation of social processes and methods, forms of scientific and professional training in higher educational institutions; the absence of comprehensive studies in Ukraine on the problems of research-based training system and the objective need for understanding and rational application of practical researches in this area.

Reforms in the system of higher education (Law on Higher Education in 2014) and in the scientific and technical sector (Law on Scientific and Scientific and Technical Activities of 2015) provide ample opportunities for the training of highly skilled specialists and clearly regulate the educational and scientific policies of modern universities and research institutions. The changes announced in these laws include the training of specialists in the system of higher education and life-long education, primarily through research techniques, i.e., research-based training.

In our research paper we understand research-based training as a form of learning/training that has its purpose, content, methods, forms of organization and tools, and can be implemented by using a specific set of learning technologies. Confirmation of this view is found in the works of famous foreign scientists, whose researches concerned the methodological basis of research-based training. Thus, the proof that the research-based training cannot be a form of learning is found in the works of Prince, M. & Felder, R. [21]; Mills, J.E. & Treagust, D.F. [18], claiming that research-based training/learning can be realized by means of certain organizational forms: problem-based, project-based, case-based teaching/training. In other words these forms of learning promote to realization of research-based training/learning as a type of training. Ifenthaler, D. & Gosper, M. [12, p.74] based on theoretical and empirical studies state that «research-based learning is a multifaceted approach for orchestrating a variety of learning and teaching strategies in order to connect research and instructions». Levy, P. & Petruilis, R. [16] in this proposed study and several others have repeatedly state that research-based training describes a great range of pedagogical approaches. This means that it cannot be any form of education, and especially the technology. The concept of research-based training is much broader and in our deep belief (and based on research findings of leading foreign scientists in this field) it is the type of training.

Consequently, according to the results of studies of foreign scientists, we can conclude that research-based learning is a complex of pedagogical goals, which are united with the main tasks in the development of research competence of students (development of skills for setting a research task and finding ways to solve it).

Despite our statement in the proposed study, we will try to determine the understanding of Ukrainian educators of concept of research-based training, its essential features, tools, methods and the main – its methodological affiliation in the system of general scientific knowledge.

At the first stage of our study, the electronic questionnaire was applied. Its goal was to obtain the necessary information from the participants to describe the methodological basis and justify the methods, forms, indicators, etc. of research-based training among competent persons and among people

who have practical experience in this field.

Questionnaire consisted of 17 questions, 10 of which were related specifically to research-based training (features of research-based training, its methodological affiliation, purpose of this study, objectives, forms of organization, types of research tasks, the effectiveness of its use) and 7 organizational questions (age, gender, work experience, place of employment, degree, students specialty and educational level). Questions concerning specifically about research-based training contained several response options and an option for own answer.

The main survey questions were formulated:

1. What is the research-based training?
2. Which type of research-based training do you prefer?
3. What are the objectives of research-based training?
4. Which form of research-based training do you prefer?
5. Which type of research tasks do you prefer?
6. What organizational forms of research-based training are the most effective?
7. What types of research tasks do you use in the classroom?
8. What are the main advantages of research-based training?
9. What is the role of the teacher in the implementation of research-based training?
10. Is it effective to use research-based training?

The main purpose of the questionnaire was to determine the possibility of application of research-based training in the system of higher education in Ukraine, Ukrainian educators general understanding of the concept of research-based training as pedagogical category, its tasks, forms and methods; to establish their compliance with existing international theoretical and practical workings of scientists and practitioners.

The questionnaire was offered electronically through the dissemination in special scientific communities in Facebook, mailing list (available through special scientific communities on the Internet), sending personal emails to employees of different universities of Ukraine.

Questioning held during the first academic semester in 2017. It was attended by 131 respondents, including 123 people working in higher educational institutions of Ukraine, 2 in higher education institutions in the USA, 2 in college, 3 in scientific institutions, 1 is temporarily unemployed. Questionnaire covered 55 employees of different universities. Age of respondents was in the range from 23 to 69 years (average age is 40 years); by sex – 99 women and 32 men. Experience: at least 5 years – 17 people, 5 to 10 years – 22 people, more than 10 years – 92 people. According to academic degrees are distributed: without scientific degree – 12, PhD Student – 15, PhD – 86, Doctor of Sciences – 18.

Before drawing up the questionnaire we have studied international experience of implementing of research-based training and its methodological basis, analysed the types of tasks that are effective under such organization of educational process, studied experimental data of the use of different types of research tasks in the educational process by foreign researchers. The quantitative and qualitative analysis of the survey data let us get following findings.

As a result of questionnaire methodological characteristics, features, forms and methods of research-based training were determined, after which the method of «theoretical sampling» was used [9]. This method makes it possible to formulate generalized characteristics by the results of questionnaire.

To study the understanding of Ukrainian lecturers/academics of concept of research-based training and its effective application in practice of national educational institutions it has been made the analysis of responses to the questionnaire. Such analysis required us to identify key positions, that the respondents pay attention and study of leading methodological principles for research-based training and the main purpose of our study – studying the issue of understanding of Ukrainian educators of the concept of research-based training, its methodological affiliation, its forms, methods and general characteristics.

The first survey question – What is the research-based training? – contained 6 options for answers: the type of training; form organization of learning; teaching method; technology of training; teaching tool; other. The leading responses were training technology – 48 (37%) and form of organization of training – 41 (31%) (figure 1).

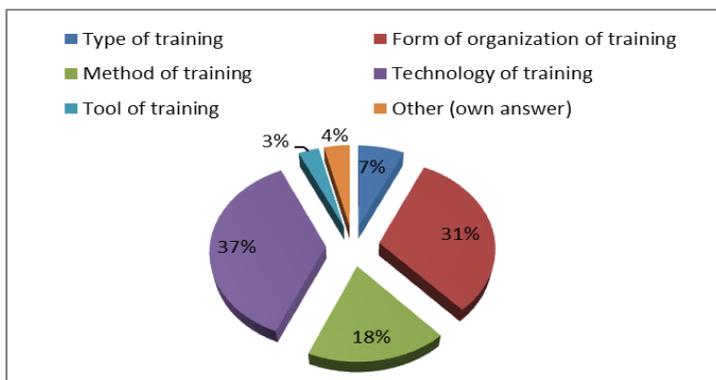


Figure 1. Distribution of respondents on the question of categorial affiliation of research-based training

Source: Based on the author's design.

All other survey question, which we offered to teachers of higher educational institutions, were concerning the contents of teaching, forms of organization, purpose, types of tasks, it advantages, etc.

As for the purpose of research-based training, the leading answers were the development of research skills – 118 (90.1%), development of critical and analytical thinking – 95 (72.5%), development of professional competencies – 69 (52.7%). A small percentage was scored by development of leadership potential, development of communication / presentation skills, development of general intelligence, the development of motivational sphere of personality (from 5% to 30%).

The question «Which type of research-based training do you prefer?» respondents have answered in this way: practice-oriented research (analysis of data) – 72 people (55%), creation of a particular research product (model, technology, tool, etc.) – 67 (51.1%), problem-exploratory study – 60 (45.8%). From 8% to 30% of respondents prefer simplified (streamlined) form of research, analysis of literary (scientific) sources, discussions on a scientific theme and conducting of academic research.

Regarding the type of research tasks which respondents preferred and used in the practice the greatest number of responses received tasks with obligatory practical result – 86 (65.6%) and almost the same number got individual, long-term (within a certain course of study) and interdisciplinary (within several disciplines of study) tasks – 60 (45.8%), 56 (42.7%) and 69 (52.7%) accordingly.

The most effective form of organization (kind of activity) of research-based training respondents consider writing/drafting of the scientific project followed by a presentation of the results, writing of scientific articles – 100 people (76%). Next were distributed: analysis and interpretation of data obtained by the results of a particular study – 74 (56.5%); drafting of models, technologies, concepts, methods, etc. – 68 (51.9%); participation in seminars, conferences, etc. – 58 (44.3%), writing of the course, bachelor's, master's papers – 36 (27.5%); analysis of scientific (professional) literature – 23 (17.6%).

The most common type of research tasks that used in the practice of Ukrainian teachers is problem-searching tasks – 101 answers (77.1%). Next types of tasks were distributed in the following ranking: presentations – 87 (66.4%); project tasks – 80 (61.1%); press conferences, discussions – 70 (53.4%). Almost the same number of responses has got the case studies – 39 (29.8%); focus groups, questionnaires, interviews – 33 (25.2%); brain storming and foresight – 32 (24.4%).

To the basic advantages of research-based training respondents have attributed development of understanding of research as a process and result – 63 (48.1%), development of scientific thinking – 62 (47.3%), development of

skills of making of qualitative scientific research – 58 (44.3%), active involvement of students into scientific research activity – 53 (40.5%), development of understanding of the value of science and research for society – 25 (19.1%). 62 respondents consider themselves as consultants in the organization of research-based training (47.3%), tutors (curators) – 51 (38.9%), motivators – 47 (35.9%), mentors – 44 (33.6%), active participants – 30.5%, evaluators and observers – 7 (5.3%) and 6 (4.6%) accordingly. However, 68 (51.9%) respondents believe that research-based training must be for all levels of education (junior bachelor, bachelor, master), only for bachelor, master – 35 (26.7%), only for master – 24 (18.3%).

The views of respondents regarding the overall effectiveness of this type of learning are generally very interesting. 125 respondents (out of a total 131) believe that this type of training is effective and 6 persons (4.6%) find it impractical for use in higher educational institutions of Ukraine. Among respondents who reported that research-based training is inefficient, there were 4 people who have worked in higher education for over 10 years, one Doctor of Sciences, four PhDs; 1 respondent who is a postgraduate student and working in higher education less than 5 years.

There is no doubt that a number of factors infuses on the answer choice. One of them and the most important are the educational programs of students, whom respondent is cooperating with.

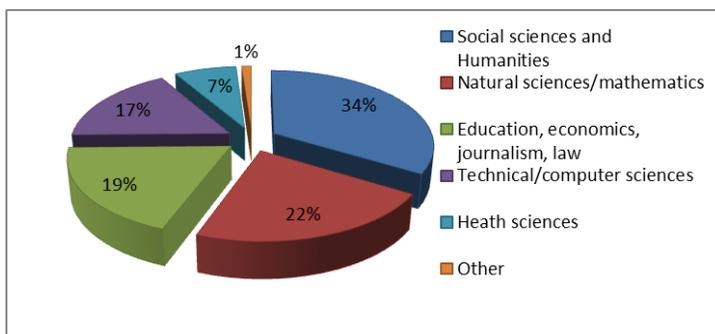


Figure 2. Educational programs of students, whom is respondent cooperating with
Source: Based on the author's design.

We know that training of specialist in applied sciences requires more practical direction and provides a large number of research tasks. Regarding the humanitarian direction, in this sector it has only recently started the introducing some changes for practical mastering of future profession, rather

than theoretical, as it had been for many years before. In other words elements of research-based training increasingly used in training of specialists of technical, natural, physical and mathematical directions, which has determined greater awareness of experts of those branches with a system of research-based training during our survey.

On the basis of the analysis of respondents' answers to the questionnaire, we can define the basic positions of Ukrainian educators in understanding of concept and methodology of research-based training.

The main question that needed answer was «what is research-based training». Ukrainian educators classified it as a technology of training and a form of organization of training. However, scientists and practitioners proved that it is the type of training. This idea of Ukrainian scientists and practitioners can be explained by the fact that research-based training does not almost apply in practices of Ukrainian higher education institutions. Only some elements of this type of training (as distinct technologies and forms of work with students) are used. A further marker for an explanation of classification of research-based training as the technology of training / form of organization of training is that there had never been any comprehensive study in Ukraine which would contain methodological substantiation of this category.

The opposite situation is observed with the formulation of objectives/goals of research-based training as an integrated system. Ukrainian educators determine it in a complex: research-based training is aimed for development of research skills, critical and analytical thinking, and professional competencies. Such position is fully consonant with the general methodology of research-based training.

The form of application of research-based training and its form of organization is mostly match with the general understanding of the world scientific community. Such forms as practice oriented education (with an analysis of the data) and the drafting of a research project together with problem-search study is now occasionally used in the practice of higher educational institutions. But they are mostly fragmentary used during the preparation of students bachelor's/master's papers. The explanation of systematic lack of use of research-based training might be like this: for a long time this form of work was called as scientific research work with students which was limited to writing course/diploma papers and theoretical scientific articles for participation in conferences, workshops. This type of work was fragmentary and built largely on the results of theoretical research. Today we can still watch it. And this again, perhaps, because of the lack of methodologically grounded system of application of research-based training in practices of higher education in Ukraine.

Regarding the types of training tasks of research-based training the respondents gave the lowest preference to those ones that really characterize

this type of training (case-stud, focus group, interview, brain storming, and foresight). This can be explained by the fact that these types of research tasks really present research-based training and require the use of a multidisciplinary approach, careful preparation of both teachers and students and are very long in its execution. It can also be explained by the fact that respondents understand research-based training as the technology or form of organization of training, not as the type of training. So we are again confronted with the lack of systematic methodological understanding of Ukrainian scientists of research-based training.

Also the lack of systematic methodological knowledge about the research-based training can be indicated by only 30.5% of respondents associating themselves (as a teacher) as active participant of research process with students. In contrast, as consultants and mentors see themselves almost 40% of respondents.

However, the general opinion of respondents about the effectiveness of using of the system of research-based training in the practice of professional training in universities of Ukraine is quite motivational. We understand that the next stage of our research is quite important – application of international experience of research-based training, grounding its methodological basis according to the theory and practice of higher education in Ukraine.

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