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Article

Research-based training: methodological characteristics and results of the analysis of educational programs

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Abstract: The purpose of the article is to determine the peculiarities of using of teaching elements of research-based training at the Institute of Human Sciences of Borys Grinchenko Kyiv University. Based on the focus group methodology, the authors identify the key methodological characteristics of research-based training, which have been put into basis of analysis of educational programs for the purpose of determining the application of tasks that contribute to the development of research skills of students. The study used a method of focus group. Its purpose was to obtain the necessary information from the participants to describe the methodological basis and justification of methods, forms, indicators, etc. of research-based training system among people who are competent, have experience in this field. After that, the method of "theoretical sampling" was used, which enabled to formulate generalized characteristics according to the results of focus groups. The practical value of the study is determination of the methodological characteristics of research-based training which is the basis for the application of tasks by university teachers that promote the development of research competence of students. The research is one of the first attempts to determine the methodological characteristics of research-based training in Ukraine.

Keywords: research-based training; methodological characteristics; development of research skills.

1. Introduction

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.

Reforms in the system of higher education (Law on Higher Education of 2014) and in the scientific and technical sector (Law on Scientific and Scientific and Technical Activities of 2015) provide sample 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 training of specialists in the system of higher education and life-long education, primarily through research techniques, using research-based learning.

The system of research-based training has become widely developed in foreign higher educational institutions, but, unfortunately, in Ukraine this issue is paid very little attention. Research-based training is seen as a fragmentary form of learning organization, although it has long time ago been proven that it is a type of active learning (Wildt 2010; Ludwig 2011), which is

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implemented through specific forms, has its features and specifications. In addition, research-based training is an unifying concept that covers a range of pedagogical approaches in the process of students' professional training aimed at developing of research skills (formulation and problem solving) (Aditomo et al. 2013).

Our analysis of research-based training made it possible to isolate general approaches, concepts of development of this issue in foreign studies. Some foreign researchers (Lageman 2002; Dewey 1933) relate the emergence of research-based training with the distinction of pedagogical research from the psychological system. This was preceded by a general scientific study in the system of joint sciences (for example, the humanities). Such a statement originates from the first half of the XX century. In many foreign studies research-based training is associated with project training - the student prepares a graduation work on the basis of a lengthy study with the involvement of interdisciplinary (Abbott and McKinney 2013; Baldwing 2005; Blackmore and Fraser 2007; Thomas 2000, etc.). In addition, it is known from the history of science and education that the views and activities of the German scientist Wilhelm von Humboldt (Humbold 1984) are a classic and the first example of the introduction of a research-based learning system. His ideas about the unity of science and education date back to the beginning of the nineteenth century. American scientist John Dewey more than a hundred years ago expresses a similar view - study through action, verification. The current understanding of research-based training has been developed since the 70s of the twentieth century (Spoken-Smith and Walker 2010). Due to this, we now have a significant foreign arsenal of developments in the methodology of using of research-based training. Thus, foreign studies have convincingly shown that research-based learning contributes to student-centred learning, aimed at fulfilling of student needs (Justice et al 2009; Prince and Felder 2006, 2007), contributes to the implementation of the scientific potential of the teaching staff of a higher educational institution (Healy 2005); research-based training can be realized as a means of understanding of science, and as a method of teaching (Spoken-Smith and Walker 2010).

On the basis of scientists' research, we understand research-based training as a form of learning 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 such an opinion is found in the works of well-known foreign scientists, whose research were concerned with the methodological basis of research-based training. So, the confirmation that research-based training cannot be a form of organization of training are found in the researches of Prince, M. & Felder, R. (Prince and Felder 2006); Mills, J. E. & Treagust, D. F. (Mills and Treagust 2003), who argue that research-based learning can be implemented through certain organizational forms: problem-oriented learning, project-oriented learning, learning based on case-techniques / technologies. That is, these forms of organization of teaching contribute to the implementation of research-based training as a type of training. Ifenthaler, D. & Gosper, M. (Ifenthaler and Gosper 2014, p.74) on the basis of theoretical and empirical research argue that "research-based training is based on a multidisciplinary approach for the application of diverse goals and strategies training for the purpose of interconnected and logical conducting of research and teaching / instruction". Levy, P. & Petrulis, R. (Levy and Petrulis 2012) in many of their writings have repeatedly argued that research-based training embraces a fairly wide range of pedagogical goals. This means that the concept of research-based training is very broad and, according to our deep conviction (and according to research by leading foreign scholars in this field), this is a type of study.

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).

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2. Results

As a result of the first stage of the study the activities of two focus groups, whose participants differed in their work experience in higher educational institutions, their degree and position, the main methodological characteristics of research-based training were identified. The division into more and less experienced participants was not effective, as we got very close in content response from experienced and less experienced participants in focus groups. We give below these methodological characteristics.

Research-based training 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).

Research-based training as a type of study has the following features:

- A set of student-centered learning and teaching goals that are realized through research;
- Teaching students by setting up specific tasks that involve the interpretation of experimental data, case studies (tasks) for analysis or a set of real life situations / problems for solving;
- A set of tasks that contain specific instructions and which promote student-oriented and consulting research (the teacher is a consultant);
- Management of the learning process is done by setting questions and problems / practical tasks;
- Training based on the search for novelty and its relevance;
- Student-centered learning where the teacher is a facilitator.

Learning objectives of research-based training:

- Formation of knowledge about science as a holistic and integrated education;
- Development of skills for determining the novelty and relevance of the research (through conducting own research and verification of its evidence).

Teaching methods of research-based training:

- Search/research activities aimed at solving self-identified issues/problems in an unexplored/underdeveloped field;
- Search for new knowledge, solving a research problem set by a teacher;
- Situational analysis of research results through verification of their evidence using their methodology.

Key research-based training elements: research questions and problem situations that require their pilot testing.

The main subtypes of research-based training:

- Problem-oriented learning (focused on the process of solving the problem / in the process of research, the main goal - the definition of new, unexplored);
- Project-oriented training (focused on product development; the main goal is to determine the practical use of research results);
- Evidence-based training (can be verified practically).

Forms of study of research-based training:

- Content-oriented learning (studying the general methodology of science);
- Practically oriented training - participating in short-term or fundamental academic studies;

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- Applied research - aimed at solving practical problems or providing practical recommendations;
- Academic comprehensive research;
- Simplified research (research by model, algorithm or methodology developed by others);
- Research on the basis of literature analysis (theoretical research, development);
- Discussion on a specific scientific topic (with the selection of unexplored aspects and when the result is new knowledge).

Main types of tasks and forms of work of research-based training:

- Case studies;
- Project tasks;
- Problem-search tasks;
- Brain-storming;
- Focus group;
- Polls (surveys, interviews etc.);
- Press conference, discussion;
- Presentation (research results).

The role of students in research-based training: active participants in the research process (producing ideas, determining relevance, engaging in research, developing methodologies, empirical studies, etc.).

After working out the methodological characteristics, each employee of the departments of the Institute of Human Sciences of Borys Grinchenko Kyiv University had to analyse his own educational programs of disciplines. The analysis results should have been presented in the form of the proposed table.

Here's a sample of tasks that meet the core characteristics of research-based training.

Table 3.

Results of the analysis of educational discipline for the presence of tasks that correspond to the characteristics of research-based training

Subjects	Course, specialty	Examples of tasks that match the characteristics of research-based training

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Social administration	6th year, masters, specialty "Social work"	Independent work 7. Professional activity of a specialist in the social sphere What specific skills and abilities need to be developed by the future manager to form a readiness for public administration in the social sphere? The order of the task: Develop a questionnaire whose purpose is to determine the degree of readiness of the future social worker for public administration in the social sphere. All questions of the questionnaire must be grouped into the following four blocks: - The urgency of the issue (what is)? - How to solve a question (what should be)? - What arguments can be used to resolve the issue (Why)? - What do you need to do (Action)? In this paragraph it is necessary to clearly formulate a "call" for actions that will lead to a proper resolution of the issue. Ask at least 10 respondents (5 students and 5 specialists) Analyse the completed questionnaire. Present the results in the form of an Argument Card. At the 5-point scale, try to evaluate your readiness for public administration in the social sphere by creating an appropriate scale of criteria and indicators.
Fundamentals of career guidance	2nd year, Bachelor, Practical Psychology	Determination of the readiness of the graduate to choose a profession An indicator of the readiness of the graduate to choose a profession is the availability of a professional plan. A personal professional plan is an image of a professional way, a model of professional self-determination of a person. It is important to construct it realistically, logically, clearly. Having a professional plan means: determine the profession you want to choose; determine the educational institution in which you can get the chosen profession. The substantiated professional plan is based on: knowledge of the content and requirements of the profession that it imposes a specialist; awareness of the suitability of the chosen profession; a real assessment of the possibility of admission to a selected educational institution. A professional plan must include (sample): 1. Determination of the main professional goal (who to become, what to achieve, etc.), to establish its conformity with other life goals.

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		2. Determining the closest and long-term specific goals (to finish school, to enrol in an educational institution). 3. Ways and means of achieving close goals (how to reach; with the help of which, who will help, etc.) 4. Spare options for achieving the goal in case of insurmountable difficulties (including recourse to the employment centre). 5. External conditions for the achievement of similar goals (form of study, place of study, etc.). 6. Acquaintance with the information on the chosen profession (working conditions, technology, requirements for the qualities of a specialist, etc.). 7. Cognition of own capabilities in the chosen activity (selection of techniques, identification of individual psychological features). 8. Matching own capabilities with the requirements of the profession. 9. Awareness of the possible efforts to acquire a profession. 10. Identification of ways of self-development for mastering the future profession (self-education, studying of additional literature, studying, conversations with specialists). 11. Identification of objective difficulties, possible obstacles on the way to achieving the goal. 12. Awareness of your responsibility for the decision to choose a profession. Tasks for students. The task is offered to 3-4 students, the results are presented and discussed at a practical lesson. The deadline is 3 weeks. Aim: To determine the readiness to choose the profession of a (real) student-senior pupil. Task: 1. See a sample of your personal career plan. 2. Find and agree with a graduate student about his participation in the study. 3. Conduct an advisory interview with a student and get information from him on all points in the plan. 4. Make a selection of techniques for identifying the individual psychological characteristics of the student (6 point plan). 5. Conduct research on the identification of the individual psychological characteristics of the student with the use of selected techniques.

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		6. Create a personal professional plan for a senior pupil (for all sample points). Make a presentation of this plan identifying the readiness of the graduate to choose a profession.

After the teachers' introspection of their educational programs of disciplines, the focus groups were reoccupied. This activity was organized for the purpose of studying the experience of the staff of the Institute of Human Sciences of Borys Grinchenko Kyiv University and expert analysis of their assigned tasks, which, in their opinion, correspond to the characteristics of research-based training. The purpose of the re-activity of the focus groups was to critically analyse the assigned tasks for their full compliance with the pre-developed methodological characteristics of research-based training. The quantitative characteristics of self-examination by teachers of their own educational programs and the analysis of participants in the focus group are presented in Table 4.

Table 4.

Generalized results of analysis of educational programs

Educational level	Total disciplines / modules	With research tasks (introspection of lecturers)	Fully meet the signs (analysis of participants in the focus group)
Bachelor	335 (100%)	60 (18%)	14 (4%)
Master	131 (100%)	41 (31%)	31 (24%)
All educational levels	466 (100%)	101 (22%)	45 (10%)

Let us explain some of the quantitative indicators presented in Table 4. By the educational level of the "Bachelor" at the Institute of Human Sciences at the time of the study, students study in 5 specialties: Social Work, Social Pedagogy, Psychology, Practical Psychology, Special Education (speech therapy). In total there are 28 groups of students, for whom 335 disciplines are taught in different courses and in different semesters during 4 years of study. At the educational level, "Master" students studied under similar specialties. Total number of groups is 10; during 2 years of study students study 131 disciplines in all specialties.

Summarizing the quantitative indicators, we note that the teachers as a result of self-examination, identified 60 subjects (18%) at the Bachelor level in which in their opinion there are tasks corresponding to the characteristics of research-based training. However, participants of the focus group as a result of the critical analysis fully met the methodological characteristics determined that this is 14 disciplines, which is only 4% of the total.

A slightly different picture is observed at the educational level "Master". According to the results of self-analysis the teachers indicated that in 31% of disciplines (41 units) there are tasks that

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correspond to the methodological characteristics of research-based training. According to the results of the critical analysis of the participants in the focus group this percentage has decreased to 24%, which is 31 disciplines. Such a percentage is quite permissible and is a normal indicator, since according to the new law "On Higher Education" in Ukraine (2014), education at the level "Master" may take place in educational-professional or educational-scientific areas. The training of specialists in the educational level "Master" at at the Institute of Human Sciences takes place at an educational-professional level, and the indicator of tasks of research-based training is quite normal.

As for the professional training of specialists at the educational level of "Bachelor" the percentage of disciplines that contain tasks corresponding to the methodological characteristics of research-based training is too low - only 4%. In this direction teachers were given a recommendation to review the structure of educational programs of disciplines and to consider the desirability of including tasks that correspond to the characteristics of research-based training.

3. Discussion and conclusions

As a result of the analysis of the participants of the focus group of separated after the introspection by the teachers of their own educational programmes of disciplines, the Institutional Forum “Research-based training in quality assurance of education” for the scientific and pedagogical staff of the Institute of Human Sciences of Borys Grinchenko Kyiv University was held. This topic was chosen through a number of issues on which the teaching staff of the Institute of Human Sciences works and one of them is the provision of quality of education and its on-going monitoring. (Bezpalko et al. 2016).

The results of self-examination by teachers of their own educational programs of disciplines for the presence of tasks that correspond to the methodological characteristics of research-based training and the results of expert evaluation of the participants of the focus group were presented at the Institutional Forum. Also it was again accented an attention on the methodological characteristics of research-based training with the presentation of foreign experience and concrete examples of the development of such tasks.

In addition, staff members were invited to jointly analysis of all their assigned tasks, which correspond to the characteristics of research-based training, and identify from 1 to 5 best practices and present them at the Institutional Forum in order to present best practices for the application of the elements of research-based training.

Thus, the practice of applying the case-study method in the training of future speech therapists was presented by the Department of Special Psychology, Correctional and Inclusive Education. Their practice is that during the training and practical training of students a fairly large range of cases is being used which are prepared by the students themselves, in co-operation with the teachers, and carry out the cases developed by the teachers. During the course students can not only get practical experience in speech therapy with children who have different speech and development disorders but also conduct a mini-study on a particular issue of speech development and general psychological development.

The staff members of the Department of Practical Psychology presented the system of phased involvement of students in scientific work through various types of research tasks, which are used in the teaching of different disciplines and in various courses - at the undergraduate level at the master's degree and at the level of preparation of the doctor of philosophy (postgraduate study) .

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A similar system was presented by the staff members of the Department of Social Pedagogy and Social Work. The difference was that teachers identified the specific disciplines of the professional training unit and professional practices that with the transition from the course to the student's course involve using previously acquired knowledge for conducting certain mini-studies and performing research tasks.

The teaching staff of the department of General, Age and Pedagogical Psychology presented the experience of the research partnership in ensuring the quality of higher education. The main view of the teachers of the department was presented in the form of involving students in joint research with teachers during the study of various disciplines, writing course and master's projects and participation in scientific projects of the department as researcher on equal rights with the teachers.

Conclusions and results of this study should be taken into account in light of certain limitations. First, qualitative research by its nature cannot be generalized. This means that the results of this study cannot be presentable for other institutes of Borys Grinchenko Kyiv University, universities of Ukraine. Secondly, the study was limited to the participation in focus groups of only teachers of the Institute of Human Sciences. Thus, the experience of teachers from other universities is not presented in this study.

In conclusion, this study makes it clear that planning approaches that meet the characteristics of research-based training should be based on how teachers should understand the methodological characteristics of this type of learning and approach to the use of such tasks carefully without overloading students with research tasks neglecting with the formation of professionally meaningful competencies.

4. Materials and Methods

At the first stage of our study, the focus group method 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.

Focus group method is a group interview conducted by a moderator in a pre-designed scenario with a small group of representatives of the researched contingent of respondents, similar in basic social characteristics. Our focus group was conducted according to the methodology developed by American sociologists Robert K. Merton, Patricia L. Kendall, which is now the most relevant one (Merton and Kendall 1946).

Respondents were attracted to the focus group through announcements posted on the website of the Institute Human of Sciences of Borys Grinchenko Kyiv University and suggestions in a personal letter to the staff members and heads of the departments.

For the focus groups there were selected two equal number (8 people) groups among the Institute of Human Sciences of Borys Grinchenko Kyiv University staff. Such a choice is due to the fact that the representatives of this institute expressed the desire to participate in the study and try to analyze existing educational programs to determine the presence of research-based training tasks. In general, the Institute of Human Sciences of Borys Grinchenko Kyiv University consists of 4 departments: 1) general, age and pedagogical psychology; 2) practical psychology; 3) special psychology, correctional and inclusive education; 4) social pedagogy and social work. Accordingly,

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from each structural unit 4 persons were selected, which differ in scientific degrees, work experience, have a common field of activity - the humanities.

The first focus group included experienced scientists and lecturers who have more than 10 years of teaching experience (teaching at a high school), are doctors of sciences and Ph.D.'s, associate professors and professors. The second focus group was composed of teachers who had a pedagogical experience of less than 10 years, are not Ph.D.'s (except 1) and doctors of sciences, associate professors and professors. This division made it impossible for the more experienced colleagues to pressure the less experienced, which allowed the authors to compare the insights of the participants of the focus groups.

Table 1. Focus groups participants

	Focus group 1	*Focus group 2*
Total	*8*	*8*
Age range	*32-55 years*	*32-55 years*
Experience (%)	*1-5 years – 0*	*1-5 years – 3 (37,5%)*
	5-10 years – 3 (37,5%)	*5-10 years – 5 (62,5%)*
	More than 10 years – 5 (62,5%)	*More than 10 years – 0*
Position (%)	*Lecturer – 0*	*Lecturer – 4 (50%)*
	Senior Lecturer – 0	*Senior Lecturer – 4 (50%)*
	Assistant Professor – 4 (50%)	*Assistant Professor – 0*
	Professor – 4 (50%)	*Professor – 0*
Education, scientific degree (%)	*High education – 8 (100%)*	*High education – 8 (100%)*
	PhD – 4 (50%)	*PhD – 1 (12,5%)*
	Doctor of sciences – 4 (50%)	*Doctor of sciences – 0*
	Without scientific degree – 0	*Without scientific degree – 7 (87,5%)*

As a result of the work of the focus groups methodological characteristics, features, forms and methods of research-based training were determined, after which the method of "theoretical sampling" was used (Glaser and Strauss 2012). This method makes it possible to formulate more specific questions for self-examination by lecturers of higher educational institutions of their own

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educational programs of disciplines. In addition, such a method enabled to formulate generalized characteristics by the results of focus groups.

For the next stage of the study - self-examination of educational programs by the staff of the Institute of Human Sciences of Borys Grinchenko Kyiv University - a methodological description of the main characteristics of research-based training were proposed, which were developed as a result of the activity of two focus groups. Accordingly, they had to determine the presence of research-based training elements in the educational curricula of the disciplines they taught at the bachelor's and master's levels.

After working out the methodological basis, lecturers were asked to analyse their own programs for the presence of signs, goals, forms, elements, subspecies, and tasks of research-based training. The results had to be drawn in the form of a table.

Table 2.

Sample for self-examination of the educational program for the presence of tasks that correspond the characteristics of research-based training.

Subjects	Course, specialty	Examples of tasks that match the characteristics of research-based training

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