

## Preparation of Students of Pedagogical Universities to Guide the Project-Research Activity of Pupils

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### ABSTRACT

The article is devoted to an actual problem of high school - preparation of students of pedagogical high schools to guide the project - research activity of pupils. On the basis of the research the author describes the creation of project - research sphere, which was carried out in three directions, each had certain problems. The first direction of work was aimed at developing students' methodological project and research knowledge and skills. The second direction was associated with the formation of the students' motivation - value attitude to project and research activity, and the active viewpoint on it. The third area of work was aimed at the development of personal qualities of a teacher-researcher. The main advantage of the given project - research sphere by the author is its sequence, continuity and consistency of the involvement of students in the project - research activity. Thus, activation of extracurricular project and research work of students contributes to the orientation of students to self-education, enabling students to be creative initiative, to apply the design and research knowledge into practice, to form the personality of a teacher-researcher.

### KEYWORDS

Project - research sphere, design - research activity, extracurricular work of students, methods of organization, the quality of professional training.

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### Introduction

Preparation of students of pedagogical high schools to the management of project - research work of students is one of the most pressing questions in vocational pedagogy, because a modern educated person should be able to independently find the necessary information and use it for solving problems, to determine present and future aims, to reach the goals (Obuhov, 2004; Popova, 2006). To do this, a person must have the project thinking and be skilled in project - research activity that is supported by teachers (Wang et al., 2003; Berezhnova & Kraevsky, 2005).

The importance of project - research activity is proved with the results of a survey among 2.5 million students in the U.S.A., which has showed that the

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students' participation in project - research activity makes them more competitive while applying for a job, and acquired research skills of students favorably distinguish them among others and contributes to obtain more high salary (Chetty, Friedman & Rockoff, 2011).

According to William Ruttery, one of the ways to improve the educational process is the research and project activity of pupils (Economist Intelligence Unit, 2012). Scientists in Northern Ireland highlight the most significant factor in school, which effects on students' achievement, school success, as well as the quality of the country's educational system the ability of the teacher to guide the project and research activity of students (Department for Employment and Learning, 2014).

International teaching experience on the problem of forming project - research skills and knowledge in students of pedagogical universities as the basic conditions highlights the creation of project - research environment at all stages of professional training of future teachers (Derman, 2008; Maienschein, 1999).

So, B. J. Klopfenstein (2003) in her works on the formation of project - research skills and knowledge in students of pedagogical universities attaches special importance to the personal characteristics of the students, their abilities, level of motivation, values, view of the world. The researcher points out the following conditions for the effective development of project and research skills and knowledge in students of pedagogical universities:

– Firstly, it is a subject-subject relationship between a teacher and students, which imply equal relations; secondly, the training sessions with the methods of output technology into reflexive position. So there is the acquisition of research and project knowledge, it is impossible without an analysis of their actions.

Scientific publications of John Bransford, Ann Brown and Rodney Cocking (2000) had dedicated to the formation of project and research skills in students. Studying the characteristics of the process, they identified the following stages: the first stage - the reliance on students' live experience; the second phase - in-depth study of the new material, understanding of each task, with the help of the systematization and schematization; the third stage - the preparation of the individual learning paths by students.

Considering the given positions, the concept of project - research activity is considered by us as an educational technology, involves solving research and creative tasks by students under the supervision of a specialist, during which the scientific method of knowledge is being implemented (regardless of field of study).

In this regard, the readiness of students of pedagogical universities to guide project - research activity of pupils is becoming one of the most important and systemically important component of professional training as not only an end but also a means of effective development of the person of the future teacher (Mukhina, 2006). Considering all these aspects there is a need to create an effective project - research sphere in the educational process of pedagogical institute, as a condition for improving the quality of professional training of future teachers.

The basis of the concept of "project - research sphere" is reliable to the concept "educational sphere", which had recently appeared in pedagogy. At the same time, scientists have different interpretations of the concept:

- Pedagogically organized system of conditions for satisfaction of the complex of personality's needs (Mukhina, 2006)
- Psychological, social and information environment within the framework of educational problems (Obuhov, 2004)
- Organizational forms of personal and professional development and the formation of professional consciousness of students (Semenova, 2006; Mukhina, 2006).

In the works of the authors there is a reference to the organization of project - research educational sphere, which is seen as creating of conditions where training and education are organically connected with the project and research activity and are embedded in cultural and historical context.

Accordingly, the project - a research sphere in the educational process of pedagogical university, we understand the definition as the system of psychopedagogical conditions and means, ensuring quality coverage of the information to facilitate the successful organization of teaching and learning and project-research activity of students.

Thus, our research can make a significant and much-needed contribution to the pedagogical science and practice. As the definition of personal determinants readiness of the Institute's graduates for management of design and research work of students and the creation of design and research environment will improve the quality of training of future teachers.

### Methods

The research studied and analyzed special philosophical, psychological, pedagogical, scientific, and methodological literature on the problem at hand, used general theoretical methods of analysis, synthesis, and theoretical modeling, and investigated and generalized pedagogical experience on the research subject.

### Data, Analysis, and Results

Creation of project - research environment in the training of pedagogical high school students had conducted in three areas, each of which solves certain problems.

*The first direction of work* is aimed at developing students' methodological project - research knowledge and skills.

Based on the theoretical and methodological analysis of scientific literature, one of the important conditions of preparation of students to the management of project and of research activity of pupils is an independent decision of educational and research purposes (Derman, 2008), it has set a goal to develop a set of special project and research tasks.

Development of design and research tasks is carried out on the basis of the research, design, problem methods. So, in order to stimulate interest, realization of the requirements of design and research activities, development and improvement of project and research skills, we offer the algorithm to students.

Based on the goal, the algorithm of work with students was held with the axiom: "It is not important that the answer is, better how this response has come."

The task:

1. Write down the concept that you want to define.
2. Write in a column nouns arising from the principle of free association.
3. From the list, select the drawn 2-3 words that you think most accurately represent the defined concepts.
4. Using the selected words as a key, create a definition of the selected concepts.
5. Discuss several formulations with other students.
6. Based on the discussion of formulations, give a synthesized definition of concept.

The content of research tasks had included the following aims:

- 1) Determine the theoretical and methodological approaches to the subject of your research; learn the basic provisions of these approaches.
- 2) Make analysis of the problem of your research in the pedagogical literature, make a gradual historiography.
- 3) Choose the list of references on the theme of your research, analyze and complete as required of your diploma works.
- 4) Determine the conceptual and categorical apparatus of your research; highlight key concepts and give them own definition on the basis of associations.
- 5) Explain the relevance of your research.
- 6) Choose the diagnostic methods for the study.
- 7) Prepare the diploma work.

Based on the fact that the project and research skills are being formed in a student only in practice, we have complemented theoretical lessons by the system of seminars, which made it possible to model and develop scientific thinking of students: comparison, analysis, synthesis, abstraction and generalization, as well as generate creative project - research activity of students. For this purpose, the problematic educational situations were used, encouraging students to discuss and actively find answers to these questions.

Also at the seminars, students had developed and presented creative projects on various topics. The purpose of these assignments is to educate students for management project - research activity of students. During the realization of project activities, students define several stages, during which there is a development of project - research skills:

Stage 1 - immersion in the project, which includes the introduction of students to the essence of the project: active participation in the conversation, private appropriation of the problems, involving into the situation, discussing the criteria, clarification of controversial problems.

Stage 2 - the organization of activity, consisting of the following: split into groups, the distribution of roles in the group, the choice of form and method of presentation of the expected results.

Stage 3 – realization of activity: gathering information on the issue, making the questionnaires, conducting the survey, processing of results, and creation of

the product of project activity (website, publications, and presentations). Consultations with the teacher as need.

Stage 4 - presentation: delivery of the report, a group discussion of the results and making of a conclusion.

Role play is used on practical exercises to simulate students to the management of project - research activity of pupils. The usage of role-playing games teaches students to carry out a critical analysis of their actions, to notice the mistakes of their fellow students to use the theoretical project - research knowledge into practice.

**The second direction** - is associated with the formation of the students' motivation and value attitude to project - research activity, and the positive viewpoint on it.

In order to form motivation - value attitude to project - research activities, we have created a situation of success in students experiencing specific learning difficulties. It is known that without experience the joy of success cannot really count on further progress in overcoming learning difficulties (Millar, 2006). The situation the success is created by the differentiation of tasks; promoting intermediate students' actions. An important role in creating a situation of success played a provision favorable moral and psychological atmosphere in the implementation of various learning tasks.

For the consolidation and development of motivational sphere, a lecturer entered dialogical conversation with students in order to:

- 1) Updating having established previously a student of positive incentive systems, which do not need to destroy, and to strengthen and support.
- 2) Creation of conditions for the emergence of new motivational systems (new motives, purposes) and the appearance of these new qualities (stability, awareness, effectiveness).

Great importance in formation of motivation and value attitude to project - research activity we attach to individual self-educational students' programs.

These programs promote the development of student's personality, provide individual trajectory of training. An important feature of these programs is that they take into account the personal characteristics of students. These include individual student plan and drawing portfolio.

It has been applied:

- To return to the reflexive position;
- As a measure of the student's personal growth;
- As a working folder for addressing gaps in learning.

Thus, with the help of a favorable atmosphere in the classroom, in a team; enable students to collectivist forms of organization of project and research activities; dialogic communication, in which the teacher's help was not in the form of direct intervention in the job, as well as tips that lead back the student to the correct solution, student involvement in valuation activity, creation of situations of success contribute to the fact that motivation and value attitude to design and research activities were formed in the students, and the positive viewpoint on it.

*The third direction of the work* is aimed at the formation of personal qualities of a teacher-researcher. Numerous pedagogical researches on the formation of project - research skills and knowledge in students of pedagogical universities the extracurricular scientific-research work of students, which includes a variety of organizational forms (scientific groups, problem groups, student conferences, round tables and scientific seminars) is released an important condition (Slasstenin & Podymova, 1997).

Extracurricular project - research work of students helps to:

- Expand, consolidate and deepen the knowledge gained in the classroom;
- Active acquisition of new knowledge;
- The development of a creative approach to solving problems;
- The manifestation of the student's personality;
- Formation of professional competence of the future expert

Organization of extracurricular design and research suggests sequence, continuity and consistency of the inclusion of students in scientific research work (Berezhnova & Kraevsky, 2005).

The complex nature of the system of extracurricular project-research activity of students is realized on three levels:

The first level - includes works in scientific circles and problem groups. At this level, students are engaged mainly from the first and second courses. Therefore, project-research tasks are simple (writing essays, essays, developing creative presentations, meeting with interesting scientific facts). Classes in academic circles have debating nature, more than informative one.

Improving the forms and methods of organization of extracurricular project-research activities contributes to the gradually increasing number of students involved in extracurricular project and research work. Therefore, at the second level of activation of extracurricular of design-research work of students there is the successive character. In the process of familiarizing the students with scientific works the teachers use modern innovative forms and methods, such as design, simulation, and preparation of multimedia support scientific and methodological works. At this level, students actively participate in scientific conferences, competitions, contests for the best innovative project and others.

As a result of independent extracurricular project-research activity, students accumulate experience in project-research work, there is interest in forming cognitive motivation.

The third level: creating students' initiative research groups, with the additional experimental platform. We attach particular importance to this form of extracurricular project - research work of students. At this level, there are highly motivated students who are planning to link their careers with science in the future. Students' research groups are created on a voluntary basis by students, who expressed a desire to master the skills of research and successfully combine this activity with their study.

In these groups the method of projects are widely used, which is one of the ways of implementing the research training.

In the process of creative project - research skills of the students the searching skills, research aspirations are formed, contributes to the formation of professional competencies (Middle States Commission on Higher Education,

2003). Students under the guidance of a supervisor of the project are testing and realizing business - projects, research projects and make their presentation. The use in the preparation of modern information technologies projects contributes to the development of interest in the research process. The research results are heard at the department meetings. Most research projects are involved in competitions at various levels for the best innovative project.

The main goals and objectives of these competitions are:

1. The promotion of the country's intellectual potential.
2. Encouraging scientific-research and project activities of students;
3. The selection and support of the most talented and gifted students.

At the same time all conducted activities have large learning effect and cause considerable interest and a high level of professional and cognitive activity of students.

In addition, a student research center helps to increase of project-research competence of students. Program of student research center includes international cooperation between universities in the meeting with well-known scientists of the world, conducts online conferences, video conferences, participation and organization of online competitions, participation in extramural distance conferences.

Student research center is an experimental platform for the development of project research skills of students.

Students have the opportunity to:

- Work out the methodology of training with the use of active learning methods (project method, research method, plot-role-playing game);
- Carry out experiments in the framework of the implementation of projects and dissertations.
- Develop the personal qualities of the teacher-researcher.

Student research center complements the complex training in extracurricular activity and is a part of independent work on a number of majors, specific curricula, and state educational standards.

According to the analysis of psychological and pedagogical studies of successful management of project - research activity of students depends on the individualities of teacher's personality.

## Discussion

We agree with statement of Popova (2006), which says that such important characteristics of a teacher - researcher, as the ability to organize and conduct an experiment to have critical thinking, have adequate self-esteem and love pupils.

Therefore, psychological trainings and exercises are included in the content of a student research center. The peculiarity of this training program is that the students develop it by themselves, and are testing and deploying in a real pedagogical practice.

In process of application of psychological trainings there is a personality correction of a future teacher-researcher, cognitive processes are activated, motivation is increased, and skills of psychological trainings are practiced.

Thus, activation of extracurricular project and research work of students contributes to the orientation of students to self-education, enabling students to be creative initiative, to apply the design and research knowledge into practice, to form the personality of a teacher-researcher.

Project - research environment in the educational process of pedagogical high school was carried out in three directions.

**The first direction of work** is aimed at developing students' methodological project research knowledge and skills. At this stage, the unity of theoretical and practical training of students was realized to management of project research activity of students by developing a set of design and research tasks, the creation of situations of success, the use of role-playing games, the development of creative projects.

**The second direction** - is associated with the formation of the students' motivation and value attitude to project-research activity, and the positive viewpoint on it. These tasks were carried out by the orientation of students in the self-education: the construction of the training sessions based on dialogic principle, equal partnership interaction of a teacher and students, as well as the drawing up of individual self-education programs: an individual plan and student portfolios.

**The third direction of work** is aimed at the development of personal qualities of a teacher-researcher, through enhanced of extracurricular project-research activity of students.

Thus, the study of the problem of preparation of students to management of project - research activity of students is one of the urgent problems of didactics, because the creative project - research activity of students is a necessary condition for successful initial quality of education. One of the leading principles of pedagogy is the principle of scientific study. Project - research activity of the future experts, their conscious and organizational activities is a powerful source of social and technological progress of society.

## Conclusion

The leading concept in our article is a "project-research activity", which is considered by us as an educational technology, involves solving research and creative tasks by students under the supervision of a specialist, during which implemented the scientific method of knowledge (regardless of field of study).

The study of the position of investigated problem of psychological and pedagogical science has shown the need for organization of project - research environment in the training of future teachers, by which we mean a system of psycho-pedagogical conditions and means, ensuring quality coverage of information to facilitate the successful organization of teaching-learning and project-research activity of students. Moreover, project - research activity acts as a factor integrating the educational process in a single system, which shows personal development, improvement and research of key competences for all participants in the educational process of the university. Accordingly, the project-research environment is to provide a common space of efficient cooperation of all subjects of the educational process.



## Disclosure statement

No potential conflict of interest was reported by the authors.

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