

Pedagogical system of independent scientific activities management promoting formation of creative abilities of future professionals

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Abstract. Currently, the content and quality of education in all areas of science in the context of Kazakhstan's joining the world educational space, is directly related to the effective management of independent scientific activity for future specialists. In this regard, in order to increase the level of knowledge available in integral educational process, the designation of objectives and tasks, searching and ordering forms, shapes, positive ways and methods of independent research activities of students, enabling the establishment of creative abilities and skills of future professionals is an actual scientific problem. Therefore, in our opinion, we can conclude that a specially organized, purposeful, scientifically based management of pedagogical system of independent scientific and research activities of students in and out of the educational process in accordance with its goals and objectives is the main condition for the formation and development of creative abilities of future specialists.

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Introduction

The development Strategy of "Kazakhstan - 2050", the State Program of Education Development for 2010-2015, tasked in front of the higher education system to ensure the creation of education models aimed at achieving results and its integration into the international educational space in the context of globalization [1; 2; 3].

Thus, there was taken as a basis the need for competent professionals who for the purpose of consolidating and supplementing, overall improvement within the gained knowledge in the whole educational process, adhering to scientific fields, can, out of the educational process, effectively manage the research activities and express oneself creatively, not limiting with the development of the scientific evidence by the youth population [4, 5, 6, 7]. In particular, during the training focused specifically on the planned educational process, a particular specialty (in accordance with national standards and programs, plans of variant components), regardless of the scope of work.

As our long-established, daily practice and a special investigation, a young professional who graduated from college, apart from theoretical, psychological, pedagogical, methodical preparation should be able to organize one's research activities in the context of new developments aimed at the creative professional activities in future, that actively promotes scientific and methodological guidance of scientists and educators at vocational training in high school.

Young people get a quality education, conscious education is a guarantee of a stable future

independent country, socio-economic, spiritual and moral development of society.

Therefore, a positive result can be achieved only if the modern universities in the process of modernization and conditions of complete transition to the loan program based on international and national experience, in addition to the development of collective experience and public education, covering standards assessments, teaching methods built on the task of forming a highly innovative education system provided by the future professionals will treat them as an independent subject of educational activities, which is able to learn, improve oneself, manage research activities, contribute to the education of creative activity of future professionals.

However, today the tendency of the higher education system of the country on entry into the world educational space is to update the content of education and improve the educational process in the credit training.

In particular, according to the goals and objectives of the educational process consistent with the requirements of the new system, for efficient and effective management of independent research work of the students, there is needed the renewal and further improvement of the scientific and research activities, the search for new shapes, forms and methods improving on the independence of the scientific and research activities of the learning process members aimed at forming a new level of creative abilities of future specialists.

Modern education system of Kazakhstan, addressing the issues of entry into the world

educational space, is at a new stage of transformation, providing training of future professionals for successful participation in economic and social life, taking into account the persistency of the world changes.

In this regard, instead of the paradigm of learning "educator" and "supporter" there has come a new paradigm with the ideas of "lifelong learning" or "persistent learning" [8; 9].

Realization of the idea of lifelong learning is directed to the basic contradiction of the education system of today, which is to exclude the basic contradictions between the disabilities of their development in the period of study and intensive development of world education.

Such contradictions require education research managements in the selection of necessary knowledge, self-education, self-view information, correct management of independent research activities aimed at the formation of creative skills necessary for future specialist [10].

In this regard, in front of each university graduate there is put a task to seek knowledge of mental labour, particularly the effective methods of independent scientific and research activities.

These include: training of independent search of necessary information and its absorption in a short time; systematization of training theories, opinions, evidence and placement; training to generalize complex problems, which are to be discussed; clear substantiation of the positions and the presentation of evidence; search for the truth in scientific controversies; ability to analyse the situation in the workplace, the decision of the problems from a creative standpoint, based on the knowledge obtained in the course of self-education.

In this regard, currently some of the major reserves in improving the quality, aimed at more efficient methods to improve cognitive activity and formation of future professionals in their autonomy in the learning process of higher education, having idiosyncratic history of formation and development, the formation of creative abilities in the education and training of future specialists are the various forms and methods of independent research.

In the scientific literature there are many pedagogical viewpoints on independent work. This demonstrates the versatility of this concept that requires clarification and specification with research and teaching positions.

In the works devoted to the study of various aspects of independent students work management in accordance with the requirements and demands of modern society it is represented as a collection of works executed at a certain time.

However, it can be understood and discussed in various senses.

Therefore, based on the goals and objectives of the research work, we consider it necessary to examine them in the light of our practice, relating a variety of forms and methods of independent university students work to independent scientific and research activities aimed at learning outcomes.

For example, a careful consideration of independent work, the derivatives with respect to the goals and objectives of studies take place in the works of Garunov M.G., Nilson O.A., and Pidkasisty P.I.

In addition, it should be noted that some issues of students independent work in credit courses are not left unattended by Kazakh scientists as well: Karaev Zh.A., Kasenov S.K., Asanov N.A., Myamesheva G.Kh., Akhmetova G.K. [11; 12; 13; 14; 15; 16; 17].

In our opinion, in the formulation proposed by Pidkasisty P.I., there are observed multiaspectual scientific and methodological points of view in the content of self-study. Because the author considers the kinds of independent work as teaching methods and research activities.

Since they are engaged in scientific and research activities to meet specific objectives and didactic problems during the development of each specific knowledge; mandatory research work to resolve certain problems of scientific knowledge at each stage of the path of students movement from not knowing to knowing and create the necessary volume and level of expertise to promote thinking ability from low to high; implementation of independent research activity for the formation of professionalism in selecting the right direction in the scientific and political information flow in the process of resolving the problems of psychological goals, training, science and industry, aimed at systematic independent completion of their knowledge; discipline in the ability to represent themselves in scientific and research activities is an important prerequisite in the development of the profession, and the nature of learning methods; pedagogical management and the manifestation of the student with professional creative side and guide their research activities in the learning process and it is a means of basic cognitive steps in the formation of creative abilities.

In addition, there are met such variants of the "self-study" concept explained by the following authors:

- Teaching method (Babanskii U.K.);
- Type of learning activity (Irina T.A.);
- Type of training (Garunov M.K.);
- A means of self-management and management of research activities (Kuzmina N.V.).

Based on these opinions, we believe that consideration of the scientific and research activities of students, aimed at the effectiveness of training and extra-curricular activities in the form of work and self-cognitive action is not contrary to the teaching and methodical laws.

Thus, based on our own experience in teaching activities, taking into account the different versions of "self-study" definition content discussed in the pedagogical literature, we suggest the following formulation: independent scientific and research activities of students, facilitating the achievement of the results of learning tasks in the learning process is the system of students design works performed under the methodological guidance aimed towards creative abilities of future specialists, without the direct intervention of the teacher.

So, the widely used in the Western countries, in higher educational institutions of the country, that have fallen so far into the three level system of higher education (Bachelor, Master, Doctorate), the system of independent scientific and research work types of the students influencing the formation of creative abilities of future specialists is carried out through preparation for lectures, seminars, labs, tests, exams, performance tasks, writing essays, presentations and development of research projects, as well as business training projects, the development of training programs in the process of teaching and practical training based on new technologies and innovative teaching conducting pedagogical monitoring, writing academic reviews of training materials and guidelines, articles, on resuming stage is provided by the training graduation project.

Independent scientific and research activities designed for two or three persons are the most effective and exert their influence on the formation of the tendency for creative ideas exchange in groups.

As evidence, there could be offered the examples of works performed by the author groups in the preparation of textbooks, guidelines, etc. in schools and universities.

The result of the cognitive scientific and research activity can be observed through increased motivation of the group work and factor of the interintellectual creative activity, and mutual control among students. The availability of a companion (partner) fundamentally changes the psychology of students.

Independent scientific and research activities of the student as a means of organizing a student to independently acquire new knowledge and skills in the process of scientific perception, appear in a single or double-sided form. On the one hand, it acts as a job, and then there is the subject of student actions represented by a teacher or curriculum, on the other

hand it is a kind of execution method of certain actions committed respectively, relative to the execution of educational tasks performed independently.

Therefore, within the tendency of shaping the content of independent scientific and research work of future specialists, this problem is a means of efficient management of the educational process from the logical and psychological aspects. Thus, an independent research activity is considered by us as a factor of development of the person and work of students, promoting the formation of creative abilities of future specialists. It is intended to compensate for the shortcomings of high school preparation, contribute to the formation of individual style, understanding of advanced pedagogical experience and qualities of becoming independent creative activity.

Having studied the formulations given in the scientific literature, and based on our own practice, in the content of independent scientific and research activities (hereinafter named as ISRAS), enabling the establishment of creative abilities of future professionals, due to the influence on the methods of execution, special management aspects, use within the educational process and beyond it, improvement of the professionally necessary creative abilities of students, influence on the mutual working of teacher and student in the creative plan, effective management of educational works, we consider it correct to group ISRAS as follows.

Here we would like to present as examples the results of the analysis of position and point of view based on our own practice within the department of undergraduates and graduates majoring in education and psychology, taken by us as the object of our study.

1. ISRAS devoted to theoretical and methodological knowledge absorption on a scientific level, aimed at producing creative abilities of future specialists in specific subjects. ISRAS on the above system is determined by the conditions and features of didactic, theoretical and methodological training, the level of interaction with the creative professional actions.

2. Due to their name, ISRAS, devoted to the acquisition of new empirical and practical knowledge, aimed at the formation of creative abilities of future specialists, are based on the development of empirical and practical knowledge.

Combining these works in one group is associated with teaching the following conditions: first, practical knowledge should be implemented in accordance with the empirical during independent scientific and research work. Secondly, the types of such independent scientific and research studies

require special teaching materials (practical tasks, pedagogical situations, educational technology, etc.). Third, their execution and methods of performance are specified in textbooks, programs, and educational complexes.

3. ISRAS, carried out to consolidate the knowledge and experience aimed at shaping the future of creative abilities of professionals, belong to the category of works that form the general knowledge, professional skills and experience. Gradually complicating the task, the scientific and research activity is brought to the level of self-sufficiency.

4. The ISRAS objective, aimed at production of creative abilities of future specialists, is the desire to be creative on the basis of the development of educational materials discovery.

5. Independent work, devoted to consolidate and systematize the acquired knowledge, is performed during the execution of the above types of independent work.

In our opinion, considering the ISRAS types within the learning process and beyond is, as a pedagogical system aimed at shaping the future of creative abilities of professionals within the conditions of the credit learning technology, as the ways of forming the competitive, competent, versatile literate citizens in the modern educational system in the context of globalization, could be imagined as the follows (Figure 1).

To confirm our scientific opinion, let us stop on the definition of "Educational System" specified in pedagogical and psychological dictionary: "Pedagogical system is the unity of all the factors aimed to achieve the goal of human improving".

Signs of pedagogical system: 1) sufficient funds to achieve the objectives; 2) the link and interdependence between the structural components of the system; 3) the presence of the leading methodological ideas, the leading rod unifying structure of the system; 4) presence of common goals uniting structural components of the system [18].

Based on the above mentioned meaningful concept value, our proposed system of independent scientific and research activities of students, aimed at forming creative abilities of future professionals, can be considered as an independent educational system.

Since this system is understood by us as the unity of independent research activities that contributes to the learning outcomes of future professionals in the educational and extracurricular activities through self-education and self-improvement.

In this case, this system is designed to be open, like any other system, due to its constant dynamic changes, additions and updates in accordance with the aims and objectives of education in

experiential learning, depending on the socio-economic situations in a certain period of society development.

The system, as shown in Figure 1, is represented as conditionally independent structure, divided into 2 groups and making up the system, these are the ISRAS in the learning process and ISRAS beyond the learning process. In turn, each group of an independent structure will consist of certain types of ISRAS. Within the training process these are the ISRAS under the management or observation of a teacher performed during the practical and laboratory classes, seminars, teaching in classrooms, computer classrooms, and information technology rooms. ISRAS beyond the educational process include writing an essay, research report, analysis of scientific literature, work with information and teaching innovative technologies, developing presentations, etc.).

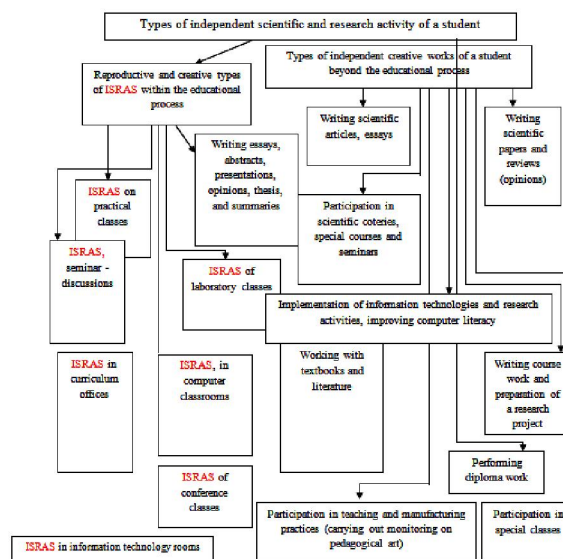


Fig. 1 Pedagogical ISRAS system aimed towards formation of creative abilities of future specialists

In our opinion, the presented by us world leading idea of a theoretical nature, uniting the ISRAS types of pedagogical system, is in the process of self-management of research activities aimed at shaping creative abilities of the future specialists in the educational space, formed in accordance with the practice of science in scientific and methodological guidelines, in addition to self-education, qualifications, improving creative skills, experience and professionalism, presented as preparation of the person with the abilities of thinking and feelings brought up in domestic general and national spirit, communicative interaction with the public, able to accept it in the creative plan.

Our position is combined with the opinion of Sukhomlinsky V.A. of the following content: "We need to teach a child to think, without turning him into a warehouse of knowledge, truth, rules and formulas".

So our conclusion mentioned above forms an opinion on its consistency with the basic principles of updating education: the paradigm of a "business person", "person prepared for life", changing the paradigm of "educated person" in charge of the principles of democratization and humanization of education aimed at the implementation of the "humanization paradigm" of education.

In this regard, the next turn characterizing some types of structural elements of the pedagogical system offered by us, which are widely used in all stages of current universities, we consider it right to completely stop on the issues of scientific and methodological features subject to formation in independent scientific and research activities of future specialists.

Because, despite knowing the ISRAS types by students, undergraduates and overwhelming majority of doctoral students (as it was revealed during the installation experiment), they master an insufficient amount of information about their goals and objectives, methods and means of execution, clearance in accordance with the scientific, pedagogical, psychological requirements within the methodological plan, in some cases even are at a loss to name their types.

We believe it is necessary to note that the pupils' knowledge of independent scientific and research activity is not formed on an adequate level that was established during the pedagogical practice and learning process at the stage of undergraduate higher education.

Therefore, we, in our practice being in line with the responsibilities of undergraduate adviser since the first days of first-year students, along with the educational provision of credit technology, bringing to the knowledge of students the necessity of paying attention to reproductive and creative work of independent scientific and research activities, give advice and brief guidelines, required for students directing on independent scientific and research activity, adjusting for creative work in the future specialty.

Certainly these stories and impromptu guidelines cannot give to the first-year students complete information about the tasks of independent scientific and research activity, the role of the new system from the scientific point of view.

Therefore, since the first years of transition to the credit system of training we prepared a small handbook "Explorer management of independent

scientific and research activities of students" especially for the first-year students.

Inside the teacher resource book for the 1-2-3-4 courses within the offered by us pedagogical system, there is provided information on the independent scientific and research activities. Let us focus on some of them.

The most widely used in educational system of independent scientific and research activities of students, on tutor assignments on individual subjects within the learning process in terms of the credit system is a review.

Review topics are prepared by tutors based on preparedness, degree-seeking, students' creative features. Sometimes, there are cases of enabling students in selecting the topic of interest. It seems that the second option is more efficient because it is associated with thinking and plans of the student.

Review (from Lat. refero – I say, I bring forward) is a summary of the scientific content of the work written on a particular topic. Review is a short, reduced form the main content source. The review should combine all the issues discussed in the original. The review applied by us in the practice has the content of the following form:

1. There is indicated the title of the chapter or section of a document based on which the review is being prepared;
2. There is specified the topic;
3. Full name of the primary source of information's author, publishing house, year (if the magazine was used, there should be shown its name and number);
4. The main idea of the review's material is provided in summary form, it is prohibited to include personal opinions;
5. The review's content is presented monotonously in accordance with the primary source system.

Report is a kind of independent scientific and research work, has value and is important for the formation of students' research skills during their studies and beyond, expanding cognitive interest, their opinions and positions. Based on a given topic for the report there should be prepared a plan and selected literature. The information obtained while working with the literature is systematized, they are used for the preparation of the conclusion and summary.

Also the widely used types of ISRAS are necessary for students for fixing theoretical materials obtained in higher education institutions, the activity in the classroom, the ability to search for and learn to shape research activities is to write annotations, essays, summaries.

Abstract is possibly a shortened version of the main content of the text. The main difference

between the abstract and a review is that the latter describes the content of the primary source, and annotation provides information from its topic. In the annotations there are used cliché and special sayings.

Annotation structure:

1. Section or chapters of the text on which the annotation is prepared;
2. Theme;
3. Information emanating from the primary source;
4. Annotation content.

Essays is a written provision of your personal opinions and points of view, the idea as for the studied and given for homework topic. And so the essay is the most important and effective form of self-research activities.

Summary is a kind of written work with the logical and systematic relationship, which is written on the content of the material being studied. It should include a plan, thesis, or two kinds of these works.

Summary differs from the other written works by a monotonous presentation of information, similar to the system and content of the given material.

Only the most important information is selected for the summary. It separates the main idea, significant words, and phrases indicated. Each new idea is written on a new line.

Summary contains the author's name, the literature source title, publisher name, address, and time sheets. In the new system, the next complex type certifying the student's propensity to independent scientific and research activity is a course work.

Course work is an independent creative and research work of the student, developing cognitive abilities on a particular topic within a particular subject.

Here students choose a certain topic, in the future by means of creative search in accordance with the project pattern represented by a tutor, by finding the necessary materials, choosing, sorting, thinking, preparing the foundation for the formation of a citizen who knows how to meditate on his own, make decisions, and qualified in free will.

The course work performance in the conditions of the credit system must comply with the following provisions:

- Course work is done in the structure of credit of the mandatory educational components of the curriculum model;
- Course work must comply with the plan and program, considered a scientifically significant topical issues;
- The theme of the course work is considered at a meeting of the department, approved and submitted to selection for the students;

- After the student chooses the coursework topic, the selected topic and supervisor are to be approved at a meeting of the department;

- A course work advisor is appointed from the group of highly qualified teachers, specialists of the department, professors, associate professors, and senior lecturers.

Conference classes (from the Latin. conferentia – gathering of all, consolidation) summarize the issues arising in the study of similar in meaning themes. The main significance lies in the compilation of materials to strengthen the knowledge of students, provide a brief and clear (laconical) conclusions.

Tutor prepares questions on topics for students' active participation in the conference work, and thorough self-study, and explains the order the conference conducting.

The leader or the manager of the conference gives the directions for resolving the issues by category and holds debates, while he does not participate. At the end of the conference he concludes on all the views expressed. These classes are humanely affecting the creative solution of duties on enhancing of the educational and cognitive aspirations of students, self-critical thoughts, its advocating, and systematic replenishment of a knowledge base.

Discussion is an active form of students' collective self-study work. While proving their point of view, they will be ready to mutual criticism. This kind of creative classes directing to students' independent work, calls for perfection and the search for new cognitive operation teams. Useful action are those aimed to remark other shortcomings, lessons learned from them, feelings of consciousness, understanding, knowledge of their environment opinions when formulating their social position.

Advance warning on paying attention to the statement of the views of students through active participation in the conversation, right conduct and possession of a disclosure of the theme has a positive impact on the system holding a conversation. These classes are organized in the form of dialogues between students, which theoretically affect the formation and practical thinking, theoretical problems are resolved.

Seminar is a feature of collective forms of discussion sessions, a presence of possibility of active participation of each student in the theoretical direction, moreover, an indication of the ways to solve problems and evaluate their correctness proof.

In our opinion, the discussions have the following significant pedagogical, psychological, methodological aspects:

- Improve personal activity and cognitive degree-seeking;

- Form a collective opinion; learn to make a general conclusion based on the opinions of the group members;

- Making by every student their mite to the common cause;

- Generate the overall credibility of a positive effect on the relationship between tutor and student.

Independent scientific and research activities of the students, formed as a pedagogical system, developing cognitive activity, creativity, brings them to the discipline, balance, towards the goal of bringing started to completion.

These research results are implemented in full due process of pedagogical management of higher education institutions, consistent with the requirements of the credit system in independent scientific and research activities of the students in the educational system and in individual subjects.

To implement the above problems, it is necessary to create a theoretical model of the management of independent scientific and research activities in higher education institutions in the credit training, guide students to creative actions and cognitive activity.

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