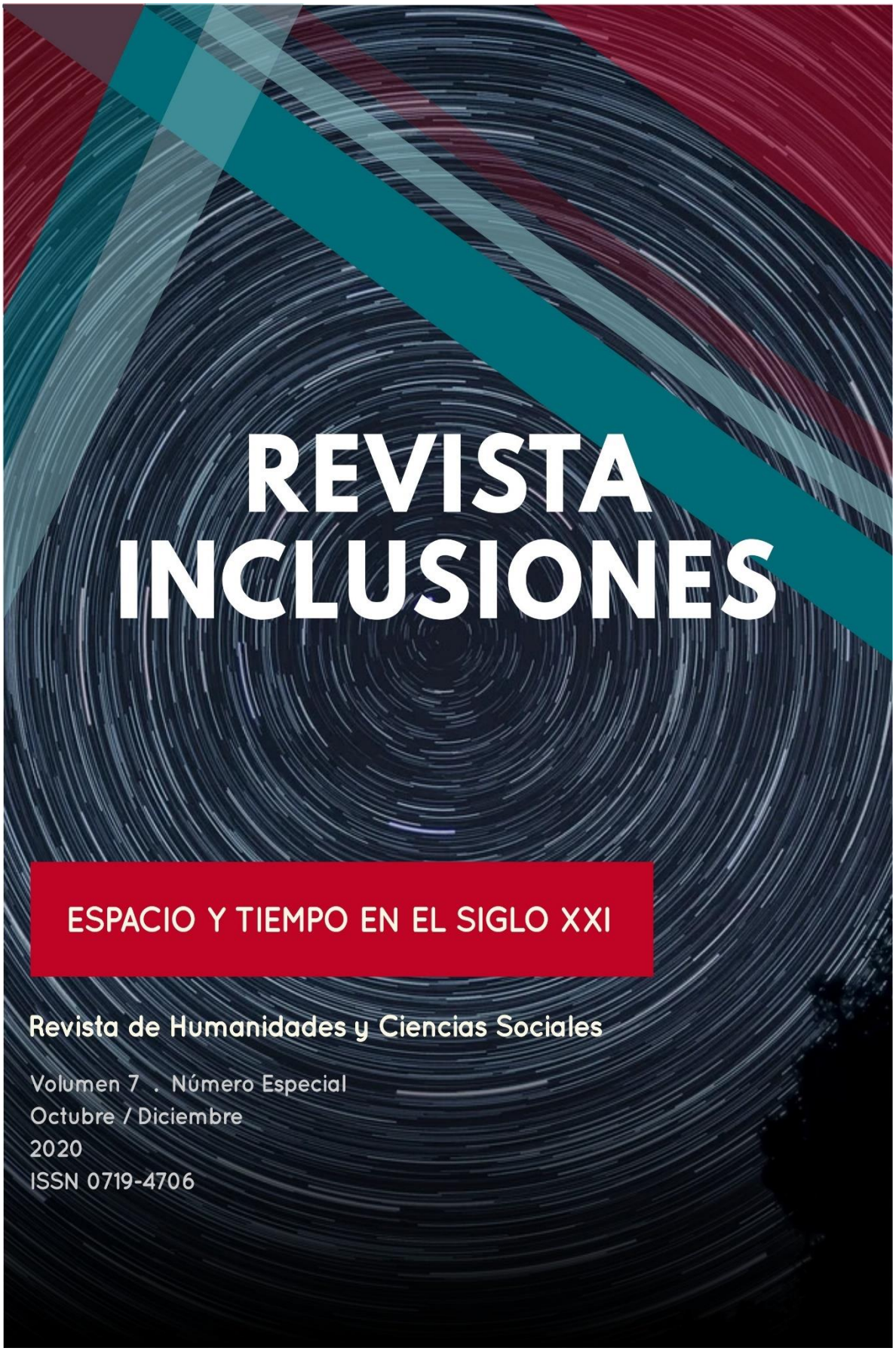

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INDEPENDENT RESEARCH WORK OF STUDENTS OF A TECHNICAL UNIVERSITY AS AN IMPORTANT CONDITION FOR PREPARING THEM FOR PROFESSIONAL ACTIVITIES

Ph. D. (C) Irina Alekseevna Pogrebnaya
Industrial University of Tyumen, Russia
ORCID iD: https://orcid.org/0000-0003-2694-7369
ya.irina0607@yandex.ru
Ph. D. Svetlana Viktorovna Mikhailova
Industrial University of Tyumen, Russia
ORCID iD: https://orcid.org/0000-0003-1292-2750
sweta02311@gmail.com

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Abstract

The article considers the importance of students' independent research work, its influence on the formation of competencies in accordance with the requirements of federal state educational standards of higher education, which determines their readiness for professional activities of professional activity. Studies of this problem were carried out on the basis of a higher technical educational institution, namely, the Tyumen Industrial University branch in Nizhnevartovsk. The following goals of the organization of students' research work are identified: strengthening and increasing the level of training, formation, multiplication and preservation of the intellectual and scientific and technical potential of young researchers; the generation of high moral qualities of a future specialist and scientist in the spirit of moral and ethical standards inherent in Russian science; application of the scientific and creative potential of students to help Russian science and higher education; consolidation of the most capable and promising students in the scientific plan in the system of science and higher education. Professional mobility (independence) and professional training of future specialists are considered on the example of students' independent work in the process of preparing and conducting practical classes in the discipline "Hydraulics". A certain part of the tasks of independent work is aimed at forming students' readiness for further production and labor activities.

Keywords

Readiness for professional activity – Professional mobility – Research work – Independent work

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Introduction

Improving the quality of training of professional personnel, and introducing students of a technical university into the practical sphere of professional activity is one of the main tasks of higher educational institutions. Independent educational research, as well as research work of students is one of the important forms of solving this problem. The issues of organizing students' independent work aimed at improving their readiness for professional activity are of particular relevance in connection with the adaptation of the educational process.

The state of readiness of an individual for professional activity should be perceived as a deep and complex education. This aspect has a complex dynamic structure between the components of which there are the following functional dependencies:

- Operating - the possession of techniques and methods of activity, as well as the necessary skills, knowledge and skills.
- Motivational - responsibility for the implementation of tasks.
- Evaluation - the ability to diagnose their level of preparedness.
- Strong-willed - own self-control and self-mobilization.

The willingness and ability of an individual to change in labor practice in connection with a number of life factors is called professional mobility. It includes the ability to promote a specialist in a job (from one enterprise to another, etc.), the ability to instantly learn and master the latest technologies. Professional activity can be achieved with the help of fundamental, in-depth training not only in general professional, but also in special disciplines, as well as continuous self-training.

Methodology

Professional mobility (independence), a large number of scientists was considered as a personal desire for student knowledge based on the convergence of such structures as professional and educational activities.[1] These scientists are of the opinion that the student's independent cognitive activity, gaining a professional orientation, should be modified into a professional, unchanging stability. Professional independent activity helps the young specialist to adapt faster and more efficiently in the special field and industry.

In the history of Russian and world pedagogy, the questions of self-organization and self-study were studied by K.D. Ushinsky[2], N.I. Pirogov[3], P.I. Pedkasisty later N.K. Krupskaya[4], A.V. Lunacharsky and A.S. Makarenko[5] delved into the issue of education of

[1] V. A Yakunin, “Features of the adaptation of freshmen to study at the university”, Education: researched in the world: international scientific pedagogical online magazine. 2004; D. A Leontiev; E. Yu Ovchinnikova; E. I Rasskazova and A. Kh Fam, Psychology of choice (Moscow: Sense, 2015); N. D Levitov, Labor Psychology (Moscow: Uchpedgiz, 1963); A. S Bakirov, “Optimization of management of a professional school in an experiment”, Vocational education in the region: problems, searches, solutions, num 8 (1995) y L. A Regush, Psychology of forecasting (St. Petersburg: Speech, 2003).

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the young generation. Scientists M.T. Gromkova[6], N.G. Yaroshenko[7], N.V. Borisova,[8] V.V. Pleschev[9], M.I. Yeretsky[10], N.D. Nikandrov[11] and others have contributed to the theory of self-education over the past few years.

In the process of studying the training of future specialists, a large number of scientific researchers[12], focus on various teaching methods, as well as methods of applying didactic tools in practice.

Results and discussions

The developed system for involving research work is one of the sections of the main professional program for the preparation of bachelors, specialists, masters and is aimed at building competencies in accordance with the requirements of federal state educational standards of higher education and the main educational programs of TIU. The goals of the research work organization are:

- Strengthening and increasing the level of training, the formation, multiplication and preservation of the intellectual and scientific and technical potential of young researchers.
- Increasing the prestige of higher education.
- Preservation, development and stabilization of domestic scientific schools. Generation of high moral qualities of a future specialist and scientist in the spirit of moral and ethical standards inherent in Russian science.
- Application of the scientific and creative potential of students to help Russian science and higher education.
- Consolidation of the most capable and promising students in the scientific plan in the system of science and higher education at the Tyumen Industrial University of Nizhnevartovsk.

Much attention is paid to the independent work of students in the process of preparing and conducting practical classes in the discipline "Hydraulics" at the Tyumen Industrial University of Nizhnevartovsk. Already in the first year, the teacher acquaints students with the organization and forms of independent work, methods and techniques of

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working with special literature. An important place is given to the mastery of students by the methodology and specific research methods. Students are offered a series of specific research tasks related to an in-depth study of the discipline "Hydraulics" (the study of the basic laws of equilibrium and fluid movement, the formation of the ability to build mathematical models of the processes of fluid and gas movement in pipeline and gas pipeline systems, the formation of skills for calculating the movement of liquid and gas). A certain part of the tasks of independent work is aimed at forming students' readiness for further production and labor activities.

Students are keenly interested in completing assignments related to writing reports, essays and seminars. The system of tasks for independent work also envisages the activity of students connected with the search for problematic solutions, as well as optimizing the conclusion for further objectification. An important role in the formation of the search orientation, the skills of independent research activities belongs to term papers in the discipline "Hydraulics". The task is set in such a way that the topic taken by the student to develop the course project is relevant, meets his scientific interest and, at the same time, improves his knowledge in order to solve problems that can often be encountered in his professional activity.

Students of the Tyumen Industrial University take an active part in city, national, international student scientific conferences, forums, competitions, and olympiads.

The main forms of research activities are: collecting information on the topic of research; preparation and presentation of scientific reports to which the requirements of relevance, independence, theoretical and practical significance are presented; conducting round tables, disputes with the invitation of experienced specialists - theorists, as well as practitioners; preparation of scientific papers and publications; laboratory experiments and assembly of model plants.

Practice testifies to the fidelity of this approach, especially in working with part-time students (the need for independent acquisition of scientific knowledge, as well as for creative research activities, is being updated). The research beginning fertilizes their educational activities, in turn, contributes to the scientific creativity of students.

An important role in stimulating the independent search activity of students in the field of psychology is played by the interaction of the teacher (scientific supervisor) with students. In the process of professional communication at the level of truly creative cooperation and co-creation, sharp differentiations in roles are removed, which can be observed at earlier stages of interaction in the "teacher-student" system; particularly favorable conditions are created for the formation of students' cognitive orientation, interest in search activity.

A study was conducted at the Department of Oil and Gas Business in Nizhnevartovsk on the basis of the Tyumen Industrial University, the purpose of which was to clarify the students' attitude to understanding independent research work for further readiness for professional activity.

The study involved 98 students from various courses:

1 year of study -32 students: 2 year of study-27 students; 3 year of study - 21 students; 4 year of study -18 students.

The question was asked: do you participate in scientific activities (city, national, international student scientific conferences, forums, competitions, contests)?

The purpose of the question was to identify students' attitudes toward independent research work.

According to the survey, it turned out that for 1 year of study -43.75%; 2 year of study -59.25%; 3 year of study - 76.19%; 4 year of study - 83.33% of students took part in various scientific activities (Fig. 1).

Thus, the analysis of the obtained data indicates a gradual increase in interest in scientific work, skills and knowledge in the learning process.

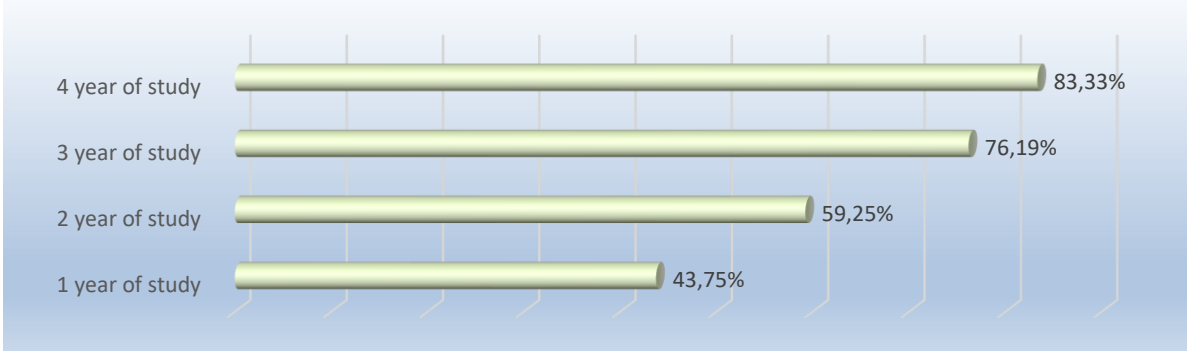

Figure 1
Participation in scientific activities

The answers to the following question are analyzed: “Do you agree that independent research work among students is of most interest in senior years?”

The purpose of the question was also to identify students' attitudes toward independent research work.

Students of 1 year of study -87.43%; 2 years of study -74.52%; 3 years of study - 63.21%; 4 years of study -31.46% agreed with this statement. While in the initial courses the majority of respondents agreed with this statement, then 31.46% of the students shared this statement in the 4th year of study (Fig.2).

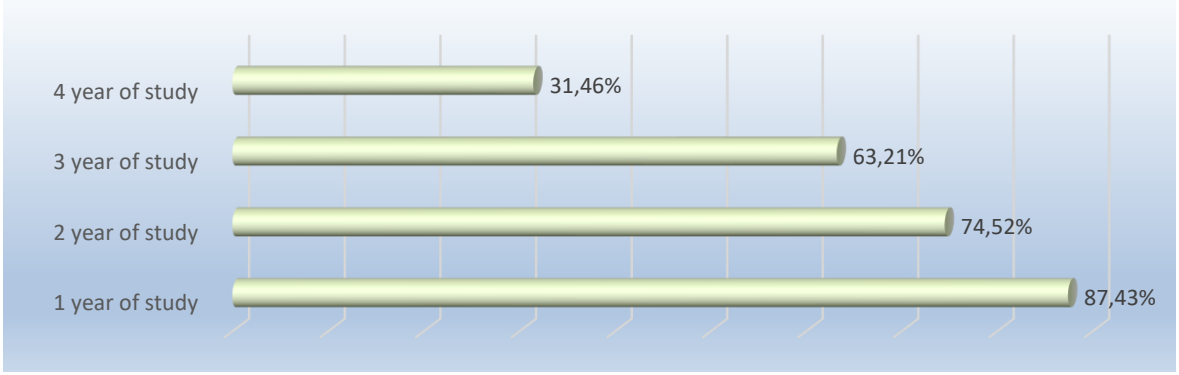

Figure 2
Identification of students' attitudes towards independent research work

Then we tracked the dynamics of student participation in conferences, over four years, on the basis of the Tyumen Industrial University in Nizhnevartovsk. The results are shown in table 1 and Fig. 3.

Year	Year of study	Number of students participating	Number of students participating (in percent)	Total amount
2016	1	4	10,81%	37
	2	9	24,32%	
	3	12	32,43%	
	4	12	32,43%	
2017	1	4	9,52%	42
	2	10	23,80%	
	3	14	33,33%	
	4	14	33,33%	
2018	1	7	12,06%	58
	2	9	15,51%	
	3	18	31,03%	
	4	24	41,37%	
2019	1	10	13,51%	74
	2	19	25,67%	
	3	23	31,08%	
	4	22	29,72%	

Table 1
The Dynamics of student participation in conferences over four years

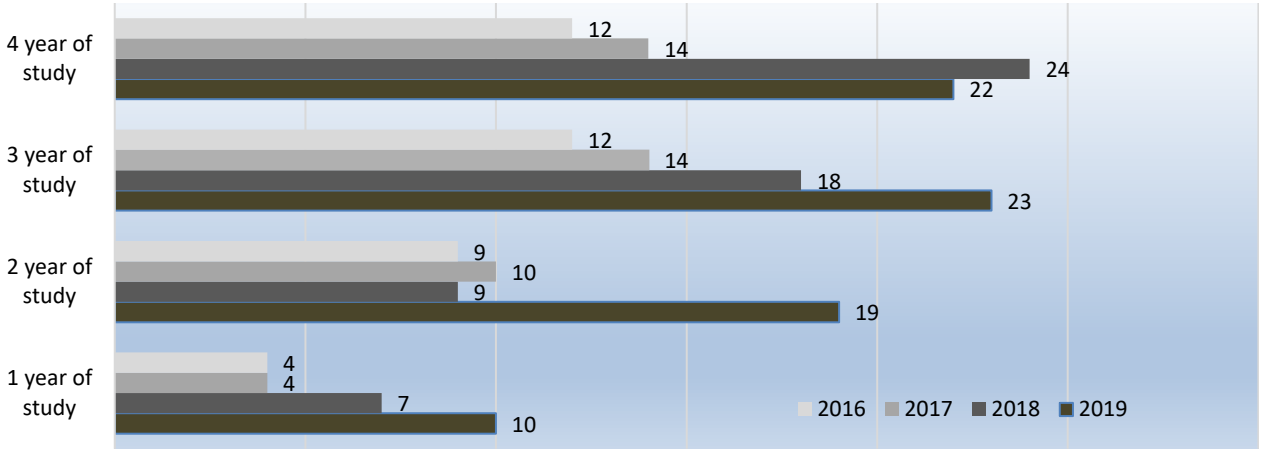

Figure 3
Dynamics of student participation in conferences

Conclusion

An analysis of the data on the first course found that a significant number of respondents were diagnosed with a lack of readiness for professional activity. The readiness for professional activity of students, future specialists in the oil industry is not a dogma, but an actively developing phenomenon.

Psychological training of future specialists is generated in the process of studying at a university. This phenomenon is subjected to constructive, qualitative and quantitative modifications, is reflected in the progressive dynamics of transformation from one stage to another, is determined by the internal balance between its components and provides an efficient and effective solution to educational and professional tasks of various levels of content and complexity. The transformation of one stage of the readiness of professional activity to another is implemented gradually and correlated with the stages of study at the university. Accounting for dynamics is a priority factor for the success of professional activities of future specialists in the oil and gas industry.

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