

## Artículo de investigación

**Formation of readiness and motivation of students for independent work in higher technical educational institution**

Формирование готовности и мотивации студентов к самостоятельной работе в высшем техническом учебном заведении

Formación preparación y motivación de los estudiantes para el trabajo independiente en instituciones de educación técnica superior

Recibido: 6 de junio del 2019

Aceptado: 14 de julio del 2019

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**L.A. Ibragimova**<sup>155</sup>**Abstract**

The article is devoted to the problem of organizing independent work of students in a higher technical educational institution, held in Tyumen Industrial University of the Nizhnevartovsk branch. This paper analyzes the requirements for students to master the skills of independent work on the basis of the competency model of a university graduate in accordance with the requirements of the professional standard of higher education. The competence of a successful specialist in any dynamically developing industry is considered. The author made an analysis of the works of scientists, teachers, researchers, dealing with the problem of motivation and improving the efficiency of the organization of work activities of students. The tendency to steady interest of students in additional material related to the profile of the main direction of study in the form of problem situations is revealed. Three forms of organization of independent work are highlighted and described in detail: extracurricular, classroom, and creative in the form of NIRS (students' research work). Express questionnaires of students were conducted to measure the time spent on independent work, to identify students' claims for research skills, for the types of independent work that are most laborious for respondents, diagnosing time spent on extracurricular work per week. According to the results of the study, graphs were made and diagnostic diagrams were constructed. The conclusion is formulated.

**Аннотация**

Статья посвящена проблеме организации самостоятельной работы студентов в высшем техническом учебном заведении, проводимой в Тюменском индустриальном университете Нижневартовского филиала. В статье анализируются требования к студентам освоить навыки самостоятельной работы на основе модели компетенций выпускника вуза в соответствии с требованиями профессионального стандарта высшего профессионального образования. Рассматривается компетенция успешного специалиста в любой динамично развивающейся отрасли. Автором проведен анализ работ ученых, преподавателей, исследователей, занимающихся проблемой мотивации и повышения эффективности организации работы, виды деятельности студентов. Выявлена тенденция к устойчивому интересу студентов к дополнительному материалу, связанному с профилем основного направления обучения в виде проблемных ситуаций. Выделены и подробно описаны три формы организации самостоятельной работы: внеклассная, аудиторная и творческая в форме НИРС (научно-исследовательская работа студентов). Экспресс-анкетирование студентов проводилось с целью измерения времени, затраченного на самостоятельную работу, выявления притязаний студентов на исследовательские навыки, на виды самостоятельной работы, наиболее

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**Key words:** Motivation, problem situation, competence-based approach, extracurricular independent work, classroom independent work, creative independent work, integrated education.

трудоемкие для респондентов, диагностики времени, затраченного на внеурочную работу в неделю. По результатам исследования построены графики и диагностические диаграммы. Сформулирован вывод.

**Ключевые слова:** мотивация, проблемная ситуация, компетентностный подход, внеаудиторная самостоятельная работа, аудиторная самостоятельная работа, творческая самостоятельная работа, интегрированное обучение.

## Resumen

El artículo está dedicado al problema de organizar el trabajo independiente de los estudiantes en una institución de educación técnica superior, celebrada en la Universidad Industrial de Tyumen de la sucursal de Nizhnevartovsk. Este documento analiza los requisitos para que los estudiantes dominen las habilidades del trabajo independiente sobre la base del modelo de competencia de un graduado universitario de acuerdo con los requisitos del estándar profesional de educación superior. Se considera la competencia de un especialista exitoso en cualquier industria en desarrollo dinámico. El autor realizó un análisis de los trabajos de científicos, docentes, investigadores, abordando el problema de la motivación y mejorando la eficiencia de la organización de las actividades laborales de los estudiantes. Se revela la tendencia a mantener el interés de los estudiantes en material adicional relacionado con el perfil de la dirección principal de estudio en forma de situaciones problemáticas. Se resaltan y describen en detalle tres formas de organización del trabajo independiente: extracurricular, aula y creativa en forma de NIRS (trabajo de investigación de los estudiantes). Se realizaron cuestionarios expresos a los estudiantes para medir el tiempo empleado en el trabajo independiente, para identificar los reclamos de los estudiantes sobre habilidades de investigación, para los tipos de trabajo independiente que son más laboriosos para los encuestados, diagnosticando el tiempo dedicado al trabajo extracurricular por semana. De acuerdo con los resultados del estudio, se realizaron gráficos y se construyeron diagramas de diagnóstico. La conclusión está formulada.

**Palabras clave:** Motivación, situación problemática, enfoque basado en competencias, trabajo independiente extracurricular, trabajo independiente en el aula, trabajo independiente creativo, educación integrada.

## Introduction

The quality of training of future specialists for the domestic industry is one of the key goals of the higher education system (Pogrebnaya, Mikhailova, 2016). Tyumen Industrial University provides training for students who are capable of research, design and organizational-production activities aimed at developing and producing competitive scientific and technical products. Teachers and scientists of the Tyumen Industrial University decided to train specialists of a new generation who will be in demand in modern high-tech industries of the country (Petrovsky, Yaroshevsky, 2009).

In connection with the dynamic development of society, a form of education has emerged, in which a huge amount of information has to be found, studied and assimilated independently, without a teacher, outside a higher educational institution (Karpenko, 2010). New insights into the learning process have led to the emergence of

a problem between the teacher's leadership participation in the educational process and the need to familiarize students with cognitive activity, with the help of a well-thought-out system when organizing independent work. The solution to this problem is the goal of our research.

## Methodology

The organization of independent work of students plays an important role in the creation and development of students' intellectual initiative and thinking at all stages of training in a technical college. During training, the student must master the skills of forming independently to obtain information, highlight the main idea, be able to work with large volume materials, outline and reduce it, engaging in self-education and self-development.

At this time, the main skill of a successful specialist in any dynamically developing

industry is the efficiency of the organization of his work activity, the rational use of personal time. In a developed modern society, an individual cannot achieve the highest results without a progressive - conscious attitude to his life, its design and position in modern politics (Common European Framework...).

1. A large number of scientific researchers, such as P.I. Pidkasisty, V.A. Slastenin, I.A. Urazmetov, E.V. Buntova, G.N. Dinitz, I.A. Winter, O.E. Lebedev, M.P. Makarova and others (Dinits, 2003; Zimnyaya, 2016; Slastenin et.al., 2013; Slastenin, 2000) studied the problem of motivation and improving the efficiency of work organization in the independent work of students and the competence-based approach.

An analysis of the literature has shown that students' interest and motivation for independent activity increases in cases where the teacher entices students with additional material, which is closely related to the direction of student learning. It is also possible to provide a problematic situation to students (Insights from the Common European Framework, 2004; Zaguidoullina, et.al., 2006).

A problem situation is an individual's intellectual difficulty, which arises when he does not know how to explain the phenomenon, cannot achieve the goal in a way known to him, which motivates him to independently develop a plan for its resolution, as well as explore new ways of explaining the action (Aysmontas, 2016).

Obviously, the process of obtaining an integrated education is not feasible without the motivation of students.

### Results and Discussion

Education is one of the areas of social and cultural life, interpreted as a comprehensive cultivation of a moral and free person, able to defend their point of view and their values. The direction and activity of a specialist is predetermined not only by acquired knowledge and by skills in the field of professional and personal qualities, but also expressed in the degree of their formation. The formation of professionally significant qualities in students covers the individual development of the subject in the learning process (Zimnyaya, 2016).

Motivation is the encouragement of students to

knowledge, personal self-development, organization, the acquisition of new experience and the consolidation of already acquired skills. The concept of "motivation" was used for the first time in the work of A. Schopenhauer.

When studying academic disciplines, the organization of independent work can be represented in three forms:

- Extracurricular independent work;
- Classroom independent work (most effective under the supervision of a teacher);
- Creative work in the form of scientific research.

Extracurricular work consists of several types: preparing an informational message, writing an essay, writing a summary of the original source, composing an essay, compiling a reference outline, compiling a glossary, text and response standards for them, creating charts, illustrations and other written works on a given topic (Zaguidoullina et.al., 2006). It is desirable that the student could choose the type of extracurricular work. To motivate development and positive attitude to independent work, it is necessary to establish strong contact with a group of students, explain goals and objectives at each of the stages of independent work, monitor the understanding of these goals and solve tasks (Akker, 1994).

Classroom independent work consists of practical classes in the performance of laboratory studies, seminars, as well as during the lecture course. When reading lecture material in the classroom, it is necessary to control the assimilation of information by the majority of students, by conducting express tests on specific sections or test control. When conducting seminars and practical classes, there are different types of independent work that help not only to assimilate educational material, but also to make it fascinating, as well as significantly increase the interest and activity of a larger share of students in the classroom. Game training "business games" is best suited for undergraduates from a variety of forms of independent work in practical classes. The subject of the game can serve as problems related to production, containing tasks, situational models, with current problems (Glaeser, Schlic). The goal of this game is to simulate the conditions, giving the student the opportunity to make decisions on their own. When conducting such studies, students have the opportunity to perform independent work, both individually and in small groups, each of which explores the focus of the project through direct

personal communication. Further, another group analyzes completed tasks of the second group. Work in a group significantly enhances the factor of motivation and mutual intellectual activity, increases the cognitive activity of students, due to circular control and self-control (Lookatch, 1995). The public defense of the project motivates the student to complete the assigned tasks, and significantly rebuilds the psychology of the student. A good motivational factor is the control of knowledge, namely, current grades, tests, rating control, examination measures. Such types of control, under certain conditions, give impetus to the self-improvement of students (Akker, 1994).

Creative work in the form of students' research work (NIRS) is the main form of preparing students for the performance of course and final works in accordance with the curriculum of the specialty and the requirements of the Federal State Standard. In the course of research, the student searches for scientific information, analyzes and organizes it:

- Identifies the problem and identifies specific tasks necessary to solve it, collects factual material in the course of the pilot study; - processes the data obtained, analyzes them, compares with the available information in the literature;
- Draws conclusions based on the data obtained;
- Draws up the results of the study in accordance with the requirements for scientific work.

There are incentives in the form of awards, scholarships, additional points for positive achievements in the educational and creative activities of students; there are also penalties for poorly done work (Bezrukova, 2013; Mudrik, 2007; Pidkasiystym, 1998). Thus, to organize

independent work of students at a high level, it is necessary to apply:

1. An integrated approach to drawing up a work program, end-to-end planning, special educational and methodological literature, diagnostics of students' readiness (Professional Task-based...).
2. Ensuring quality control. High availability of computers, the possibility of free communication between students, the use of new technologies.

Using these positions in independent work, students will be able to produce new knowledge, new understanding, new activities, which increases interest in the learning process as a whole (Akker, 1993).

Summing up the analysis of the above, there was a need for questioning to measure the time spent on the performance of independent work, to identify the attitude of students to research skills. It is also necessary to identify what kind of independent work has the greatest complexity for the respondents.

This rapid diagnosis was carried out in 2018, among 2 groups of students (I course - 27 people and II course - 29 people) on the basis of Tyumen Industrial University in Nizhnevartovsk. Anonymous questioning was used for diagnostics.

The following output data was received for the question "What type of independent work for you has the greatest complexity?": Preparation for seminars (58.6% - I course, 48.1% - II course), preparation for laboratory and practical work (72.4% - I course, 59.2% - II course), preparation of essays, preparation of individual tasks (34.4% - I course, 26.0% - II course). The analysis is reflected in Table 1 and Figure 1.

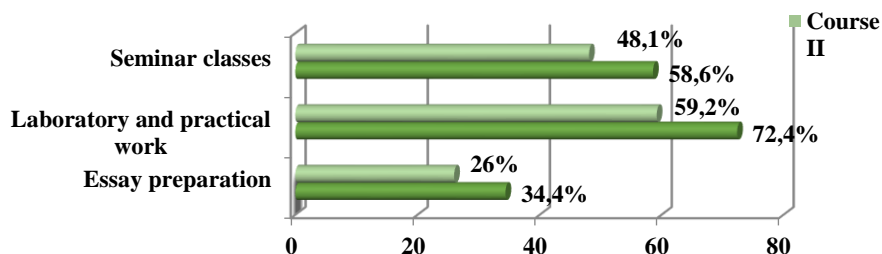


Figure 1. Type of independent work, which has the greatest complexity

Table 1. Type of independent work, which has the greatest complexity

Suggested answers to the question "What kind of independent work has the greatest complexity for you?"	I course		II course	
	Number of students	%	Number of students	%
Seminar classes	17	58,6	13	48,1
Laboratory and practical work	21	72,4	16	59,2
Essay preparation, preparation of individual tasks	10	34,4	7	26,0

The results of the study indicate that laboratory and practical work in the form of independent work is the most labor intensive (72.4% - I course, 59.2% - II course) for students of Tyumen Industrial University. To perform these works, students independently study the relevant sections of the course, make the necessary calculations, arrange the work in accordance with the requirements.

The next question is "How much time do you spend on extracurricular independent work a week?". Data analysis showed: less than 5 hours (77.7% - I course, 20.6% - II course), 5–10 hours (92.5% - I course, 44.8% II course), 10–15 hours (37.0% - I course, 89.6% - II course), 15–20 hours (48.1% - I course, 41.3% - II course), 20–25 (40.7% - I course, 37.9% - II course), more than 25 hours (25.9% - I course, 34.4% - II course). The analysis reflected in table 2 and figure 2.

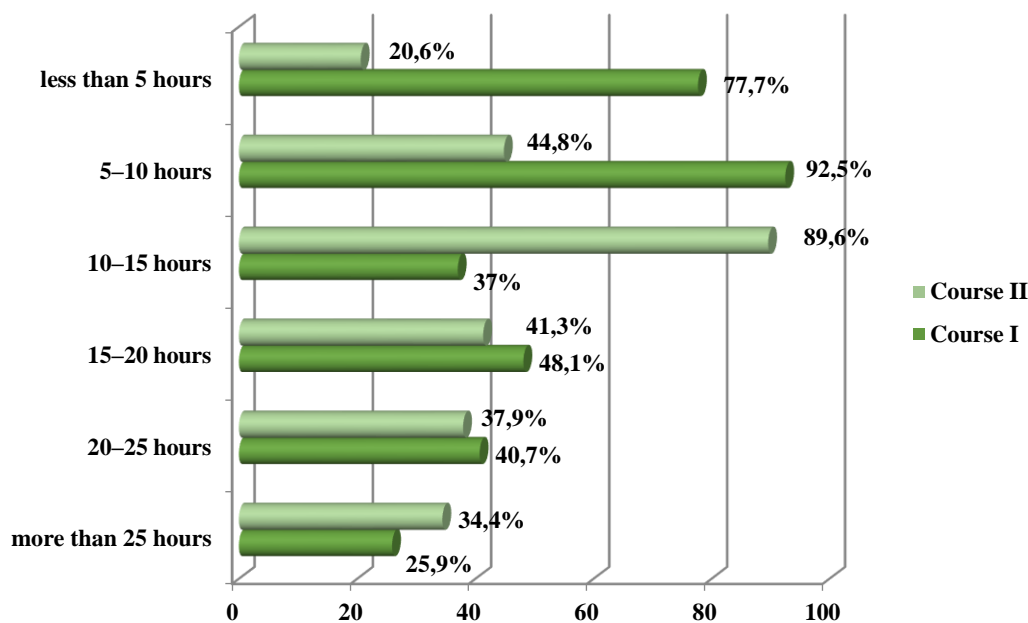


Figure 2. Time spent on extracurricular independent work per week

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Suggested answers to the question "How much time do you spend on extracurricular independent work a week?"	I course		II course	
	Number of students	%	Number of students	%
less than 5 hours	21	77,7	6	20,6
5–10 hours	25	92,5	13	44,8
10–15 hours	10	37,0	26	89,6
15–20 hours	13	48,1	12	41,3
20-25 hours	11	40,7	11	37,9
more than 25 hours	7	25,9	10	34,4

Analyzing the data obtained in the course of this survey, I would like to note that students in the first year do not regularly study on their own. Taking as a basis information sources of lectures and educational literature, 77.7% of first-year students devote less than 5 hours per week to independent, extracurricular work. These are mostly poorly performing students. The increase in the time spent on independent, extracurricular work for second-year students is due to both an increase in the number of tasks for independent review and a higher academic performance of these students.

The next question is "Which of the listed skills do students refer to as research?" Processing the answers to this question gave the following data: the ability to identify and formulate, set a goal in the study (I course - 70.3%; II course - 66.6%), the ability to work with information sources and conduct a theoretical analysis of the problem state (I course - 44.8%; II course - 55.5%), the ability to plan the upcoming study (I course - 79.3%; II course - 81.4%), the ability to process the results of the study (I course - 89.6%; Course II - 86.2%), the ability to summarize and evaluate the results of the study (Course I - 62.1%; Course II - 74.1%). The analysis reflected in the table 3 and figure 3.

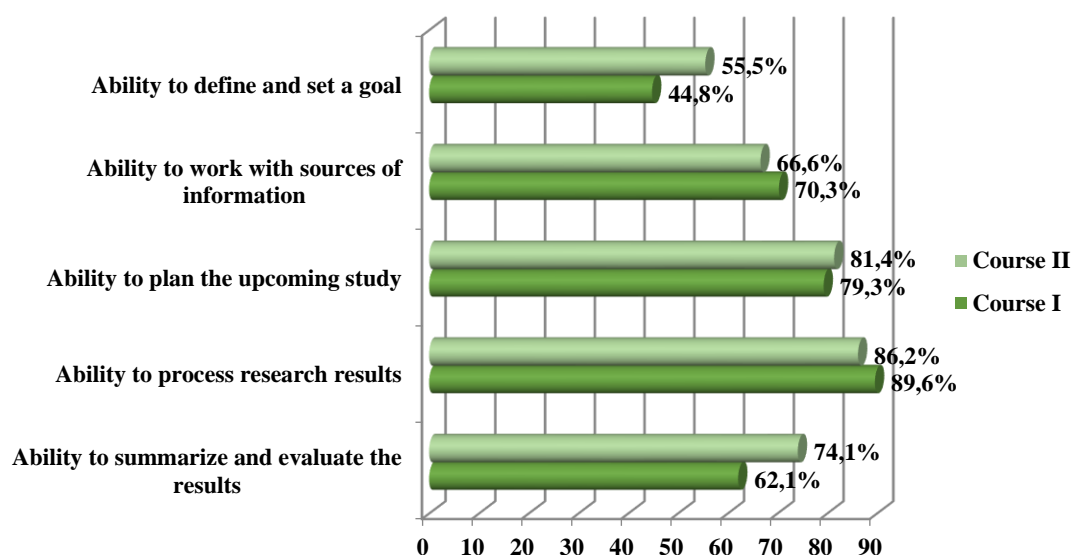


Figure 3. What skills do students refer to research

Table 3. What skills do students refer to research

No	Research skills	Question: "Which of the listed skills do you consider research?"			
		I course		II course	
		Number of answers	%	Number of answers	%
1	The ability to determine and formulate, set a goal in the study	13	44,8	15	55,5
2	Ability to work with information sources and conduct a theoretical analysis of the problem state (drawing up abstracts and theses)	19	70,3	18	66,6
3	Ability to plan the upcoming study	23	79,3	22	81,4
4	Ability to process research results	26	89,6	25	86,2
5	Ability to summarize and evaluate the results of the study	18	62,1	20	74,1

Summing up this question "Which of the listed skills do you consider to be research?", we can single out the predominance of the ability to work independently with various sources of information (abstracts and theses), since these skills are the fundamental core of independent work. In addition, a significant number of responses were received regarding the independent use of the ability to process the results of an experiment conducted in the audience, which suggests a relatively high level of teaching in terms of the formation of these skills.

### Conclusion

It can be concluded that in the process of educational activity and the organization of independent work of the student, in particular, there is a process of changing the leading functions of the teacher and the student. The teacher needs to organize the educational process in such a way that it would cause the student to have a need and interest in learning the disciplines taught, thereby equipping the student with all the necessary skills for learning activities. The students' desire to study the subjects taught at Tyumen Industrial University in Nizhnevartovsk and the generated skills of intellectual activity with the help of precise independent work will create the prerequisites for the development of cognitive activity in students.

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