

Reveals the functions in which competence in assessment activities is revealed, namely: value function (self-assessment and self-improvement as the main factor determining the quality of assessment activity), motivational function (encouraging oneself to self-improvement and self-development), reflexive function (analysis of causal relationships), communicative function (understanding and effective interaction with all subjects of the educational process). The author clarifies the indicators that determine the formation of the primary school teacher's evaluative and analytical competence. The author reveals that the development of evaluative and analytical competence is a multi-level individual process that includes self-education, participation in the work of methodical associations and professional communities, professional development and, if necessary, professional retraining. The author describes assessment methods: qualitative, quantitative and combined, which should be used by a primary school teacher with developed assessment and analytical competence in assessment activities.

Key words: *evaluative and analytical competence, professional activity, evaluation of learning results, primary school teacher.*

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REASONS OF LOW MOTIVATION TO STUDY HIGHER MATHEMATICS AMONG TECHNICAL UNIVERSITY STUDENTS AND WAYS TO ELIMINATE THEM

The article examines the reasons for the low motivation of technical university students to study higher mathematics and suggests ways to solve this problem. It is shown that the main task of a teacher of mathematics is the ability not only to introduce students to the basics of higher mathematics, but also to arouse interest in the discipline, to form the mathematical competence of technical university students as an integral part of their general cultural and professional competences, to show the importance of mathematical knowledge and skills. The teacher must create such learning conditions in which students will understand the value of mathematics education for their own development in the context of future practical activities and will understand the expediency of studying mathematics.

A survey of 2nd-year students of the instrument-making faculty of the Kyiv Polytechnic Institute named after Igor Sikorsky was conducted to investigate their motivation for studying a higher mathematics course. The results of the survey showed that low motivation to study higher mathematics is an actual problem that interferes a student to receive a quality education.

Today, we work in harsh conditions of war, when it is especially necessary to help students organize independent work in distance learning mode when studying higher mathematics.

The results of the student questionnaire are given, which indicate that the students rate the process of organizing the educational process in the period of distance learning sufficiently high. The results of the student survey became the basis for the formation of proposals for improving the educational process during the distance learning period.

The practical experience of students' independent work has shown that systematically conducted independent work with proper organization contributes to the students' acquisition of deeper and stronger knowledge compared to what they will directly receive during higher mathematics classes from the teacher.

Key words: *motivation, mathematics, distance learning, independent work, questionnaire, teacher, students, education.*

(статтю подано мовою оригіналу)

Currently, the amount of time provided by the curriculum for the presentation of the higher mathematics course at a technical university is being reduced. At the same time, the volume of necessary knowledge in higher mathematics cannot be reduced, otherwise students will not be able to study special disciplines later. Therefore, the teacher faces an array of problems: concisely, but qualitatively and easily present the necessary material; to activate the work of students in the classroom; organize independent work of students outside the classroom; establish a contact between teacher and student; to make students interested in studying the subject, to provide persistent motivation.

The educational process in a higher educational institution involves young people who continue to form their personality, so the task is to find methods and means to increase learning motivation that contribute to the maximum development of students' personal qualities necessary for their successful professional activities.

The priority direction in the field of modern education is the transition to the implementation of the STEM model, which represents the presence of a single educational core in four areas: S – natural sciences (science), T – technical sciences (technology), E – engineering, M – mathematics. The contradictions that arise during the implementation of this model are primarily related to the content of mathematics in secondary school and the graduates' awareness of the fact that the skills formed at school in the process of further education and work become unclaimed, since mathematical processing of data in subject areas is performed by technical devices. Understanding the meaning of such a contradiction reduces the motivation of students to receive mathematical education, while even higher school students are not always interested in obtaining stable mathematical skills.

The purpose of the article is to investigate the reasons for the low motivation of technical university students to study higher mathematics and to indicate ways to eliminate them. To show that the main task of a mathematics teacher is to be able not only to introduce students to the basics of higher mathematics, but also to arouse interest in the discipline, to form the mathematical competence of technical university students as an integral part of their general cultural and professional competences, to show the importance of mathematical knowledge and skills.

Teachers often face students' misunderstanding of the need to study certain disciplines. First-year students often have a question: "Why should a student of a technical university study higher mathematics?" We must help them answer this question. If students do not see the point in learning the subject, they will lose interest in studying it.

The word "didactic" comes from the Greek word "didachos" which means "I teach". From the standpoint of modern learning theory, in the structure of the didactic (educational) process, it is necessary to clearly distinguish three of its interrelated and interacting parts: motivation for learning, educational and cognitive activity of students and the teacher's activity in learning management [1].

The learning process can be represented by the formula [1]:

$$DP = M + Af + Ac,$$

where DP is a didactic process, M is motivation for learning, Af is a functioning algorithm (educational and cognitive activity of students), Ac is a control algorithm (a teacher's activity in learning management).

It is no coincidence that motivation is in the first place in the formula. It serves as a fundamental factor in the educational process. In pedagogy, motivation (from lat. movere) – an impulse to act – is a dynamic process that controls human behavior, a person's ability to actively satisfy own educational needs, i.e. readiness of a person to learn and perceive new knowledge. Motivation as the driving force of human behavior and activity is the leading link in the personality structure and determines the effectiveness of any human activity, including activities aimed at obtaining education [2]. Thus, the presence of actual motivation of the academic discipline is a necessary condition for the student's productive learning.

The reasons for students' lack of motivation to study higher mathematics are different [3]. Let's take a look at some of them.

1. Unconscious choice of specialty. The introduction of science and mathematics education into the educational process will make it possible to improve the quality of education and develop the skills of scientific research and engineering activity, invention, early professional self-determination and readiness for students to consciously choose their future profession.

If the future profession is chosen randomly, then students usually have a weak motivation for learning, and with a conscious choice, the student is characterized by strong motivation. The presence of professional motivation contributes to improving the quality of the acquired knowledge, skills and abilities.

An important motivational factor for a student's desire not only for a diploma, but also for a quality education is the confidence that the student will be in demand in the future as a specialist and will be able to apply the acquired knowledge in practice.

To form a high motivation for education, a student must have a formed image of the future profession, which will give personal meaning to the educational process. Understanding how the acquired knowledge affects the change in his professional situation, how they will help solve professional problems, is the key for a student to be motivated to study deeply.

Here are the results of the author's survey of students, with the help of which you can find out the attitude of students to the discipline "mathematics", its value for students, both in terms of education as a whole and in future professional activities.

We conducted a survey of students of the 2nd year of the instrument-making faculty of the Kyiv Polytechnic Institute named after Igor Sikorsky in order to investigate the motivation for them to study the university program of higher mathematics. Traditionally, a serious course of classical mathematics is taught at a technical university, which is rightfully considered to be one of the most difficult courses. Low motivation for studying higher mathematics is an actual problem that steps in between a student and acquiring a quality education. Our study showed that on a question "How often do you use mathematical knowledge in everyday life?" 38% of the students replied "often".

Only 41% of surveyed study mathematics in order to receive skills that allow them to become a specialist in their field, while the rest are only interested in successfully passing exams and obtaining a diploma of higher education, i.e. have additional motivation relative to the discipline.

At the same time, 95% of students placed mathematics in the top three most difficult academic disciplines at the university.

2. The difference in the level of basic training in elementary mathematics.

Weak students experience great difficulties in overcoming the backlog. This leads to a loss of interest in the subject, and in the future there are difficulties in mastering special disciplines on issues related to higher mathematics.

3. Students' lack of independent work skills. The main goal of independent work of students is to acquire fundamental knowledge, professional skills, experience in creative, research activities.

The tasks of organizing independent work of students are:

– development of the ability to work independently, the formation of independent thinking and decision-making;

- development of activity and cognitive abilities of students, development of research skills;
- stimulation of self-education and self-upbringing;
- development of the ability to plan and manage own time.

In addition, independent work of students is inextricably linked with the formation of such important competencies as the ability to apply knowledge in practice and the ability to find, process and analyze information from various sources.

When organizing independent work, students face a number of difficulties, which, in our opinion, is associated with the inability to organize their educational activities, work through large amounts of information, and carry out self-control and introspection. As a result, work with literature is reduced to rewriting individual information, rather than analyzing and systematizing it. It is not always possible to learn a large amount of material, relying only on memorization. Preparation becomes not systematic, students perform the practical part of the work according to the model, without delving into the essence of the tasks thoroughly. And as a result, they get low marks. Poor academic performance, in turn, reduces the motivation to learn.

The last three years have been years of challenges for education in Ukraine. The coronavirus pandemic and now a full-scale war, both significantly limited the ability of students to physically attend a higher educational institution and thereby pushed educators to look for new formats of education. The coronavirus pandemic has already forced all educators to adapt and adjust their work to remote mode. However, the war in Ukraine brought new challenges. And if during the COVID-19 pandemic the main task was to limit physical contact to minimize the spread of the virus, then in the conditions of war teachers face the task of making the educational process safe without losing quality. Today, we work in harsh conditions of war, when it is especially necessary to help students organize independent work in distance learning mode when studying higher mathematics.

Individual counseling of students by the teacher becomes especially relevant in the period of distance learning.

Individual counseling of students by a teacher can take place via e-mail, through the popular messengers Viber and Telegram. We indicate the main features and advantages of such communication:

- sending your letters and reading incoming messages takes place at a convenient time for the participants in the correspondence;
- the student can send the result of independent work by e-mail;
- the student can consult with the teacher about the correctness of doing homework;
- the student masters the ability to ask questions: clearly and to the point (it is known that a well-formulated question already contains part of the answer to it), which contributes to the development of thinking;
- providing students with links to search for the necessary information located on the Internet allows the teacher to save consulting time;
- the very fact of correspondence allows the teacher to indirectly assess the student's interest in doing homework, to see the problems that arise in the student's activities, to correct the content of assignments in the future;
- the teacher can promptly inform students about the grades they received for completed tests, send recommendations for preparation to students who received an unsatisfactory grade.

At the beginning of 2021, we conducted a survey of 2nd-year students regarding distance learning. The following questions were included in the questionnaire: satisfaction and level of knowledge acquisition in distance learning conditions; the level of conducting classes in ZOOM conference mode; acquisition of new competencies or deterioration of skills during distance learning; advantages and disadvantages of distance learning. The survey made it possible to determine the level of satisfaction of students with the educational process in general and distance learning technologies in particular. According to the results of the survey, 30% of students were satisfied with the distance learning process, 43% were quite satisfied, and 17% were rather dissatisfied. The results of the survey show that the students rate the process of organizing the educational process in the period of distance learning quite high.

Regarding the level of information perception and assimilation of knowledge by the student, 64% of students answered that the material submitted remotely required additional explanation from the teacher. And to the question "How is information perceived better?" 21% of students replied "online", 37% – "face-to-face", 57% – "information is perceived equally". During distance learning, students acquired or developed several competencies, including the ability to manage time, work with information resources, self-control, and self-organization.

At the same time, 72% of students determined that they had lost communication and teamwork skills.

Among the main advantages of distance learning, students attributed a flexible study schedule and the possibility of combining work and study, increasing motivation for self-study.

As disadvantages of distance learning students included: technical problems, inability to access the Internet (48%); difficulty of learning the material (38%); low level of knowledge of information technology by teachers and students (11%).

The results of the student survey became the basis for the formation of proposals for improving of educational process during the distance learning period.

4. The complexity of mathematics itself. Any knowledge consists of "information" and "skill". In mathematics, "skill" is the ability to solve problems, conduct proofs, critically analyze the solutions and proofs obtained. Skills and habits are a more important part of mathematical culture than just knowing some facts and theorems.

5. Misunderstanding of the role of mathematics in modern society. The task of the teacher is to show the beauty and elegance of the subject, to provide students with a clear understanding of the need for a mathematical component in general training, to develop an idea of the role and place of mathematics in modern civilization and in world culture.

Particular attention should be paid to the first lecture, as it largely determines the future success of the taught discipline. It is necessary to emphasize the universality of mathematics, which is due to its abstractness. After all, the same equation can describe many real processes. The same regularities turn out to be common for a huge range of processes and phenomena. Common to them is a mathematical model built on the basis on these laws.

In the context of a negative attitude towards the upcoming classes, it is important from the first day to try to eliminate the psychological barrier, the fear of the complexity of studying topics. The teacher needs to tell students about the demands of modern society in the preparation of literate and intellectually developed specialists.

Students are interested in analyzing the mistakes they make when solving problems. When demonstrating errors, the reasons for their occurrence are revealed and the correct solutions are given. For example, gross errors are made when it is required to change the order of integration in a double integral. This kind of error is a consequence of the inability to correctly depict the area of integration.

Rating technologies in higher education contribute to the development of narrow personal motives, introduce elements of the game and competition into the process of teaching mathematics.

Motivation for a deep assimilation of the foundations of mathematics contributes to a deeper understanding of special disciplines in the future.

The teacher must create conditions under which students will understand the value of mathematical education for their own development and in the context of future practical activities and realize the expediency of studying mathematics.

There are some tips that can help in increasing motivation:

1. Based on the results of the entrance control, to conduct additional classes with weak students or organize and control their independent work in order to fill in the gaps in knowledge of elementary mathematics.

2. To demonstrate in the classroom the connection of higher mathematics with other disciplines, as well as to solve practical problems related to the future specialty of students. One of the main directions in the development of the education system at the present stage is the movement towards strengthening its applied and practical orientation. Therefore, the development and implementation of the technology of a contextual approach to the study of higher mathematics, which involves linking the learning process to the future professional activities of students, is becoming an urgent task today.

3. In the learning process, use game technologies and problem-based learning technology [4].

4. Pay attention to the independent work of students: issue individual tasks, monitor the implementation, encourage.

Systematic preparation for classes is the basis for the formation of deep and solid knowledge. A university graduate must have a certain amount of knowledge, be able to organize their activities, show a deep interest in their chosen specialty, and be able to work with information sources.

Properly organized independent work can form students' need for self-education, self-development, active work. When organizing independent work of students, it is important to prevent overloading students with educational tasks for extracurricular work, as this can lead to a decrease in their cognitive activity. Independent work of students should take place under the guidance of a teacher in the form of business interaction. The student receives instructions for performing independent work, and the teacher performs the function of monitoring the completed tasks.

Among the second-year students, we conducted a survey in order to find out the learning difficulties and their causes. To determine learning difficulties, students were asked to evaluate the following reasons on a three-point scale: complex and voluminous material, lack of time for preparation, inability to organize their time, inability to systematize the studied material, lack of independent work skills, lack of perseverance. At the same time, the most compelling reason was evaluated with three points, and the least compelling – with one point.

As the survey showed, the main reasons for learning difficulties are complex and voluminous material and lack of time for preparation. At the same time, most students do not consider such reasons as the inability to systematize educational material, the lack of skills for independent work with literature to be compelling. Even in the second year, students do not associate academic performance with the level of formation of educational skills and the organization of their own activities. Therefore, it is necessary to purposefully work on the formation of methods of educational activity in the organization of independent work.

The thoughtful and expedient use of control questions in the organization of independent work arouses students' interest in the subject being studied, contributes to a better understanding, assimilation and consolidation of information, the formation of self-esteem.

Performing test tasks allows students to conduct self-diagnosis, identify weaknesses in the material being studied, and correct their knowledge. Compiling assignments in a test form by the students themselves is very effective: in order to correctly compose a task, student must be well versed in the educational material and be able to apply knowledge for solving educational problems. In addition, this form of work contributes to the formation of professional skills to design tasks for organizing knowledge control.

As the classes showed, the students responsibly approached the implementation of the proposed tasks, while the quality of work improved markedly as they mastered the proposed techniques. Students note that completing test tasks in preparation for classes allows them to better understand the material being studied (54%), see gaps (36%) and systematize knowledge (31%).

The effectiveness of the application of this model was confirmed by the results of modular control: the number of unsatisfactory grades in the discipline has significantly decreased and, most importantly, the quality of knowledge has increased.

In this regard, for each of the topics studied during the course of higher mathematics, students are given theoretical questions for self-control (they are the theoretical part of the test tasks), thematic tests are compiled that carry out intermediate control of knowledge on a particular topic. Therefore, at almost every practical lesson, surveys are conducted in the form of express tests lasting up to 5 minutes.

The practical experience of conducting independent work of students has shown that systematically conducted independent work, with its proper organization, contributes to the acquisition of deeper and more solid knowledge by students compared to those that they acquire when the teacher communicates ready-made knowledge to them.

5. Attract students to participate in olympiads in higher mathematics.

6. Apply a differentiated approach, take into account the abilities and psycho-physiological characteristics of each student.

7. Clearly explain to students the methodology of evaluating their educational activities. With the rating system of control, points are given not only for knowledge, skills and abilities, but also for active participation in the educational process: work at the blackboard, additions from the field, homework. The task is to involve as many students as possible in the educational process, to show that, often, it is the process of proof that is important – drawing up a chain of logical statements, and not mechanical calculations.

8. Use information and communication technologies (Power Point presentations, computer testing, graphing in Mathcad and Matlab, communication with the teacher on the forum).

Distance learning is very important for the modernization of education, it gives students access to new sources of information, increases the efficiency of independent work, provides new opportunities for creativity, finding and consolidating various professional skills.

One of the main elements of distance learning has become a video conference in real time online. Video conferencing is one of the modern means of communication that allows classes to be held in "remote classrooms" when students and teachers are not in direct contact. Video conferences of classes in higher mathematics are held on the Zoom cloud platform. This platform is convenient because during conferences and workshops you can demonstrate materials on the desktop of your PC, smartphone or tablet not only to the teacher, but also to all conference participants.

During higher mathematics practical classes students were offered creative tasks – to create slide presentations on the topics proposed by the teacher. These presentations were then presented by the students during class. Tools for creating slide presentations include Microsoft Office PowerPoint, OpenOffice.org Impress, Powerbullet Presenter, ProShow Producer, Quick Slide Show, MySlideShow. Microsoft PowerPoint is a visual and graphics application used primarily for creating presentations.

Most often students created presentations in PowerPoint in the form of a set of slides on which various types of information were placed: drawings, diagrams, hyperlinks, etc. PowerPoint can work in two main modes: creating and editing presentations; demonstration of presentations. They can be used to visualize the educational material, manage the educational and cognitive activities of students, control and check the assimilation of the educational material, generalize and systematize knowledge, and determine the educational achievements of students.

So, not only the teacher explains the new material to the students during the online class, but also the students take an active part in such a class, demonstrating and commenting the relevant presentations.

There is another important aspect that should be taken into account. The construction of the corresponding courses should be carried out in such a way that students have a holistic view of the main stages in the development of modern mathematics, the basic mathematical concepts and methods, the role and place of mathematics in various fields of human activity.

Lectures and practical classes are the creativity of the teacher. The same text delivered by different people can have different effects. It must be remembered that different people from the same lecture carry away different content and impressions from it. It depends on the level of their readiness, on their attitude to the given lecture and on the ability to work at the lecture. When a lecture is not interesting, students listen inattentively and learn very little.

Conclusions. To form a high motivation for education, a student must have a well-formed image of the future profession. Understanding how the acquired knowledge affects the change in his professional situation, how they will help solve professional problems, the student will be motivated to study the material in depth. E.P. Ilyin rightly notes that "a goal will stimulate a person only when its achievement makes some sense for him. Senseless work not only reduces the strength of the motive, but also humiliates the dignity of a person" [2].

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Рудик Т. О., Суліма О. В. Причини низької мотивації до вивчення вищої математики у студентів технічного університету і шляхи їх усунення

В статті досліджено причини низької мотивації студентів технічного університету до вивчення вищої математики та запропоновано шляхи вирішення цієї проблеми. Показано, що основна задача викладача математики полягає в умінні не тільки познайомити студентів з основами вищої математики, але й викликати інтерес до дисципліни, сформувати математичну компетентність студентів технічного університету як невід'ємну складову їх загальнокультурної і професійної компетентностей, показати значущість математичних знань і вмінь. Викладач повинен створити такі умови навчання, при яких студенти зрозуміють цінність математичної освіти для власного розвитку в контексті майбутньої практичної діяльності та зрозуміють доцільність вивчення математики.

Проведено анкетування студентів 2-го курсу приладобудівного факультету Київського політехнічного інституту імені Ігоря Сікорського з метою дослідити мотивацію вивчення ними курсу вищої математики. Результати анкетування показали, що низька мотивація вивчення вищої математики є актуальною проблемою, що стоїть на шляху отримання студентом якісної освіти.

Сьогодні ми працюємо в жорстких умовах війни, коли особливо необхідно допомогти студентам організувати самостійну роботу у режимі дистанційного навчання при вивченні вищої математики.

Приведено результати анкетування студентів, що свідчать про достатньо високу оцінку студентами процесу організації освітнього процесу у період дистанційного навчання. Результати опитування студентів стали підґрунтям для формування пропозицій щодо удосконалення освітнього процесу в період дистанційного навчання.

Практичний досвід проведення самостійної роботи студентів показав, що систематично проведена самостійна робота при правильній її організації сприяє отриманню студентами більш глибоких і міцних знань по рівнянню з тими, що вони безпосередньо отримують під час занять з вищої математики від викладача.

Ключові слова: мотивація, математика, дистанційне навчання, самостійна робота, анкетування, викладач, студенти, освіта.

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Ситнік Т. І.

ОРГАНІЗАЦІЯ РОБОТИ В МАЛИХ ГРУПАХ МАЙБУТНІХ МЕДИЧНИХ СЕСТЕР НА ЗАНЯТТЯХ ДИСЦИПЛІН ГУМАНІТАРНОГО ЦИКЛУ

Статтю присвячено одній із найважливіших проблем сучасної вищої медичної освіти, пов'язаної з упровадженням в освітній процес інтерактивних методів підготовки майбутніх фахівців, зокрема медичних сестер. У ній акцентовано увагу на впливові інтерактивної технології на формування у здобувачів освіти професійних умінь і навичок, через яке відбувається максимальне наближення академічного навчання до реальної майбутньої професійної діяльності медичних сестер. Уточнено, що робота в малих групах є різновидом методів колективно-групового навчання. Конкретизовано сутність методики організації навчання студентської молоді в малих групах під час проведення практичних занять, а саме предметів, що входять до дисциплін гуманітарного циклу. Проаналізовано наукові джерела з проблеми дослідження, виокремлено, на яких принципах ґрунтується зазначений метод, варіанти його поєднання з іншими в межах інтерактивної технології. Вказано на переваги та можливості колективно-групового навчання студентів, детально описано саму методику організації та проведення практичних занять із використанням методу роботи в малих групах із таких дисциплін, як "Основи правознавства", "Українська мова (за професійним спрямуванням)" й "Педагогіка та мистецтво викладання". У статті підкреслено роль викладача під час застосування цього методу у комунікативній взаємодії між студентами кожної з визначених груп. Загалом, викладач виступає модератором