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IDENTIFYING REASONS FOR STUDENTS LEARNING ACTIVITY IN VOCATIONAL TECHNICAL EDUCATION

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Abstract. The fundamental changes taking place in socio-economic life, both in the country and abroad in recent years, have required a revision of priorities in the system of training engineering personnel and have identified one of the most important goals of a higher technical school – the preparation of the future engineer for independent professional and creative activity, as a necessary condition for the formation of the student's personality, motivated by the creative realization of personal potential, professional skills and abilities. Among the psychological and pedagogical problems of higher education, the most significant is the problem of developing the educational motivation of students, since a high level of educational motivation is one of the most effective means of increasing the efficiency and quality of the educational process. The article includes theoretical and empirical research focused on learning motivation among students of the study programs of Engineering and Management in Transport and Automotive Transport Engineering within the Faculty of Mechanical, Industrial and Transport Engineering of the Technical University of Moldova, identifying the specifics of the dominant learning motivation depending on the year and study program, determining students' attitude towards the objects of the curriculum from the perspective of interest, importance and understanding, and establishing the factors influencing students' learning motivation.

Keywords: *motivation, learning motivation, school motivation, demotivation, vocational education.*

Rezumat. Schimbările fundamentale care au loc în viața socio-economică atât în țară, cât și în afara ei în ultimii ani au necesitat o revizuire a priorităților în sistemul de pregătire a personalului ingineresc și au identificat unul dintre cele mai importante obiective ale școlii tehnice superioare – pregătirea viitorului inginer pentru activitate profesională și creativă independentă ca o condiție necesară a formării personalității studentului, motivată de realizarea creativă a potențialului personal, aptitudinilor și abilităților profesionale. Dintre problemele psihologice și pedagogice ale învățământului superior, cea mai semnificativă este problema formării motivației educaționale a studenților, întrucât un nivel ridicat de motivație educațională este unul dintre cele mai eficiente mijloace de creștere a eficienței și calității

procesului de învățământ. Articolul cuprinde o cercetare teoretică și empirică axată pe motivația învățării la studenții programelor de studii Inginerie și Management în Transporturi și Ingineria Transportului Auto din cadrul Facultății Inginerie Mecanică, Industrială și Transporturi a Universității Tehnice a Moldovei, identificarea specificului motivației dominante a învățării în funcție de anul și programul de studii, determinarea atitudinii studenților față de obiectele planului de învățământ din perspectiva interesului, importanței și înțelegerii și stabilirea factorilor de influență a motivației învățării la studenți.

Cuvinte cheie: *motivație, motivația învățării, motivația școlară, demotivare, învățământ profesional tehnic.*

1. Introduction

The fundamental changes taking place in socio-economic life, both in the country and abroad in recent years, have required a revision of priorities in the system of training engineering personnel and have identified one of the most important goals of a higher technical school – the preparation of the future engineer for independent professional and creative activity as a necessary condition for the formation of the student's personality, motivated by the creative realization of personal potential, professional skills and abilities.

In the current educational context, motivation plays a crucial role in students' academic success, especially in vocational education, where preparation for a specific career is a priority. Developing and maintaining learning motivation in these students presents challenges and involves a deep understanding of the psychopedagogical factors that influence their learning process.

Motivation is a complex and complicated field of research. For many years, motivation has been a field of increased interest for specialists and the subject of an impressive number of investigations. The problem of learning motivation is not new either, it has been addressed in a series of pedagogical, psychological, psychosocial studies.

Motivation to learn influences the learning process itself and, implicitly, the results and finalities of this process. Negative phrases and labels, *such as students are no longer interested in learning, they don't like books, they are not motivated to learn, they are no longer the same as before etc.*, have often appeared in investigations carried out by various researchers in educational institutions [1]. It is a reality frequently reported by teachers in our country and a pressing and current problem, to which specialists in the field of educational sciences, but also practitioners, are trying to find solutions. Due to its importance, the specialized literature has focused a lot on this topic, which remains relevant.

The problem of motivation, in general, and that of learning motivation, in particular, is broad and complex. The various approaches have generated multiple definitions, theories, conceptions, models, the circulation of which from one scientific field to another, their mutual interweaving and their reappearance in a renewed form sometimes make their identification difficult.

The term „*motivation*” comes from the Latin „*motivus*”, which means „*mobile*” and „*move*” or „*movere*”, which means „*to move, to relocate, to set in motion*” [2-4]. It follows that motivation is any force, regardless of its nature, that sets the organism in motion, the activity it carries out.

Motivation comes from the word „*motive*”, which encompasses the needs, desires, or impulses that drive an individual to accomplish tasks and goals [5]. Motivation is essentially the presence of an incentive that drives people to take action.

Motivation is a fundamental concept in psychology and related fields such as education, management, and mental health. There are several definitions of motivation [6-19], and these may vary depending on the perspective and context in which they are used.

Motivation is a complex and multifactorial process, involving a number of different components. For a long time, it has been viewed as a set of forces that drive our activity: need, reason, interest, belief, aspiration, ideal, aspiration, tendency, passion, desire, curiosity, will, instinct etc. [2, 10, 20-23]. These components of motivation are interconnected and can vary depending on the individual and the specific circumstances. Taken together, they can influence a person's behavior and decisions and play an important role in achieving goals and satisfying one's needs. Each of these components of motivation can be analyzed individually to better understand their role in the human motivation process.

Motivation for learning is a complex and fascinating field in psychology and education, involving a wide range of psychological factors and processes. Motivation for learning (academic/school) refers to an internal state of the student that initiates and maintains behavior directed towards the goal of learning.

Learning motivation is the set or totality of internal motives of behavior directed towards the accumulation of knowledge. Some students come to university with a well-pronounced cognitive need, others come because „*it is necessary*”, as a student duty; for some students, learning motivation is more theoretical, intellectually oriented, and for others – towards practical.

School motivation is an essential component of learning and has a significant role in achieving academic and, implicitly, professional performance. With age, students begin to know their possibilities, skills and interests and to act in accordance with the expectations of their family, teachers and the society they are part of, personal aspirations etc.

In a school context, motivation is nothing more than the process that leads, guides and maintains a certain behavior desirable for the student status: attending classes, engaging in learning activities in class and at home, successfully completing tasks, etc. and is adequately understood only when it is not only related to the object of learning, but also to the conditions within which learning is carried out, the perceptions that the student has regarding a certain didactic activity [2].

Starting from the premise that each student has certain non-specific positive tendencies, related to the need for success, fulfillment, and competence, certain situations can be created in school that stimulate and amplify these resources and thus influence the efficiency of learning. Specific motivational situations are: the situation of control, competition, game, and performance [24].

From the point of view of learning, training and development, there are: general, specific, intrinsic and extrinsic motivation. The school and any other educational institution must promote intrinsic motivation in order to be able to carry out training that will make students autonomous and responsible. If the student is to give meaning to learning, intrinsic motivation must be more important than extrinsic motivation. Scholars outline five conditions for a person to learn [2]: to create motivation and reinforcement systems; to define their own goals; to design strategies to achieve them; to be satisfied when they have achieved their goals; not to give up in case of failure. Otherwise, the student enters a process of demotivation.

There are several factors that can demotivate the learning process and negatively influence commitment and learning outcomes, including: lack of relevance, unfavorable

learning environment, excessive or insufficiently challenging demands, negative feedback, frustration and repeated failure, loss of interest, excessive stress, lack of autonomy, lack of recognition or reward, personal problems (health, family or financial).

2. Motivating student learning in higher vocational education

Starting studies in higher vocational technical education, the former student faces a number of changes: firstly, the level of external control over his educational activities is sharply reduced; secondly, the structure of the educational activity itself changes – learning motives are complemented and closely linked with professional motives; thirdly, there is an entry into a new social community – „*studenthood*”. Therefore, at this stage of adaptation, the process of motivating students becomes particularly important.

In order for a student to be satisfied with the results of his educational activities, he must self-organize and control them. But this requires a fairly pronounced motivation for learning on the part of the student. It is also important that the very structure of educational and professional motivation ensures the correct direction of educational activities. Professional motivation, related to the educational activities of students in the system of higher vocational education, is understood as a set of factors and processes that encourage and direct a person to study future professional activity [25,26]. More productive development of a student's professional education is possible only at a high level of formation of professional motivation for learning, which determines the internal development of professional competence. In this case, by motives of professional activity is understood the awareness of students of the importance of motives (obtaining higher education, professional development).

The structure of professional learning motivation includes internal and external learning motives. The motive, formed under the influence of factors related to educational activities, is internal. Intrinsic motivation is perceived by the student as a state of happiness and satisfaction from the educational activity itself. Internal motives of students' learning in higher vocational technical education include broad cognitive motives and motives of self-education. They arise in the course of independent cognitive activity, are focused on mastering new knowledge, continuous cognitive activity, initiative, the desire for competence, independence, thereby ensuring the ability of students to overcome emerging difficulties in the learning process.

The motive that is caused by any conditions of the surrounding reality and is not related to the educational process is external. External motives constitute the motivation based on some specific educational activities put forward to the student for achievement. External motives include narrow educational and cognitive motives: receiving a scholarship, a diploma, obeying (submitting) the requirements of a teacher or parents, receiving praise, recognition from peers.

Analyzing the psychological features of the development of students' educational and cognitive activity, the entire period of study is divided into three stages [25]. Stage I (year 1) is characterized by high-level indicators of professional and learning motives that govern educational activities; at the same time, they are idealized, since they are conditioned by the understanding of their social, and not personal, meaning. Stage II (year 2) is characterized by a general decrease in the intensity of all motivational components; cognitive and professional motives cease to govern educational activities. Stage III (years 3-4) is characterized by an increased degree of awareness and integration of various forms of learning motives.

At the initial stage, students with a penchant for humanities disciplines encounter certain difficulties in real and technical disciplines. To prevent the reduction of motivation in these students, the integration of the content of general education and special disciplines is used, an example being optional classes for in-depth study of technical English or another foreign language. In these classes, students improve their English language skills and acquire additional knowledge in their specialty by extracting information from technical texts in foreign languages, which increases their self-confidence and motivation to master the profession.

At the final stage, the number of students combining study with work is increasing, which leads to absenteeism from classes and a negative impact on the efficiency of educational activities. Relevant pedagogical assistance consists in developing in students an understanding of the priority of obtaining an education that will ensure them a permanent job in their specialty in the future, before temporary earnings, and in providing assistance in the rational distribution of work and study time.

The basis of pedagogical work with students who have combined studies with work activity is a differentiated approach that takes into account various factors: the significance of this activity for the student, the financial situation of the student's family, the ability to organize and control their activities. Pedagogical assistance consists either in helping students combine studies with work by jointly searching for ways to rationally allocate time, drawing up an individual schedule for attending classes and consultations, using distance learning opportunities, or convincing them to give up earning money, if the student is unable to independently catch up on the missed material, if he has accumulated numerous academic debts, and further combining work with studies threatens him with expulsion.

A necessary condition for the implementation of a scientifically based learning process in order to develop students' motivation for learning and professional activities is educational and methodological support, which includes educational and methodological documentation and tools. Educational and methodological documentation is aimed at determining the content and basis for planning learning, and educational and methodological tools are material objects that ensure the organization of training at a modern technical level. The professional learning process is bidirectional, characterized by the joint participation of the teacher and students, therefore educational and methodological support should serve both parties interacting on equal scientific and pedagogical terms.

Following the analysis of the literature and scientific works on the development of learning motivation in students in vocational and technical education, it was found that the study needs to be initiated with the diagnostic stage by identifying groups of students according to their level of training, learning motivation and reasons for attending the educational institution.

To study the dominant motives for attending an educational institution, one can apply the well-known methodology of T. I. Ilyin [25,27], which contains three scales: *acquiring knowledge* (the desire to accumulate knowledge, curiosity); *obtaining a profession* (the desire to acquire professional knowledge and develop professionally important qualities); „*obtaining a diploma*” (the desire to obtain a diploma through formal acquisition of knowledge, the desire to find „*bypass solutions*” when passing exams and tests). The results obtained in the study represent a characteristic of the initial motives of students, on the basis of which the university should develop a system of means for developing motivation in learning, scientific

research and educational activity of students, especially in the first year of study. Special attention should be paid to students who came to the university primarily to obtain a diploma.

A specific motive for the student's cognitive activity is interest. In this regard, the objects (disciplines) in which students show increased interest and the objects in which there is a low level of interest are identified. The increased or decreased level of interest is influenced by the content of the studied material, the methods of work (teaching) and the personality of the teacher. In disciplines with a high level of interest, the teacher presents practice-oriented content, uses interactive methods and technologies, and in disciplines with a low level of interest, mainly traditional classical methods of reproductive teaching are used and there is no practical significance of the educational material content

3. Developing diagnostic and assessment tools for student learning motivation

The diagnosis and assessment of student learning motivation can be achieved through a variety of methods and techniques. These methods include the use of questionnaires and rating scales, structured or semi-structured interviews, direct observations of student behavior and engagement in learning activities, educational portfolios, individual feedback and discussions, and self-assessment and reflection. Each method has specific advantages and limitations, and their use in combination can provide a more comprehensive understanding of student learning motivation.

The organization of the research aimed at: establishing hypotheses and investigative objectives, determining the research period, delimiting the experimental subject groups, selecting research methods, processing and interpreting data.

It was assumed that there are differences in the manifestation of learning motivation in students of the first cycle of the bachelor's degree, first, second, third, fourth year of studies and the second cycle of the master's degree, first year of studies in two study programs: Engineering and Management in Transport (EMT) and Automotive Transport Engineering (ATE) within the Faculty of Mechanical, Industrial and Transport Engineering of the Technical University of Moldova. The differences in the manifestation of motivation in students refer to: priority reasons for learning; factors influencing learning; students' attitudes towards academic subjects according to the criteria of interest, importance, understanding; motivational dominants of learning.

The general objectives of the observational experiment were related to [27]:

- analyzing the correlations of students' opinions from the two programs at different years of study;
- identifying the weight/proportion of functions that influence students' learning motivation;
- determining ways to stimulate learning motivation;
- measuring/investigating the availability for participation in a motivational development program;
- presenting conclusions and identifying solutions.

The research sample consisted of 153 students from the Faculty of Mechanical, Industrial and Transport Engineering of the Technical University of Moldova. Experimental subjects were selected according to the following criteria: to represent different years of study (years 1-4, cycle I bachelor and year 1, cycle II master); to represent two study programs (EMT and ATE); to carry out full-time studies. Finally, five experimental groups were formed: year 1 – 31 students, year 2 – 32 students, year 3 – 39 students, year 4 – 22 students and

year 1 master – 29 students (Table 1). The study applied the indirect observation method: analysis of specialized documents, reports of previous research and statistical documents [1].

The research on student learning motivation was carried out during the 2023-2024 academic year, in three stages: *in the first stage*, the research instruments were selected and adapted, *in the second stage*, the ascertaining experiment was carried out, examining the specifics of student learning motivation, *in the third stage*, the results were processed, analyzed and interpreted.

Table 1

The sample of students interviewed

Year of study	Study program		Total
	EMT	ATE	
Year 1	15	16	31
Year 2	21	11	32
Year 3	10	29	39
Year 4	10	12	22
1st year of master's degree	9	20	29
Total	65	88	153

Note: EMT - Engineering and Management in Transport; ATE - Automotive Transport Engineering.

The research methodology focused on identifying students' opinions regarding the dominant motivation for learning, on establishing students' attitudes towards academic subjects, and on determining the particularities of learning motivation.

1. To highlight the dominant motives of students, the *Questionnaire for Determining Motives for Learning*, developed by Karpova [2], was applied.

The questionnaire is aimed at determining the dominant motives, recognized by students, in the learning activity: *cognitive, communicative, emotional, personal development, achievement, social position, external, professional*. The subjects were asked to assess the importance/significance of the learning motives for university studies, assessing the degree of importance through a score from 0 to 3 points. Each point has the following significance: 0 points – no significance; 1 point – partial significance; 2 points – moderate significance; 3 points – total significance. The following motivational groups are identified: *cognitive* – 2, 10, 18; *communicative* – 4, 12, 20; *emotional* – 1, 9, 17; *personal development* – 7, 15, 23; *social position* – 8, 16, 24; *self-realization* – 6, 14, 22; *external* (stimulation, punishment) – 5, 13, 21; *professional* – 3, 11, 19. The sum of the points obtained for each motivational group is calculated and the motivational profile is determined.

2. To determine students' attitudes towards academic subjects, the *Questionnaire on Attitudes towards Academic Subjects*, developed by Bahurina [2,28,29], was used.

The questionnaire highlights students' attitudes towards academic subjects according to the criteria of *interestingness, importance, understanding*. Subjects were asked to rate each subject of study according to these criteria according to a scale from 1 to 5 points: 1 – low score, 5 – high score.

3. In order to determine the particularities of students' learning motivation, the *Questionnaire for Determining Learning Motivation* [30,31] was applied, developed by the Bucharest Municipality Center for Educational Resources and Assistance (BMCERA), the Bucharest Municipality Center for Psychopedagogical Assistance (BMCPA), the Interschool Logopedic Center – Bucharest (ILC), adapted for students of the two study programs within

the Faculty of Mechanical, Industrial and Transport Engineering of the Technical University of Moldova.

The survey includes 20 questions with multiple answer options [29]. Based on the answers obtained for each topic, the priority reasons were established, the factors that determine students for choosing a specialty, the factors that influence learning in general, and the motivation for learning in particular. For more efficient processing, the relative frequencies (%) of each year per study program and in general were determined, which makes it possible to compare the empirical results.

4. Results of the ascertainment experiment of student learning motivation

4.1. Determining the dominant learning motivation

The questionnaire aims to identify the reasons perceived by students as important/unimportant in the learning activity. Both data within each year of study by program and comparative data between years are analyzed. The results are presented in Table 2.

a) The presented results allow highlighting the reasons for learning considered by students as dominant or, on the contrary, less important. Thus:

- for the 1st year of studies the dominant reasons are professional (15.36%) and cognitive (14.87%), less important are external (10.29%) and communicative (10.78%);
- for the 2nd year of studies the dominant reasons are professional (14.37%) and cognitive (13.98%), less important are communicative (10.30%) and external (10.70%);
- for the 3rd year of studies the dominant reasons are cognitive (15.56%) and professional (15.32%), less important are external (8.44%) and communicative (9.21%);
- for the 4th year of studies the dominant reasons are cognitive (15.09%) and professional (14.99%), less important are communicative (9.86%) and external (10.16%);
- for the 1st year of the master the dominant motives are cognitive (15.00%), professional development (14.41%), self-realization (14.26%) and professional (14.26%), less important are external (8.56%) and communicative (9.86%);
- for all years of study (total) the dominant motives are cognitive (14.89%) and professional (14.87%), less important are external (9.58%) and communicative (9.89%).

b) Comparison of the obtained data and the common reasons for most students, regardless of the year and study program. The dominant reasons in all years of study are cognitive and professional, with the exception of the first year of the master's degree, where in addition to the two reasons mentioned, professional development and self-realization are also added; the less important reasons are external and communicative.

Table 2

Dominant motives for learning

Year and study program	The dominant motives, %								
	Cognitive	Communicative	Emotional	Personal development	Social position	Self-realization	External	Professional	
Year 1	EMT	15.38	10.49	11.78	13.22	11.06	13.22	9.91	14.94
	ATE	14.38	11.07	12.31	12.86	11.20	11.76	10.65	15.77
	Total	14.87	10.78	12.05	13.04	11.14	12.47	10.29	15.36

Continuation Table 2

Year 2	EMT	14.08	10.25	12.84	13.77	11.80	11.90	11.18	14.18
	ATE	13.80	10.39	11.11	13.26	13.80	13.08	9.86	14.70
	Total	13.98	10.30	12.20	13.58	12.53	12.34	10.70	14.37
Year 3	EMT	14.69	9.72	12.09	14.69	12.32	13.03	7.35	16.11
	ATE	15.85	9.05	12.81	13.45	12.33	12.65	8.81	15.05
	Total	15.56	9.21	12.63	13.76	12.33	12.75	8.44	15.32
Year 4	EMT	14.90	9.94	11.23	13.39	14.69	10.58	12.31	12.96
	ATE	15.26	9.79	10.96	14.48	12.52	11.94	8.22	16.83
	Total	15.09	9.86	11.09	13.96	13.55	11.30	10.16	14.99
1st year of master's degree	EMT	15.24	10.86	10.23	13.15	12.32	14.40	10.23	13.57
	ATE	14.86	8.56	12.16	15.09	12.84	14.19	7.66	14.64
	Total	15.00	9.36	11.49	14.41	12,66	14.26	8.56	14.26
Total	EMT	14.77	10.28	11.83	13.61	12.23	12.56	10.38	14.34
	ATE	14.99	9.60	12.09	13.82	12.47	12.80	8.96	15.27
	Total	14.89	9.89	11.98	13.73	12.36	12.70	9.58	14.87

From the above, we can highlight two important moments. First, within each year, most students consider important, on the one hand, the reasons for learning, related to knowledge, which will help them develop their mind, intelligence, spirit, learn new things, expand their knowledge about the world and their future profession, and, on the other hand, the reasons related to personal and professional development, namely – to know as much information as possible, in order to become interesting and cultured people, as well as to possess useful knowledge for their application in practice. Secondly, it is found that the results obtained in relation to the reasons considered less important – external and communicative – find their explanation in the specifics of these reasons: students learn to receive praise for certain progress or to avoid moralizing and tiring reprimands from teachers or parents, they also avoid socializing with colleagues and friends, they do not get involved in self-education, and success in learning is not the main element for being respected and recognized in the group.

4.2. Identifying students' attitudes towards academic subjects

To identify students' attitudes towards academic subjects, the *Questionnaire on Students' Attitudes towards Academic Subjects* was applied [2,9,10]. Students were asked to rate each subject according to the following criteria: *interesting, important, and understandable*, using a scale from 1 to 5 points.

Analyzing the data obtained, we can state that, in general, students demonstrate a positive attitude towards the subjects, which according to the *interesting* criteria constitute 3.88 points, *importance* – 4.04 points and *understanding* – 3.87 points. They have determined their priorities and interests, demonstrating an active learning attitude. However, as a result of a more detailed analysis, some differences can be noted within each field to which the subjects are assigned.

The subjects in the 1st year mostly depend on the fundamental, general and vocational training, in the 2nd year they are mostly vocational training, and in the 3rd and 4th years – specialized. The subjects according to the field to which they belong and the criteria were scored as follows: *fundamental* – on the *interesting* criterion with 2.99 points, *important* with

3.26 points and *understanding* with 3.02 points; *humanitarian* – on the *interesting* criterion with 3.10 points, *important* with 3.15 points and *understanding* with 3.22 points; *general* – on the *interesting* criterion with 3.83 points, *important* with 3.83 points and *understanding* with 4.02 points; *vocational training* – on the *interesting* criterion with 4.33 points, *important* with 4.24 points and *understanding* with 3.87 points; *specialized* – on the *interesting* criterion with 4.33 points, *important* with 4.48 points and *understanding* with 4.32 points.

Analyzing the grading of subjects by years of study and criteria, the following is attested: year 1 – for the *interesting* criterion with 3.61 points, *important* with 3.77 points and *understanding* with 3.62 points; year 2 – for the *interesting* criterion with 3.97 points, *important* with 4.14 points and *understanding* with 3.92 points; year 3 – for the *interesting* criterion with 4.07 points, *important* with 4.23 points and *understanding* with 4.03 points; year 4 – for the *interesting* criterion with 4.33 points, *important* with 4.39 points and *understanding* with 4.32 points.

From the above, we can see that students demonstrate a positive attitude towards the subjects studied, with increasing interest, importance and understanding as they progress through the years of study, reaching maximum scores in specialized subjects in year 4. However, the notable differences between subject areas reveal a lower appreciation for fundamental and humanitarian subjects compared to vocational and specialized ones.

4.3. Determining the peculiarities of learning motivation in students

In order to determine the particularities of learning motivation among students of the *Engineering and Management in Transport and Automotive Transport Engineering* study programs within the *Faculty of Mechanical, Industrial and Transport Engineering* of the *Technical University of Moldova*, the *Questionnaire for determining learning motivation* was applied [11, 12].

1. Determining the important academic subjects for the specialty chosen by the students.

Each student was asked to choose 15 most important subjects from the curriculum and 5 subjects that they consider important to be introduced into the curriculum for the formation of the individual professional plan for the purpose of effective training according to the specialty.

Analyzing the most important academic subjects for the individual professional plan mentioned by students, it was found that the emphasis is placed on specialized and professional training subjects, both in general and on a separate study program, which constitute: in general for *specialized subjects* – 24.09 nominations on average per subject of study, at ATE – 24.55 and at EMT – 14.00; in general for *professional training subjects* – 20.77 nominations on average per subject of study, at ATE – 21.31 and at EMT – 15.67.

The subjects less frequently nominated by students as important for their individual professional plan, in general, are the *humanitarian* and *fundamental* subjects, which constitute 9.77 and 10.17 nominations respectively on average per subject of study. By study programs, the results are different from the general ones for this indicator. At ATE, the subjects less frequently nominated are the *humanitarian* and *general* subjects with 4.33 and 6.43 respectively on average per subject of study, and at EMT, the subjects less frequently nominated are the *fundamental* and *humanitarian* subjects with 1.80 and 5.33 respectively.

The most important subjects for the individual professional plan with the most nominations are: *in general* – Vehicle construction (75 nominations), Foreign language (57), Technical diagnostics of vehicles (52), Technical drawing (51), Internal combustion engines (50); in the *ATE study program* – Technical diagnostics of vehicles (52), Internal combustion

engines (50), Vehicle construction (49), 3D modeling (44), Technical drawing (41); in the *EMT study program* – Transport legislation (37), Freight transport (31), Foreign language (29), Passenger transport (28), Marketing and logistics (28).

The most important subjects for the individual professional plan with the fewest nominations are: *in general* – Chemistry (3 nominations), Special Mathematics (3), Technical and Material Basis of Transport (3), Urban Transport Planning and Infrastructure (3), Ethics and Academic Integrity (4); in the *ATE study program* – Communication and Academic Writing (1), Chemistry (3), Basics of Computer Programming (3), Ethics and Academic Integrity (3), Special Mathematics (3); in the *EMT study program* – Chemistry (0), Information Technologies (0), Linear Algebra and Analytical Geometry (1), Descriptive Geometry (1), Ethics and Academic Integrity (1).

According to the analyzed data, several common subjects can be identified for the two study programs considered important to be introduced in the curriculum for the formation of the student's individual professional plan, including: Advanced technologies in the automotive industry (11 nominations), Motorways (7), Environmental protection, Engineering and environment (6), Project management in the field of transport (5), Road traffic design and planning (4), Study of electric vehicles, hybrid/electric vehicles (4), Entrepreneurship (4), Investments in transport, Financial education (4).

At the same time, many other subjects were nominated only once, such as: Transportation of dangerous and oversized goods, History of mechanical engineering, Artificial intelligence in the automotive industry, Labor Code, International transport, Business communication skills, Psychology, Automotive design, Business software tools, Risk and safety management, Applied mathematics, etc.

Determining the factors that influenced the choice of specialty. To determine the factors that influenced the choice of specialty, each student was asked to choose the most important influencing factor from the proposed list. The results obtained are presented in Table 3.

From what is presented, it can be seen that: the dominant factors influencing the choice of specialty are – the desire to study the selected subjects in depth (50.33%), confidence in one's own abilities in the selected subjects (35.29%) and one's own practical professional experience (28.76%), and the less dominant factors – this specialty was chosen by my friends (1.96%), other factors (8.50%), and teacher recommendations (9.80%).

Table 3

Factors influencing the choice of specialty

Factors influencing the choice of specialty	Frequency of responses, %		
	EMT	ATE	Total
Desire to study the selected subjects in depth	54.55	44.62	50.33
Mass media, internet, social networks	12.50	18.46	15.03
Own practical professional experience	26.14	32.31	28.76
Suggestions from parents or relatives	14.77	24.62	18.95
Examples and suggestions from acquaintances	13.64	18.46	15.69
Teacher recommendations	9.09	10.77	9.80
Confidence in one's own abilities in the selected subjects	31.82	40.00	35.29
Intuitive decision-making	22.73	30.77	26.14
This specialty was chosen by my friends	1.14	3.08	1.96
Other	10.23	6.15	8.50

The comparative analysis of the obtained data allows us to highlight, within each program and year of study, the common factors that influence the choice of specialty, as well as the specific factors. Thus, the common factors of both study programs are the desire to study the selected subjects in depth and the confidence in one's own abilities and practical professional experience, and the less dominant specific factors are the advice, recommendations and suggestions of friends, acquaintances, teachers, parents and relatives, mass media, internet, social networks. At the same time, a fairly large share is intuitive decision-making (26.14%).

2. Determining learning objectives. To determine learning objectives, students were asked to select the dominant objectives from the proposed list. The results obtained are presented in Table 4.

Table 4

Dominant student learning objectives

Learning objectives	Frequency of responses, %					Total
	Year 1	Year 2	Year 3	Year 4	1st year of master's degree	
Deepening theoretical knowledge in the field studied	35.48	40.63	48.72	45.45	55.17	45.10
Developing practical skills (working with specific tools, technologies or methodologies)	64.52	65.63	61.54	68.18	51.72	62.09
Learning domain-specific competencies (technical, creative, communication or leadership skills)	51.61	43.75	53.85	59.09	55.17	52.29
Understanding the context and practical implications of decisions and actions taken	22.58	50.00	20.51	40.91	17.24	29.41
Developing critical and analytical thinking	29.03	62.50	38.46	54.55	48.28	45.75
Cultivating creativity and innovation	16.13	25.00	25.64	18.18	20.69	21.57
Developing collaboration and communication skills	32.26	40.63	43.59	50.00	44.83	41.83
Improving domain-specific problem-solving ability	45.16	37.50	51.28	50.00	37.93	44.44
Other	6.45	0.00	5.13	0.00	0.00	2.61

From what is presented in the table, it can be seen that:

- the dominant objectives of 1st year students are: developing practical skills (64.52%) and learning domain-specific competencies (51.61%);
- the dominant objectives of 2nd year students are: developing practical skills (65.63%) and developing critical and analytical thinking (62.50%);
- the dominant objectives of 3rd year students are: developing practical skills (61.54%) and learning domain-specific competencies (53.85%);
- the dominant objectives of 4th year students are: developing practical skills (68.18%) and learning domain-specific competencies (59.09%);
- the dominant objectives of 1st year master students are: deepening theoretical knowledge in the studied domain (55.17%) and learning domain-specific competencies (55.17%).

The analysis of the results allows us to state that the main objectives of the students, with minor exceptions, relate to the development of practical skills (62.09%) and learning domain-specific competencies (52.29%).

3. Determining the degree of self-assessment of academic success. In order to determine the degree of self-assessment of academic success, students were asked to assess their academic success according to the following ratings: *excellent, good, average, below average, poor*. The results obtained are reflected in Table 5.

Table 5

Self-assessment of academic success	Frequency of responses, %				
	specialized disciplines	vocational training disciplines	fundamental disciplines	general disciplines	humanitarian disciplines
Excellent	33.99	24.18	14.38	17.65	13.73
Good	50.33	55.56	52.94	54.90	52.94
Average	13.07	19.61	27.45	20.92	23.53
Below average	0.00	0.65	4.58	5.88	7.19
Poor	2.61	0.00	0.65	0.65	2.61
Total	100	100	100	100	100

From the Table presented, it can be seen that more than half of the students self-assess their academic success in all subjects, regardless of the field, at a good level. Separately by field, the results look as follows: in *specialized subjects* – excellent (33.99%), good (50.33%) and average (13.07%); in *vocational training subjects* – excellent (24.18%), good (55.56%) and average (19.61%); in *fundamental subjects* – excellent (14.38%), good (52.94%) and average (27.45%); in *general subjects* – excellent (17.65%), good (54.90%) and average (20.92%); in *humanitarian subjects* – excellent (13.73%), good (52.94%) and average (23.53%). According to the results obtained, it is found that students self-assess their academic success to be at a higher level in specialized and vocational training subjects.

4. Identification of factors that influence learning success. In order to identify the factors that influence learning success, students were asked to assess to what extent the presented factors influence school success, noting with „+” if it is positive and with „-” if it is negative. The results obtained are presented in Table 6.

Table 6

Factors influencing learning success	Frequency of responses, %					
	Year 1	Year 2	Year 3	Year 4	1st year of master's degree	Total
The correctness of choosing academic subjects for the individual professional path	80.65	96.88	82.05	81.82	82.76	84.97
Teachers' requirements for academic subjects	58.06	75.00	76.92	68.18	65.52	69.28
Optimal complexity	74.19	78.13	74.36	63.64	55.17	69.93
Teaching forms and methods	70.97	96.88	87.18	81.82	68.97	81.70

Continuation Table 6

Teachers' professional training	74.19	84.38	84.62	72.73	79.31	79.74
School resources and access to quality education	54.84	87.50	89.74	68.18	75.86	76.47
Lesson schedules	54.84	65.63	61.54	40.91	55.17	56.86
Family environment	67.74	53.13	64.10	63.64	55.17	60.78
Relationships with colleagues	67.74	75.00	71.79	63.64	62.07	68.63
Motivation and involvement	74.19	90.63	76.92	63.64	79.31	77.78
Stress and stress factors	41.94	68.75	53.85	40.91	31.03	48.37

From what is presented in the Table 6, it can be seen that 1st year students highlighted the following factors that influence learning success: correctness of the choice of academic subjects for the individual professional path (80.65%), optimal complexity (74.19%), professional training of teaching staff (74.19%), motivation and personal involvement (74.19%); 2nd year students – correctness of the choice of academic subjects for the individual professional path (96.88%), teaching forms and methods (96.88%), motivation and personal involvement (90.63%), school resources and access to quality education (87.50%); 3rd year students – school resources and access to quality education (89.74%), teaching forms and methods (87.18%), professional training of teachers (84.62%), correctness of choice of academic subjects for the individual professional path (82.05%); 4th year students – correctness of choice of academic subjects for the individual professional path (81.82%), teaching forms and methods (81.82%), professional training of teachers (72.73%); 1st year master students – correctness of choice of academic subjects for the individual professional path (82.76%), professional training of teachers (79.31%), motivation and personal involvement (79.31%), school resources and access to quality education (75.86%).

In general, for all years of study, the following factors that influence learning success are highlighted: the correctness of the choice of academic subjects for the individual professional path (84.97%), teaching forms and methods (81.70%), professional training of teachers (79.74%), motivation and personal involvement (77.78%).

5. The reasons why students learn. In order to identify the reasons why they learn, students were asked to select from the nominated list 5 options that they consider to suit them the most. The results obtained are reflected in Table 7.

Motivation has not only an activating character on behavior, but also one of directing learning behaviors. There is no universal and general motivation, but it is possible to have one oriented more or less precisely towards solving or not solving specific problems. Therefore, what motivates students does not correspond, in all situations, to what the teacher believes about their motivational system.

Table 7

The reasons why students learn

The reasons why students learn	Frequency of responses, %					
	Year 1	Year 2	Year 3	Year 4	1st year of master's degree	Total
To be the best	16.13	18.75	28.21	36.36	41.38	27.45
To be recognized and respected by others	29.03	31.25	15.38	36.36	24.14	26.14

Continuation Table 7

Because the teacher explains in a way that I understand	29.03	37.50	48.72	50.00	10.34	35.29
Because the teacher has an attractive teaching style	19.35	50.00	35.90	27.27	31.03	33.33
Because the teacher is close to us	22.58	31.25	12.82	9.09	13.79	18.30
Because the teacher is pleasant in physical appearance	3.23	3.13	2.56	0.00	0.00	1.96
Because the teacher is calm. does not get angry	19.35	25.00	17.95	40.91	27.59	24.84
Because the teacher inspires fear in me	0.00	9.38	0.00	0.00	6.90	3.27
Because the teacher inspires respect in me, being a role model for me	25.81	59.38	20.51	13.64	31.03	30.72
Because the subject is interesting	70.97	50.00	74.36	86.36	75.86	70.59
Because the subjects will be useful to me later	58.06	65.63	79.49	81.82	72.41	71.24
Because my parents insist that I learn	9.68	6.25	5.13	4.55	0.00	5.23
Because my parents reward me if I learn	0.00	3.13	0.00	0.00	3.45	1.31
Because I like to study	25.81	28.13	51.28	27.27	58.62	39.22
Because the learning tasks given by the teacher are clear	29.03	12.50	7.69	9.09	20.69	15.69
Because the teacher makes a correct assessment	3.23	6.25	5.13	4.55	17.24	7.19
To get good grades	9.68	9.38	15.38	0.00	0.00	7.84
To not embarrass myself	3.23	3.13	2.56	4.55	3.45	3.27
To have a successful career	83.87	46.88	76.92	72.73	55.17	67.32
Other	9.68	3.13	0.00	0.00	3.45	3.27

A very high percentage of students are motivated to learn by subjects that will be useful to them later (71.24%), by interesting subjects (70.59%) and by the prospect of a successful career (67.32%). An exception are the 2nd year students, who apart from interesting subjects (50.00%) and subjects that will be useful to them later (65.63%) are motivated to learn by the respect that the teacher inspires, being a role model for them (59.38%) and the attractive teaching style (50.00%), while the prospect of a successful career is placed at a lower level (46.88%).

A large portion of students mentioned that they enjoy studying (39.22%), a smaller percentage study to be the best (27.45%), recognized and respected by other colleagues (26.14%).

Teachers are not only holders and transmitters of information, but also educators, mentors and character builders. Teachers assume this role and the function of guiding values, expecting students to follow this model. Teachers are considered a role model and inspire respect by 30.72% of those surveyed. Other reasons why students learn are: the teacher explains in a way that they understand (35.29%), has an attractive teaching style (33.33%), is calm and does not get angry (24.84%), is close to them (18.30%) etc.

6. Students' learning styles. In order to identify their learning styles, students were asked to tick the most appropriate answer corresponding to their learning style for each statement in the proposed list. The results obtained are reflected in Table 8.

From the analysis of the first answer option it appears that 34.46% of students always try to understand what the teacher teaches in class and 50.00% most of the time. This aspect is very important in the learning process. The transmission and acquisition of knowledge must be done logically and be as clear as possible.

In the case of the second response option, students believe that they always (34.94%) and most of the time (47.26%), when studying, they associate new knowledge with what is already known.

To learn better, students (37.16% most of the time and 23.65% always) try to logically retain the information taught. Passive memorization is less used, giving way to active memorization.

In the opinion of students (30.82% sometimes, 26.71% rarely and 13.70% never), the source of information from parents, siblings, grandparents, relatives is not very often requested by students in learning. This can be explained either by the lack of training of family members in certain fields, the existence of a gap between the curriculum studied by the two generations, or by the limitation of the time available to students. The computer and the internet have become a much faster and more efficient source of information search.

Table 8

Student learning styles	Frequency of responses, %				
	evermore	mostly	sometimes	rarely	never
When I learn, I try to understand what the teacher is teaching in class	34.46	50.00	14.86	0.68	0.00
When I study, I associate new knowledge with what I already know	34.94	47.26	16.44	0.68	0.68
To learn better, I try to logically retain the information taught (in the form of diagrams, tables, formulas etc.)	23.65	37.16	31.08	8.11	0.00
I appeal to the information that I believe my parents, siblings, grandparents, other people, other sources of information have	8.90	19.87	30.82	26.71	13.70
When I learn, I try to find the usefulness of the information in everyday life	29.93	42.18	24.49	2.72	0.68
I tend to learn by heart	3.40	9.52	26.53	44.22	16.33

The purely pedagogical teaching style in which the student listens or takes notes is not exactly suitable for today's students. 42.18% of students try, most of the time and 29.93% always, to find the usefulness of information in everyday life when learning. The role of teachers consists in helping students find the usefulness of information in everyday life and in developing in them the ability to correlate the theoretical world with the practical one.

The vast majority of students tend to learn by heart rarely (44.22%), sometimes (26.53%) and never (16.33%).

7. Time allocated to various activities in a day. To determine how much time they allocate to various activities in a day, students were asked to indicate the approximate time allocated to each activity in the list. The results obtained are reflected in Table 9.

Analyzing the time students spend on various activities, it is found that students spend the least time watching TV: none (69.66%) and less than an hour (20.69%); playing computer

games: none (50.34%), less than an hour (19.31%) and 1-2 hours (16.55%); reading: none (21.23%), less than an hour (41.10%) and 1-2 hours (25.34%); organized courses: none (33.10%), less than an hour (17.24%) and 1-2 hours (35.86%). Students spend more than an hour on family activities: 1-2 hours (30.82%), 2-4 hours (25.34%) and more than 4 hours (13.70%); activities with friends: 1-2 hours (48.25%), 2-4 hours (21.68%) and more than 4 hours (13.70%). Students allocate less than half an hour (36.81%) and 1-2 hours (29.17%) to outdoor recreational activities, and less than half an hour (26.03%), 1-2 hours (39.04%) and 2-4 hours (23.29%) to the learning process.

Table 9

Time allocated in a day to various activities

Activities	Frequency of responses, %				
	not at all	less than an hour	1-2 hours	2-4 hours	more than 4 hours
Watching TV	69.66	20.69	6.21	2.76	0.69
Playing on the computer	50.34	19.31	16.55	8.97	4.83
Family activities	9.59	20.55	30.82	25.34	13.70
Activities with friends	8.39	13.99	48.25	21.68	7.69
Organized courses: dance, musical instrument, foreign languages, sports etc.	33.10	17.24	35.86	8.97	4.83
Outdoor recreational activities	13.19	36.81	29.17	12.50	8.33
Reading	21.23	41.10	25.34	10.27	2.05
Learning	2.74	26.03	39.04	23.29	8.90
Other	6.77	21.05	23.31	21.80	27.07

8. Extracurricular activities in which students are involved. In order to know the extracurricular activities in which they are involved, students were asked to select from a nominated list the activities in which they are involved. The results obtained are reflected in Table 10.

The extracurricular activities in which students are involved are:

- year 1: sports (74.19%), watching shows/movies/concerts (32.26%) and volunteering (29.03%);
- year 2: sports (50.00%), volunteering (37.50%), museum visits (31.25%) and educational programs/projects (31.25%);
- year 3: sports (64.10%), watching shows/movies/concerts (41.03%) and excursions (33.33%);
- year 4: sports (54.55%) and watching shows/movies/concerts (45.45%);
- 1st year of master's degree: sports (75.86%) and excursions (37.93%).

Table 10

Extracurricular activities in which students are involved

Extracurricular activities in which students are involved	Frequency of responses, %					1st year of master's degree	Total
	Year 1	Year 2	Year 3	Year 4			
Sports	74.19	50.00	64.10	54.55	75.86	64.05	
Art (painting, drawing, modeling)	12.90	18.75	5.13	4.55	20.69	12.42	
Dance	6.45	6.25	12.82	4.55	3.45	7.19	

Continuation Table 10

Watching shows/movies/concerts	32.26	21.88	41.03	45.45	24.14	32.68
Museum visits	16.13	31.25	23.08	4.55	10.34	18.30
Excursions	22.58	25.00	33.33	13.64	37.93	27.45
Volunteering	29.03	37.50	12.82	4.55	24.14	22.22
Educational programs/projects at university	9.68	31.25	12.82	9.09	24.14	17.65
Other	12.90	12.50	17.95	9.09	13.79	13.73

According to students, the extracurricular activities they engage in are sports (64.05%), watching shows/movies/concerts (32.68%) and excursions (27.45%). These are the activities that students probably engage in the easiest, being more attractive and entertaining. However, sports are seen by students as a hobby, which is not related to school, and is not as accessible as extracurricular activities. Not all students have sports skills. Therefore, only about 2/3 of students get involved in sports activities. A satisfactory percentage of students chose volunteering (22.22%).

9. The extent to which extracurricular activities help the student in learning. To determine the extent to which extracurricular activities help in learning, students were asked to select according to the criteria: *very much, a lot, appropriate, a little, not at all*. The results obtained are reflected in Table 11.

Education through extracurricular activities aims to identify and cultivate the optimal correspondence between skills, talents, cultivate a civilized lifestyle, as well as stimulate creative behavior in different fields. Extracurricular activities are the non-institutionalized way of achieving education. For students, extracurricular activities are a source of relaxation, confidence, recreation, good mood and less of a source of support for the learning process. Therefore, only 10.46% of students believe that the above activities help them very much in learning and 25.49% a lot.

Table 11

The extent to which extracurricular activities help the student in learning

The extent to which extracurricular activities help the student in learning	Frequency of responses, %					1st year of master's degree	Total
	Year 1	Year 2	Year 3	Year 4	Year 5		
Very much	9.68	3.13	7.69	9.09	24.14	10.46	
A lot	32.26	18.75	23.08	18.18	34.48	25.49	
Appropriate	22.58	50.00	20.51	40.91	24.14	30.72	
A little	22.58	18.75	23.08	27.27	10.34	20.26	
Not at all	12.90	9.38	25.64	4.55	6.90	13.07	
Total	100	100	100	100	100	100	

10. The existence of other ways to succeed in life besides studying at university. In order to find out their opinion, students were asked to answer *yes* or *no* if there are other ways to succeed in life besides studying at university. The results obtained are reflected in Table 12.

The vast majority of students (86.93%) believe that there are other ways to succeed in life besides studying at university. Succeeding in life does not only mean proving initial performances, but also winning or having a mental mode of functioning characterized by performance and competitiveness. Success in life can have multiple definitions, it can be

achieved, depending on each person's needs, on one or more levels. That is why the percentage of people who answered „yes” is quite high.

Table 12

The existence of other ways to succeed in life besides studying at university

Answer option	Frequency of responses, %					Total
	Year 1	Year 2	Year 3	Year 4	1st year of master's degree	
Yes	93.55	90.63	94.87	72.73	75.86	86.93
No	6.45	9.37	5.13	27.27	24.14	13.07

4th year and 1st year master's students, practically all of whom are employed, have a slightly different opinion regarding the existence of other ways to succeed in life besides studying at university, but anyway the percentage of those who answered „yes” is quite high.

11. The level of motivation for learning of students. To determine the level of motivation for learning, students were asked to rate their personal level of motivation for learning on a scale from 1 to 10. The results obtained are reflected in Table 13.

Table 13

The level of motivation for learning of students

Year of study	Frequency of responses, %									
	1	2	3	4	5	6	7	8	9	10
Year 1	0.00	0.00	0.00	3.23	12.90	6.45	32.26	25.80	16.13	3.23
Year 2	0.00	0.00	0.00	6.25	3.13	6.25	18.75	31.25	28.12	6.25
Year 3	2.57	2.57	5.13	5.13	7.69	7.69	25.64	20.51	20.51	2.56
Year 4	4.55	0.00	0.00	0.00	9.09	0.00	27.27	45.45	9.09	4.55
1st year of master's degree	0.00	0.00	3.45	0.00	6.90	10.35	20.69	31.03	13.79	13.79
Total	1.31	0.65	1.96	3.27	7.84	6.54	24.84	29.41	18.30	5.88

Analyzing the level of motivation for learning appreciated by students, it is found that only 5.88% of students attribute a grade of 10 and 18.30% a grade of 9. Grade 8 is assumed by 29.41% of students and grade 7 by 24.84%. Year 1 students appreciated their level of motivation for learning on average by 7.26 points, year 2 – by 7.75 points, year 3 – by 6.82 points, year 4 – by 7.32 points, year 1 master – by 7.62 points, and the total average – by 7.33 points.

The conclusion of the analysis shows that the level of motivation for learning of students is moderate. The low percentage of students who evaluate themselves with maximum grades (10 and 9) reflects a general tendency of realistic or modest self-appraisal in relation to motivation for learning.

12. Factors that help students learn the most. In order to identify the factors that help them learn the most, students were asked to select from the nominated list the factors that they consider to be most suitable for them. The results obtained are reflected in Table 14.

The hierarchy established according to the students' choices is as follows:

- ✓ the information taught is useful to me (79.74%);
- ✓ to practically apply what I have learned (70.59%);
- ✓ the atmosphere during the classes (45.10%);

- ✓ the classes are engaging (24.18%);
- ✓ my opinion is taken into account by the teachers (20.26%);
- ✓ reward through gifts, money, other advantages received (18.25%);
- ✓ reward through praise, positive appreciation, encouragement, prizes (11.11%).

Table 14

Factors that help students learn the most

Factors that help students learn the most	Frequency of responses, %					Total
	Year 1	Year 2	Year 3	Year 4	1st year of master's degree	
The information taught should be useful	70.97	84.38	87.18	77.27	75.86	79.74
The atmosphere during the lessons	45.16	50.00	53.85	36.36	34.48	45.10
Reward through praise, positive appreciation, encouragement, awards	12.90	21.88	5.13	9.09	6.90	11.11
Reward through gifts, money, other benefits received	16.13	25.00	15.38	13.64	24.14	18.95
The lessons should be engaging	29.03	21.88	20.51	22.73	27.59	24.18
My opinion should be taken into account by the teachers	12.90	28.13	15.38	27.27	20.69	20.26
To practically apply what I have learned	67.74	46.88	89.74	81.82	65.52	70.59
Other	3.23	0.00	7.69	0.00	3.45	3.27

It is observed from the hierarchy of the answer options that most students believe that it would help them learn more if the information taught is useful to them, in second and third place being the practical applicability of what has been learned and, however, the atmosphere during the classes is also particularly important. Rewards through gifts, money, other benefits received and rewards through praise, positive appreciation, encouragement, prizes are positioned in the penultimate and last place respectively.

13. Success in life. To find out what success in life means, students were asked to rate the nominated statements on a scale from 1 to 5. The results obtained are reflected in Table 15.

Table 15

Possible factors of success in life	Frequency of responses, %					Average grade
	1	2	3	4	5	
Starting a family	8.78	4.73	14.86	22.30	49.32	3.99
Social prestige	4.73	10.14	27.70	35.81	21.62	3.59
Successful career	2.03	2.70	10.14	32.43	52.70	4.31
Money	1.35	4.05	13.51	35.14	45.95	4.20
Harmonious relationships with others	2.70	6.08	16.22	27.70	47.30	4.11

Analyzing the data presented in the table, it is observed that success in life represents for students a successful career (average score 4.31), money (4.20), but also harmonious relationships with others (4.11). In fourth place is the founding of a family (3.99), and in last place, in the opinion of students, is social prestige (3.59).

14. The extent to which a successful career is important in the student's life. To determine the extent to which a successful career is important in life, students were asked to respond with the following ratings: *very high, high, moderate, low and very low*. The results obtained are reflected in Table 16.

Table 16

The extent to which a successful career is important in the student's life

The extent to which a successful career is important in the student's life	Frequency of responses, %					1st year of master's degree	Total
	Year 1	Year 2	Year 3	Year 4			
Very high	38.71	28.13	53.85	31.82	44.83	40.52	
High	48.39	40.63	35.90	54.55	37.93	42.48	
Moderate	12.90	31.25	10.26	13.64	17.24	16.99	
Low	0.00	0.00	0.00	0.00	0.00	0.00	
Very low	0.00	0.00	0.00	0.00	0.00	0.00	

For 42.48% of students, a successful career in life is of great importance and 40.52% very important. Changes in the labor market, unemployment, the continuous increase in information about jobs in the socio-economic context of our country create confusion, indecision and misinformation for young people in terms of choosing their own career path. They want to obtain a career that will bring them material and financial satisfaction, in a very short time, without pursuing a suitable or enjoyable activity. A successful career is a way to overcome certain problems.

In conclusion, it can be noted that for students, a successful career is very important, which once again confirms the hierarchy in *item 14*.

15. Elements that contribute to building a successful career. To determine the main elements that contribute to building a successful career, students were asked to list three factors that they consider most important.

The elements that contribute to building a successful career in the opinion of students are: motivation, determination and perseverance (37 nominations), knowledge and skills (36), studies and education (27), the desire to learn something new and continuous study (21), active involvement in the work process (18), harmonious relationships with others (15), family and close people (15) etc.

Other elements that contribute to building a successful career were also listed: learning ability, goal setting and planning, faith in God, correct decision-making and decision-making skills, computerization, honesty and kindness, work-life balance, teamwork, etc. and 29 other responses.

16. Things considered important in university. In order to assess what things are considered important in university, students were asked to list the options that they consider most appropriate. The results obtained are reflected in Table 17.

It is found that 84.97% of students state that practical activities are carried out in laboratories/cabinets at the university, 50.00% claim that it is important to be good friends.

Table 17

Things considered important in university

Things considered important in university	Frequency of responses, %					1st year of master's degree	Total
	Year 1	Year 2	Year 3	Year 4			
Practical activities are carried out in laboratories/offices	87.10	78.13	89.74	95.45	75.86	84.97	

Continuation Table 17

Competition is encouraged	12.90	18.75	15.38	4.55	31.03	16.99
Collaboration, cooperation are encouraged	58.06	46.88	46.15	40.91	37.93	46.41
In my group it is important to have good results	16.13	21.88	2.56	9.09	17.24	13.07
In my group it is important to be good friends	54.84	56.25	56.41	54.55	27.59	50.33
Other	3.23	0.00	5.13	0.00	0.00	1.96

in their group and 46.41% believe that collaboration and cooperation are encouraged at their university. In the opinion of students, only 16.99% of them believe that competition is encouraged at the university and 13.07% – in their group it is important to achieve good results.

17. Reasons for poor student achievement. In order to identify the reasons for poor achievement, students were asked to list the factors that demotivate them from a nominated list. The results obtained are reflected in Table 18.

Table 18

Reasons for poor student achievement

Reasons for poor student achievement	Frequency of responses, %					Total
	Year 1	Year 2	Year 3	Year 4	1st year of master's degree	
I don't have the conditions	0.00	0.00	2.56	4.55	0.00	1.31
I don't have the will	22.58	15.63	28.21	9.09	10.34	18.30
That's all I can do	12.90	18.75	28.21	31.82	20.69	22.22
I don't have time	16.13	12.50	25.64	27.27	48.28	25.49
I don't care what I do at university	6.45	3.13	7.69	0.00	3.45	4.58
I don't want	3.23	3.13	2.56	4.55	3.45	3.27
I don't want to be considered a nerd	0.00	0.00	2.56	0.00	0.00	0.65
It doesn't matter to my family	0.00	0.00	0.00	0.00	0.00	0.00
I don't understand anything that is taught	16.13	3.13	10.26	4.55	3.45	7.84
The teacher doesn't appreciate/value me	6.45	6.25	10.26	18.18	10.34	9.80
It doesn't help me in what I plan to do later	19.35	6.25	35.90	31.82	13.79	21.57
Other	35.48	40.63	28.21	31.82	13.79	30.07

The main reasons why they do not learn, according to students, are: they do not have time (25.49%), they can only do (22.22%), it is of no use to them in what they intend to do later (21.57%), they do not have the will (18.30%) and others (30.07%), where most said. There are also some exceptions such as: in the 1st year – 16.13% and the 3rd year – 10.26% of students claim that they do not understand anything of what is taught to them, which raises serious questions; in the 3rd year – 10.26%, the 4th year – 18.18% and the 1st year of the master – 10.34% of students believe that the teacher does not appreciate them.

18. The environment that determines success in life. In order to identify the environment that determines success in life, students were asked to rank the nominated environments from 1 to 7 in descending order of importance. The results obtained are reflected in Table 19.

Table 19

The environment that determines success in life

The environment that determines success in life	Frequency of responses, %					1st year of master's degree	Total
	Year 1	Year 2	Year 3	Year 4	Year 4		
School	17.76	17.66	16.03	15.85	18.33	17.12	
Family	18.71	20.70	19.75	21.08	19.68	19.92	
Friend group	16.57	16.99	17.48	16.83	16.97	17.01	
Mass media	12.40	11.25	11.05	13.56	12.18	11.93	
Extracurricular activities	15.61	11.92	13.22	16.01	13.41	13.86	
Educational programs/projects	13.71	16.31	15.04	11.60	13.53	14.26	
Other	5.24	5.17	7.43	5.07	5.90	5.90	
Total	100	100	100	100	100	100	

The environment that determines success in life for students is in first place the family (19.92%), followed by school (17.12%) and the group of friends (17.01%). In last place are the mass media with 11.93% and other media (5.90%).

19. The contribution of success in university to increasing the chances of success in life. To assess the extent to which success in university contributes to increasing the chances of success in life, students were asked to select according to the criteria: *very high, high, moderate, low and very low*. The results obtained are reflected in Table 20.

Approximately 39.22% of students believe that university contributes to increasing the chances of success in life to an appropriate extent and 26.14% to a large extent, and 15.03% believe that university contributes to a small extent and 9.80% to a very small extent to success in life.

Table 20

The extent to which success in university contributes to increasing the chances of success in life

The extent to which success in university contributes to increasing the chances of success in life	Frequency of responses, %					1st year of master's degree	Total
	Year 1	Year 2	Year 3	Year 4	Year 4		
Very high	6.45	6.25	10.26	4.55	17.24	9.15	
High	25.81	28.13	25.64	18.18	31.03	26.14	
Moderate	45.16	53.13	23.08	45.45	34.48	39.22	
Low	12.90	3.13	28.21	18.18	10.34	15.03	
Very low	6.45	9.38	12.82	13.64	6.90	9.80	
Don't know	3.23	0.00	0.00	0.00	0.00	0.65	

5. Conclusion

The ascertaining experiment of learning motivation among students at the Faculty of Mechanical, Industrial and Transport Engineering of the Technical University of Moldova demonstrated that there are certain differences in the manifestation of learning motivation depending on the year and study program followed. By organizing the research and applying specific instruments, it was possible to identify the dominant learning motives and attitudes towards academic subjects, as well as determine the peculiarities of learning motivation among students.

The analysis of the results showed that the dominant reasons for learning for most students are cognitive and professional, regardless of the year or study program followed. These reasons include the desire to gain new knowledge, develop their intellectual skills and prepare for their future career. Also, reasons related to personal and professional development were considered important by the majority of students. As for the reasons considered less important, such as external and communicative ones, the results showed that these are mainly related to the desire to avoid reprimands or receive praise, as well as a lack of interest in socializing with peers or in self-education.

The average values of the appreciation of academic subjects indicate that students generally consider the subjects to be interesting (with an average of 3.88 points), important (with an average of 4.04 points) and easy to understand (with an average of 3.87 points). This positive attitude reflects the fact that they determine their priorities and interests and are engaged in the learning process. However, a more detailed analysis of the data reveals some differences in the appreciation of subjects depending on the field and year of study. For example, vocational and specialized training subjects are generally rated better than fundamental or humanitarian ones. It is also observed that in general, with advancing in years of study, students give greater importance and appreciation to the subjects, which suggests an increase in involvement and interest in the subject matter as they progress in their academic program. At the same time, identifying attitudes towards academic subjects can provide useful information for adapting the learning process to the specific needs and interests of students, thus contributing to improving their performance and involvement in the educational process.

Overall, the responses provided by students provide a detailed picture of their motivation, goals and learning methods, as well as the role that extracurricular activities play in their academic and personal lives. These responses suggest that, in the students' view, success in life is influenced by several factors, including education, motivation, interpersonal relationships and family environment, and that university education plays an important role in preparing them for future success.

Thus, the experiment constitutes an important starting point for optimizing the educational process and for supporting students' motivation and commitment in their academic and professional careers.

6. Recommendations

Based on the *conclusions* that reveal the theoretical, applied results and values of the research, the following *recommendations* are put forward in order to develop and stimulate learning motivation among students of the Faculty of Mechanical, Industrial and Transport Engineering of the Technical University of Moldova.

6.1. Recommendations for teachers

Given that student motivation is influenced by the teacher's level of competition, his involvement in teaching, and the enthusiasm and passion with which he does his job, the teacher must analyze his own motivation and the way in which he carries out his teaching-learning-evaluation activities. In this context, a complex of strategies (factors) for stimulating and developing learning motivation is recommended, the essence of which is summarized in the following:

- *Creating a stimulating and positive learning environment.* The teacher builds a classroom atmosphere in which students feel comfortable and encouraged to express their ideas and questions. A positive and encouraging attitude from teachers can increase students' motivation and self-confidence.

- *Ensuring relevance and applicability.* The teacher ensures that the material taught is relevant to students and that they understand how what they are learning can be applied in practice or in their future professional lives. They make connections between the course content and real-life problems or contexts that they may face.

- *Engaging students in the learning process.* The teacher promotes the active participation of students in the teaching-learning process. They use active teaching methods, such as group discussions, case studies or projects, that involve students in practical activities and problem solving.

- *Providing constructive feedback and recognizing performance.* The teacher provides regular and specific feedback on students' performance and recognizes their efforts and achievements. Constructive feedback can help guide students toward continuous improvement and maintain their motivation.

- *Using instructional technology effectively.* Integrating modern technology into the teaching process can be an effective way to stimulate student interest and engagement. The teacher uses digital tools, online learning platforms, and other technological resources to diversify teaching methods and provide access to relevant and up-to-date educational materials.

- *Creating opportunities for individualized learning.* The teacher understands the individual needs and interests of students and adapts the teaching process to support their personal and professional development. Provides flexible and personalized learning options that allow students to explore and develop their passions and skills.

- *Positive role model.* As a teacher, the teacher demonstrates passion and commitment to the subject taught and shows students the importance and benefits of continuous learning and personal development. Being a positive role model, inspires and motivates students to follow their own aspirations and push their limits etc.

Special attention should be paid to weak and unmotivated students, encouraging them to work. Towards them, the teacher can adopt the following behaviors: expressing confidence in the ability to succeed; giving them attention as if they were stronger students; avoiding competitive situations with good students; excluding remarks in front of colleagues; avoiding expressing contempt when they fail; showing interest in their successes. At the same time, it can be specified that the problems of learning motivation being extremely diverse, the teacher's intervention cannot be reduced to recipes, but must be adapted to each individual situation.

6.2. Recommendations for students

Committing to the learning process with determination and courage can maximize the potential and achieve success in studies and in the student's personal and professional life. In this context, the following recommendations are proposed:

- *Setting clearly defined goals.* The student identifies personal and academic goals and sets priorities based on them. Well-defined and achievable goals can provide direction and motivation in the learning process.
- *Identifying passion.* The student explores areas that interest him/her and tries to choose courses and activities that stimulate his/her interest and curiosity. Studying a subject that he/she is passionate about can make the learning process more enjoyable and motivating.
- *Effective time management.* The student creates a structured and efficient learning schedule that allows balancing academic tasks with other activities and responsibilities. Prioritizes tasks according to importance and deadlines and tries to avoid procrastination.
- *Adopting a positive mindset.* The student approaches learning with an open and positive mindset and believes in the ability to learn and grow. Avoids negative and self-limiting thinking and focuses on solutions and overcoming obstacles.
- *Actively engaging in the learning process.* The student actively participates in classes, discussions, and practical activities and asks questions when he/she needs clarification or additional help. Collaborates with colleagues and gets involved in projects and extracurricular activities that can expand knowledge and skills.
- *Seeking additional resources and support.* The student uses available resources, such as books, online materials, tutorials, and academic counseling services, to consolidate understanding and overcome difficulties. Does not hesitate to ask for help when needed and gets involved in tutoring or mentoring programs.
- *Celebrating progress and rewards.* The student recognizes efforts and achievements and celebrates each success, no matter how small. Sets rewards or motivates himself/herself with small rewards for achieving goals and for maintaining learning motivation etc.

The recommendations outlined above lead to the development of autonomous, independent, self-directed, self-regulated learning skills. As students acquire these skills, their dependence on external influence and control over their learning decreases.

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