

Comparative report on the results of the survey of undergraduates for 2018-2022.

on the educational program:

7M07106 “Heat power engineering” (6M071700 “Heat power engineering”)

The Center for Quality Management and Accreditation in 2018-2022 academic years conducted a survey "Satisfaction of undergraduates with educational services" as part of the planned complex of questionnaires for all consumer groups.

The purpose of the study is to assess the level of satisfaction of undergraduates with educational services of the university.

The object of the study was undergraduates of KTU from 1-2 courses.

Research objectives:

1) Determine the degree of involvement of undergraduates in the work of the department and the university as a whole;

2) Analyze the degree of satisfaction of undergraduates with the work of the supervisor;

3) Development of recommendations to improve the quality of educational services of the university

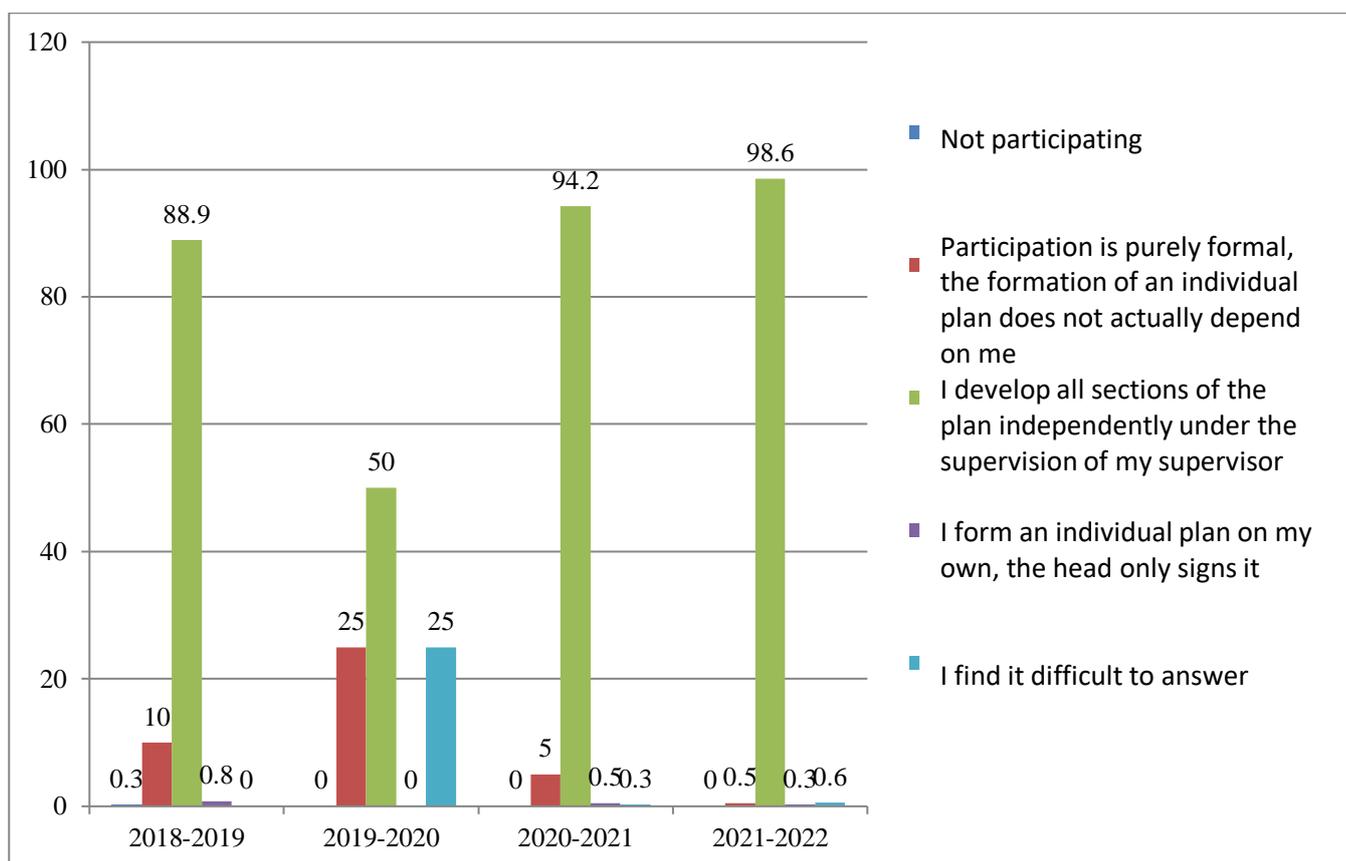
The survey was conducted anonymously in electronic format.

The questionnaire of the undergraduate student contained 12 questions on the formed sections of the organization of educational, pedagogical and research activities.

1. Evaluate your participation in the formation of an individual master's work plan.

Table 1

	2018-2019	2019-2020	2020-2021	2021-2022
Not participating	0,3	-	-	-
Participation is purely formal, the formation of an individual plan does not actually depend on me	10	25	5	0,5
I develop all sections of the plan independently under the supervision of my supervisor	88,9	50	94,2	98,6
I form an individual plan on my own, the head only signs it	0,8	-	0,5	0,3
I find it difficult to answer	-	25	0,3	0,6

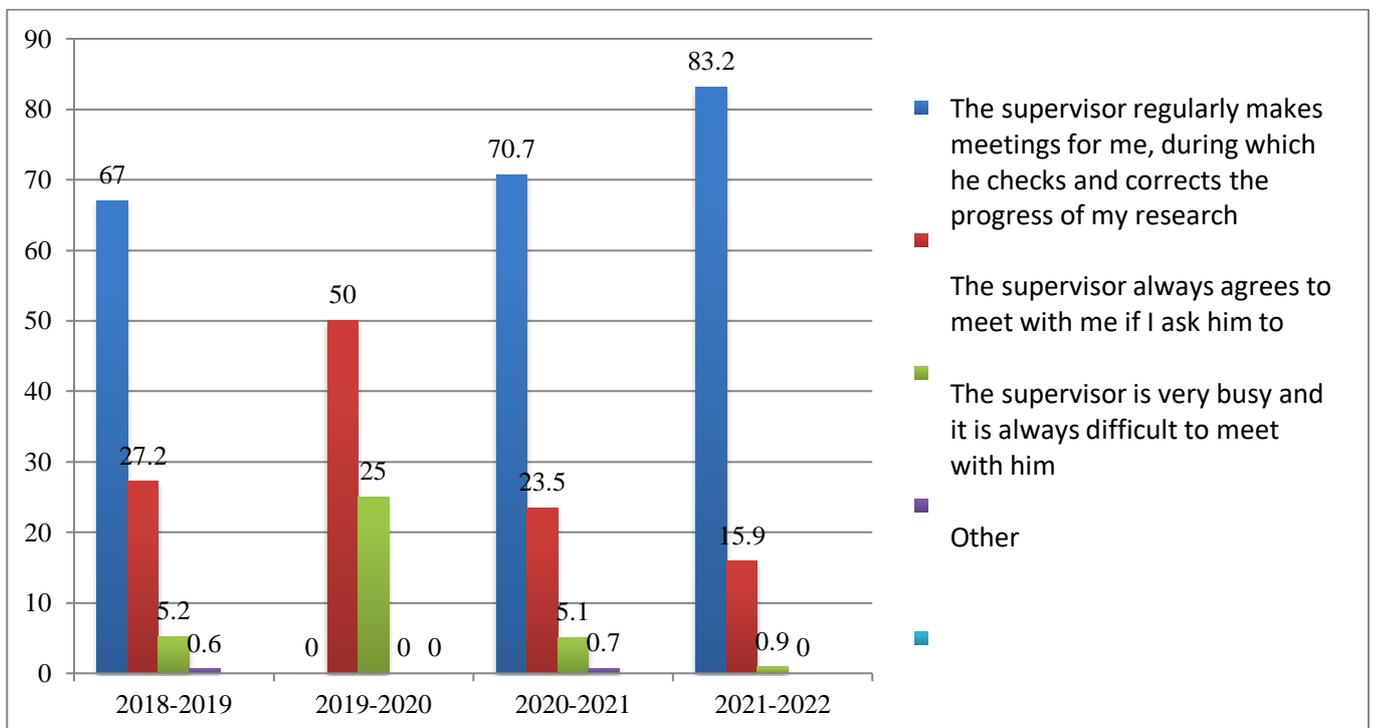


The Master's degree program is organized in accordance with the individual master's work plan developed on the basis of the curriculum of the master's program. An individual plan is developed by a master's student together with a supervisor for the entire periods of study, taking into account the plans and results of work for semesters. Responsibility for the timely, complete and high-quality compilation and execution by undergraduates of all types of work reflected in the individual work plan is borne by both undergraduates and supervisors of undergraduates. To assess these factors, undergraduates were asked to evaluate their participation in the formation of an individual master's work plan.

The results of undergraduates in general indicate the maximum level of participation of undergraduates in the formation of an individual plan, under the supervision of a supervisor (the average final score is **82.9%**), as well as the data obtained during the study (see Table 1) show that undergraduates at the university receive assistance and advice from scientific supervisors. Thanks to the joint activity of the supervisor and the undergraduate, both the quality of scientific work as a whole and the level of development of professional competencies of the student himself increases.

2. How often do you meet with the supervisor and on whose initiative? Table 2

	2018-2019	2019-2020	2020-2021	2021-2022
The supervisor regularly makes meetings for me, during which he checks and corrects the progress of my research	67	-	70,7	83,2
The supervisor always agrees to meet with me if I ask him to	27,2	50	23,5	15,9
The supervisor is very busy and it is always difficult to meet with him	5,2	25	5,1	0,9
Other	0,6	25- the supervisor does not schedule meetings until I myself take the initiative at the end of the semester	0,7	-



For the dissertation work, the supervisor plays the second most important role, after the master's student, he monitors the progress of his research, regularly makes

appointments, checks the completion of the work in parts or as a whole, changes and supplements what is necessary in the work.

84.3% of respondents regularly meet with their supervisor, and the initiator of the meeting is both the supervisor (55.2% of responses) and the graduate student himself (**29.1%** of responses). **9.5%** of respondents noted that "meeting with the supervisor is very difficult, since he is almost always busy". **6,2%** of undergraduates chose the option "other" and left their feedback: "The supervisor does not schedule meetings until I myself take the initiative at the end of the semester".

Based on the data obtained, it can be concluded that research supervisors regularly interact with undergraduates on issues of general research work.

Scientific supervisors who have received an unfavorable assessment by undergraduates are recommended to hold regular meetings, carry out systematic monitoring of the progress of research according to the schedule. And also involve undergraduates in independent active work according to the approved plan in cooperation with the supervisor.

At the initial stage of research work, when it is necessary to clarify the purpose and objectives of scientific research, to determine the object and subject of research or project, the direct assistance of the supervisor is simply necessary. At subsequent stages, the independence of undergraduates should increase, and the recommendations of the supervisor relate mainly to the issues of processing the results of the research, compiling a list of used literature, literary design of the text of the qualifying work and the location of the material in it, the formulation of conclusions and practical recommendations.

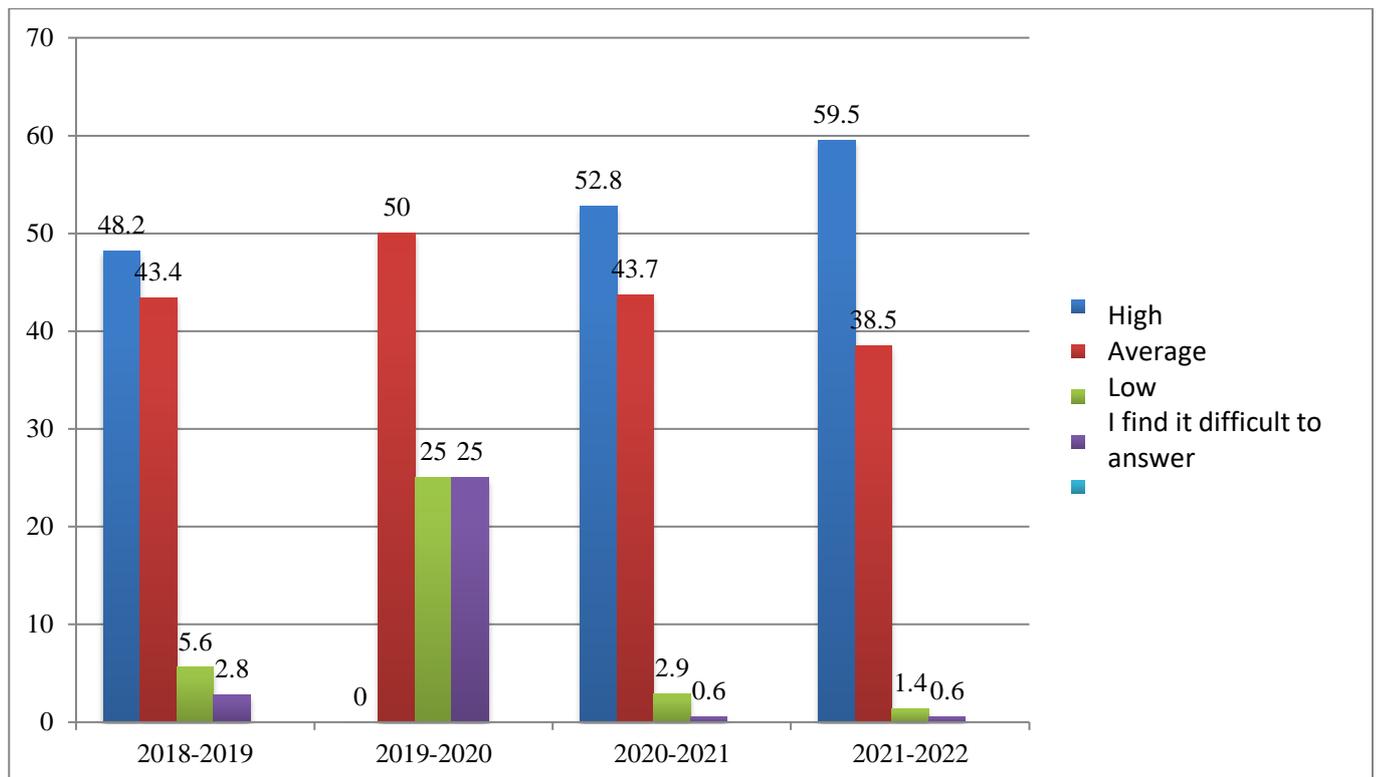
3. Evaluate the level of your participation in the following types of work of the department

	2018- 2019	2019- 2020	2020- 2021	2021- 2022
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High	48,2	-	52,8	59,5
Average	43,4	50	43,7	38,5
Low	5,6	25	2,9	1,4
I find it difficult to answer	2,8	25	0,6	0,6

3.1. Research work of the department (design, development, technological, etc.) as a full participant

Table 3.1



Estimates of the level of participation of undergraduates in the work of the department (design, development, technological, etc.) have a range of estimates: **40.1%** of respondents rated it as "high", **43.9%** as "average", **8.7%** - as "low" and **7.2%** - **found it difficult to answer**.

Most often, the reason for the low level of participation of undergraduates in research and development, according to undergraduates, is, on the one hand, the overload of their studies, on the other hand, the heavy workload of teachers, as well as poor awareness of the scientific activities of the university and from specific graduate departments.

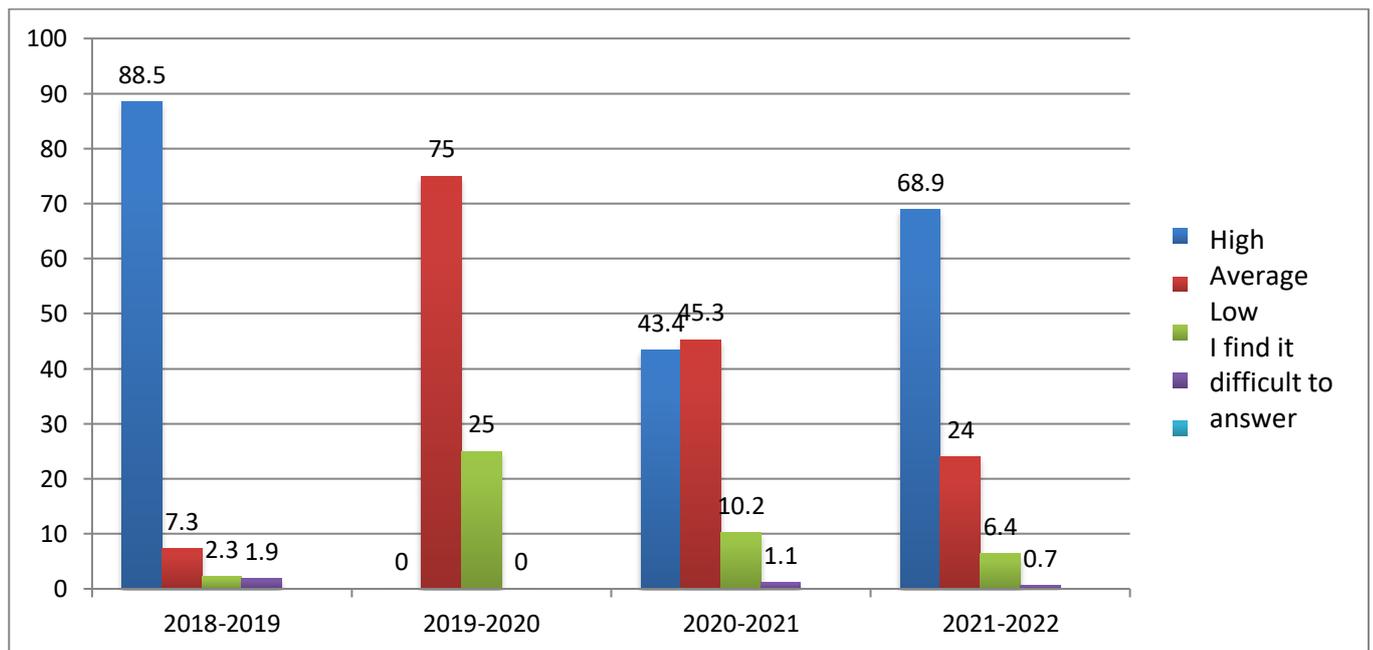
Participation in the scientific work of the department allows undergraduates to develop and realize their creative potential. Design activity is one of the components in the system of specialists' activities, where the abilities for professional activity are laid,

which is aimed at the formation of scientific and technological thinking of future technology teachers. As a result, undergraduates of the first year of study must determine, coordinate and approve the topic of the dissertation, and undergraduates of the second year of study must demonstrate consistent implementation of the dissertation work plan.

3.2. Writing scientific articles

Table 3.2

	2018-2019	2019-2020	2020-2021	2021-2022
High	88,5	-	43,4	68,9
Average	7,3	75	45,3	24
Low	2,3	25	10,2	6,4
I find it difficult to answer	1,9	-	1,1	0,7



Writing an article is the first important step in scientific activity for a graduate student. The author's business reputation, prospects for further development as a highly qualified specialist and as a scientist largely depend on how well, logically and legally competently the material is structured and written.

The most popular answer to this question was **"high"** – 50.2%; the second most popular answer is **"average"** -37.9%, followed by **"low"** – 11%; **"difficult to answer"** – 0.9%.

According to the data obtained, the "Average" and "low" grades of undergraduates give the following conclusion: the lack of interest and motivation in research activities of undergraduates may be explained by the fact that they do not understand the meaning of writing articles and speeches at the conference, the difficulty in determining the topic. It is also possible that they are not sufficiently informed about the possibility of participating in various conferences; another reason for refusing to participate in research activities and writing an article is the financial side of the issue, and one of the last reasons for lack of interest is the fear of writing, associated with the lack of sufficient methodological basis, knowledge and rules for writing scientific papers and fear of performing in front of a large audience.

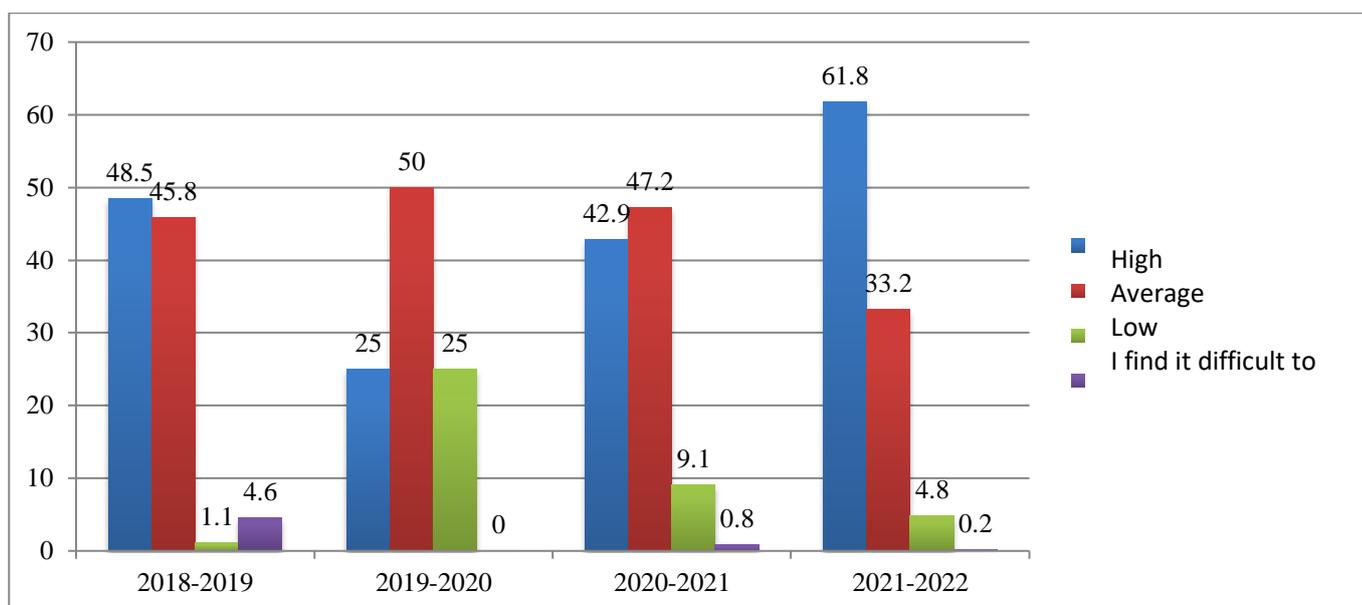
The system of research work of undergraduates is a set of activities aimed at mastering by undergraduates in the process of learning according to curricula, techniques and skills of performing research work, the development of abilities for scientific creativity, independence and initiative.

From the point of view of motivation of undergraduates, it is necessary to consider the work of a supervisor who, with the help of his own experience and existing knowledge, can instill a disinterested interest in science in a graduate student. Such a mentoring system serves as a motive for scientific activity among undergraduates. In order for this work to be effective, it is necessary to train teaching staff capable of motivating undergraduates to research activities through their own example and research. Holding such events has a positive effect on the formation of the future personnel reserve of universities and the development of knowledge-intensive fields of knowledge. Along with the motivation of undergraduates in the organization of research and development, we should also talk about the motivation of teachers, since to carry out this work we need a teacher who can and wants to guide undergraduates in conducting scientific research, i.e. we are talking about a symbiosis of professionalism and teacher motivation.

3.3. Participation with reports at conferences and seminars

Table 3.3

	2018-2019	2019-2020	2020-2021	2021-2022
High	48,5	25	42,9	61,8
Average	45,8	50	47,2	33,2
Low	1,1	25	9,1	4,8
I find it difficult to answer	4,6	-	0,8	0,2



One of the factors that increase the effectiveness of scientific and pedagogical training of undergraduates is participation with reports at conferences and seminars. "Participation with reports at conferences and seminars" the majority of undergraduates **44.5%** of all years mark as **"high"**. Average – **44%**; low – **10%**; difficult to answer – **1.4%**.

When preparing for a report or a speech, a master's student gets experience in systematization and generalization of material, acquires the skills of scientific creativity, masters the important art of reasoned polemics. In addition, the presentation and publication of the material allow the undergraduate to gain public recognition among professionals and, what is also very important, copyright to the results of scientific creativity. The uniqueness of this area of work is also determined by the fact that it allows the student to reach the level of independent thinking, tune in to research activities, acquire useful communication skills with reviewers and editors. In other words, in the process of preparing student scientific conferences, the studied educational material is systematized and, consequently, the effectiveness of the educational process itself is increased.

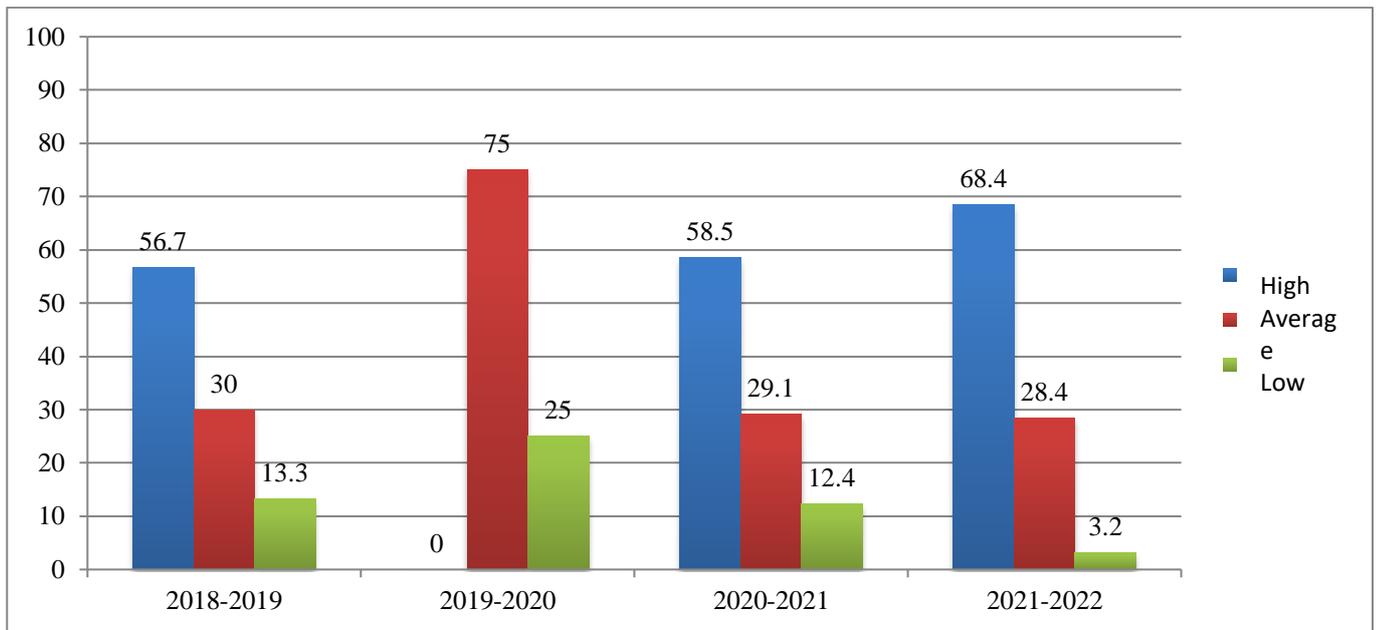
Attention is also drawn to the fact of a decrease in scientific conferences devoted to the Master's degree as a new educational phenomenon. Their content is rather "closed" to a specific university, which hinders the development of fundamental issues of master's education common to the higher education system.

	2018-2019	2019-2020	2020-2021	2021-2022
High	56,7	-	58,5	68,4

Average	30	75	29,1	28,4
Low	13,3	25	12,4	3,2

3.4. Preparation of research reports, abstracts

Table 3.4



Preparation of research reports, abstracts – **45.9%** of undergraduates of all ready rated as "**high**". Average – **40.6%**; low – **13.5%**. The data show that undergraduates are active in compiling research reports, abstracts.

The planning and organization of research and development are aimed at developing the skills of future specialists in conducting scientific research. Along with carrying out experimental research, undergraduates take part in the collection and processing of statistical data, compilation and preparation of various computer products. Undergraduates present the results of scientific research at conferences, scientific seminars of departments, obtaining patents, etc.

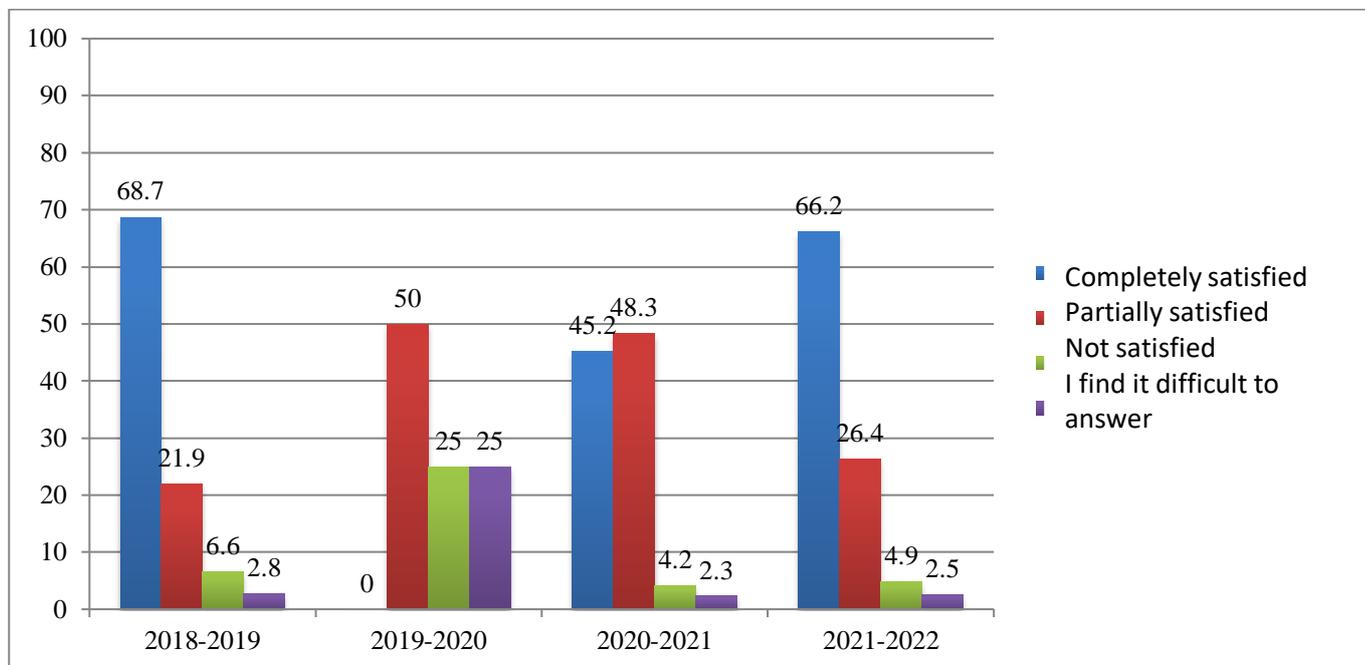
4. Are you satisfied with the scientific and educational environment of the university when studying for a master's degree?

4.1. Organization of conferences, round tables, forums at the university, with the participation of undergraduates

Table 4.1

	2018-2019	2019-2020	2020-2021	2021-2022
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Completely satisfied	68,7	-	45,2	66,2
Partially satisfied	21,9	50	48,3	26,4
Not satisfied	6,6	25	4,2	4,9
I find it difficult to answer	2,8	25	2,3	2,5

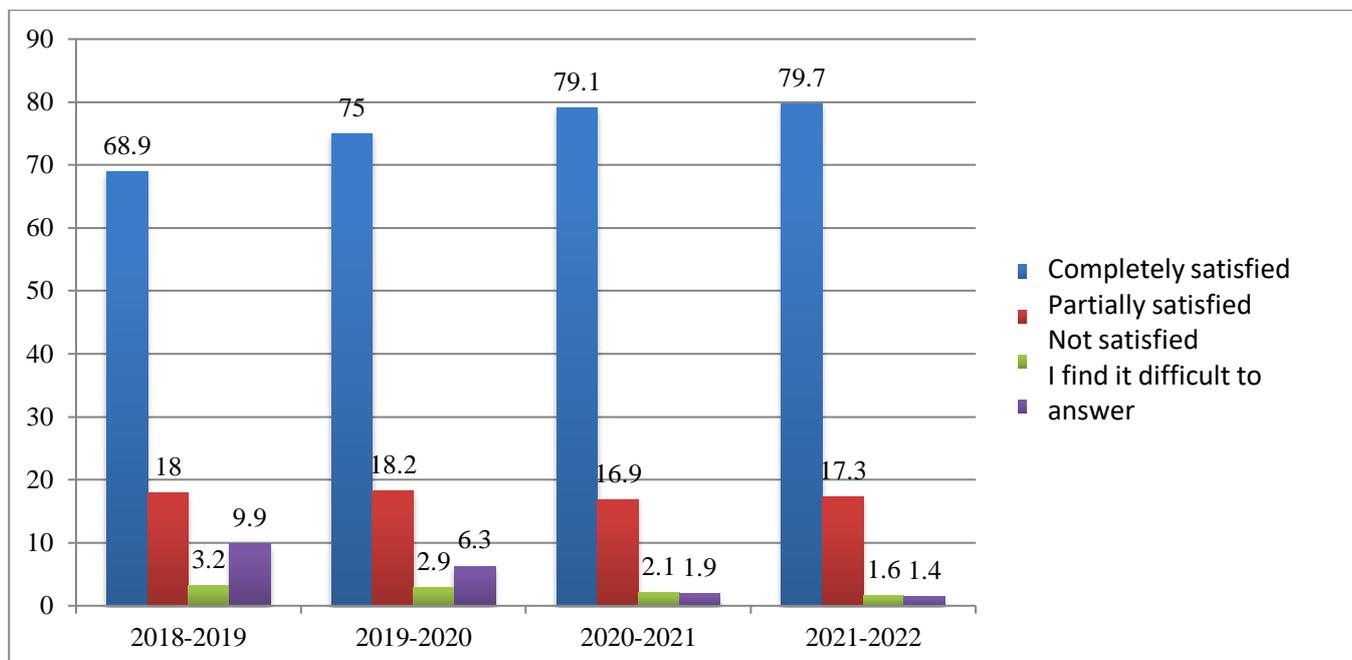


The majority of respondents (**45%**) are "completely satisfied" with the organization of conferences, round tables and forums with the participation of undergraduates held at KTU. Participation in conferences, round tables and forums ensures the development of the ability to conduct discussions using rational arguments and conclusions based on a rigorous, analytical and critical approach to data.

4.2. Material and technical support of applied scientific research

Table 4.2

	2018-2019	2019-2020	2020-2021	2021-2022
Completely satisfied	68,9	75	79,1	79,7
Partially satisfied	18	18,2	16,9	17,3
Not satisfied	3,2	2,9	2,1	1,6
I find it difficult to answer	9,9	6,3	1,9	1,4

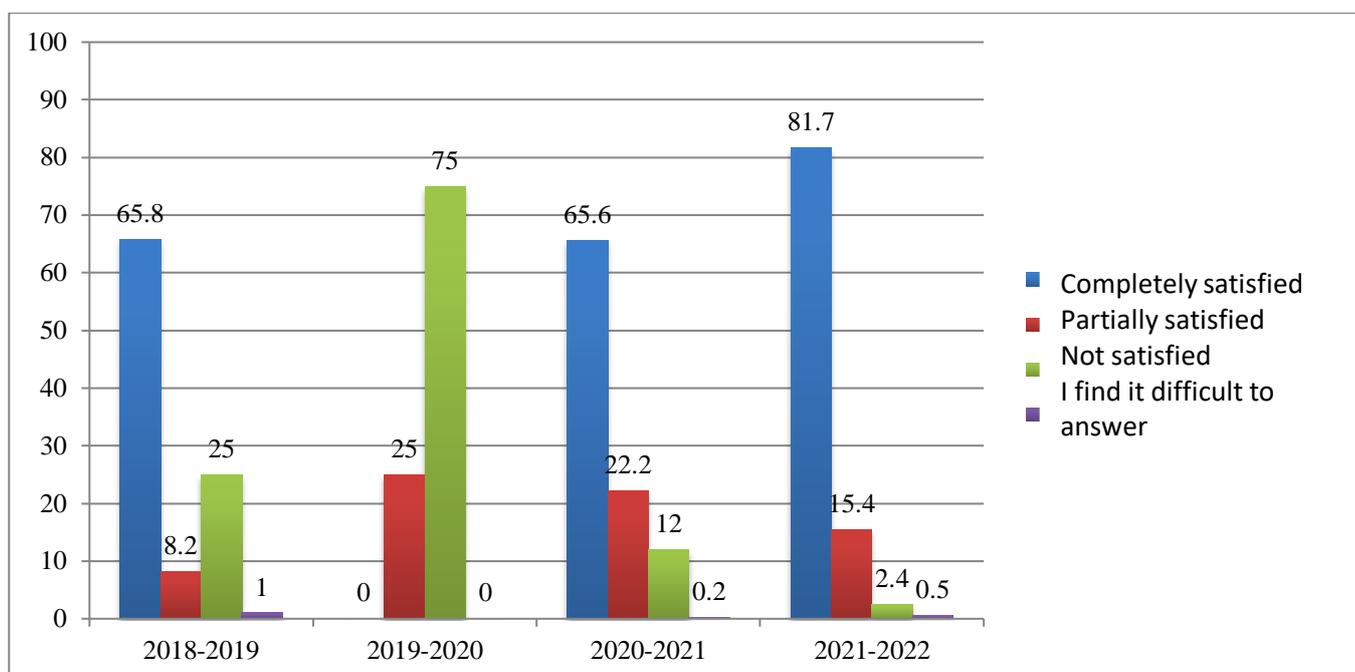


75.7% of undergraduates are fully satisfied with the material and technical support of applied scientific research. "Partially satisfied" – **17.6%**, "not satisfied" - **2.4%**, "found it difficult to answer" - **4.9%**. The data obtained indicate the satisfaction of undergraduates with the conditions of their studies at the university. According to the majority of students, the university is equipped with the necessary equipment for the successful implementation of the educational process. This fact is important in the issue of the interest of undergraduate students in educational material, which directly affects their satisfaction with the quality of education received.

4.3. Availability of KTU library collections

Table 4.3

	2018-2019	2019-2020	2020-2021	2021-2022
Completely satisfied	65,8	-	65,6	81,7
Partially satisfied	8,2	25	22,2	15,4
Not satisfied	25	75	12	2,4
I find it difficult to answer	1	-	0,2	0,5



Free and fast access to information is an important factor for the development and competitiveness of the university. Therefore, the assessment of the activity of libraries and the availability of its fund is one of the main aspects of the assessment of the educational process.

When evaluating the activities of library staff, undergraduates showed one of the highest percentage of satisfaction equal to **53.3%**. Such indicators indicate that students are fully provided with the opportunity to work with educational and scientific information, which undoubtedly contributes to their academic performance and competence. Due to the fact that the library fund of the library is formed in accordance with the curriculum and educational programs at the university, students can increase not only their academic performance, but also form new professional skills, the ability to use information and communication technologies.

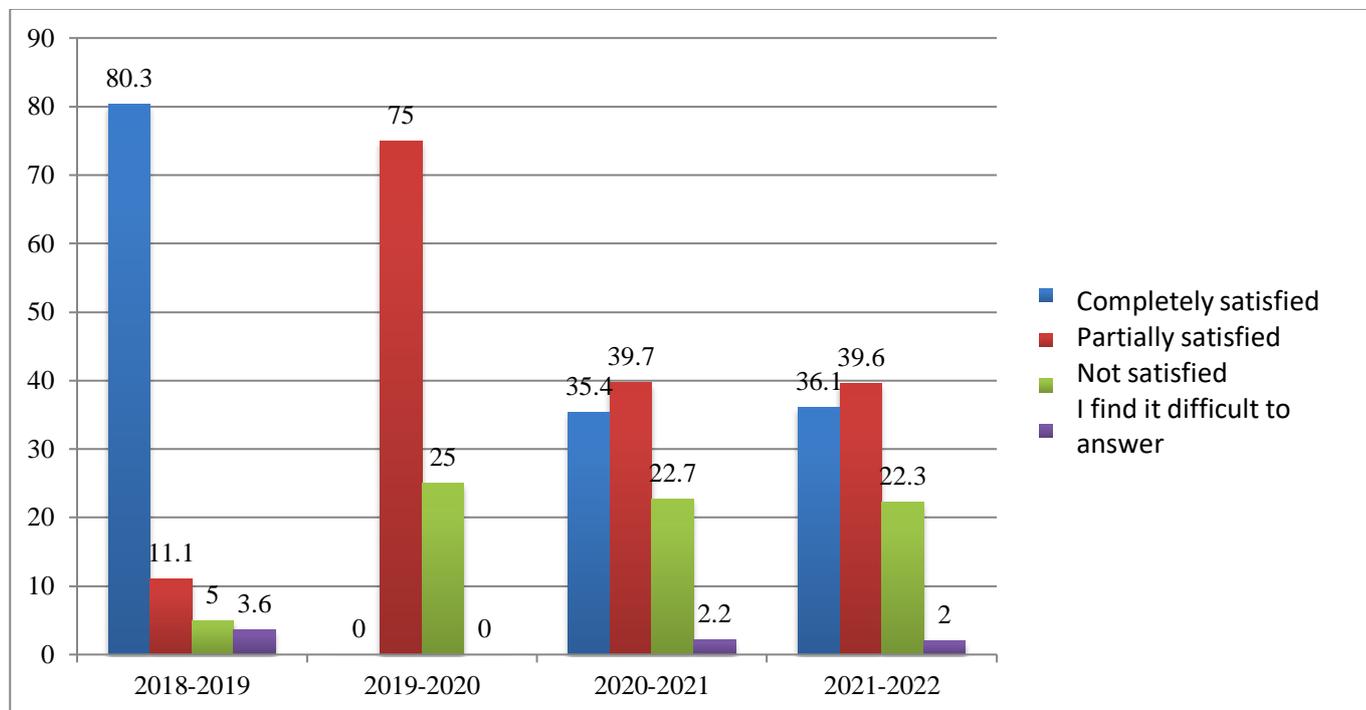
Having considered the dissatisfaction of undergraduates, it suggests that efforts should be made to eliminate the inconveniences of students associated with library hours (at night) of libraries, the possibility of organizing rest rooms in libraries, with the search for the required literature for independent work.

4.4 The general level of organization and conduct of an internship abroad

Table

	2018-2019	2019-2020	2020-2021	2021-2022
Completely satisfied	80,3	-	35,4	36,1

Partially satisfied	11,1	75	39,7	39,6
Not satisfied	5	25	22,7	22,3
I find it difficult to answer	3,6	-	2,2	2



The level of organization and conduct of foreign internships, undergraduates are "fully satisfied" - **37.9%**; "partially satisfied" – **41.3%**; "not satisfied" - **18.7%**; "found it difficult to answer" - **1.9%**. The COVID-19 pandemic has limited the opportunities for undergraduates to undergo foreign scientific internships. On March 16, 2020, President of Kazakhstan Kassym-Jomart Tokayev introduced a state of emergency in the republic due to the threat of the spread of coronavirus, in this regard, all universities of the Republic of Kazakhstan switched to a distance learning system, stopped sending all undergraduates and doctoral students for scientific internship abroad. It is recommended to transfer the internship to another academic period, or to organize it in a remote format.

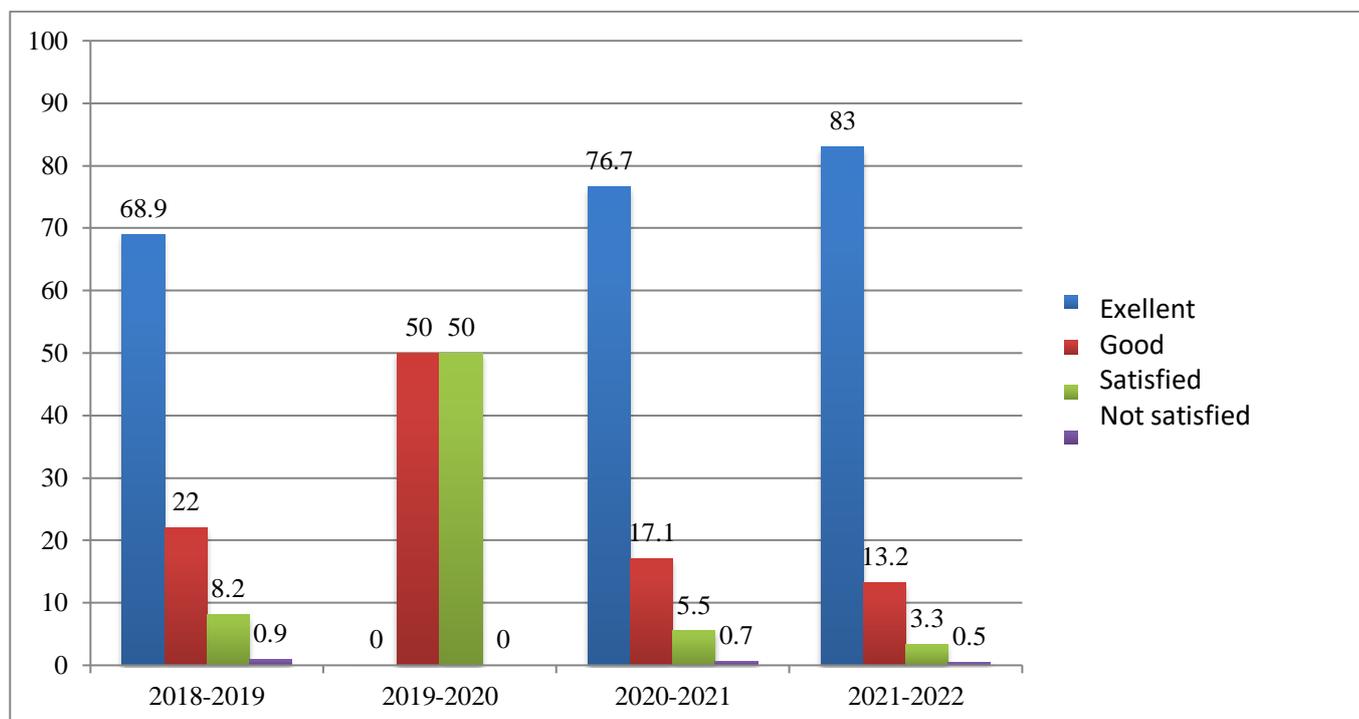
5. How would you assess the teaching staff of your Master's program in general?

	2018-2019	2019-2020	2020-2021	2021-2022
Excellent	68,9	-	76,7	83
Good	22	50	17,1	13,2

Satisfied	8,2	50	5,5	3,3
Not satisfied	0,9	-	0,7	0,5

5.1 Knowledge, qualifications

Table 5.1



The quality of education is largely determined by the quality of teaching of the teaching staff. When assessing the **"knowledge, qualifications of the teaching staff of the master's program"**: 57.1% of respondents answered that "excellent"; "good" - 25.6%, "satisfactory" - 16.7%, "not satisfactory" - 0.5%.

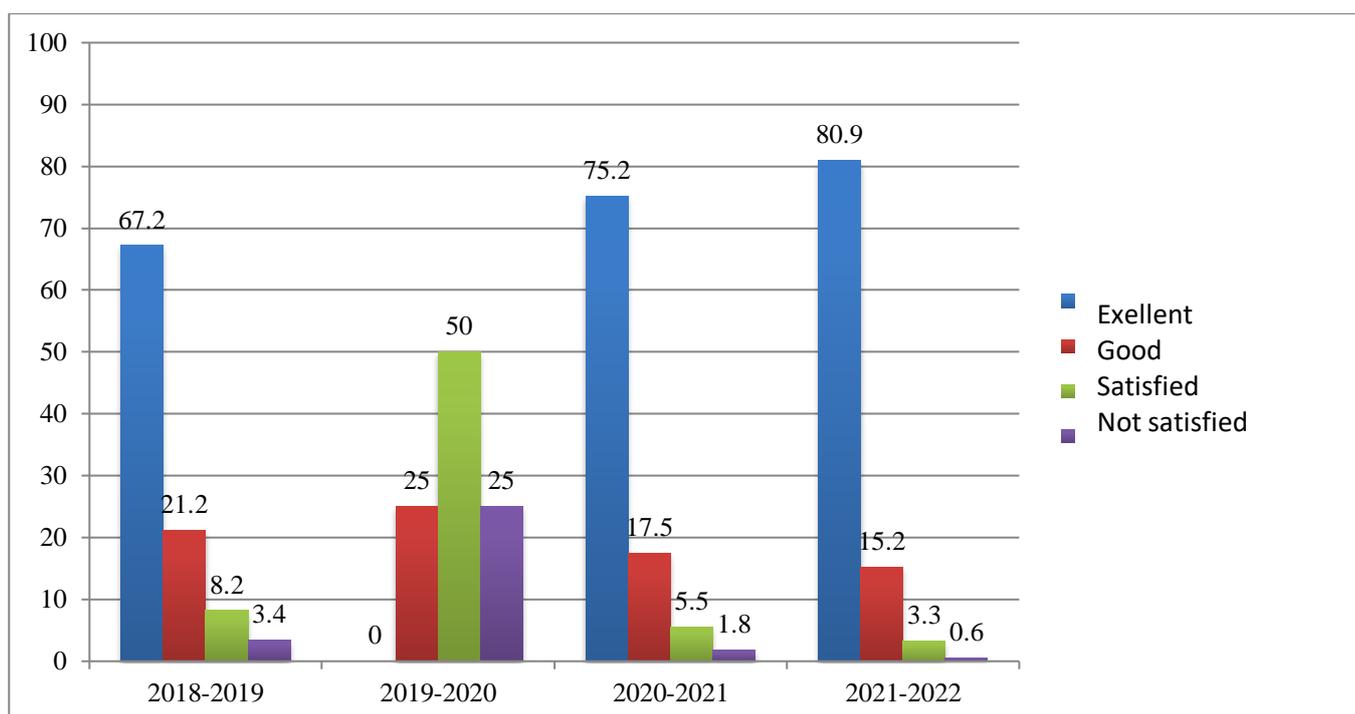
Based on the data obtained during the study, it is possible to note the professionalism of university teachers and their ability to interest the audience with the information presented within the framework of academic disciplines. Most of the respondents (89.6%) are satisfied with the forms of educational work that teachers offer them. With the help of a variety of classroom work, the teacher increases the interest of undergraduates in their discipline, contributes to the formation of their new professional competencies, which together affects students' satisfaction with the quality of their education.

	2018-	2019-	2020-	2021-
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	2019	2020	2021	2022
Excellent	67,2	-	75,2	80,9
Good	21,2	25	17,5	15,2
Satisfied	8,2	50	5,5	3,3
Not satisfied	3,4	25	1,8	0,6

5.2. Teaching methods used

Table 5.2



Undergraduates highly appreciate the teaching methods used: **55.8%** are completely satisfied, rated "excellent"; **19.7%** rated "good"; **16.7%** rated "satisfied"; **7.7%** rated "not satisfied".

The overwhelming majority of undergraduates surveyed (55.8%) note on the positive side the activities of teachers who present the material of training sessions to strictly planned topics. Due to this fact, undergraduates are more involved in the educational process during classes, as teachers take into account their interests and awareness of the course topics, which directly affects the performance of undergraduates themselves.

Students associated their dissatisfaction with these issues, on the one hand, with a large amount of educational material, on the other hand, the way this material is provided, the lack of feedback from teachers and students, i.e. not all teachers and not always take into account the level of readiness of students to master their discipline.

If you are having difficulties studying for a master's degree, then what are they caused by? (write): ** The answers of undergraduates are presented in the original. The spelling and punctuation of the author are preserved*

Having experience at work for which I am studying for a master's degree, I can say that the teaching staff has very little knowledge in special subjects (especially from practice). It has happened more than once when I refute and start arguing with the teacher about the theory (and if the teacher also lectures on paper without having a clear idea of his subject, then there is nothing to argue about). During the master's degree, I did not get anything new for myself, for work.

Your training profile:

– Heat power engineering

** The answers of undergraduates are presented in the original. The spelling and punctuation of the author are preserved*

Please write what questions, in your opinion, should be added to this questionnaire to determine the assessment of the organization of the educational process, the quality of education and other areas of the university's activities?

Are there any people among your teachers who have more than 10 years of experience in this subject? (It is for such a period that you can get relatively high-quality work experience)

** The answers of undergraduates are presented in the original. The spelling and punctuation of the author are preserved*

Conclusion

In general, the results of the survey indicate a high degree of satisfaction of undergraduates with studying at the university.

A fairly high level of satisfaction is associated with the content and organization of the educational and pedagogical process and research activities of undergraduates.

1. The results of undergraduates indicate the maximum level of participation of undergraduates in the formation of an individual plan, under the supervision of a supervisor (the average final score is **82.9%**), as well as the data obtained during the study show that undergraduates at the university receive assistance and advice from scientific supervisors.

2. It should be noted that most of the respondents are satisfied with the joint work with their scientific supervisors. According to **55.2%** of undergraduates, the supervisor

regularly makes appointments during which he checks and corrects the progress of the study.

The supervisor should assist the student in developing an individual work plan for the master's thesis, as well as monitor the progress of its implementation.

Considering that the work on the master's thesis is two years, a student in the process of studying for a master's degree needs to complete a large number of intermediate tasks. The supervisor should monitor whether the student meets the deadlines for completing individual assignments. Recall that if a student deviates from the schedule of preparing a dissertation, the supervisor is obliged to inform the head of the department or university about this.

In practice, there are often situations when, with the connivance of the supervisor, a student is in no hurry to work on a master's project, as a result, a month before the final edition of the dissertation is submitted, it turns out that not a line is written in the work.

As a rule, the supervisor of the undergraduate student participates in organizational meetings and research seminars with the participation of undergraduates, as well as participates in the approval of the research plan and in the defense of the report on the research of the undergraduate.

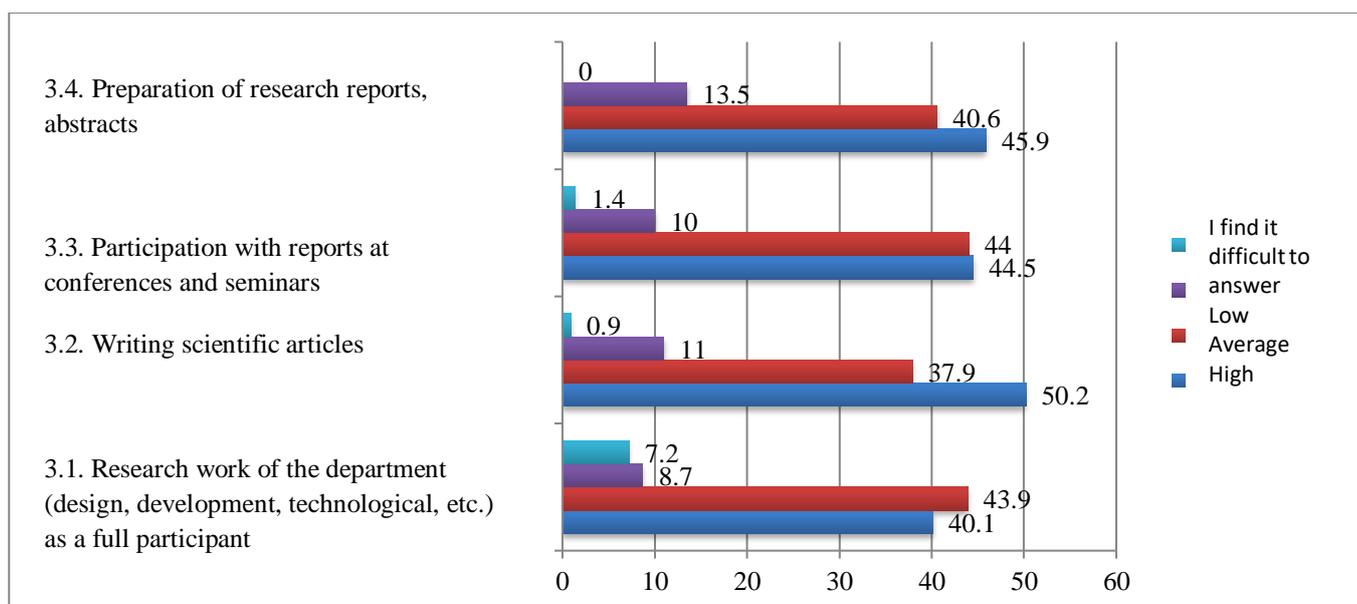
It is mandatory that the scientific supervisor of the undergraduate conducts regular individual consultations with him, the form of which may be different:

- personal interaction at the department during the established office hours of the supervisor;
- interaction by correspondence by e-mail;
- consultations by phone, etc.

3. **According to the 3rd block** of questions, the assessment of the level of participation of undergraduates in the work of the department is quite at the average level – **45.2%**. At the same time, the largest percentage of respondents who rated their level of participation as "**high**" by writing scientific articles (50.2%). The least of all undergraduates, judging by the results of the survey, participate with reports at conferences and in the research work of the department. These results indicate an average level of interest of undergraduates in research activities. Thus, in order to achieve a "high" level of interest, it will be necessary to synthesize the educational research work of undergraduates, the motivation of the undergraduate himself, as well as their scientific and organizational work related to enriching experience and stimulating the development of scientific activity.

3. Evaluate the level of your participation in the following types of work of the department	High	Average	Low	I find it difficult to answer
3.1. Research work of the department (design, development, technological, etc.) as a full participant	40,1	43,9	8,7	7,2

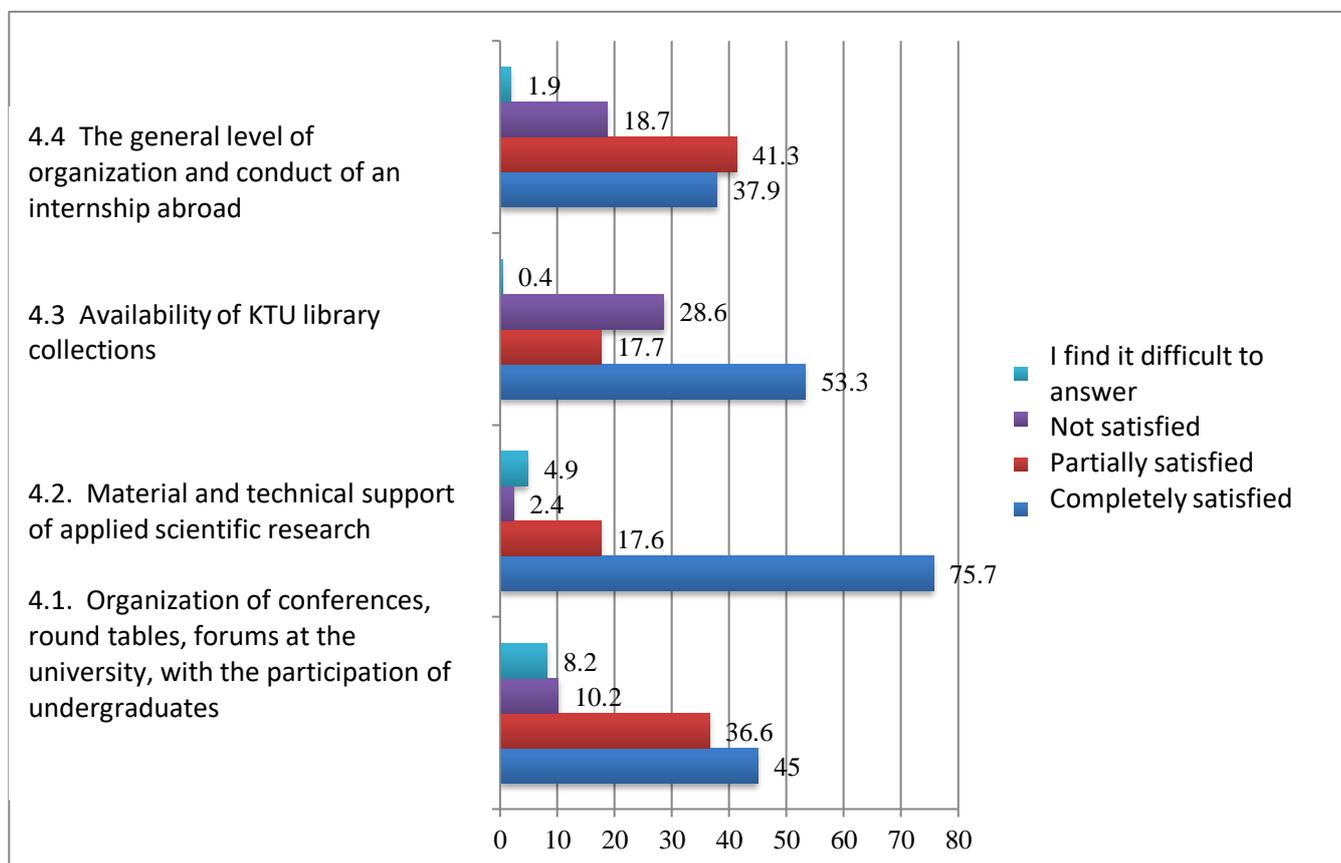
3.2. Writing scientific articles	50,2	37,9	11	0,9
3.3. Participation with reports at conferences and seminars	44,5	44	10	1,4
3.4. Preparation of research reports, abstracts	45,9	40,6	13,5	-
Total	45,2	41,6	10,8	2,4



4. On the 4th block of questions, undergraduates expressed full and partial satisfaction. Mostly satisfied with the availability of material and technical support for applied scientific research - **75.7%**. **37.9%** of respondents are "partially satisfied" with the overall level of organization and conduct of a foreign internship. Full satisfaction with the scientific and educational environment of the university when studying for a master's degree (on 4 block of questions) according to the university, it is **53%**. Based on this, the management of departments should consider measures to improve the organization of the scientific and educational environment of the university.

4. Are you satisfied with the scientific and educational environment of the university when studying for a master's degree?	Completely satisfied	Partially satisfied	Not satisfied	I find it difficult to answer
4.1. Organization of conferences, round tables, forums at the university, with the participation of undergraduates	45	36,6	10,2	8,2
4.2. Material and technical support of applied scientific research	75,7	17,6	2,4	4,9

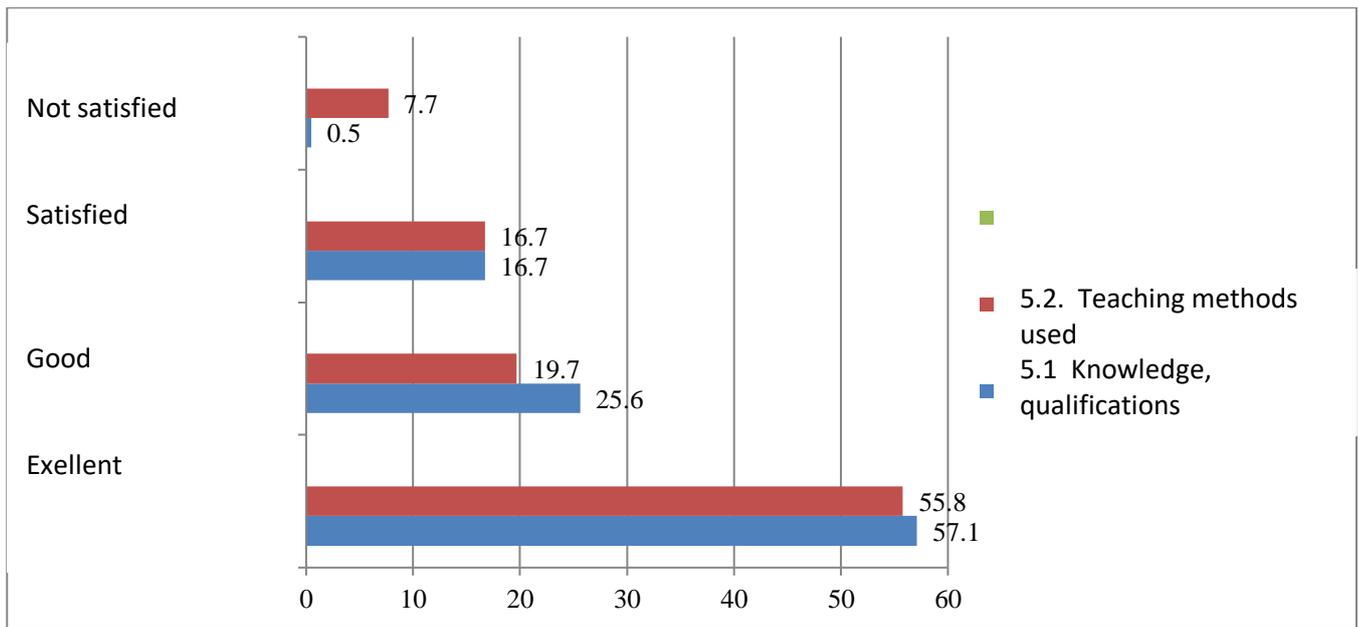
4.3 Availability of KTU library collections	53,3	17,7	28,6	0,4
4.4 The general level of organization and conduct of an internship abroad	37,9	41,3	18,7	1,9
Total	53	28,3	14,9	3,8



5. According to the results of the answers to the questions of **block 5**, it was found that **56.4%** of undergraduates at the university "in general, the teaching staff of the master's program" rated "**excellent**".

5. How would you assess the teaching staff of your Master's program in general?	Excellent	Good	Satisfied	Not satisfied
5.1 Knowledge, qualifications	57,1	25,6	16,7	0,5
5.2. Teaching methods used	55,8	19,7	16,7	7,7

Total	56,4	22,7	16,7	4,1
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When studying at the master's degree, they generally do not experience difficulties, but a small part of undergraduates complain about: "workload of materials", "combining study with work", "financial problems", "lack of an adequate training plan", "lack of orientation of undergraduates in their projects", "low competence of teaching staff".

But on this issue, it should be noted that, of course, the initiator of mutual communication between the undergraduate and the supervisor should be the undergraduate himself. You should not expect that the supervisor will, on his own initiative, control the timing of writing a research plan or drawing up a report. It would also be absurd to expect a supervisor to remind a master's student that he should work on his master's thesis, submit a report on practice in a timely manner, etc. All these are the duties of the master's student exclusively.

A master's student should be able to organize and conduct his activities for the development of an educational program independently and proactively, this is inherent in the characteristics of his professional activity and solved professional tasks.

The supervisor is called upon to assist the undergraduate in new activities or in solving difficult issues and the supervisor should do this at the request of the undergraduate, and not on his own initiative.

One of the important points in the lesson for undergraduates is to understand the need for personal interest in acquiring knowledge, to motivate it so that undergraduates can feel their competence not only as a result, but also throughout the entire learning process, this is the condition for the developing impact of learning on the individual. Therefore, the modern course of discipline should be built in such a way that specially

organized activities and ordinary interpersonal communication are combined. Through a personal communication plan in the classroom, the age and psychological characteristics of undergraduates are taken into account: their willingness to expand the circle of communication, to empathize with problems in society, the desire for self-affirmation.

Due to the fact that the process of developing the personality of a graduate student includes not only classroom classes, but also working with information resources outside of classes (remotely), the modern educational process also imposes new requirements on the teacher (teaching staff), who not only transmits the accumulated experience, knowledge, but also organizes the learning process for the development of internal potential of students. Teaching staff are required to constantly improve the efficiency, productivity of teaching knowledge, improve activities, knowledge of new modern technologies, deepen theoretical and practical knowledge based on modern achievements of science, progressive technology and technology, develop concrete proposals for improving the educational process, introducing advanced achievements of science, technology and production into teaching practice, be on par with undergraduates who have a higher level of development of logical and creative thinking, communication skills.