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# INNOVATORS: ADVANTAGES AND DISADVANTAGES OF THE FUTURE PROFESSION FROM THE PERSPECTIVE OF STUDENTS

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*Abstract:* Development and implementation of innovations in different fields of human life have become a driving force for the economic development of any country in the modern world. Russian higher educational institutions are enrolling students in the “Innovatics” course to train future innovators. This raises a logical question - who is an innovator, and what is he/she dealing with?

The purpose of the survey discussed in the article was to identify students’ opinions - the future innovators – on the advantages and disadvantages of their future professional activity.

Key methods of the research were general scientific cognition methods, such as theoretical analysis of different positions on such areas of knowledge as Innovatics and the profession of innovator, as well as empirical methods, such as observation, interviews and questionnaires.

The surveys of students obtained data on not only the advantages and disadvantages, which, according to future innovators, are associated with their professional activities but also on what would be interesting for them to learn in the course of their professional activity.

Key competencies to be formed in the process of Innovatics training were listed to make the innovators-graduates demanded in the labor market.

*Keywords:* innovatics, innovator, innovation, advantages and disadvantages of the profession, training, educational organization.

## Introduction

The modern economy is an innovation economy, and innovations are the main impulse that sets the market mechanism in motion and keeps it going. Implementation of innovations within the

company itself (innovations in management, innovations in applicable technologies, etc.), as well as development of innovative products/services, are among the competitive advantages of present-day companies.

In general, we can define the innovativeness

of a company by the following attributes (Hamel, 2017):

- the company's employees are trained in innovative thinking;
- the company's employees challenge the established rules and traditional approaches;
- they use any tendencies, trends, etc., underestimated by competitors;
- innovators apply their proven skills and available assets in their work;
- the company's employees try to meet the "unexpressed" (unspoken) needs of the customers.

With the need for innovators in modern companies, the question arises: Where and how are innovators trained? Russian educational institutions have launched a training course called "Innovatics", whose graduates are specialists in innovations.

There is currently a great deal of debate about this training course. What is Innovatics? What is this training course? What kinds of specialists are being trained in this program? Who are the innovators? What positions can graduates of this training course hold? More and more questions arise when you say "Innovatics".

Now, we refer to various dictionaries. The Dictionary of innovation management and related fields defines Innovatics as "a field of knowledge that covers the issues of methodology and arrangement of innovation activity. Innovatics as science has some independent areas: generation of novelties, social and psychological problems of introduction of innovations, diffusion (distribution of innovations), adaptation to novelties of a company and personnel subsystems, innovative organizations, development of innovative decisions, the market of innovations, and innovative strategies. In its applied aspect, Innovatics is a special field in innovation management, which means the movement from innovation to entrepreneurship" (Suslov, 2008). The Dictionary of Innovation Terms gives similar definitions. Innovatics is: 1) "the science that studies various theories of innovation: formation of novelties, their diffusion, etc."; 2) "a special field in Russian innovation management, meaning the movement from innovation to entrepreneurship. New independent trends appeared within the Innovatics itself: formation of novelties, resistance to innovations, diffusion (distribution of novelties), human adaptation thereto and adaptation to

human needs, innovative organizations, development of innovative solutions, etc." (Kharin, Kolensky, & Kharin (Jr.), 2016, p. 50).

Today, Innovatics is recognized as a new, promising area of education. It is considered a technical area of training at the intersection of several fields: engineering, economics, and management. Graduates combine the knowledge of an engineer, economist, and manager and are innovators, in fact.

Next, we will discuss who an innovator is and what kind of profession it is.

Various dictionaries and academic writings treat the term "innovator" differently. An innovator is 1) "the author of an innovation (discovery, invention, utility model, design solution, know-how, industrial sample, rationalizations, etc.), who commences the innovation process and who also initiates the commercial use of innovation; an entrepreneur, enthusiastic about the new idea and ready to risk for the sake of turning it into an innovation" (Suslov, 2008); 2) "an enthusiastic entrepreneur, fascinated by a new idea and ready to do his best to make it a reality, and a leader-entrepreneur, who accepted the risk of taking a project, found investment, organized production, promoted a new product on the market and thereby realized his commercial interest" (Kharin, Kolensky, & Kharin (Jr.), 2016, pp. 50-51).

The Russian language distinguishes between the terms "novator" and "innovator". Novator is a person who discovers an innovation or who introduces new ideas in any field; he is an inventor, discoverer, and creator. He gains an insight into the essence of a process or phenomenon, understands its nature and purposefully changes some parameters, resulting in new properties and qualities; while Innovator is a person who has implemented the successful commercialization of an innovation, i.e., he uses the innovation for commercial benefit; he is a facilitator of the process to extract the commercial potential embedded in the innovation and turn it into profit (Bondarenko, 2021).

Every sphere of the economy and every area of life of a modern person needs an innovator (from an innovation manager to an invention engineer). Now, the Innovatics training course offers many professions of the future, for example, a consultant on inventive solutions, intellectual property appraiser, startup mentor, etc. (Varlamova & Sudakov, 2020).

A few years ago, they thought that an innovator was a profession of the future, but in recent years, it has gradually become an in-demand profession of today.

As stated above, there was no well-informed opinion as to who innovators were. Here are the results of a study described in the book “The Innovator’s DNA: Mastering the Five Skills of Disruptive Innovators” (Dyer, Gregersen, & Christensen, 2018). The authors of this book believe that innovators are distinguished by five capabilities (discoverer’s skills):

- Associating (associative thinking, which helps to seek and develop new ideas);
- Questioning (original questions aimed at a new perspective, new opportunities, etc.);
- Observing and noticing (ongoing observation and discovery of new ideas based on it);
- Networking (searching for and testing ideas with non-traditional methods, searching for different viewpoints and other approaches);
- Experimenting (ongoing testing of different, challenging hypotheses, research, and approbation of new things).

In this regard, it is interesting to analyze the opinion of students trained in Innovatics: how do they see their future professional activity?

Using a longitudinal method, two groups of students who took the Innovatics course (bache-

lor’s degree) were monitored for four years, which allowed for identifying the students’ opinions on both how they imagined their future profession and how this opinion had changed throughout the period of study.

### Research Methods

The methodology of the research is based on a set of theoretical methods (analysis, summary and systematization of any available information on the interpretation of Innovatics and Innovator) and empirical methods (observation, surveys).

A longitudinal study (2018 - 2021) was conducted: two groups of students enrolled in 2017 were monitored during their 4-year training course in order to examine changes from year to year and their perceptions of future professional activity during their education (with the creation/acquisition of new knowledge in the process of studying new disciplines, practice, etc.). Students of “MIREA - Russian Technological University” (RTU MIREA) majoring in Innovatics took part in the survey.

Students were asked to complete a table, “Evaluating Future Profession”, at the end of each academic year (Table 1).

Table 1.

Evaluating Future Profession (compiled by the author).

“+” of the profession chosen	“-“ of profession chose	What is of interest?

Below are the results.

### Results

First-year course in 2018, 34 respondents were interviewed (67 students in two groups).

Figure diagrams 1 – 3 illustrate the results of how the first-year students completed the proposed table 1.

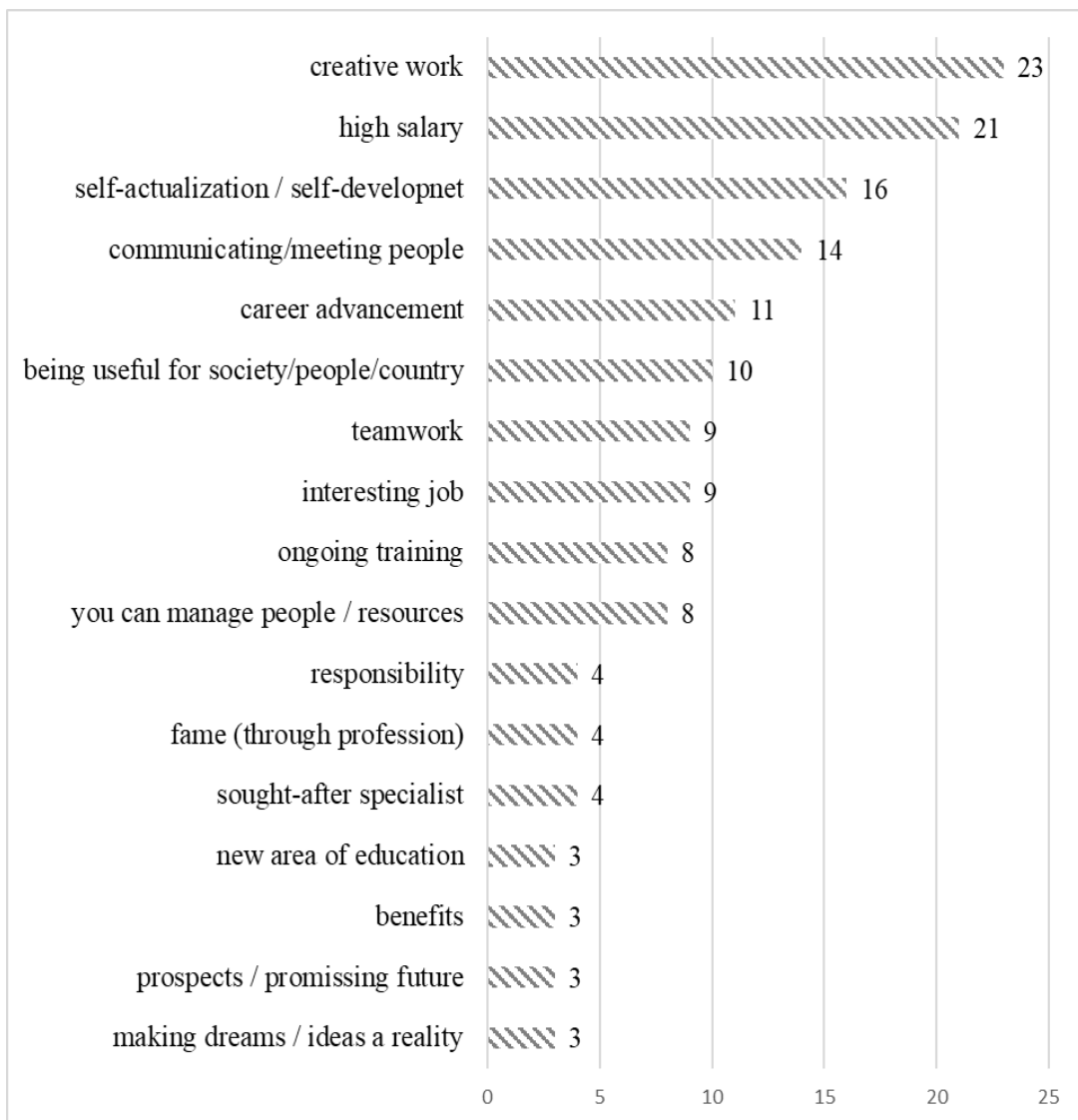


Figure 1. Advantages of the Chosen Profession (Respondents) (compiled by the author).

Among the advantages of their chosen profession, the first-year students usually note (Fig. 1): creative work (23 respondents), high salaries (21 respondents.), the potential for self-development (16 resp.) and regular communications with people (14 resp.). Single answers: getting new knowledge in different spheres and high risks related to future professional activity.

Among the disadvantages of their future professional activity, those indicated were (Fig. 2): much time to be spent on work (19 resp.), challenging work (15 resp.), work associated with risks (15 resp.) and high responsibility (14 resp.).

One vote each went to such answers as: “uncertain future” and “fear of being unable to self-actualize”.

Given the above disadvantages, students have a logical question “will there be any free time?” (16 respondents). Also, students wonder how difficult it will be for them to come up with something new (9 options) and whether they will be satisfied with the work schedule (6 options). Single answers: “looking for non-standard solutions” and “when I get bored with this job” (Fig. 3).

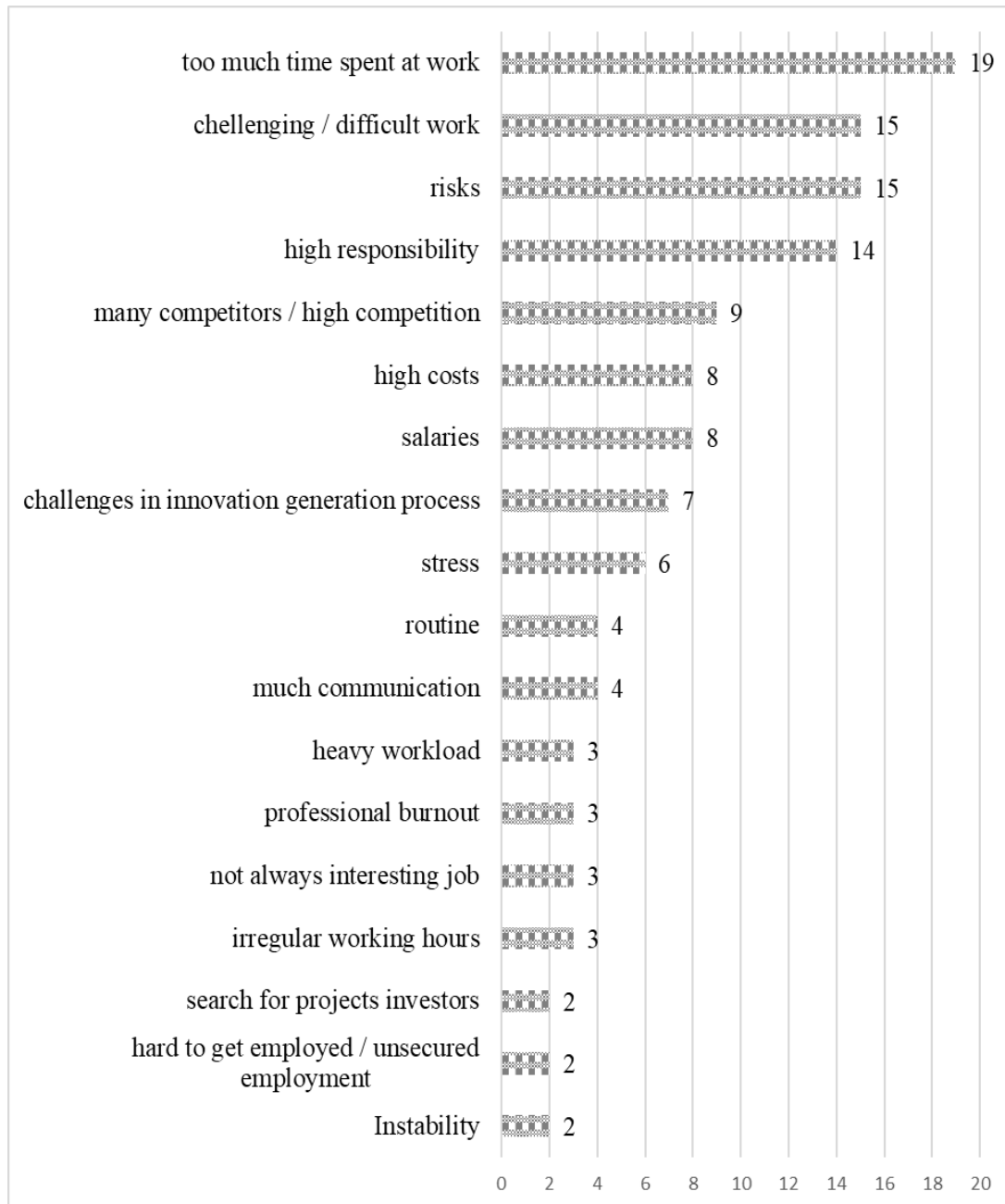


Figure 2. Disadvantages of the Chosen Profession (Respondents) (compiled by the author).

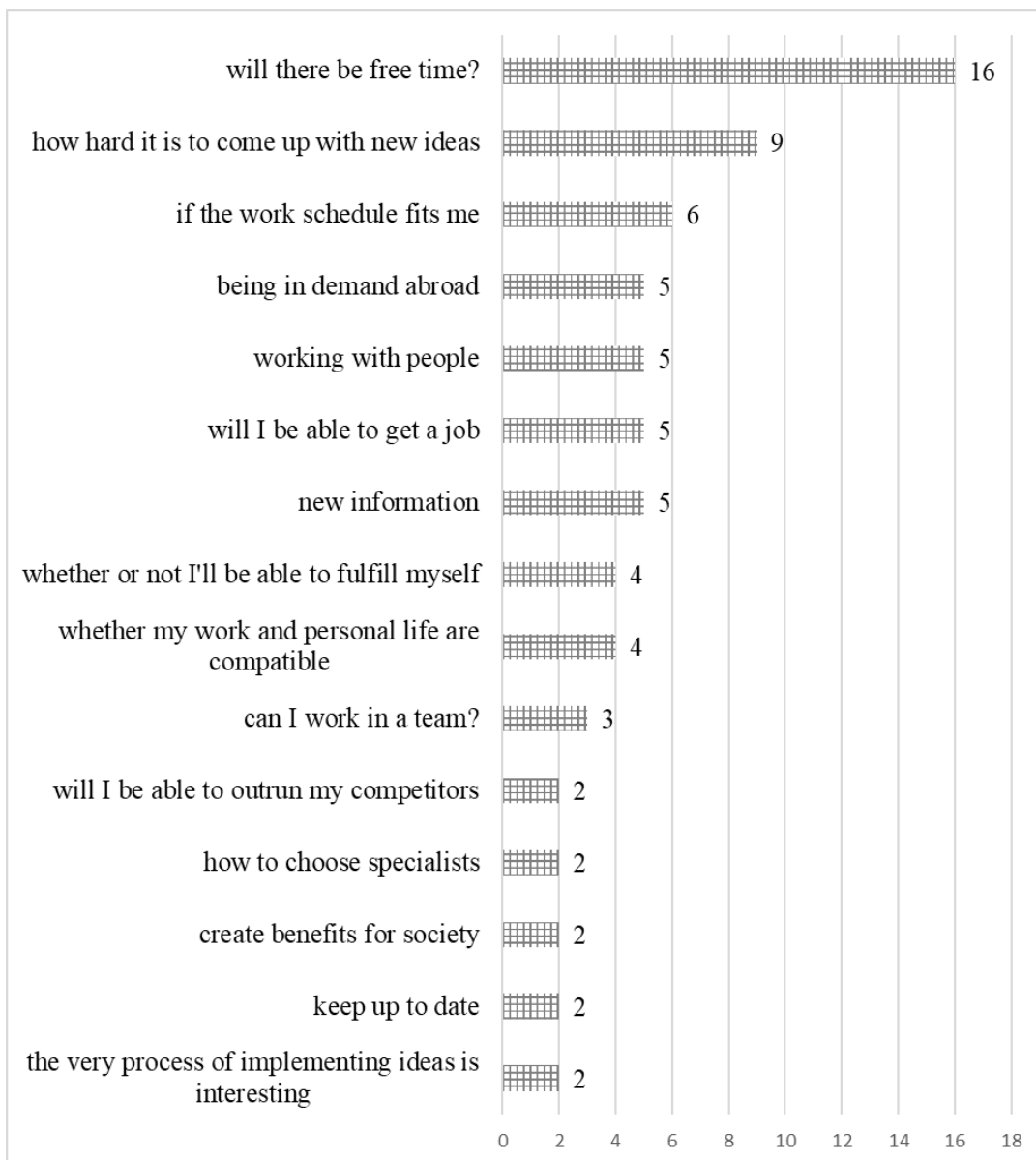


Figure 3. Answers to a Question “What is Interesting in the Future Professional Activity?” (Respondents) (compiled by the author).

Second-year course in 2019, 26 students participated in the survey (61 students attended in two groups).

The number of students in groups was reduced due to expulsions for failure at exams or due to a change of training course. Students often change their major after their first year, when an introduction to their future profession is already underway.

The second-year students gave an equal number of votes (9 each) to “diverse activities” and “creative work”. Further, meeting famous, inter-

esting, creative people, as well as regular communication in the professional sphere, were among the advantages. It is encouraging that a quarter of the participants in this survey (6 respondents) pointed to the demand for such a profession as an innovator (Fig. 4).

Various risks existing in future professional activity are one of the main disadvantages for almost half of the respondents (12 resp.). Again pointed out were difficulties in getting a good job (5 resp.). For the first time, their answers (3 respondents) contained a requirement for theoretic-

cal knowledge that would be more necessary in professional activity (Fig. 5).

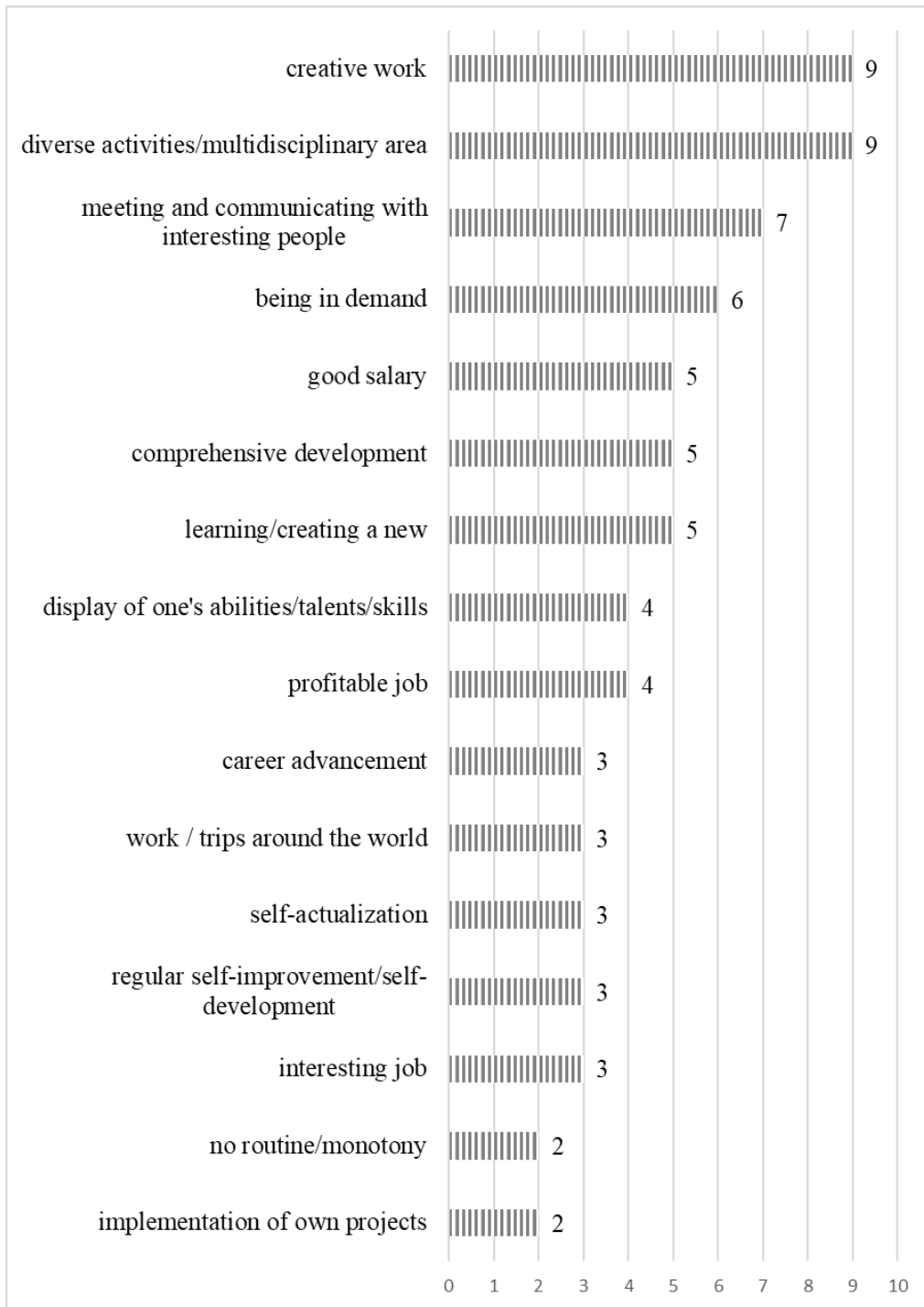


Figure 4. Advantages of the Chosen Profession (Respondents) (compiled by the author).



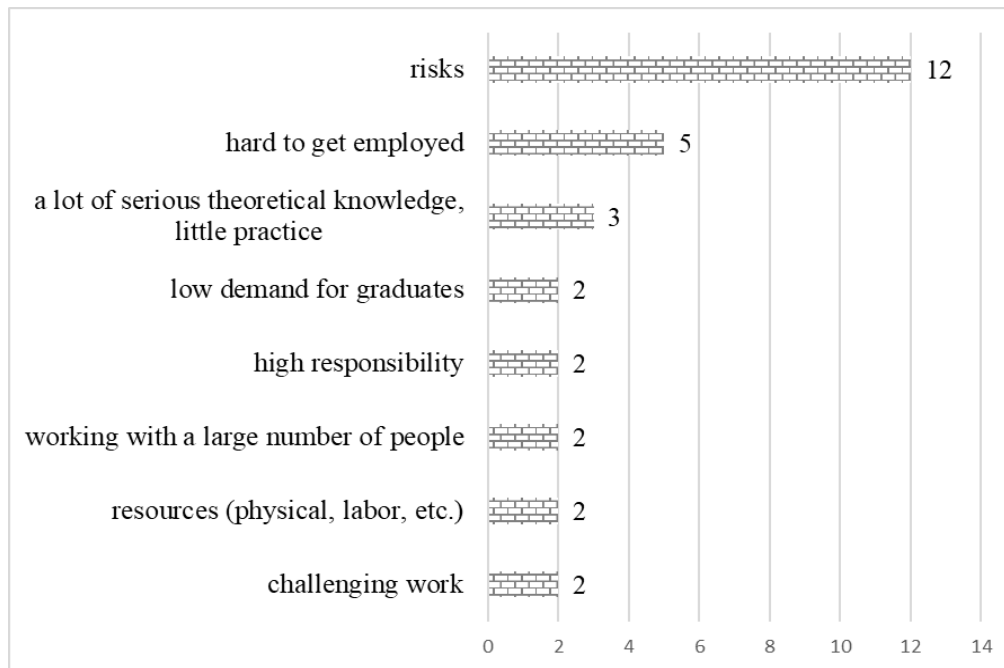


Figure 5. Disadvantages of the Chosen Profession (Respondents) (compiled by the author).

Interesting single answers:

1) advantages:

- to be first to learn about new innovations in technology; the opportunity to promote a really high-quality product;
- informational race: the need to learn about innovations before others in order to be able to gain profit;
- to be always up-to-date with innovations in computing;
- opportunity to influence people's needs;
- a rewarding job;
- remote work opportunity;

2) disadvantages:

- a high level of stress because of the need to get ahead of others;
- I do not really see my future job (how to work and what job to hold);
- risk of losing money and time before you can promote your innovation.

It is also worth noting that some answers of the same respondents fell into both advantages and disadvantages, for example, the answer: “a lot of communication”. It depends on the personality: some people like to communicate a lot and need to interact while working, and some people

think that such communication distracts them from work.

There were only two single answers to the question, “what is interesting?” i.e. “useful experience for starting your own business” and “comprehensive development in different spheres of life”.

3) Meanwhile, in the first course, these groups had much more questions in the “interesting” column (Fig. 3). We can assume that the second-year students have already received answers to many of their questions.

In their conversations, many students said that their parents and friends often wondered what field they could pursue after graduating with a degree in Innovatics, and what qualifications a graduate obtained.

*Third-year course in 2020*, 23 students participated in the survey (54 students attended two groups).

The third-year students have a very wide range of opinions regarding the advantages and disadvantages of their future professional activity due to different fields of application of innovative solutions (Fig. 6 and 7).

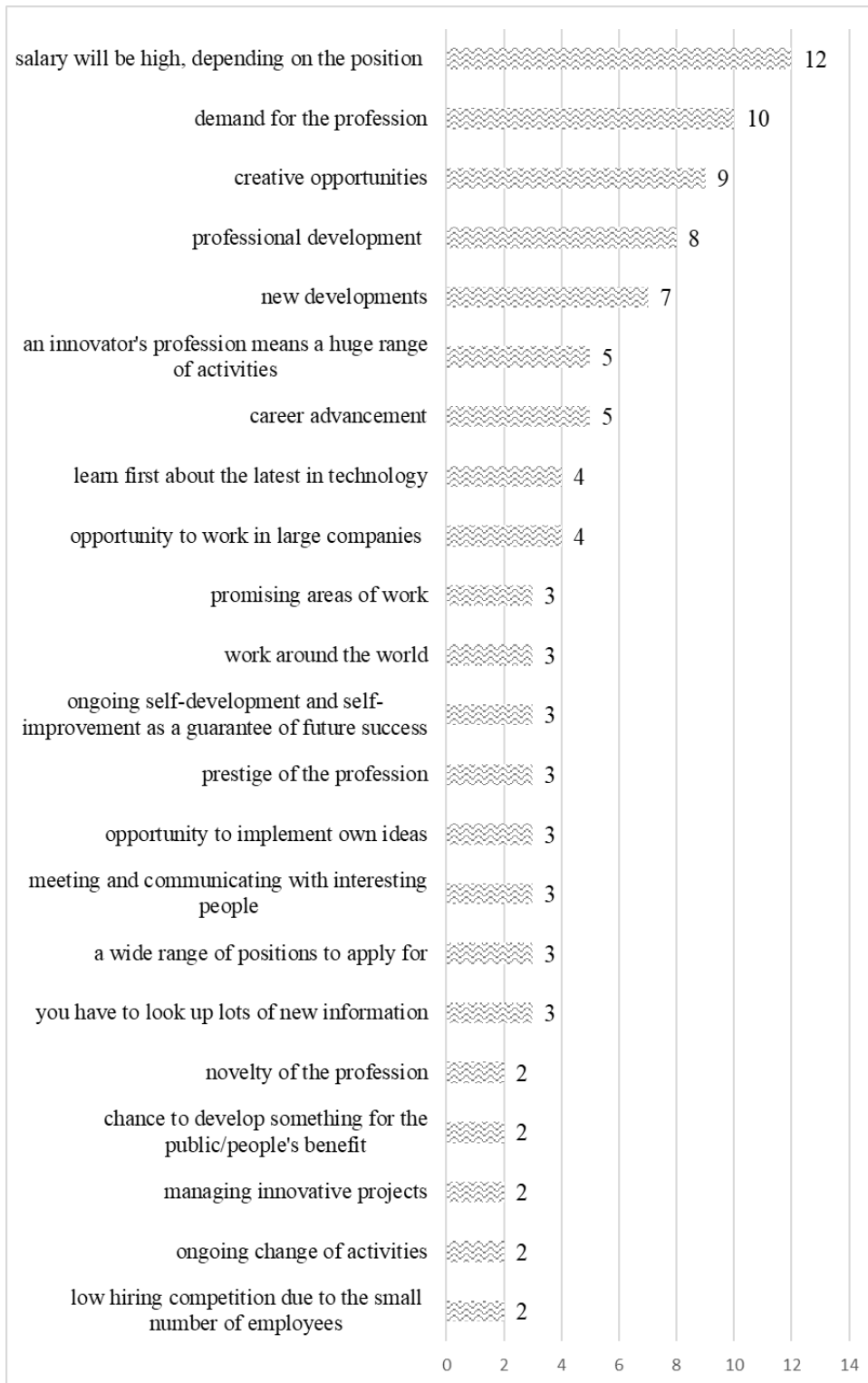


Figure 6. Advantages of the Chosen Profession (Respondents) (compiled by the author).

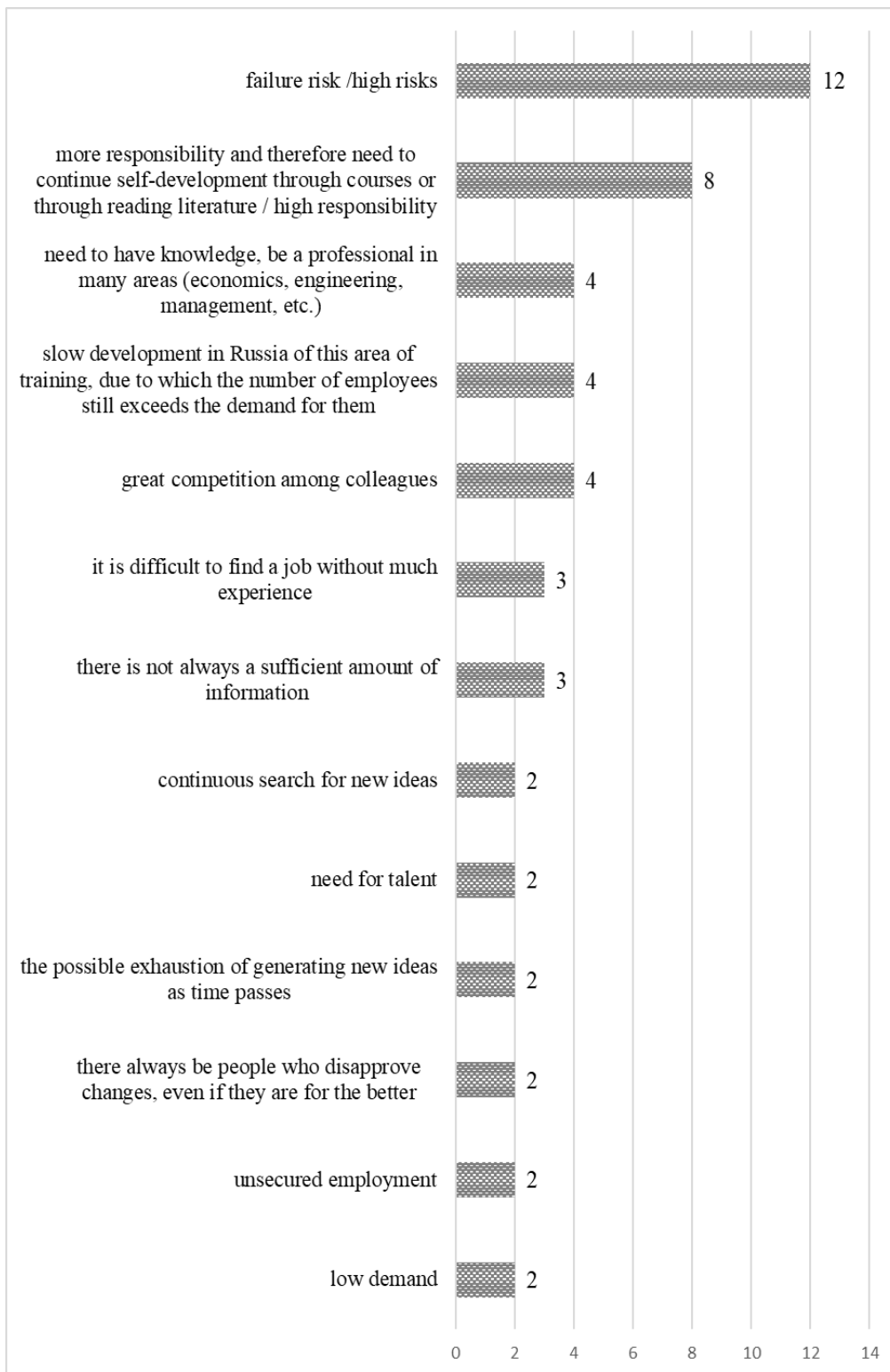


Figure 7. Disadvantages of the Chosen Profession (Respondents) (compiled by the author).

Among the advantages, the leading answer is “high salary” (12 respondents), followed by “de-

mand for the profession” (10 respondents) and “opportunities for creativity” (9 respondents).

Work in innovation is seen as prestigious, promising, and interesting (Fig. 6). The most popular answer among the second-year students was “creative work”, although this answer has the same number of votes as in the third course (Fig. 4 and 6).

Again, the opinions were divided, and there were a lot of opposite answers (high competition - low competition in innovation, high demand - low demand for specialists, etc.). While one considers it an advantage, the other sees it as a disadvantage. The perspective of remote work has become of interest after the coronavirus pandemic. This diversity of opinions suggests that there is already a practice of working in completely different areas and in different companies, etc.

In addition, such single answers were among the pluses (advantages):

- remote work is possible;
- routine tasks and creative tasks alternation;
- an active way of life;
- parents’ approval of the chosen profession;
- technical as well as managerial work on the project;
- work with the research staff;
- commercialization of developments, profit-making.

The third-year students still have “risks” as the most popular answer for disadvantages (12 respondents), followed by the answer “high responsibility” (8 respondents)” (Fig. 7).

Single answers related to disadvantages of the chosen profession:

- heavy workload;
- stress during work;
- clear deadlines that should not be missed;
- a lot of analytics;
- sometimes interacting with companies’ employees who do not understand the innovation process;
- failure to “have a break” from work; you need to always be aware of everything that is going on, be on the crest of the wave;
- the need to work with people who sometimes differ from your usual social environment;
- creative crisis;
- emotional burnout;
- dress code in some companies;
- lack of clear specialization in a particular industry;
- high risk of losing earned reputation and

funds in case of an unprofitable (unsuccessful) project.

As for the question “What is interesting for you in your future activity?” many answers are in line with the advantages of the profession noted by students. Two answers are the most popular: you can choose practically any field of activity, depending on your own interests (6 respondents), and you are interested in the process of implementation of ideas (3 respondents). The other answers are singular:

- it is interesting to put your ideas into practice;
- the process of learning the profession is interesting;
- attending training sessions on various topics because the profession is multifaceted;
- increasing self-esteem;
- constant self-improvement;
- looking for like-minded people;
- you can experience different professions, from marketer to engineer;
- the opportunity to work in absolutely any industry you want;
- opportunity to work in high-risk (venture) projects with the possibility of significant excess profits.

Questions about “What’s interesting in your future profession?” have become more diverse and specific.

*Fourth-year course, 2021* (49 students attend two groups). At the end of the fourth course, students said that their opinion after the third year had not changed, and they would complete the proposed table just as they had completed it in the third year. The conclusion can be made that students have almost a complete idea of their future professional activity by the end of the third year.

In 2019, in parallel with the longitudinal study, another survey of students from different groups of 1 - 4 courses studying Innovatics was conducted (111 persons were interviewed). The survey also showed the prospects (pluses) students saw in their future professional activity at the time of training, the way they perceived their future profession, any existing disadvantages and questions they were interested in relating to the profession. Among the positive aspects of the profession, the most frequent answer is “creative work” - 63.1% of respondents chose that answer, then comes “high salary” - 43.2%, next “com-

munication with people” - 39.6%, “opportunity for self-actualization/self-development” - 37.8%, and “interesting work” - 32.4%. Negative aspects of the future professional activity included risks - 29.7% and challenging work - 26.1%, the fact that the profession was unknown to both public and employers - 21.6%, while 20.7% of respondents believed that the profession was highly competitive. The student’s primary questions of interest are “Will I have free time?” (17.1%) and “Will I be able to generate ideas?” (12.6%). The overall results show that the students attending different courses in Innovatics see their future profession as creative and rather promising in today’s world but challenging and associated with various risks, as well as time-consuming.

The results of this survey are almost identical to the results of the longitudinal study.

### Questions to Be Discussed

The advantages and disadvantages listed by students in their future professional activities show the required competencies and skills to perform their professional duties successfully.

Today, practitioners identify the following skills a potential innovator should possess (Hamel, 2017):

- be free to use a variety of tools to innovate;
- be able to create multiple opportunities for unconventional, out-of-the-box thinking;
- be able to avoid premature judgments when evaluating new opportunities;
- be prone to unusual ideas;
- encourage innovators and welcome “reasonable failures”;
- personally manage the innovative teams;
- release time and money for innovation;
- hire and promote people, paying particular attention to their creativity;
- work continuously to remove bureaucratic barriers to innovation;
- understand and apply the principles of rapid prototyping and low-cost experimentation.

Interviewed L&D professionals (learning and development) believe it is important to develop the following skills in employees in 2021, regardless of their field of work (*Professional Development, Retraining, and Employee’s Inner Mobility are L&D’s Priorities in 2021*, 2021):

- digital skills;

- stress tolerance and adaptability;
- emotional intelligence;
- creativity;
- time management;
- inter-team communication, including remote;
- cross-functional interaction;
- leadership in the time of change;
- change management;
- stress management.

Based on data obtained in the course of study, the author attempted to draw up a list of basic competencies required for an Innovatics course graduate:

- having digital, functional, mathematical, and environmental literacy;
- ability to make decisions and act in non-standard situations;
- stress resistance, high endurance to workloads and quick reaction to changes;
- technological capability (ability to use new tools in their work) and technological adaptability;
- self-learning and self-development;
- ability to work and manage a team in a remote work mode;
- creativity;
- organizational skills, planning and distribution of work;
- self-learning, retraining, and mastering skills;
- strategic, analytical, algorithmic, systemic, and critical thinking;
- interaction / cooperation with people skills.

This list of key professional competencies does not purport to be a complete (ideal) list and can be refined based on the results of various further studies of the innovator profession.

### Conclusion

The longitudinal study conducted in groups of students enrolled in the Innovatics course focused on analyzing the changes in their opinions on the advantages and disadvantages of the chosen profession. We can conclude that the opinions of students have not changed dramatically throughout the period of study at the University. Generally, the priority setting has changed only in different courses. As for their professional activity, the future innovators are interested in salary and opportunities for the development and

manifestation of creativity, the way in which they will be able to cope with risks and how difficult and responsible their work will be.

In general, we can say that this area of education (this profession) is chosen purposefully, and students can assess their prospects, opportunities and difficulties associated with future professional activity already in the process of training.

Finally, we outline some basic steps to solve the problems identified during the study related to the formation of students' attitudes towards their future professional activity:

- Introduction to Specialty course (a well-designed and competently developed course of study for first-year students, "Introduction to Professional Activity") is mandatory in the curriculum;
- arranging internships for students at a number of companies (different sectors of the economy), and, if possible, arranging and offering residency;
- ongoing updating of curricula: adding the necessary disciplines (optional courses) to the curriculum based on the results of the students' survey (for example, "Risk Management of Innovation Activity" or "Risk Management in Innovation Activity", "Theory of Inventive Problem Solving", etc.);
- attracting practitioners involved in the development of different innovations to the studies;
- holding regular round tables involving employers, practitioners, professors and students to discuss topical issues and difficulties and to solve arising practical issues (based both on students' experience acquired during the internship and real-life work situations);
- cooperation with other educational organizations providing training in "Innovation studies" focused on the exchange of experience, holding joint conferences, etc.;
- arranging and conducting various control activities (including competitions for the development of innovative projects) in order to identify the knowledge, skills and abilities of students acquired in the process of training;
- consultations by teaching staff and practitioners when necessary or requested by students;
- considering the possibility of organizing so-called support for students after their graduation (working meetings, consultations, optional courses, etc.).

The listed steps are simple but effective if

they are thoroughly thought through and regularly implemented. It is important for educational institutions to focus their educational work with students on the formation of students' motivation for their future professional activities and a positive attitude towards success, as well as on the accomplishment of their abilities and opportunities within their chosen profession.

#### Comment on Public Access to Data, Ethics and Conflict of Interest

All the procedures of the research, with the participation of people, comply with the existing ethical standards.

There is no conflict of interest relating to this work.

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