

TRENDS IN THE TECHNOLOGY START-UPS INTEGRATION IN THE EDUCATIONAL PROCESS OF FUTURE ENTREPRENEURS

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ABSTRACT

Cooperation of enterprises and universities in the field of scientific activity leads to an increase in the level of education, as well as the status of the educational institution, and contributes to a better employment of students. However, involvement in this cooperation may not be sufficient. That is why the purpose of this study was to assess the level of this involvement and form possible recommendations for its improvement. To conduct the study, a survey of 650 students from four Russian universities that have connections with various enterprises was organized. The survey showed that, despite the high awareness of the importance of such cooperation, students are not sufficiently involved in the joint research activities of universities and enterprises. To solve this problem, seminars with employees of companies can be organized, a system of encouragement for students, expansion of cooperation with foreign enterprises, as well as organization of financial support for projects of gifted students can be developed. The results and results of this article can be used for further research in this area.

Keywords: Entrepreneurship, Entrepreneur Education, Universities and Enterprises Cooperation, Knowledge Exchange.

INTRODUCTION

Work and employment, and especially entrepreneurship, are among the basic and important principles in any individual and social life and play an important role in all ages and communities of people. Entrepreneurship makes a difference in the human life cycle. Entrepreneurship education in the education system is one of the most effective ways to promote entrepreneurship (Azizi & Mahmoudi, 2018).

Entrepreneurship learning goes beyond just learning how to do business. Students should not only learn how to create their own business, but also be encouraged to creative thinking, to develop self-esteem and empowerment. Entrepreneurship learning requires critical thinking skills and reflexive learning processes (Kakouris, 2015).

Non-traditional learning methods, such as extra-curricular activities, outdoor activities, practical feasibility studies, internships and small business consultations, can develop important skills and familiarize students with entrepreneurial behavior that is needed to develop the potential of start-ups in the future (Botha & Ras, 2016).

There are several main characteristics of entrepreneurs:

The Need for Achievements

A person who needs achievements will perform tasks better than before, if the implementation of these tasks has the value of achievement for them. Any person has this need, but its level varies (Kusmintarti et al., 2016).

Propensity to Risk

Entrepreneurs often face uncertain business conditions; therefore, entrepreneurial activity is associated with risk. Thus, risk appetite is very important for the person who will create a new business. Students who are willing to take risks and feel that they can control the events in their lives are more laborious about creating their own business (Arasti et al., 2012).

Creativity

Creativity is the ability to develop something new to look at problems and opportunities. The entrepreneur must be creative. Without creativity, he is not a real entrepreneur, but simply an ordinary merchant and the creativity necessary for a person who chooses an entrepreneurial profession (Wibowo, 2012).

Social Interaction

The pursuit of social interaction is beneficial in the entrepreneurial process. It provides information and connections.

Tolerance for Uncertainty

Entrepreneurs need the skill of tolerance for uncertainty, because they often face unclear situations, as problems and opportunities for success of a new business are unpredictable (Al Mamun et al., 2016).

Entrepreneurial intent is a cognitive view of the actions of someone who creates a new business or creates new values in an existing company. A person who has entrepreneurial intent is more willing to do business and be motivated to develop a business (Salhi, 2018).

The fundamentals of quality entrepreneurship education depend on an understanding of entrepreneurial competencies that stimulate entrepreneurial intentions. Intentions are crucial for understanding the process of entering a business and are perceived as the first step in starting a business (Astorga & Yáñez Martínez, 2014).

Getting the necessary entrepreneurial qualities is better not just within the walls of the university, but with the direct interaction of students with relevant activities. Complex projects provide an opportunity to learn quickly (Young, 2014).

One of the problems in the learning-by-doing approach is to provide sufficient support for the teaching staff and its ability to achieve a successful result. An unsupported member of academic staff managing a complex project can lead to failure due to stress. In turn, this devalues the benefits that can be gained from engaging in business activities (Jones et al., 2018).

Cooperation of educational establishments with enterprises brings financial, cultural and social results.

Universities can play a crucial role in the development of their regions, as they can continuously perform their traditional tasks-prepare skilled labor for the labor market and ensure

the ability to meet the technological needs of a country-and mainly produce knowledge that is considered the main innovative engine in the learning economy and can be transferred to firms scattered throughout the region. In this context, a key factor in promoting economic growth, as well as regional competitiveness, is interaction and cooperation between universities and local private firms. Indeed, the success of many regions of the world depends on building regional capacity, in which partnership between universities and firms is a concrete and decisive factor (Bastos et al., 2014).

The importance of knowledge transfer, company-university cooperation is of great importance due to its valuable contribution to global development and competitiveness. This is a development in which the production, absorption, acquisition, reproduction and transfer of knowledge are considered as fundamental characteristics of competitive dynamics (Wei & Miraglia, 2017).

Collaboration between firms and universities plays a particularly important role in countries with low technology and industry. Collaboration between university companies is an important method because it allows to explore and prove innovative knowledge transfer (Aristei et al., 2016).

Strengthening cooperation between universities and enterprises and innovations in the administrative model of vocational education were key points in the development of higher vocational education (Penaluna et al., 2012).

Thus, it can be concluded that the exchange of experience between universities and enterprises is a good practice for both parties. However, it is difficult to say whether there is a sufficient level of such cooperation in our country. In this regard, the objectives of this study were formed:

- Find out how widespread is cooperation between various enterprises and Russian universities.
- Conduct a survey that reveals the depth of this cooperation, as well as what results it brings.
- Identify the main problems that may be associated with this area.
- Form possible recommendations for solving these problems based on the results of the study.

METHODS

Research Design

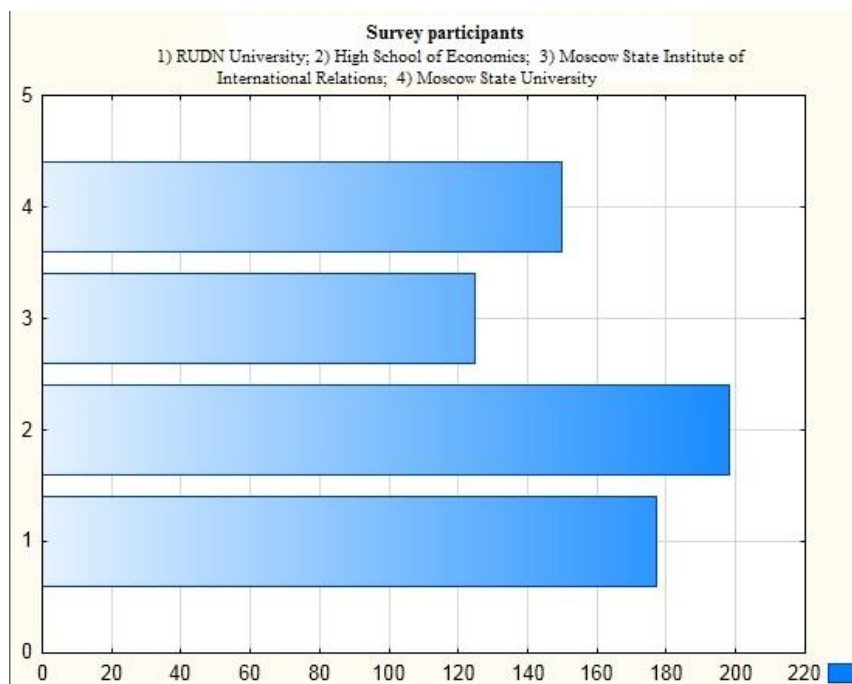
Based on the goals, for the collection of information, an empirical study was conducted, which consisted of a survey of students. The study used the methodology of quantitative research to collect and analyze interpretations and values of the survey. In addition, prior to the survey, a study was organized of the websites of several large Russian universities for cooperation with various enterprises. Subsequently, the students of these particular establishments took part in the survey.

Participants

On the basis of the goals set, an empirical study was organized and conducted, which consisted of a survey of bachelor students at state universities. Survey took place among four universities. A total of 650 students took part in the survey. The number of men and women surveyed was approximately equal (48% of men and 52% of women). All students are full-time students. The age of respondents ranged 20-21. Purposive sampling was considered the most appropriate sampling method (Table 1).

Number of students	Age	University
177	20-21	RUDN University
198	20-21	High School of Economics
125	20-21	Moscow State Institute of International Relations
150	20-21	Moscow State University

The surveyed students were trained in various areas, since such a sample seems to be the most effective, allowing to obtain data regardless of a particular specialty. Among the respondents were representatives of both humanitarian and technical specialties (Figure 1).



**FIGURE 1
PERCENTAGE OF SURVEY PARTICIPANTS**

The Participant’s Selection Criterion

650 bachelor students studying in various specialties, both technical and humanitarian participated in the survey. This is due to the fact that representatives of different types of activity may vary involvement in the cooperation of universities with enterprises. In addition, only fourth-year students participated in the survey. This is due to the fact that senior students are the most formed potential workforce who are ready to enter the labor market. Also at this stage of training, students have already completed most of the special courses in their field, completed practical tasks, and also completed practice. This increases the likelihood of their involvement in the cooperation of universities with enterprises.

Research Instruments

Before conducting a survey of students, a study was carried out on the websites of Russian universities in order to ascertain whether they cooperate with any enterprises. The first university was the RUDN University. It was found out that the university cooperates with many companies of various activities (for example, LENOVO, Renault Russia, UNILEVER, Heinz, etc.). This allows the university to introduce in the learning process technologies provided by company employees, as well as provide students with internship places.

The next university whose site was reviewed was the Higher School of Economics. This university also cooperates with various enterprises, one of them is Henkel Russia. It can be concluded that this also has a positive effect on the educational process and the internship of students.

The website of the Moscow State Institute of International Relations also found a fairly large list of organizations collaborating with the educational institution. Among them, there was a tourist destination (Anywayanyday company), the field of energy (Rosseti), the oil industry (Rosneft) and others. This cooperation takes place in the educational, scientific, scientific and practical areas and vocational training.

According to data obtained from the website of the university, Moscow State University also has a wide range of friendly enterprises. Companies cooperating with the university work in various areas. Among them are international (IBM) and Russian (Gazprom Neft). This cooperation ensures the conduct of joint research projects, which will include nanotechnologies, biology, technical design, financial activities and risk management, and other scientific, technical and economic fields.

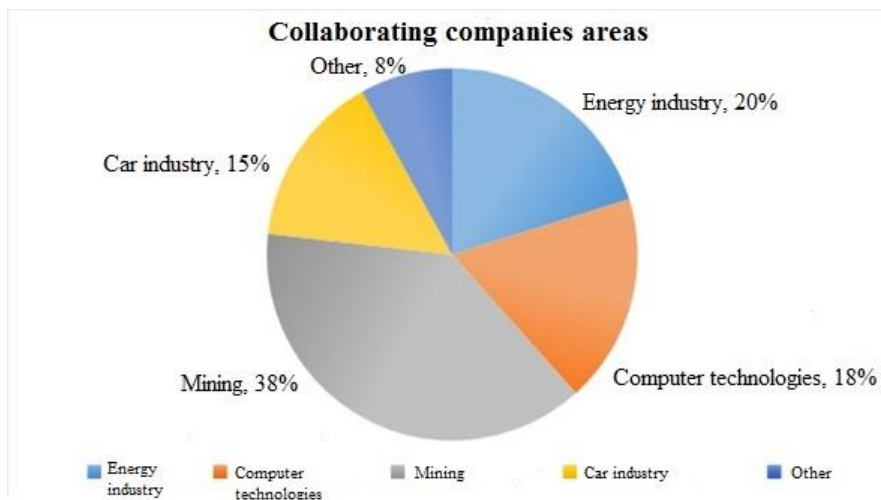


FIGURE 2
COLLABORATING COMPANIES AREAS

Figure 2 shows the most common areas of employee companies. In order from one to five: energy, computer technology, mining and processing of resources, automotive, and more.

Further, a survey was organized for students of these universities, affecting the sphere of cooperation with enterprises and involving an assessment of its effectiveness for students. In total, the survey contained eleven questions that were asked to answer "yes" or "no".

First of all, during the survey, it was necessary to find out whether the students are aware of the cooperation of their educational institution and of any enterprises. This was the first question (did you know that your university cooperates with various enterprises?). Despite the fact that all universities have a corresponding connection, some of them may still not be aware of this.

The next question (do you think that cooperation between universities and enterprises is necessary for the better development of an educational institution?) Was aimed at finding out whether students understand the link between such cooperation and the development of an educational institution. This relationship can be in several aspects, ranging from scientific to financial, and it must be aware of.

The third question (do you think that the cooperation of universities and enterprises is necessary for a higher level of education of students?) To some extent it overlaps with the second, though its goal was to find out whether students see a link between the level of education and university cooperation with enterprises. This relationship can also be considered very strong, since such cooperation allows students to undergo internships and participate in various innovative projects.

Next, it was necessary to find out whether respondents are aware of scientific projects that are being carried out jointly with enterprises (do you have projects in your university that are based on its cooperation with enterprises?). In this question, the goal was only to determine the level of awareness, without taking into account involvement in these projects.

In the next question (Did you have to participate in a project based on cooperation with enterprises?), The goal was to find out what percentage of the students surveyed had ever participated in such projects. This criterion is important, as involvement in such projects can have a positive effect on learning activities.

Next, it was necessary to find out the level of interest of respondents in scientific activities organized by cooperation with enterprises (Are you interested in scientific activities related to cooperation with enterprises?). Results on this issue may provide data on the how useful such events were.

Internship search is one of the difficult stages of undergraduate education. If there are companies that cooperate with an educational institution, finding a place to practice can be simplified, since students have the opportunity to choose from the options offered. That is why the next question (do you think that it is easier for university students cooperating with enterprises to find an internship?) was aimed at finding out whether the interviewed students agree with this assumption.

The issue of employment after high school worries all students without exception. One of the goals of the survey was to find out whether respondents consider it possible to get a job in a university-friendly company, which will make it easier for them to find a job (Do you consider it possible to get a job in a university-friendly enterprise?).

Research plays an important role in the learning process, as well as in student learning. One of the ways to support it is cooperation with enterprises. Students were asked to assess the relationship between the level of research activities of the university and the fact that it cooperates with any enterprises (Do you think the level of research activities of your university would decrease without cooperation with any organizations?).

In the penultimate question, the respondents had to conclude about the usefulness of such cooperation for the enterprises themselves (Do you think that such cooperation is useful not only for universities, but also for the enterprises themselves?). For friendly companies there may be

several positive aspects. From increasing prestige to providing themselves with reliable young personnel who have undergone quality training.

In the last question (In your opinion, is financial support by enterprises for interesting student projects possible?), Respondents were asked to evaluate the possibility of financial cooperation. Cases where the research activity of students led to the creation of any invention are not rare. However, sometimes young inventors face a problem in the form of insufficient financial support. That is why the respondents were asked to answer whether financial support for such projects is possible.

Data Analysis

After collecting the necessary information, the analysis of the research data was carried out using STATISTICA. This software, developed on the basis of Microsoft Windows, allows to visualize data in a statistical analysis. The size of the error is 7%, about 30 questionnaires were incorrectly filled out (some respondents did not answer all the questionnaire questions or chose more than one answer).

Research Limitations

The study involved only students of Russian universities. In addition, all respondents presented one age group. This does not allow to judge the attitude to cooperation of universities and enterprises from undergraduate students. Also, the survey was conducted only among students of the largest Russian universities, with several partner companies. This does not give an indication of how the situation is in more provincial educational establishments. In addition, the data obtained in the quantitative analysis can be quite general.

The results obtained on the first issue were expectedly high. 94% of respondents were aware that their educational institution cooperates with various enterprises. This may indicate that students are interested in this issue, and there is sufficient promotion of this cooperation in the university.

On the second question, the percentage was also quite high (87%). This suggests that students are aware of the importance and multidimensionality of cooperation between universities and various companies. This result, without doubt, can be considered positive.

88% of respondents agreed with the direct link between the presence of friendly companies and the level of education. This data also suggests that students are aware of the fact that cooperation with enterprises expands educational opportunities, helping to gain better and wider knowledge.

The data on the following question turned out to be quite low. Only 62% of respondents reported that they are aware of the existence of projects organized in cooperation with friendly enterprises. This may indicate that students are not interested in this area.

In connection with the data obtained on the previous question, the results on the following turned out to be expectedly low. Only 48% of respondents reported that they had ever participated in joint projects of the university and the enterprise. This may indicate that they have little interest in directly participating in project activities of this kind.

Oddly enough, 72% of respondents expressed interest in joint research activities of universities and companies. This may indicate that, despite the lack of desire to participate in projects, students have an interest in them, which must be stimulated.

A large percentage (58%) agreed that it is easier for students of universities that have connections with any enterprises to find an internship. This may indicate that at least some of the respondents were provided with internships at partner enterprises.

Also, a rather large percentage (54%) considered it possible to find employment in friendly companies. This suggests that students are aware of the usefulness of such cooperation.

More than half of the respondents (72%) came to the conclusion that in the absence of cooperation with enterprises, the scientific activities of their universities would become worse. This suggests that they understand the contribution that such cooperation brings to the academic life of an educational institution.

Not many (47%) students realize the usefulness of such cooperation for enterprises. This may be due to the fact that students can not look at this issue from the other side.

Many respondents (67%) agreed on the possibility of financing projects of gifted students. This suggests that they are aware of the possibility of personal scientific cooperation.

Expansion of Cooperation

Despite the fact that the study showed a fairly high level of cooperation between universities and enterprises, in this area there is still room to grow. In order to provide wider research activities, as well as to provide internships abroad, it is possible to ensure cooperation with international or foreign companies.

Increased student Interest

Despite the fact that the interviewed students showed a high level of awareness about various aspects of cooperation with enterprises, their direct participation in related projects is rather low. This suggests that in universities there may not be enough popularization of such activities. In order to achieve greater involvement of students in research activities in cooperation with enterprises, seminars with the participation of company employees can be held in educational establishments, and some system of incentives for students participating in research activities can be developed.

Financial and Didactic Support

One of the goals of cooperation between universities and enterprises is a scientific activity, which often consists of joint projects. However, there are also individual students who are interested in any field and are able to bring in their innovations. To support gifted students, universities and friendly companies shall organize a special fund that will provide financial support. In addition, from the side of enterprises, the didactic help of students-inventors can pass.

DISCUSSION

In 2015, a study was conducted in Malaysia aimed to study the attitudes of public universities towards entrepreneurship education, its promotion, and the inclusion of strategies to incorporate undergraduate and graduate education. Empirical data was collected through focus group discussions and semi-structured interviews with key officials at all twenty state-funded higher education establishments in Malaysia. An analysis of the university's online pages was also conducted (Ahmad & Buchanan, 2015).

Semi-structured interviews were intended to obtain personal opinions regarding the development of entrepreneurship. The questions concerned the respondents' opinions regarding the implementation of entrepreneurship education in higher education in Malaysia. The data were analyzed using a qualitative-phenomenological approach.

A total of 57 people took part in the survey. Participants were selected by a researcher using a focused sample of business or small business lecturers and entrepreneurship development instructors. The focus group sample represents a fairly wide range of entrepreneurship experts. The target sample was identified as appropriate when the researcher wants to identify specific types of cases for in-depth investigation (Ahmad et al., 2014).

Purpose of this paper was to analyze the latest trends and the current situation for the development of entrepreneurship education in Malaysian universities. Because of the nature of entrepreneurship, top-down policies can promote entrepreneurship, but are less able to promote individual readiness, skills, knowledge, and relationships that characterize a successful enterprise. Traditional approaches to learning and testing are not suitable for preparing students for independent work. Such teaching methods differ from the starting reality that start-up entrepreneurs face.

The present study shows high awareness (88%) among students regarding the importance of ties between student-friendly companies and firms and the level of education. Similar results were obtained in (Harms, 2015); the author claims that team learning and psychological safety are positively related to assessments at the group level.

Entrepreneurship education should raise students' awareness of entrepreneurship as possible career options, as well as provide specific business skills and knowledge about starting and running a business. Entrepreneurship should improve graduates' attitudes towards self-employment, risk taking, creative thinking, as well as the skills necessary to manage and manage newly created sustainable business projects, and not just to train students in the functions and roles of entrepreneurship. In addition, universities should expand their collaboration with relevant organizations, such as diverse businesses (Mason, 2011).

In 2019, a study was conducted aimed at examining the exchange of experience between universities and enterprises. In order to achieve the goals set, a survey was conducted through a phone survey of 500 companies distributed in intensive knowledge services (65.6%, 328) and distributed technologies (34.4%, 172). 84.6% Most of them were private (84%) and were located in urban areas of Portugal (north -24.6%, center -31.6%, Lisbon -20.6%, Alentejo -4%, 407) (Teixeira et al., 2019).

As noted, only 15.8% of surveyed companies reported cooperating with universities in order to transfer knowledge. The average age of the respondents was 42.1 ± 8.0 years, most of them had a higher education. As for the transfer of knowledge, 15.8% noted the company's cooperation with universities, 47.2% did not mention the introduction of any innovations in 2016, and 1.2% implemented three innovations.

Descriptive statistics (average values and standard deviations) of the variables included in the study, as well as the corresponding correlations, were determined to characterize the sample under study. Regarding the modeling of variables that influence the company's collaboration with universities, binary regression based on logistic distribution was used, since the dependent variable is a case of binary results. The logistic model is a natural model, since it corresponds to the use of a canonical relationship with a binomial distribution (Atherton, 2013).

After our statistical analysis, we found that with regard to the characteristics that promote cooperation between universities and companies, we found that the older an entrepreneur, the

less likely it is that knowledge will be transferred from universities to companies. It also turned out that companies located in the Lisbon region more often cooperate with universities. Some studies show that knowledge transmitted through collaboration networks is not related to the knowledge gained by these networks. However, this does not mean that the formal or informal arrangement of these relations in the literature has not been studied. There is a certain consensus that university transfer of knowledge has a more obvious impact on local industry, since it often depends on communication networks and cooperation in an urban environment (Azagra-Caro et al., 2017).

Cooperation between companies and universities plays a particularly important role in the activities of companies both financially and at the level of organizations. Thus, cooperation between universities and companies is an important method, because it allows to explore and test innovative knowledge transfer. If enterprises increase their innovative capabilities, they will help improve financial performance and, consequently, increase their competitiveness (Aristei et al., 2016). There will also be a positive effect on the part of educational establishments, since such cooperation will allow students, at the educational level, to become more familiar with work at enterprises or to see their functioning from the inside, which in the future can help them to start their own business. Therefore, it is extremely important to create programs that promote cooperation with higher education establishments, and at the same time to thoroughly encourage companies for their innovative potential (Gomezelj Omerzel & Smolčić Jurdana, 2016).

In 2016, another study was conducted in China, revealing cooperation between universities and enterprises. For the study, questionnaire thematic questionnaires were used to cover the fundamental characteristics of cooperation between universities and enterprises in Chinese higher vocational education in terms of “*vision-reality*”. In the process of developing questionnaires to ensure the reliability of the study, indicators were selectively developed to study aspects of the fundamental characteristics of cooperation between universities and enterprises, the depth of cooperation, the quality of cooperation, the motivation for cooperation, willingness to cooperate, rules and systems, etc. guarantee the performance of the study (Haisheng et al., 2016).

In this survey, a total of 775 questionnaires were issued: including 532 copies issued to enterprises, 136 received and 117 valid questionnaires; and 243 copies issued by higher professional educational establishments, with 113 received back and 87 valid questionnaires. The sampling of enterprises was mainly from nine central-eastern regions with a relatively developed manufacturing industry. They covered eight industries. A sample of higher vocational schools came from eleven different provincial districts.

According to surveys, only 20% of enterprise employees had previously studied at universities that collaborated with them. Only about 33% of enterprises had a ratio of more than 20% of newly hired employees working in cooperating vocational schools. In addition, higher vocational schools did not become the main ways of educating employees.

Cooperation between universities and enterprises in the field of higher vocational education has rich consequences and in fact is expressed in reality in various forms. One of the most common is an internship for students and practical training for them. With regard to organizing internships, enterprises more often use students as workers in production positions, with relatively little attention to the goal of the need for training qualified personnel: internships for students are mainly organized on the basis of the production needs of the unit (83%), the proportion of students corresponding to vocational training is sufficient low (17%) (De Fuentes & Dutrénit, 2012).

According to the study, at the current transitional stage of socioeconomic development, promoting cooperation between universities and enterprises in Chinese higher vocational education is a crucial step in meeting the demand of enterprises for highly skilled workers and improving the competitiveness of enterprises. This study showed that at present, cooperation between universities and enterprises is characterized by poor quality, shallow cooperation, limited links between enterprises and vocational schools, as well as insufficient participation of the government and industry organizations. Exploring innovative models and encouraging local experimental work in cooperation between schools and enterprises can help remove existing barriers to cooperation between schools and enterprises and increase the benefits for both enterprises and vocational schools (Carboni, 2012).

CONCLUSION

To conduct research and identify problems that may be associated with the cooperation of universities and enterprises, a survey of fourth-year students of Russian universities was organized. Such a sample made it possible to identify the attitude of students towards such cooperation and to determine their level of involvement in related activities.

On the basis of the results obtained, it is possible to form further recommendations on the expansion of cooperation between enterprises and educational establishments in Russia. The achievements of this study can be expanded and improved, including for other studies. In addition, to determine a more complete situation in the matter of cooperation between universities and enterprises, it is possible to conduct this survey in smaller educational establishments in order to determine how the situation is in small cities.

The study showed that students are well aware and understand the importance and usefulness of cooperation between universities and various companies. However, while analyzing the data, there was a lack of student involvement in scientific activities organized on the basis of this collaboration. To solve this problem, several ways are offered.

Firstly, it is necessary to increase the popularization of such activities among students. To do this, you can hold meetings with employees of friendly companies, where they would talk about their activities, as well as develop a system of incentives for students participating in scientific activities. Secondly, it is necessary to work in expanding cooperation with international and foreign companies. This will allow not only the exchange of experience between countries, but also provide students with the opportunity to undergo an internship abroad. Thirdly, educational establishments and organizations cooperating with them can create a special financial fund aimed at supporting their own scientific developments of gifted students. In addition, employees of friendly organizations can provide didactic and technical support for such students.

The results and results of this article can be used for further broader research. Research can be conducted taking as respondents representatives of other age groups, from applicants to students enrolled in graduate school. In addition, based on this study, it is possible to study the attitude of citizens of other countries to this issue in order to more fully assess the situation, since the level of cooperation between companies and universities can vary greatly depending on the country.

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