PROJECT-BASED LEARNING AS A TOOL FOR THE FORMATION AND DEVELOPMENT OF THE ENTREPRENEURIAL SKILLS OF STUDENTS

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ABSTRACT

In modern conditions, one of the university functions is to train specialists who have advanced entrepreneurial skills, are competitive in the labor market and are ready for self-realization. The purpose of this research is to highlight the basic entrepreneurial skills of students and to determine the role of project-based learning in their formation. On our research we have used a combination of statistical analysis and questionnaires. The questionnaire consisted of 16 entrepreneurial skills, including technical, managerial, entrepreneurial and personal skills. To assess the responses of students a 3-point Likert Scale was used. The study involved 140 students from 2 universities of Omsk. All the participants were full-time students of the Faculty of Economics aged 21 to 23 years. The study revealed that the level of entrepreneurial skills of students after the project activity based on the business game "Business Consultant" is 12% higher than that of the control group. The indicator of 13 out of 16 assessed skills increased by 8% ± 4%. The exception was the skills of "communication", "use of information and communication technologies" and "search and discovery of new business opportunities", which decreased by 3%. Project-based learning helped the students to learn how to evaluate project risks and make decisions.

The research can affect the quality of the basic entrepreneurial skills formation among students. The introduction of project-based learning in education will strengthen the position of the university in the market of education by quickly adapting to external changes, as well as improve the competitiveness of graduates.

Keywords: Entrepreneurial Education, Educational Process, Business Game, Entrepreneurial Skills.

INTRODUCTION

Higher education plays a key role in creating and spreading entrepreneurial knowledge and skills, providing students with necessary entrepreneurial skills (Baaken et al., 2015). Entrepreneurial skills are defined by higher educational institutions as important attributes of graduates that must be learned and used by students in the future (White et al., 2017).

In the modern world, the requirements of society to universities in the preparation of specialists have increased (Pugacheva et al., 2016). Entrepreneurship education is important not only for shaping the thinking of young people, but also for creating opportunities, ensuring social justice, establishing trust and boosting the economy (Shahiwala, 2017). From the literature

review, it has been revealed that entrepreneurial skills are divided into four groups: entrepreneurial, technical, managerial and personal maturity skills (Durkin & Gunn, 2016). The level of education and training necessary for the development of these skills is largely dependent on human capital, which people may have before starting a business (Martin et al., 2013).
Technical skills are those skills that are necessary for the product production or business services;

- Managerial skills are necessary for the daily management and administration of the company.
- Entrepreneurial skills are necessary for assessing economic opportunities; they include the search for new business opportunities and the ability to assess risks.
- Personal maturity skills consist of self-awareness, responsibility, emotional and creative skills (Kutzhanova et al., 2009; Koe et al., 2018).

Enterprises and company executives are looking for students who are able to evaluate and analyze information, as well as to use this information to solve real projects (Sullivan & Dallas, 2017). Higher education is aimed at relevant practical knowledge foundation that will help students understand and acquire entrepreneurial skills (Samerkhanova et al., 2016).

Different specialists can participate in the creation and implementation of business projects. They form a temporary organization, which is often referred to as a *"project"*. A characteristic design feature is the creation of new products and at the same time the knowledge of what can occur simultaneously (Keppell et al., 2006). The main project functions are research, analytical, prognostic, transformative and normalizing. If the project activity is performed by students, it performs the educational function (training, education and development of students) (Filho et al., 2016; Chu et al., 2017). The technology of the project activity, which is based on the project method, is one of the modern educational technologies (Belova & Belov, 2016). The project method focuses on solving a problem. On the one hand, the problem involves the use of various education methods and means, and on the other, the integration of knowledge and skills from various fields of science, engineering and technology (Rezhake et al., 2018). Nowadays, in higher education institutions project learning technology along with other educational technologies is becoming a means of engaging students into active cognitive, communicative, practical, and other activities to solve various problems (Tlhoaele et al., 2016).

Project-based learning is also aimed at avoiding the *"pure"* theory. The project activity system is based on active and interactive teaching methods (trainings, master classes, creative workshops, business games, case study). This helps students organize their activities and interact, acquire skills in teamwork and manage their time. The development of entrepreneurial skills at the university is related to the improvement of critical thinking skills, problem solving, and job placement skills (Wilmore & Willison, 2016; Willison et al., 2017). These skills are often referred to as "general skills." Active development of the skills is taken place on the basis of project-based learning using curricula, starting with small training sessions and finishing with large projects (Dodds et al., 2016).

There is a gap between what educational institutions offer and what is necessary for the project implementation in a modern, complex work environment. Therefore, there is a need to identify the main tools for the formation of entrepreneurial skills of students. The purpose of this research is to determine the impact of project-based learning in universities on the development of entrepreneurial skills of students.

METHOD AND METHODOLOGY

Research Design

Based on the set goals, a study was developed, organized and conducted. It consists of two stages. The first stage is the development and implementation of project-based learning in the educational process of students. The second stage is a survey in the form of a questionnaire. The purpose of the first stage is to create conditions for the practical application of students' entrepreneurial skills. The students were invited to participate in the Business Consultant game (Appendix 1.) (Zeldovich, 2011). The purpose of the survey is to determine the level of entrepreneurial skills of first year master students before and after the organization of project activities in universities.

Participants

The study involved 140 students from 2 universities. All the participants were full-time students of the Faculty of Economics aged 21 to 23 years. The error probability is almost 5%.

The criterion for this selection is explained by the fact that senior students are potential human resources and have the greatest theoretical and practical experience. The survey participants are students of the Faculty of Economics in two Omsk universities: Dostoevsky Omsk State University (85 respondents) and Omsk State Agrarian University named after P.A. Stolypin (55 respondents). The survey involved 78 (55.7%) men and 62 (44.3%) women.

The survey involved first year master students.

Data

Among the forms of project learning organization in the university, we chose a business game. Therefore, the business game *"Business Consultant"* was developed and conducted for the first stage of the study. It meets all our research requirements. Business games are held in small groups; they are short-term, informational, and they are focused on creativity.

In the second stage we conducted an anonymous survey. The questionnaire included 16 entrepreneurial skills identified in the literature analysis (Table 1). For the assessment of the skills presented in the questionnaire the Likert scale was used (Kitsantas et al., 2017), where 1 is low, 2: sufficient, and 3: high.

The minimum number of points is 16 and the maximum is 48 points.

Table 1 QUESTIONNAIRE FOR ENTREPRENEURIAL SKILLS ASSESSMENT	
Entrepreneurial skills	**Student's assessment of the formed skill**
Technical	
1. Communications (effective communication and persuasion skills, ability to negotiate with partners)	1 -low, 2 - sufficient, 3 - high.
2. Research and action strategies	1 -low, 2 - sufficient, 3 - high.
3. Knowledge of foreign languages	1 -low, 2 - sufficient, 3 - high.
4. Financial management	1 -low, 2 - sufficient, 3 - high.
Managerial	
5. Ability to develop a concept and business plan	1 -low, 2 - sufficient, 3 - high.
6. Decision making	1 -low, 2 - sufficient, 3 - high.
7. Environmental observation	1 -low, 2 - sufficient, 3 - high.
Entrepreneurial	
8. Use of information and communication technologies (knowledge of HTML, graphic design, organization of video conferences and webinars)	1 -low, 2 - sufficient, 3 - high.
9. Search for new business opportunities	1 -low, 2 - sufficient, 3 - high.
10. Risk assessment	1 -low, 2 - sufficient, 3 - high.
Personal maturity skills	
11. Ability to take risks	1 -low, 2 - sufficient, 3 - high.
12. Perseverance	1 -low, 2 - sufficient, 3 - high.
13. Creativity	1 -low, 2 - sufficient, 3 - high.
14. Responsibility	1 -low, 2 - sufficient, 3 - high.
15. Self-confidence	1 -low, 2 - sufficient, 3 - high.
16. Initiative	1 -low, 2 - sufficient, 3 - high.

The answers to these questions will help us to summarize the situation related to the introduction of project forms of education necessary for the entrepreneurial skills formation. The deans of the faculties of the participating universities, as well as the curators of the groups helped to conduct the survey.

Statistical Analysis

The analysis of the data was made in the STATISTICA system. For the sake of convenience, piece of the data has been transformed into histograms, developed in Origin 9.1. The 95% Confidence Interval (CI) was used to assess the responses of the respondents. To calculate the confidence interval, the student's t-distribution was used, where $p \leq 0.01$ and the standard deviation of the sample (σ). The null hypothesis was decided to be $M>1.10$, where M is the average value. The error factor for the survey is 5% ± 1%, since not all the questionnaires were correctly filled in.

The validity of the survey consisted in calculating the average score for the survey among university students in order to determine the level of entrepreneurial skills before and after participating in a business game.

Research Limitations and Implications

The study involved of first year master students. That is why a number of problems and difficulties that have been revealed in the study, as well as recommendations for solving them, can only be applied to fifth year students and programs that are held in the last year of studies. The size of our sample does not allow us to claim the statistical accuracy of our results. It should be noted that the questionnaire does not measure real skills as it depends on the self-assessment of students.

RESULTS

The qualitative analysis of the *"Business Consultant"* game showed that the students were interested in and reacted positively to this form of the educational process organization. The participants showed initiative, creativity and they actively used Internet resources. In general, the students said they had received a good experience.

The statistical analysis of entrepreneurial skills of students showed that on average, all the students of the control group scored 2.02 ± 0.07 points. And after the introduction of project-based learning, the average score was 2.52 ± 0.3 (Table 2).

Personal entrepreneurial skills of students are the most developed, since the control group students scored 2.1 ± 0.008 points on average, while in the test group the average response rate was 2.4 ± 0.009 points. This indicates that the educational environment contributes to the development of personal entrepreneurial skills.

Table 2
THE AVERAGE SCORE OF RESPONDENTS IN HIGHER EDUCATIONAL INSTITUTIONS AND THE SIGNIFICANCE OF THE RESPONDENTS 'ANSWERS

Entrepreneurial skills	Total respondents	Mean	Sig. (1-tailed) P-value	σ (standard deviation from the sample)
Technical				
Control group	140	1.98	≤ 0.01	0.06
Test group		2.23	≤ 0.01	0.08
Managerial				
Control group	140	1.5	≤ 0.01	0.008
Test group		1.97	≤ 0.01	0.009
Entrepreneurial (professional)				
Control group	140	1.43	≤ 0.01	0.007
Test group		1.51	≤ 0.01	0.005
Personal entrepreneurial qualities				
Control group	140	2.1	≤ 0.01	0.008
Test group		2.4	≤ 0.01	0.009
Test value was considered to be 1.10				

Students' technical entrepreneurial skills are formed by 65% (Figure 1). From the analysis of the results, it is clear that after participating in the project, the students gave the communication skill a lower point. From the point of view of emotional overcoming and self-awareness, perhaps many students thought that they could easily cope with the project, in our case, participation in the game. When they put their knowledge into practice, they found that their ability to cope with uncertainty was not as high as they thought. They had to understand what the real problems of organizations were, and almost everyone realized that they did not

have enough skills and knowledge. It is known that students have insufficiently developed abilities to persuade, negotiate and build mutually beneficial communication (Chang & Rieple, 2013). The result of the *"research and action strategies"* skill after the game increased by 9%. After participating in the *"Business Consultant"* game, the students learned to analyze the state of the organization and make the most appropriate decisions. As Figure 1 shows, the *"knowledge of foreign languages"* skill is highly developed, while the indicator has not changed much before and after the game. The least developed skill is the ability to manage finances. It is less than 50% and there is a slight increase (by 4%) after the game. We believe that this result indicates a lack of practical skills necessary to work with finances.

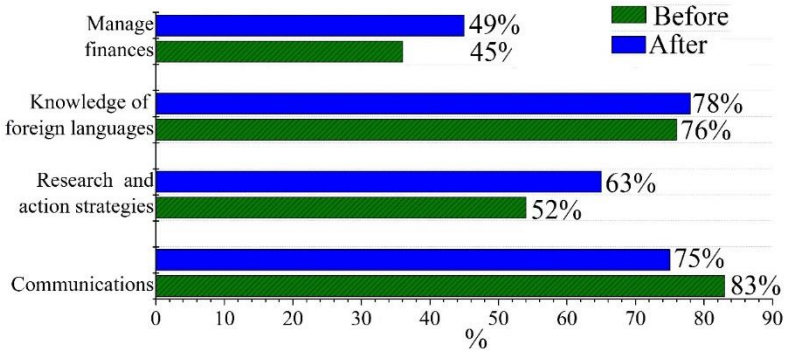

FIGURE 1
THE RESULTS OF THE SURVEY, THE ASSESSMENT OF TECHNICAL SKILLS

The result of the survey showed that managerial skills are formed by 45% (Figure 1). After the game, the result increased by 6%. A low assessment of the *"environmental observation"* skill indicates that the students don't have necessary knowledge to study the environment. There were changes in the perception of *"decision making"* skills and *"ability to develop a concept and business plan"* before and after participating in a business game. The indicator *"after"* increased by 10%. The increase in the perceived managerial skills is apparently the result of participation in the previous *"Business Consultant"* game in which the students identified the necessary managerial knowledge.

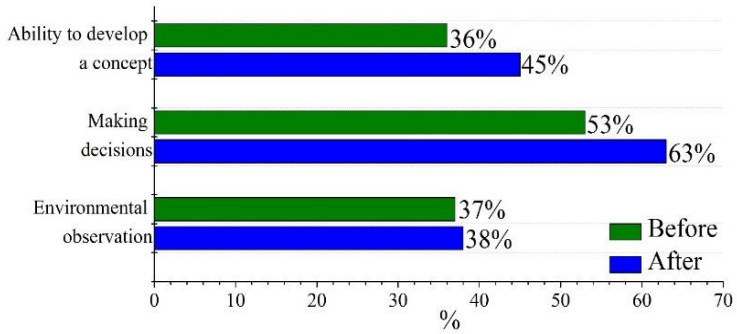

FIGURE 2
THE RESULTS OF THE SURVEY, THE ASSESSMENT OF MANAGERIAL SKILLS

As it can be seen from Figure 2, the perception of entrepreneurial skills is estimated at less than 50%. The analysis of the survey results showed that the *"use of information and communication technologies"* and *"search for new business opportunities"* skills received the lowest points. This is explained by the fact that information and communication technologies are a relatively new and priority direction in education. The survey results (Figure 3) show a decrease in the perception of the *"use of information and communication technology"* and *"search for new business opportunities"* skills after the game by 2% and 4%, respectively. This can be possibly explained by the fact that the students faced with real problems and were able to realize their skills in a new way.

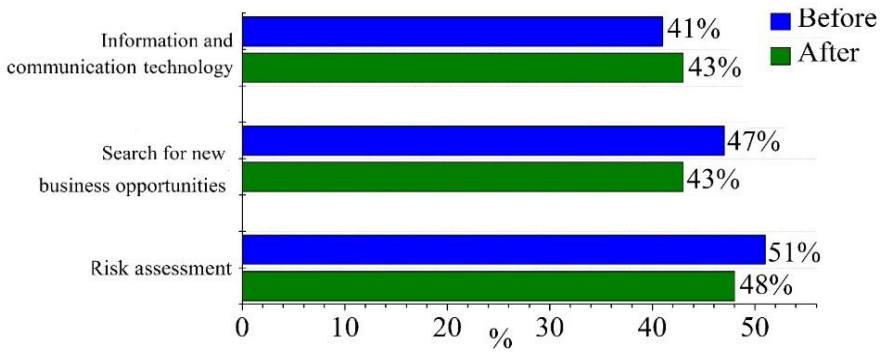

FIGURE 3
THE RESULTS OF THE SURVEY, THE ASSESSMENT OF ENTREPRENEURIAL SKILLS

Personal entrepreneurial qualities (65%) were positively assessed (Figure 4). Despite the decline in students' self-confidence skills by 5%, there is a slight improvement (2%) in the overall indicator of students' personal skills after the game. The students are characterized by high initiative and responsibility, but creativity must be developed (Figure 4). The results of the analysis point to the need to use methods for the development of creativity, critical thinking and self-confidence of students during entrepreneurial training.

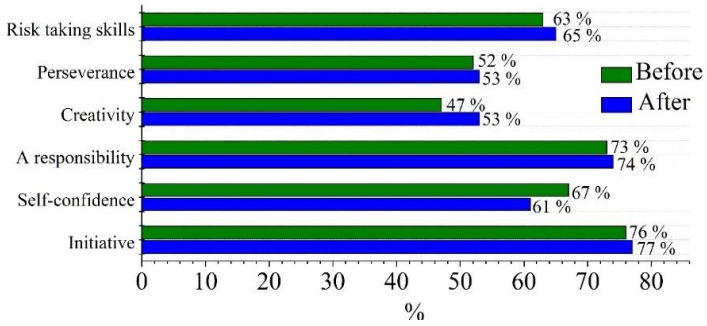

FIGURE 4
THE RESULTS OF THE SURVEY, THE ASSESSMENT OF PERSONAL SKILLS

The analysis of the survey results (Figure 5) showed that the entrepreneurial skills of students were formed at a sufficient level (>50%).

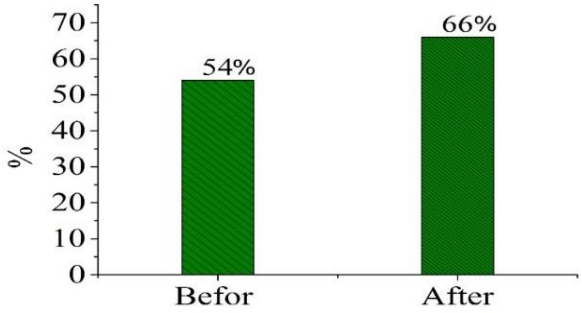

FIGURE 5
THE GENERAL LEVEL OF ENTREPRENEURIAL SKILLS OF STUDENTS BEFORE AND AFTER THE GAME

After the game, the students demonstrated an increased perception of their skills (by 12%). The indicator grew in almost all 13 assessed skills, with the exception of those 3 skills, which are more closely related to business activities. This indicator shows the effectiveness of the business game.

DISCUSSION

Scientists point out that project-based learning provides a link to real-world problems. Students develop entrepreneurial skills and at the same time improve their learning outcomes (Stefanou et al., 2013). Some studies have found some negative consequences associated with project-based learning for the development of entrepreneurial skills. This can be explained by the fact that not all university teachers have relevant experience. In addition, there are limitations associated with the duration of the project or the timing and curriculum. Even when technologies are used, assessment and time problems may arise (Efstratia, 2014).

To develop the personal qualities that form the basis of entrepreneurial thinking, US institutions of higher education are trying to include the course of psychology into entrepreneurship education. This contributes to the development of students' personal qualities, such as responsibility and tolerance, motivation and creativity (Wheadon & Duval-Couetil, 2016). South Korean scholars claim that when inexperienced university students try to set up new businesses, getting practical support from experienced staff and teachers can be necessary and useful. This assistance can help students realize their entrepreneurial intentions, including the creation of a real business.

The skills acquired by the students in the group project-based learning enable them to further define an important goal for themselves, search for and collectively realize the ways to achieve it in their future professional activity. The educational process at the same time becomes creative, more intense, exciting, and most importantly, effective (Brundiers & Wiek, 2013).

In the Baltic countries, especially in Lithuania, which is currently experiencing a start-up boom, a separate course is offered at private and public universities to help students set up their first business. It takes into account technical stages and forms motivation and tolerance to stress in students (Shams, 2016).

As the analysis shows, modern education in foreign countries is focused on the development of entrepreneurial abilities as a significant factor in innovative production. In this regard, starting from the first days of learning, the events aimed at identifying entrepreneurial

abilities of students are held (Shageeva et al., 2018). The method of group project-based learning in the education system may become a component of the educational process that promotes human development, ensuring the formation of personnel for current and future needs of the socio-economic development of the Russian Federation (Zavyalova et al., 2017).

CONCLUSION

The development of entrepreneurial skills in entrepreneurial education means creating an environment in which the classical system will be able to gradually develop its creativity and improve the level of teaching. This is possible only through the formation of interdisciplinary methods in business education, which allow effective development of students' knowledge of the organization and management of business activities. Project-based learning contributes to bridging the gap between practical and theoretical knowledge and student skills. To study the impact of project-based learning on the formation of entrepreneurial skills, a business game "Business Consultant" was organized and conducted. During our research, we found out that the final-year students highly assessed their entrepreneurial skills. The questionnaire showed that the personal skills of students were the most developed (>53%). These results indicate the importance of introducing project methodologies into the university educational in the Russian Federation, so that graduates can meet the high requirements of modern society.

APPENDIX 1

Business Game: Business Consultant

The aim of the Business Consultant game is to acquire practical skills for assessing and analyzing external changes and making an appropriate decision based on the state of the organization.

At present, the CEO is increasingly confronted with the same dilemma: whether to plan future reforms or to wait for the circumstances to make him/her do it. For the most effective decisions and their multilateral analysis the leaders prefer to contact business consultants.

This business game is aimed at solving the following tasks:

- Teach participants to analyze the state of the organization;
- Enable the players to evaluate and make the most appropriate for the organization decision.

How to Play the Game

At the beginning of the game, the participants are divided into four groups (in a group of 6–8 people), three of which represent business consultants of various firms, and the fourth–the managerial board of a large, prosperous printing company. The formation of groups is carried out randomly.

When the groups are formed, the participants take their seats and receive handouts from the game organizers. The organizers introduce the players to the rules of the game: a large, prosperous printing company needs to invest the available amount of money in the most efficient way. The leader of this organization has three possible investment options and assigns checking of their effectiveness to business consultants. The CEO in order to inform the consultants has to talk about his/her company and the proposed projects for consideration. At the end of the game

the managerial board will choose one of the options. Each group proceeds with the tasks assigned to them.

Then each group representing business consultants announces the results of the intra-group discussion and the members of other groups are allowed to ask questions. The group representing the company's managerial board also asks clarifying questions and, having conferred, announces their reasoned decision on the investment option it considers the most appropriate.

Group Structure

- Managerial board of a large printing company: 4-6 people.
- Business consultants: three groups of 5-7 people.

Game Regulations

- Group formation: 5 min.
- Introduction to handouts: 5 min.
- Presentation of the company: 5 min.
- Work within groups: 25 min.
- Discussion of the results between groups: 30 min.
- Concluding remarks by the managerial board: 10 min.
- Game analysis: 10 min.
- Total: 1 h 30 min.

General Recommendations to Players

While working in groups, try to take notes of your ideas. This will help you not to miss important details. During the game, follow the rules-otherwise penalties that will lower your total score will be applied. While taking part in the discussion, do not forget about the culture of behavior and communication. Your presentation should be reasoned and convincing.

Game organizers

At the first stage, the organizers briefly introduce the participants to the rules of the game. Then they form groups and give out the game materials in a sufficient quantity.

During the game, the organizers act as coordinators and consultants. They strictly monitor discipline and compliance with the rules.

Handouts

Group description

Part I. Managerial board

You are the management of a large printing company *"Polygraph +"*, which has been successfully operating in the market for more than 7 years. Your company consists of a publishing and printing complex and a printing office. You print offset weekly magazines.

Your company is characterized by high economic performance. The company directed most of its net profit to the development of production. The tough competition encouraged the management to continuously improve production (new equipment stock). The company has always been characterized by an immediate response to changes in the industry, and also the ability to foresee them. The *"Polygraph +"* managerial board made efforts to improve its image and competitiveness to the company's profitability.

Due to the unstable economic situation in the country and the increasing financial crises, the managerial board decided to be on the safe side regarding investment issues and to use the services of business consultants. The managerial board have approved three financing projects:

1. Establishment of its own research and development department to improve technology and organization of production.
2. Establishment of its own center for advanced training of the managerial staff and some leading specialists.
3. Production capacity increase due to the development of a new product (preliminary marketing research showed that there is a demand for this product).

At the same time, the company has an opportunity to finance only one of the projects. The project that the managerial board will finance will be selected on the basis of reports from three groups of business consultants (each group selects a project and submits it to the board: it has to highlight all the positive and negative aspects of funding the project, as well as to explain its choice).

Group Tasks

- Presentation (information about the company and the three financing projects).
- Independent analysis of financing options (pros and cons).
- Consideration of the proposals given by business consultants.
- Final decision (selection of the project).

Part II. Business Consultants

You are a member of an independent consultants group. A large printing company, *"Polygraph +"*, offered you to analyze one of the financing options.

Your task is to provide expert advice that will help the company make the most appropriate decision. In accordance with your analysis, the advice can be both persuasive and dissuasive.

Group Tasks

- Analysis of the chosen financing option (pros and cons);
- Report of the work done.

Samples of Documents

Managerial board
You are the CEO of a large printing company *"Polygraph+".*
Name_____.
Managerial board (2 copies)
You are the assistant of the CEO of a large printing company *"Polygraph+".*
Name._____.
Business consultant. Group 1.
Name_____.

Financing project: establishment of its own research and development department to improve technology and organization of production.

Business consultant. Group 2.

Name_____.

Financing project: establishment of its own center for advanced training of the managerial staff and some leading specialists.

Business consultant. Group 3.

Name_____.

Financing project: production capacity increase due to the development of a new product.

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