



Professional Entrepreneurial Competencies and Creativity Skills Formation Under the Influence of Educational Practices of Start-Up Projects Development

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Abstract: This article defines the role of start-up projects as a pedagogical tool aimed at consolidating and updating vocational training of students majoring in entrepreneurial studies. It presents an online survey conducted among Russian and Azerbaijan entrepreneurs, which allowed identifying key competencies necessary to practice a flourishing business activity in the current environment. The role of start-ups in strengthening and upgrading entrepreneurship students' professional competencies was identified based on self-assessment of their professional progress during educational training. The research methodology made it possible to identify levers of influence on students' involvement in training, the effective usage of which can dramatically change the quality of future specialists' education due to the synergy of theoretical and practical activities. Using a survey of 50 Russian and Azerbaijani entrepreneurs, selected using a series of filters and based on a random sample, a list of entrepreneurs' competencies and skills was formed. Checking by the Cronbach method a demonstrated the acceptability of the internal reliability of the resulting list ($\alpha = .821$). This list was used to survey 395 students from 5 Russian and one Azerbaijani universities using the method of assessing on a 4-point Likert scale their results in entrepreneurship training after The practical vocational training in the "Start-up Projects - New Generation" ecosystem, described in this study. The students' assessment of the level of development of their vocational skills turned out to be relevantly high. In practice, the research results can be applied in the creation of entrepreneurship training courses, as well as with the aim of increasing student entrepreneurship motivation and enhancing their practical experience.

Keywords: Entrepreneurial skills, professional competencies, start-up ecosystem, start-up projects

1. Introduction

Digital transformation of social and economic life and advancements in science, computing, mathematics, engineering, and technology have caused subsequent shifts in the educational paradigm, providing students with a variety of opportunities to participate in global educational processes (Tamrongkunan & Tanitteerapan, 2020). The main goal of the current educational space is to allow students to acquire modern vocational skills and competencies necessary for living a prosperous life and building a successful career in the era of the Fourth Industrial Revolution. Against this background, staffing of the new digital age is focused, first of all, on developing the following skills and competencies: complex problem solving, critical thinking, creativity, people management, coordinating with others, emotional intelligence, judgment and decision making, service orientation, negotiation, and cognitive flexibility (Gleason, 2018).

The global market is predominantly driven by a knowledge-based economy. At the same time, competitive advantages in this knowledge-based economy depend greatly on technological progress and innovation. Knowledge has become one of the main factors influencing not only the economic but also the social dimension (Tamrongkunan & Tanitteerapan, 2020). The transition to a knowledge-based economy is associated with the innovation system's paradigm shift. This shift implies the increasing importance of social innovation, combines the economic and social innovation aspects, and presupposes equal priority in creating profit opportunities and generating social value. Today, the global business sphere is notable for the prevalence of transnational corporations with an increasing stratum of employees, specialists, and managers, whose career is connected with many countries globally (Syzdykova et al. 2020).

The development of science and technology results in new socio-economic challenges that become more complex and diverse. Therefore, a more creative approach is required to address numerous rapidly developing problems of our time (Vidergor et al. 2019). The introduction of a creative approach to education, as well as active integration of scientific knowledge and technological and creative skills, contributes to producing new generations having potency to solve complex social and environmental issues (Yusnaeni et al. 2017). Such generations are predicted to be productive, innovative, flexible, and adaptive in overcoming the impacts of science and technology development.

Entrepreneurship is a key competence for growth, employment, and personal fulfilment in the modern world. Education systems can significantly contribute to successfully addressing the entrepreneurial challenge associated with the lack of professional workers in the business segment. In this regard, numerous university programs and courses aim to upgrade conditions for entrepreneurial activity among their students. Their mission is to develop and enhance students' skills to work in an entrepreneurial context (Saukkonen, 2017). Modern students should be able to think rationally and solve various challenging situations (Duda et al. 2019; Zainuddin et al. 2020). Therefore, the central task of higher education is to support the comprehensive development of students' creative thinking (Zainuddin et al. 2020).

In recent years, partly due to the recession and partly due to technological changes, the promotion of entrepreneurship has become among the priorities of countries' economic development. Entrepreneurship education stimulates the creation of business initiatives by developing students' creative thinking, delivers future business owners an understanding of entrepreneurship concepts, as well as trains and motivates them to engage in vocational training. We do not know of any academically precise, generally accepted definition of the difference between entrepreneurial and traditional business education. Business education has a longer history, which is why it is often referred to as a traditional discipline. The difference in these two types of educational disciplines manifests itself in different instructions, course content and, above all, in the careers towards which the graduates are oriented. It is believed that the Bachelor of Entrepreneurship is focused on finding and identifying entrepreneurial opportunities, starting your own business, or running a small and medium-sized business. A more traditional business education involves a more scientific approach to understanding the internal working conditions of large businesses to learn how it can better run and effectively drive change within a large business (Aparicio et al. 2019).

In today's changing business environment, education plays a significant role in the development of entrepreneurship. However, there is a need to carry out more research on the way of conducting entrepreneurship training. Entrepreneurship development attracts the attention of academics, policymakers and practitioners. The role of education vocational training in fostering entrepreneurship is gaining importance rapidly since educational institutions' initiatives to support the creation of new businesses are viewed as driving forces for economic growth, job creation, and innovation (Azanza et al. 2017).

Already a traditional approach to the training of entrepreneurs has become the use of problem-oriented learning (PBL), which allows you to immediately prepare a specialist to face risky situations and focus him on finding ambiguous and non-obvious solutions (Munawaroh, 2020; Wang et al. 2019). Self-search is one of the key competencies for an entrepreneur. No less traditional in business education and no less widely used is role-based training, which stimulates motivation, human relations and social competence of future entrepreneurs (Fellnhöfer, 2017). However, this type of training, with high emotionality, rarely allows the full use of the entire volume of economic data that requires comprehension in order to make decisions within the framework of solving a problem. In connection with solving problems, real-life cases are involved, which are often offered to teach or conduct individual training to specially invited experienced entrepreneurs or company representatives (Galvão et al. 2018; Henry & Lewis, 2018; Sopjani, 2019). The disadvantage of this form of vocational training is manifested in the fact that more often it takes place in the form of transferring information from an invited person, which excludes obtaining one's own experience. On the other hand, the use of computer economic modelling programs can be effective, but it excludes the peculiarities of the stress of human

communication, the flow of real business processes with their surprises or the unpredictable nature of the change of circumstances (Mavi et al. 2017).

The novelty and contribution of the research to the study of vocational training is determined by the students' assessment of an attempt to create a modeling environment based on the development of their own startup using role-based and modeling tools and problem-based learning based on real-life cases offered by experienced entrepreneurs. The difference between this method and others proposed in the literature lies in the creation of not only a digital modeling environment, and not exclusively role-based modeling of situations, but a complete sequence of startup development throughout the course with the inclusion of unpredictable human communication and intervention of little predictable factors, which brings modelling closer to real entrepreneurial experience. In this regard, this article intends to determine the role and influence of start-up projects viewed as a pedagogical tool aimed at strengthening and upgrading the professional competencies of students majoring in entrepreneurial studies. This goal can be achieved after the following tasks are fulfilled:

- i. conduct an online survey among entrepreneurs of the Russian Federation and Azerbaijan and determine the key competencies required for successful entrepreneurial activity in modern business conditions;
- ii. develop a “Start-up Projects - New Generation” concept aimed at improving entrepreneurial initiatives and test it in the context of educational programs of the Peoples’ Friendship University of Russia, Azerbaijan State University of Economics, Herzen State Pedagogical University of Russia, Tomsk State University of Control Systems and Radioelectronics, Moscow Aviation Institute, and Plekhanov Russian University of Economics;
- iii. characterize the main pedagogical models embedded in the concept;
- iv. identify the role of start-ups in strengthening and upgrading the professional competencies of entrepreneurship students based on self-assessment of their professional progress during training in the “Start-up Projects - New Generation” ecosystem;
- v. analyze the influence of start-up developing practices on the subjective quality of the educational process from the standpoint of students’ opinion;
- vi. define the conditions for assessing the relationship between opportunities for professional growth of students and the perceived quality of education;
- vii. assess the relationship between opportunities for professional growth and the perceived quality of learning from the point of view of female and male students.

2. Materials and Methods

2.1. Research Design Pedagogical Models of the “Start-Up Projects - New Generation” Concept

Problem-Based learning (PBL) is a learning model that provides students with the ability to acquire critical thinking skills and solve complex challenges by modelling real-world problems, the conceptual basis of which is relevant for the sphere of future professional activity. The PBL approach to teaching allows one to consolidate the theoretical knowledge gained in the learning process and then apply it in practice when generating solutions to problematic issues. In particular, the PBL process in its theory supports the development of critical thinking skills based on applied designs (Darhim et al. 2020). In the PBL, problems are used as the first step in collecting and integrating new knowledge. This learning model provides students with a deeper understanding of both theoretical and practical analysis of current issues. PBL focuses on presenting a problem (real-stimulus) to students, then asking them to solve it through research and a series of investigations based on the theory, concepts, and principles learned from different perspectives. The PBL curriculum consists of problems that have been carefully designed and chosen, requiring students to be proficient in critical thinking, problem-solving, self-directed strategic learning, and teamwork skills. The process replicates the systemic approach commonly applied to address the challenges a person faces during life and career (Munawaroh, 2020). The PBL model is a learning approach in which students work on authentic problems to develop their own knowledge as well as research and higher-level thinking skills.

Modelling, simulation, and role-playing are often referred to as effective pedagogical methods applied during PBL. Simulation in educational practice is regarded as a teaching method that reflects a real situation through a game, scenario, role play, and sociodrama carried out by imitating real-world phenomena through the interactional process to gain professional experience, consolidate knowledge and skills. Simulation is an active learning method that can improve the students’ involvement and give them a chance to participate in a real business environment through gaining professional analytical experience, namely, observing and reflecting process. Simulation of real situations in teaching entrepreneurship develops students’ interest in studying the discipline and promotes the use of knowledge in practice. Learning technique in simulation role-play is the active, innovative, and effective learning to achieve a specific educational goal, such as the application of theoretical knowledge to solving a real problem (Amri et al. 2020). Simulation-based learning is a very effective and interactive learning experience that allows one to visualize the real condition of socio-economic phenomena.

This novel technology is empowered to create an environment that enables cooperation and the application of available knowledge and skills to solve real business challenges.

Similar to PBL, creative responsibility-based learning (CRBL) is an innovative learning design that facilitates the development of students' scientific creativity skills that act as a connecting factor between scientific knowledge gained in solving real-life challenges. The mastery of scientific knowledge is a prerequisite for scientific research and the fulfilment of scientific creativity tasks. However, there is no significant correlation between students' scientific knowledge and scientific creativity in CRBL. This innovative learning practice is designed to teach students the responsibilities, science process skills, and scientific creativity; while scientific knowledge is only a nurturing effect of the learning environment with CRBL (Zainuddin et al. 2020).

The generation of economically valuable and fresh ideas is critical to the 21st-century economy (Tamrongkunan & Tanitteerapan, 2020). Apart from this, the ability to generate and apply novel and useful solutions to specific issues via transforming them into solutions that add value to society continues to be critical for many world economies' development (Sopjani, 2019). One way innovative ideas can positively impact society is through newly hatched business ventures known as start-ups. The geography of start-up activity and venture capital investment is experiencing rapid globalization, thereby delivering more interaction into communities in terms of exchanging ideas and developing solutions (Sopjani, 2019).

A start-up is regarded as a newly emerged business venture that aims to create a feasible business model to address the needs of society by building a virtuous cycle ensuring constant improvement through innovative solutions (Hanadi & Busler, 2017). Start-ups create models designed to enhance a country's welfare and performance based on critical determinants for driving change. Any start-up operates in an environment of utmost uncertainty, which, at the same time, has a potential for rapid growth and internationalization due to scalability (Saukkonen, 2017). A start-up is also defined as a community of people who have united to achieve an unusual goal with the help of extraordinary intellectual efforts and non-traditional corporate culture. It is often understood as a temporary organization designed to search for a repeatable and scalable business model (Blank & Dorf, 2020).

The start-up ecosystem includes a variety of actors and supporting organizations that collaborate in a specific geographic region to shape new businesses and give momentum to existing ones (Tripathi et al. 2019). Ecosystems of start-ups are important drivers of innovation, fostering technological development through collaborative networks of entrepreneurs, start-up builders, and investor groups. The relationships formed in these communities are crucial to provide access to resources that allow carrying out projects, creating innovative technologies, developing infrastructure, and organizing start-ups' funding and scaling (Mamede et al. 2018).

The start-up ecosystem is an environment for entrepreneurial experiments that provides a space for self-realization and opportunities to develop and implement unusual and risky ideas to satisfy existing market needs. The advancement, success, and survival of a start-up usually depend on the quality of its business model, team, and business strategy. A model is a tool for developing, testing, and implementing an entrepreneurial idea, a team is a small social group that creates a personal start-up experience, and a business strategy is a manifestation of purposeful actions of a start-up in a competitive environment (Slávik, 2019).

Similar to an innovation ecosystem where interaction with various stakeholders is performed to create a business, the primary goal of the designed university start-up ecosystem is to develop new start-ups as part of educational programs for training specialists in various sectors of the economy.

2.2 Research Design

The structure of the study is shown in Figure 1.

Stage 1 - Identification of Key Competencies Needed in the Business Environment

To become a successful entrepreneur, one needs to master a set of professional skills, abilities (Gonçalves & Rui, 2017), and be ready to combine available opportunities, experience, and resources (Sousa, 2018). In order to determine the key competencies necessary for successful entrepreneurship under the current business conditions, an online survey was conducted among entrepreneurs of Russia and Azerbaijan. The survey included 50 individuals whose activities are related to the provision and sale of services and commercial products. Participants entrepreneurs were selected by methods of random sampling with the participation of filters: 1) the presence of successful profitable activities over the past 5 years; 2) the absence of problems with the law and claims from tax and inspection government bodies; 3) own experience of entrepreneurship (the business was opened and from the very beginning was managed by this entrepreneur).

To define a list of competencies and skills, these 50 selected entrepreneurs were asked to define their list of competencies and skills in a free form. After obtaining the individual lists, they were brought together, semantically and syntactically analyzed and reformulated by the experimenters to obtain one common list. The general list of competencies and skills was again offered to 50 survey participants - entrepreneurs to agree on the wording. This reconciliation process was repeated over 4 iterations, until a list of competencies and skills was obtained, which was fully agreed by all respondents. At the next stage of the study, which will be described below, according to the results of a survey among students, the reliability of the resulting list was checked by the Cronbach Alpha method. Based on the questionnaire

results, the skills and abilities that are crucial and relevant to carry out entrepreneurial activities and able to impact the effectiveness and efficiency of business processes significantly were identified (Figure 2).

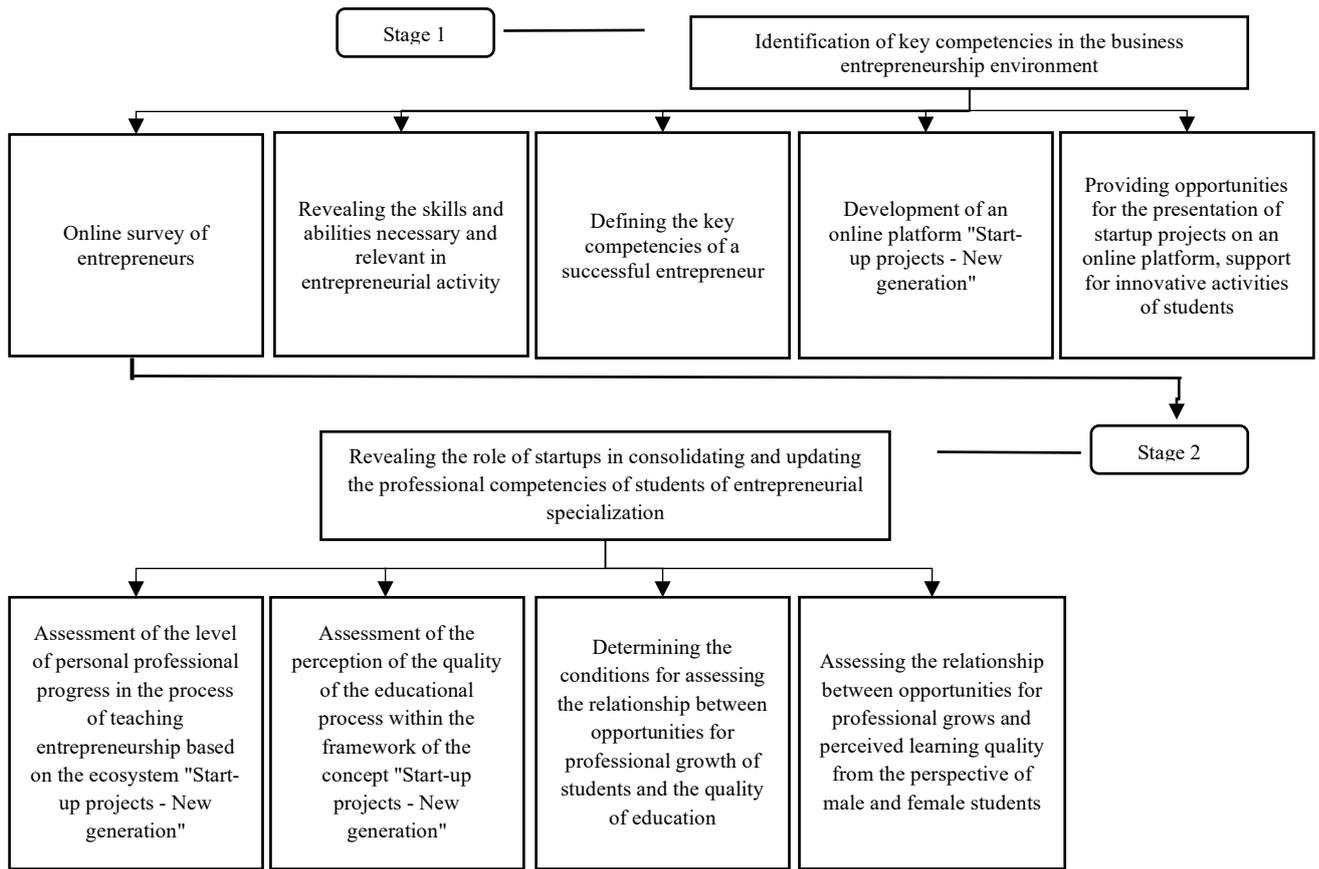


Fig. 1 - Structure of the study
*developed by the author

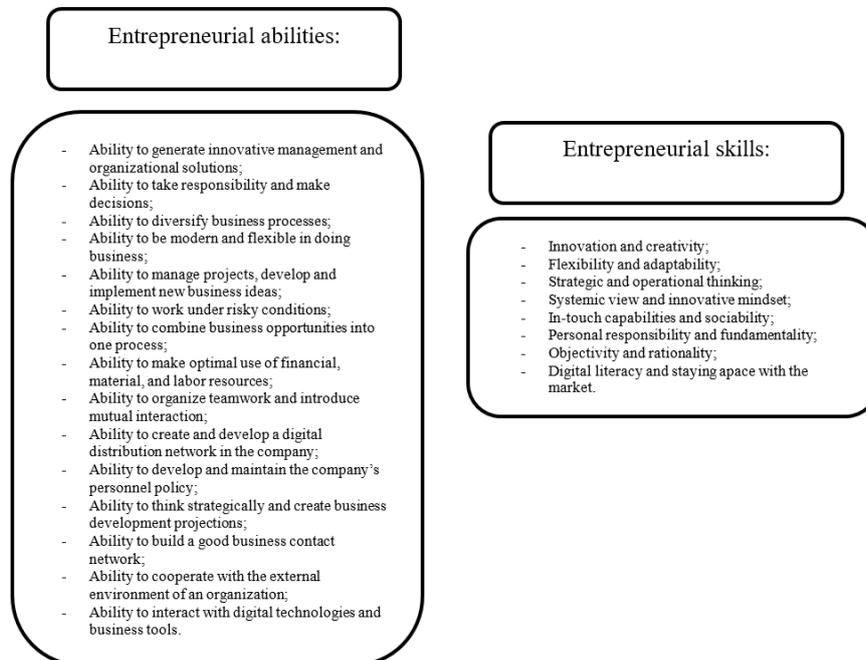


Fig. 2 - Key competencies of a successful entrepreneur
*developed by the author

To consolidate and update the professional competencies of individuals studying entrepreneurship, in universities enrolled in the experiment, the online platform “Start-up Projects - New Generation” was developed. It united innovative ideas and start-ups of students from the Peoples’ Friendship University of Russia, Azerbaijan State University of Economics, Herzen State Pedagogical University of Russia, Tomsk State University of Control Systems and Radioelectronics, Moscow Aviation Institute, and Plekhanov Russian University of Economics. Functionally, the developed startup ecosystem was aimed at:

- stimulating the formation of professional interest in entrepreneurship among students;
- generating innovative ideas and developing entrepreneurship skills in students;
- providing the necessary conditions for students to create and launch a viable business;
- increasing the speed of transformation of innovations and knowledge into new enterprises;
- providing opportunities for start-ups’ presentation, finding partners, investors, and interested parties;
- promoting cooperation and financial support for start-up projects’ development;
- providing information support to start-up enterprises and opportunities for scaling business processes;
- conducting joint training and offering mentorship programs to young entrepreneurs in the process of developing and introducing innovative products and services to national and international markets.

Various innovative learning models aimed at expanding scientific knowledge and experience of their practical application in real socio-economic processes are being introduced in modern higher education institutions’ training strategies. The “Start-up Projects - New Generation” concept of preparing future entrepreneurs was based on problem-based learning, creative responsibility-based learning, as well as modelling, simulation, and role-playing approaches. A practical incentive for students to acquire and consolidate professional competencies was the program for developing and promoting entrepreneurial start-ups based on the “Start-up Projects - New Generation” digital platform.

The practical entrepreneurship training in the “Start-up Projects - New Generation” ecosystem included teachers of specialized economic disciplines, psychology, negotiation techniques, students and visiting business specialists and real businessmen as participants in role cases. Business modelling programs, such as "Arena", were used to create changing business conditions in the process of solving real-life cases, modelling business growth and development processes, changing the introductory conditions of action in the markets, modelling a competitive environment. The ecosystem allowed all students’ projects to be saved in such a way that they could follow the stages of business development, solving real-life problems proposed by teachers and invited representatives of real business from their real experience. Thus, the effect of continuity and coherence in the perception of the entrepreneurship process was created. The individual elements of the implemented concept described below were implemented in the form of role-playing games, software and role-based simulations, discussions with representatives of real business and teachers.

Stage 2 - The Role of Start-Ups in Strengthening and Improving the Professional Competencies of Student Entrepreneurs.

The next stage of the educational experiment was to study the impact of developing and implementing start-ups on strengthening and improving the professional competencies of students majoring in entrepreneurship. At this research stage, the effectiveness of start-ups as pedagogical tools for raising a successful business elite was determined. In total, the study involved 395 individuals who took an active part in entrepreneurial initiatives aimed at creating and implementing start-ups “Start-up Projects - New Generation” (Table 1).

2.3 Participants

An experimental survey in the form of a survey was conducted with the participation of 395 students of all grades from 5 Russian students (Peoples’ Friendship University of Russia, Herzen State Pedagogical University of Russia, Tomsk State University of Control Systems and Radioelectronics, Moscow Aviation Institute, Plekhanov Russian University of Economics) and one Azerbaijani university (Azerbaijan State University of Economics). Students represent 7 different Entrepreneurship and Business Specialized Institutes and Departments of the named universities (Table 1).

Table 1 - Research participants

Number of respondents	Degree Level	Educational Program	Institute/Department	University
57	MA	International Project Management	Institute of World Economy and Business	Peoples’ Friendship University of Russia
71		International Business Management		
23	MA	Management	Department of Business and Management	Azerbaijan State University of Economics
18		Business Organization and Management		

Table 1 - Continue

Number of Respondents	Degree Level	Educational Program	Institute/Department	University
12		Economics and Management of Production and Services		
57	MA	International Project Management	Institute of World Economy and Business	Peoples' Friendship University of Russia
71		International Business Management		
23	MA	Management Business Organization and Management	Department of Business and Management	Azerbaijan State University of Economics
18		Economics and Management of Production and Services		
12				
19	MA	Management Personnel Management	Institute of Economics and Management	Herzen State Pedagogical University of Russia
28		Entrepreneurship in Education		
16				
14	MA	Innovation	Department of Innovation Management	Tomsk State University of Control Systems and Radioelectronics
18		Project Management (Management)	Department of Economics	Moscow Aviation Institute
26		Business Management (Management)		
13	MA	Corporate and Social Entrepreneurship (Economics)	Institute of Management and Social-economical Designing	Plekhanov Russian University of Economics
17		Technological Entrepreneurship and Blockchain Technologies (Economics)		
18		Digital Business Transformation (Economics)		
27		Digital Business (Business Informatics)	Institute of Digital Economics and Information Technologies	
18		Digital Economy Technologies (Business Informatics)		

**developed by the author*

The key competencies of a successful entrepreneur, identified as a result of a preliminary survey of business representatives, laid the foundation for students' educational progress self-assessment according to the Likert scale.

2.4 Instrument and Data Analysis

The analysis of the data obtained in the course of the survey was carried out on the basis of a study of the descriptive statistics of the study of self-esteem of students in accordance with a 4-point Likert scale for each individual competence or skill identified by the authors separately. The percentages of participants were determined for each individual assessment. The Cronbach Alpha test was used to determine the reliability and internal consistency of the assessment method used, as well as the reliability of students' self-assessment. Assessing by pre-test and post-test was difficult in this case due to the fact that the course involved the development of understanding and general skills that can hardly be

assessed by objective testing. Obtaining such an integral test is the goal of further research in this direction. The study of the results of the survey of Cronbach Alpha methods showed a high internal consistency of the characteristics describing the studied object ($\alpha = .821$). This result allows the descriptive statistics to be judged to be more representative.

2.5 Ethical issues

The survey was conducted based on the personal consent and anonymity of the study participants. No personal data of the participants were collected, analyzed or stored. The questionnaires were collected using specially created email addresses associated with each of the participants, but so that the study authors did not know which addresses belong to whom. The use of a special learning environment and the practical entrepreneurship training did not affect other elements of the student's curriculum or their assessment.

3. Results

Students assessed the level of their professional progress after the practical entrepreneurship training in the “Start-up Projects - New Generation” ecosystem according to four options: “Very Good”, “Good”, “Bad”, and “Very Bad” (Table 2).

Table 2 - Assessment of personal professional growth during entrepreneurship training within the “start-up projects - new generation” ecosystem

Competencies of a successful entrepreneur	N=395			
	Level (%)			
	Very bad	Bad	Good	Very good
<i>Entrepreneurial abilities:</i>				
Ability to generate innovative management and organizational solutions	-	-	33	67
Ability to take responsibility and make decisions	-	13	42	45
Ability to diversify business processes	-	23	45	32
Ability to be modern and flexible in doing business	-	-	25	75
Ability to manage projects, develop and implement new business ideas	-	-	21	79
Ability to work under risky conditions	-	15	69	16
Ability to combine business opportunities into one process	-	45	32	23
Ability to make optimal use of financial, material, and labor resources	-	23	67	10
Ability to organize teamwork and introduce mutual interaction	-	-	21	79
Ability to create and develop a digital distribution network in the company	-	17	59	24
Ability to develop and maintain the company's personnel policy	-	3	80	17
Ability to think strategically and create business development projections	-	-	89	11
Ability to build a good business contact network	-	-	36	64
Ability to cooperate with the external environment of an organization	-	-	79	21
Ability to interact with digital technologies and business tools	-	-	82	18
Average score	0	9.3	52	38.7
Standard deviation		2.12	4.55	4.99
<i>Entrepreneurial skills:</i>				
Innovation and creativity	-	-	18	82
Flexibility and adaptability	-	-	25	75
Strategic and operational thinking	-	-	10	90
Systemic view and innovative mindset	-	-	35	65
In-touch capabilities and sociability	-	-	10	90
Personal responsibility and fundamentality	-	-	40	60
Objectivity and rationality	-	-	32	68
Digital literacy and staying apace with the market	-	-	39	61
Average score	-	-	26.1	73.9
Standard deviation			1.64	1.64

**developed by the author*

The obtained survey results make it clear that practical experience in developing start-ups has a significant impact on students' progress in acquiring and consolidating entrepreneurial skills and abilities. Respondents enrolled demonstrated a fairly high level of confidence in personal skills and abilities. Working with projects developed the ability to generate innovative management and organizational solutions (67% - very good, 33% - good); manage projects and develop and implement new business ideas (79% - very good, 21% - good); make business contacts (64% - very good, 36% - good); organize teamwork and introduce mutual interaction (79% - very good, 21% - good); work under risky conditions (16% - very good, 69% - good); develop and maintain the company's personnel policy (17% - very good, 80% - good); think strategically and create business development projections (11% - very good, 89% - good); cooperate with the external environment of an organization (21% - very good, 79% good); and interact with digital technologies and business tools (18% very good, 82% good). On average, 52% of involved students had good entrepreneurial skills, 38.7% - very good, and 9.3% - poor.

Apart from this, study respondents highly evaluated the level of entrepreneurial skills acquired and strengthened in the course of developing start-ups, in particular, innovation and creativity (82%), flexibility and adaptability (75%), strategic and operational thinking (90%), systemic view and innovative mindset (65%), in-touch capabilities and sociability (90%), personal responsibility and fundamentality (60%), objectivity and rationality (68%), digital literacy and staying apace with the market (61%).

The next research stage was directed at studying the impact of start-up development practice on the subjective quality of the educational process. The corresponding investigation was performed from the students' standpoint (Table 3).

Table 3 - Subjective assessment of the educational process quality within the framework of the “start-up projects - new generation” concept

Evaluation criteria	<i>N=395</i>			
	<i>Level (%)</i>			
	Strongly disagree	Rather agree than disagree	Agree	Strongly agree
Working with start-up projects allowed bringing my business ideas into reality	-	6	25	69
Learning within the framework of start-up developments has actualized the need for constant professional growth and self-improvement	-	-	24	76
Start-up development consolidated the knowledge and skills acquired during university study	-	-	10	90
Introduction of practical tools for creating and developing my own business into educational practice increased my interest in acquiring professional knowledge	-	-	7	93
Start-up projects act as a useful tool when studying entrepreneurship	-	-	11	89
Personal start-up project development allowed revealing my potential as an entrepreneur and helped in identifying the strategic vectors of my future professional development	-	-	33	67
Development and promotion of a personal start-up project made it possible to put the acquired educational experience into practice	-	-	29	71
The use of the “Start-up Projects - New Generation” platform expanded the scope of my views on doing business and became an activator in generating new ideas for developing my own business in the future	-	-	10	90
The concept of partnership within the “Start-up Projects - New Generation” ecosystem defined my attitude to establishing business relationships and expanded the scope of my business contacts, strategically important for future professional activity	-	-	5	95
The introduction of the “Start-up Projects - New Generation” concept into educational practice and the provision of practical learning opportunities enhanced the quality of the educational product drastically, making it much more interesting and highly-demanded on the market	-	-	25	75

Table 3 - Continue

Evaluation criteria	N=395			
	Level (%)			
	Strongly disagree	Rather agree than disagree	Agree	Strongly agree
Ability to convert theoretical knowledge into practical value greatly influenced my involvement in training	-	-	6	94
Average score	-	0.5	16.8	82.6
Standard deviation		0.14	1.65	1.75

**developed by the author*

Given the results of the survey describing students' perception of the quality of the educational content, one can assert that the "Start-up Projects - New Generation" is an effective and innovative educational method in entrepreneurs' training that can notably influence the development of actual professional competencies. The work with start-up projects provided students with the opportunity to implement personal business ideas into reality (69%); made it possible to put the acquired educational experience into practice (71%); actualized the need for constant professional self-development and self-improvement (76%); consolidated knowledge and skills gained during university study (90%); increased the interest in accumulating professional knowledge (93%); enhanced respondents' involvement in training (94%); made it possible to reveal personal potential and identify strategic vectors of future professional development (67%); became an activator in the generation of new ideas for business development (90%); and expanded the scope of contacts strategically important for future professional activity (95%).

Consequently, the introduction of the "Start-up Projects - New Generation" ecosystem into educational practice and the ability to "turn knowledge into action" increase the quality of a comprehensive educational product, making it exciting and in-demand on the educational market. Hence, start-up projects in business education are given the title of effective learning methods.

After analyzing the results of assessing the subjective perception of the quality of the educational process within the framework of the concept of "Start-up projects - New generation", we determined the conditions for assessing the relationship between the opportunities for professional growth of students and the perceived quality of education (Figure 3).

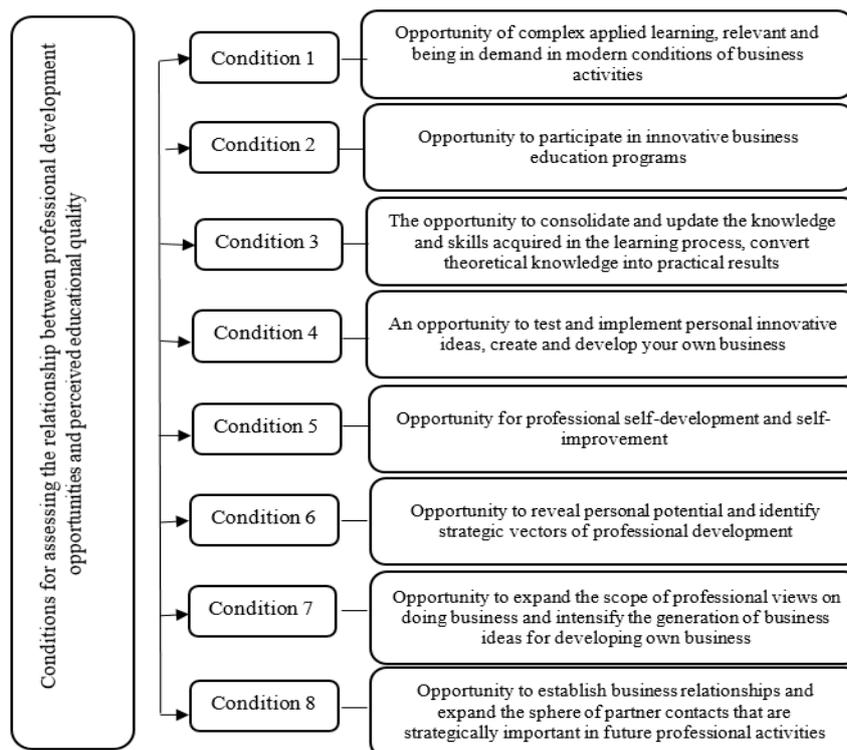


Fig. 3 - Conditions for assessing the relationship between professional grows opportunities and perceived educational quality

**developed by the author*

The participants in the educational experiment were asked to assess the degree to which conditions influence their personal perception of the quality of education. The evaluation results are shown in Figure. 4.

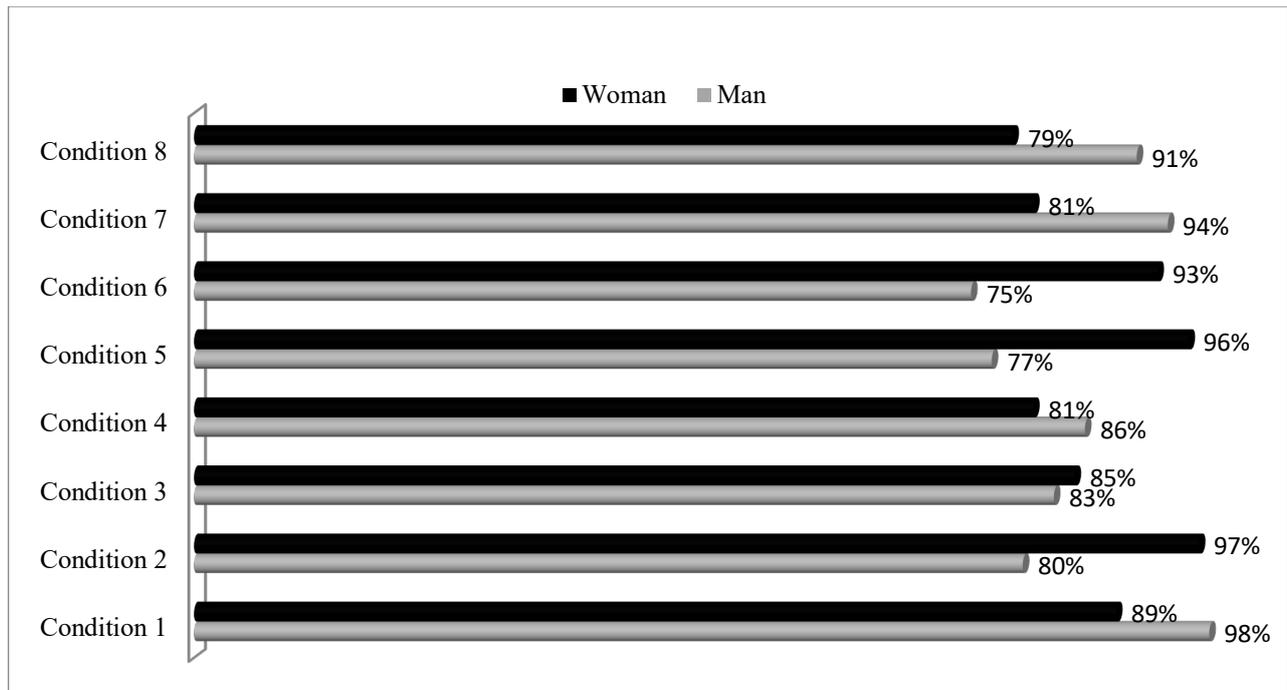


Fig. 4 - Relationship between opportunities for professional growth and perceived quality of learning (influence in %)

**developed by the author*

From the perspective of male students, the key conditions affecting their perceived learning quality are:

- Priority 1 - comprehensive applied training, relevant and in demand in modern business conditions;
- Priority 2 - expanding the scope of professional views on doing business and activating the generation of business ideas for developing their own business;
- Priority 3 - establishing business relations and expanding the sphere of partner contacts, strategically significant in future professional activities

From the perspective of female students, the key conditions affecting their perceived learning quality are:

- Priority 1 - training in innovative business education programs;
- Priority 2 - providing opportunities for professional self-development and self-improvement;
- Priority 3 - providing opportunities for unlocking personal potential and identifying strategic vectors of professional development.

4. Discussion

In order to maintain the relevance of educational programs for the modern generation of students and meet the market demand for a high-quality workforce, higher education institutions are to create an ecosystem of entrepreneurship, as well as revolutionize and develop sustainable and innovative solutions for various sectors of the economy. Existing educational strategies for training specialists in the field of entrepreneurship should include innovative practical activities aimed at projecting, developing, and supporting new business models, products, and services that satisfy the demands of society and are of value to the national economy.

It is generally acknowledged that the educational system of universities should provide an academic environment that can serve as a catalyst for start-ups. Although innovation ecosystems can emerge and grow organically, this process can also be promoted and then managed through conscious intervention. When ecosystem elements are present but cannot be combined, resources must be controlled by a strong player willing to take the lead. A university can serve as an ecosystem organizer that strategically applies its intellectual, reputational, and financial capital to create and support this ecosystem through interaction and leadership. Supporting the innovation ecosystem, developing new enterprises and external partnerships, when managed properly, can be fully consistent with cherished academic values, thereby strengthening the university's resource base. This is especially relevant for public universities experiencing a reduction in state financial support and thus have to be more innovative and entrepreneurial (Heaton et al. 2019).

One way to connect higher education institutions to the entrepreneurship ecosystem and provide real-world training to entrepreneurs is to run a shared facility incubator that offers a combination of training, mentoring, and infrastructure resources. Entrepreneurship learning and incubation (including mentoring) are key areas in which higher education establishments can directly contribute to new start-ups' quantity and quality.

Traditional methods of teaching entrepreneurship in universities mainly include less effective theoretical approaches in terms of motivating students to do business. This leads to the fact that such practices develop a passive attitude towards future professional activities rather than promote active participation. Experiential entrepreneurship teaching methods in universities that involve practical activities and active participation can be considered crucial for developing students' entrepreneurial interest in starting and developing a business. The introduction of experimental practical activities boosts the desire to be engaged in entrepreneurial activity even during university study (Olokundun et al. 2018). In such a manner, in India, there is a trend towards direct collaboration between teachers and students to create joint start-ups.

A study on the relationship between entrepreneurial education and entrepreneurial thinking conducted at several Indonesian universities in Malang showed that entrepreneurship education positively influences entrepreneurial self-efficacy, entrepreneurial attitude, and the entrepreneurial mindset. Whereas entrepreneurial self-efficacy promotes the development of an entrepreneurial attitude instead of an entrepreneurial mindset, entrepreneurial attitude plays a fundamental role in maintaining entrepreneurship education and self-efficacy towards students' entrepreneurial mindset (Wardana et al. 2020). In this study, the researcher assessed the relationship between the opportunities for professional growth of students in entrepreneurial specialities and the perceived quality of education. The results of the assessment demonstrated the positive impact of the conditions for gaining applied educational entrepreneurial experience on the perceived quality of education.

Intention as a starting point for self-employment and launching new businesses is critical when developing a start-up. Several Korean researchers have examined the effect of business start-up education on satisfaction with the training underwent and entrepreneurial intentions of restaurant founders who started their business after start-up courses. Scholars denote that entrepreneurial education has a notable positive influence on entrepreneurial intentions and beneficially affects overall satisfaction with the training taken (Hwang et al. 2017).

Entrepreneurship education should cover both theoretical aspects of entrepreneurship and the required business skills. Students must understand that being an entrepreneur requires a completely different attitude than being an employee. An entrepreneur must possess strategic and operational thinking and be able to design and implement innovative solutions to maintain the efficiency and growth of the company. Those wishing to become entrepreneurs must also understand the role of innovation for commercialisation and business efficiency increase.

5. Conclusions

The study defined the role of start-ups in strengthening and upgrading the professional competencies of students of vocational training programs. The results of surveying 395 students from Russia and Azerbaijan concerning their assessment of the educational training quality revealed that respondents' direct involvement in developing start-ups has a significant impact on progress in acquiring and consolidating entrepreneurial skills and abilities. What is more, students demonstrated a fairly high level of confidence in personal skills and abilities. The study uncovered that personal work with projects gives the required experience to generate innovative management and organizational solutions, manage entrepreneurial projects, develop and implement new business ideas, establish valuable contacts, coordinate teamwork, and work under risky conditions. Students with practical experience in developing start-ups remarked improvements in their ability to develop and maintain the company's personnel policy, think strategically and create business development projections, cooperate with the external environment of an organization, and interact with digital technologies and business tools. In addition to that, respondents highly assessed their vocational skills acquired and strengthened in the course of studying how to design and manage start-ups. The most well-developed skills appeared to be innovation and creativity, flexibility and adaptability, strategic and operational thinking, systemic view and innovative mindset, in-touch capabilities and sociability, personal responsibility and fundamentality, objectivity and rationality, as well as digital literacy and staying apace with the market.

Seeking to determine the influence of start-up developing practices on the subjective quality of the educational training process from the standpoint of students' opinion, the present study figured out the following. Practical experience with start-ups provided entrepreneurship students with an opportunity to implement personal business ideas into reality, bring the acquired educational experience into real practice, understand the need for continuous self-development and self-improvement, and consolidate knowledge and skills gained during university study. In general, the performed experimental vocational training raised students' interest in accumulating professional knowledge, enhanced overall respondents' involvement in the educational process, made it possible to reveal personal potential and identify strategic vectors of future professional development, initiated the generation of fresh ideas for business development, and expanded the scope of strategically important contacts. The research results may have implications in the creation of entrepreneurship training courses, with the aim of increasing student entrepreneurship motivation and enhancing their practical experience. Further research in this area should be aimed at studying the objectively assessed results of modelling the creation of a start-up as applied to the possible future practical activities of an entrepreneur.

5.1 Research Limitations

The scientific experiment aimed to examine the effectiveness of implementing business environment practical tools in entrepreneurial education from the perspective of students' perception and attitude. In this regard, the evaluation of progress in professional competencies' acquisition and consolidation is subjective as based on students' self-assessments. Considering this, an ultimate judgment on the feasibility of further introduction of start-ups in education and the expansion of the "Start-up Projects - New Generation" ecosystem cannot be provided. Nevertheless, this study identifies levers of influence on students' involvement in educational activities, the effective manipulation of which can significantly impact the quality of future specialists' training due to the synergy of educational and practical activities.

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