

The Personal-Centered Model of Development of the Small Enterprises in Universities for High-Tech Sector of the Russian Economy

Yury Anatolyevich Doroshenko

*Institute of Economics and Management,
Belgorod State Technological University named after V.G. Shukhov, Belgorod, Russia.
Orcid id: 0000-0003-4250-3186*

Andrey Ivanovich Shutenko

*Institute of Economics and Management
Belgorod State Technological University named after V.G. Shukhov Belgorod, Russia.
Orcid id: 0000-0002-8385-3660*

Elena Nikolaevna Shutenko

*Institute of Economics and Management
Belgorod State Technological University named after V.G. Shukhov, Belgorod, Russia.
Orcid id: 0000-0002-4499-2756*

Petr Ivanovich Ospishchev

*Institute of Economics and Management
Belgorod State Technological University named after V.G. Shukhov, Belgorod, Russia.
Orcid id: 0000-0002-9390-648X*

Abstract

The given article presents the psychological model for promotion of the small innovative enterprises established on university base. The authors reveal conditions of students' self-actualizing in work of these enterprises, such as: a personal immersion into high-tech activity, disclosing of abilities and internal potential, social integration into the scientific process and innovation activity. The personal-centered model combines two support contours of small innovation business in the university: internal and external. The first contour provides attributive signs of students' self-actualization, the second contour is built over it and includes the application principles of high-tech business, implementing this signs. Such approach of the solving the problems of small high-tech business in the university infrastructure allows a more adequately integrate scientific-innovational, commercial and educational components in the sphere of high technologies.

Keywords: small innovative enterprise, high-tech business, conditions of students' self-actualization, personal-centered model of small innovative business.

INTRODUCTION

In present time among the important factors of modernization of the Russian economy is the creation of a favorable

innovation climate conducive to the development of small innovative enterprises in the domestic higher school. This type of the enterprises being the organic instrument of combination of university scientific and educational infrastructure and innovation entrepreneurship has a number of unique features and benefits. One of the main advantages is the ability of the quick convert of the intellectual potential into results of the scientific and technological activity in the sphere of high technologies. At the same time, the viability of small innovative enterprises (SIE), created with the participation of university in the charter capital is determined by its ability to provide workplaces for students, to give them an opportunity to realize themselves as the future specialists, to get the practical experience of the innovative work in the high-tech sector.

On the specifics of its activities SIE engaged in the development and introduction of the high technologies and products, and become as the bridge between science and innovative industry. Small enterprises often assume the risk of the development of new products and technologies, the transformation of knowledge into goods [1].

Students' self-actualization as a recipe for success of SIE in university and high-tech business: The small innovative enterprises in universities are most important element not only of the modernization of the economy, but also of the practical training of the students. These enterprises form the

contemporary intellectual elite of the country; involve young students into business, playing a leading role in the introduction of university innovations in the sphere of high technologies.

The distinctive feature of the functioning of the innovative business is that its activity includes indispensable self-actualization of the employees. This feature is caused by the product of the activity of such kind of the enterprises, those innovations themselves [2]. It is well known, that in the humanitarian aspect the innovations are closely associated with the self-actualization, because the new ideas and know-how are born by the people and depends on their motivation, creativity and a wish to implement it [3]. Innovations in high-tech business are the inevitable derivative of the subject's activity who invests their skills, knowledge, experience and itself to the solving of the significant scientific, economic and industrial problem. The innovations and various high-tech products are impossible without the creative self-actualization because the work is transformed into the indifferent, routine, ordinary, the reproductive process of the reproduction of the ready samples and patterns of the activity.

On the social and psychological level, the successful SIE is a community of the creative employees, each of them takes part in the development of new ideas and products, develops itself as a professional and qualified specialist, realizing its own potential [4].

So, the willingness and the ability to complete, creative self-actualization of subjects of the activity are based on innovative activity, its psychological source and the internal driving force [5]. Thus, self-actualization of students as the potential and actual employees is one of the main values of the small innovative enterprises in university, requires the establishment and the maintenance of the appropriate conditions.

The reduction and ignoring of the value of students' self-actualization lead in a best variant to rejection of SIE from the university system, when it actually turns into a "foreign body" and is displayed outside university process. In the worst case, the departure from this value leads to a decline of the innovative activity due to the reduction of the innovative motivation and focusing of the employees into the creative and heuristic work. The acceptance of the value of students' self-actualization indicates to the high humanitarian standard of the activity of SIE, its viability as the self-perpetuating structure responding not only to the commercial interests, but also educational and personally significant aims [6].

Unfortunately, in practice of the SIE activity in the universities the commercial dominant is often approved when the main purpose is become getting of the profit and increasing of the staff salaries. In these cases, the work of SIE, as a rule, is reduced to the replicate and dissemination of the developed product or technology, but the heuristic and high-tech activity recede into the background, or wind down. As a

result, SIE is transformed in some commercial implant, which devalues the idea and purpose of the innovative activity of university. On the other hand, the role of the commercial component of SIE activity can't be underestimating, because it provides the measure of their success on the modern market of the high-tech developments. In this context, in each case, it is important to find a balance between of scientific, innovative and commercial components in the creating of the specific innovative enterprise in the initial stage of its activity [7]. At the same time the maintenance of this balance is connected with the value of self-actualization of the SIE employees as the basis of their creative and non-standard attitude to business.

Undoubtedly, the possibility of the self-actualization in the innovative activity of the SIE for the students as for the future professionals plays an important role in the development of the professionally valuable qualities and increases their competitiveness in the current labour-market. In that case, the SIE existing in the universities, greatly complete the professional training process, filling the existing gap between the scientific knowledge of students and the practical experience [8]. The graduates become not only carriers of knowledge, but also carriers of the innovative technologies, including in the field of high-tech business; become as authors or co-authors of the various know-how in the field of high technology, which significantly expands the range of their professional and career opportunities.

METHODOLOGY AND METHODS

The research design and methodological prerequisites: In our research we proceeded from the assumption that the process of involving students in innovative activities at the university must provide subjectively significant conditions for disclosing the essential forces of students, their intellectual and creative potential in innovative business projects in the sphere of high technologies. It is obvious that the modern university should promote student initiatives through attractive proposals for interesting and promising activities in the field of advanced technologies. Students' self-actualization process is largely depends on the university practice focus on the full-fledged personality development as the most important value and mission of the higher school [9]. At the psychological level the self-actualization need as the leading life intension in the student age is obliged by the birth to deeper and more generalized state expressed in the self-determination and self-identity tendency [10]. Considering the students' self-actualization process in the university education we assume that this process acts, on the one hand, as the main line of the Growth of future specialist personality successful development and self-determination, on the other hand, as the internal criterion of university training efficiency .

The object of the research carried out by us was the innovative-entrepreneurial environment of the higher school

as a sphere of student youth's self-actualization. The main *problem* of the research consisted in identifying stable conditions of students' self-actualization in small innovative enterprises established on university base and appraisal of these moments presence and completeness degree in modern youth's university life.

Methods, procedures and participants of the study: To achieve this task, we used the following groups of methods.

Theoretical methods: the categorical synthesis, complex theoretical analysis, methods of structural, functional, comparative analysis, methods of ordering and generalization.

Prognostic methods: modeling, scientific design.

The empirical methods: observation, method of expert evaluations, questionnaires, survey, interview, focus groups. This data was collected by questionnaire and expert interviews, examination of documents, free and standardized interviews, participant observation.

Methods of data processing: content analysis, thesaurus analysis. Methods of mathematical statistics: a comparative analysis of the data, reliability analysis of differences, correlation analysis.

As the primary methods of collecting statistical data, we used a complex questionnaire methods. To obtain objective information of quantitative character, we conducted a questionnaire survey of students of humanitarian and technological university of the city of Belgorod, taking into account gender, age, professional staff (N=220 respondents). The objectives of the questionnaire was to identify the professional expectations and attitudes of students, as well as a complete self-actualization opportunities at the university, studying the dominant meanings of work in a small business.

For the purpose of verification of the data and the formation of the relevant picture, we conducted an expert survey (N=60). As experts, we have attracted faculty and business professionals innovative structures.

Research approach: The specific of university SIE is their close conjunction with the scientific and research activity of universities and their industrial base and innovative infrastructure (a part of which they are) [11]. The more scientific and industrial potential of university, the more opportunities for the development of the SIE, and as for a personal level – more opportunities for the self-actualization of the teaching staff, researchers, graduate students and students.

The experts and the scientists note, that the success of the modern university in the conditions of an increasingly competition in the global market of the educational services is largely determined by the achievement of the lasting joining of the personal, scientific and entrepreneurial dimensions of the professional training [12], ensuring the unity of the educational, research and production spheres of the activity of

the modern university [13]. The creation of the SIE in universities is a practical way of the achievement of the unity of developments and innovations. At the same time the sphere of the scientific activity is the leading line of SIE activity, generating innovation. The involvement students in that sphere are crucial in its self-actualization as future highly qualified and competitive specialists. It is not a secret that the taste of the innovations and the primary experience of the self-discovery are founded just in the scientific work, in joining of the fundamental knowledge and generalized methods in cognitive and heuristic activity [14].

FINDINGS AND DISCUSSION

Attraction to scientific work as a source for students' readiness to high-tech activity in the university SIE: Analysis of long-term educational practice has shown that the successful development of the SIE in university requires of the activation of students' scientific and research activity, the development of the integral system of the different shapes, forms and methods of the work inside university covering the practice of students' training as the subjects of the scientific, exploring and heuristic activity [15]. At the same time it is necessary to have the personalization of the scientific activity, which should be provided by the following conditions:

- there are the developed research and experimental infrastructure, scientific schools and directions in university;
- the implementation of the researches by the teaching staff;
- the personal joining of students to professor-scientist as a scientific consultant and supervisor;
- the formation of the different students' scientific communities (academic and problem groups, laboratories, circles, sections, etc.);
- the realization of the special studies on mastering the methodology and practices of high-tech research;
- the actualization of the scientific and practical experimental work by the students as the free-lance laboratorian, assistants of the laboratories, design offices, departments, etc.;
- the realization of the regular student scientific conferences, round tables with participation of the leading scientists, specialists with the ability of publishing of students' works;
- the world-wide support (including financial component) of students' research initiatives and achievements, cultivating of the image of a successful student as a successful scientist.

The list of the conditions and different approaches of the familiarizing students for research work can be continued. Today, of course, there are own valuable experience and tradition of such work in every university of the country. It is important that this experience had a real practical way, so each student was able to develop its own personal solutions of

the scientific and practical problems.

The personal-focused construction of the scientific and research sphere in university as the space of students' self-actualization can serve as a nutritional basis and essential support of their work as a motivated and trained employees of the SIE.

The psychological conditions of students' self-actualization in the activity of the small innovative enterprises: It is not a secret that the traditional system of training in the higher school is not always and not at all can provide opportunities for the self-actualization of all students. The massive character of the preparation, the known harmonization and standardization of the forms and methods of work with students not allows to fully disclosing the abilities and talents of everyone, engage their personal potential [16]. Moreover, the ensuring of students by jobs for their practical training as the professionals does not enter in the problems of education [13]. Not all universities have the required capacity and production base for this work, especially in the humanitarian sphere.

Thus, the complete experience of the self-actualization is not formed among the students in the general practice training; they can realize themselves in learning and partly in science, but, as a rule, they have no the opportunity to realize themselves in the practical professional activity, which is removed from the current preparation and takes place already outside of the universities, after graduation.

The development of the SIE network in the universities allows solving both these and the other problems of modern training, joining and bringing together the different areas of students' self-actualization, combining them into a single plan of the innovative and practical work. It is important for these enterprises to be a confined continuation of the current training and research activity of students in university and become a real platform of approbation and testing of ideas, initiatives and scientific and practical research of the students.

In order to become a full member of university process and successfully generate innovations, the activity of the SIE should certainly promote and expand the opportunities of students' self-actualization in university preparation. Obviously, that the common, basic conditions of the ensuring of such self-actualization are exist, which should be considered and respected in the activity of universities' SIE [9].

At the present time there are more than 100 SIE are founded in Belgorod State Technological University named after V.G. Shukhov, among them there are the enterprises created with involving students to the charter capital. As a result of the analysis of the enterprises the following three main conditions of students' self-actualization was determined by the authors:

1) the personal immersion into the innovative process at SIE;

2) the disclosing of the personal capabilities in the innovative process at SIE;

3) social integration in the work process at SIE [11].

In figure 1. the content of the conditions of the self-actualization, which was established on the basis of the analysis of the opinion of students involved in research and innovation activity is reflected.

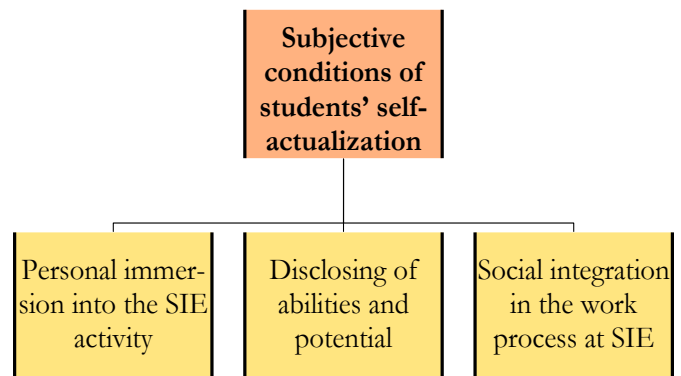


Figure 1. The psychological conditions of successful promotion of small innovative enterprises in University

The first condition – *the personal immersion* into high-tech activity in the process of university training – means the relation to the study, work in university as the main occupation in the current period of life. This condition is manifested as the interest and satisfaction of the training process in university by the students and in the work in the innovative enterprise, as recognition of the value of the chosen specialty, as the desire to get a new career and to achieve the success in the work, as well as their high psychological involvement into the research and innovative activity. This involvement of students into SIE working also connects with their desire to be like teachers and professionals in high-tech business, with a desire to get a new career and integrity express themselves in the educational, scientific and extracurricular spheres of activity [11].

The activity aspect of students' self-actualization, the degree of the intensity of their work, the interest of training, employment rate, and the whole level of the meaningfulness, subjective importance of educational, scientific and innovative activity are reflected in the content of the first condition.

The second condition – *disclosing of abilities and internal potential* – means the development of students' personal potential, their possibilities to self-knowledge and self-expression in the SIE activity, the realization of the capabilities and talents. For a complete students' self-actualization first of all it is necessary to have fullness disclosing of their personal qualities and resources, their understanding of themselves as successful and effective

subjects, the stimulating their efforts in education, research and innovative work, the understanding of the obvious usefulness of the training in university and the opportunities of a better self-knowledge and self-expression as a productive person [17].

This condition reflects the personal aspect of the students' self-actualization and presents a central condition of their professional, science and research motivation growth, because it's content consist of the plan of the internal characteristics of the self-development in the profession.

The third condition of the students' self-actualization – *social integration into the scientific process and innovation activity* – means the existence of the social attention to the student, the help of university and SIE in the solving not only of the educational, research, employment problems, but also the personal ones, the impression of community in a corporate environment, the existence of the atmosphere of trust, mutual rescue and support, the presence of the strong friendship, respect and others [9].

The social aspect of students' self-actualization in the activity of the SIE of university is reflected in the content of this condition. This aspect indicates the development of a variety social contacts and interactions of students as the subjects, not only teaching, research and innovative activity, but also social, creativity and cultural ones in general. For achievement of the self-actualization the young person needs to be integrated into the largest possible number of the social groups and communities of the different levels and orientation [5].

In general, taking into account these conditions in the SIE of the universities, enterprises will be allowed to be not only an integral part of the process of the preparation of the qualified specialists, but also greatly increase the motivational potential and attractiveness of the innovative practices in high-tech among the students.

The personal-centered model of the ensuring SIE's work in the university

As it was shown above, in addition to research, innovative, commercial and entrepreneurial components the formation of the activity of the SIE in university must have a clear personal addressing and imperative basis, reflecting the substantial signs of students' self-actualization. The analyze of the experience of the practical implementation and operation of the innovative enterprises established with the participation of university, has allowed us to identify a number of important steps of their personal orientation in a descriptive model (Fig. 2).

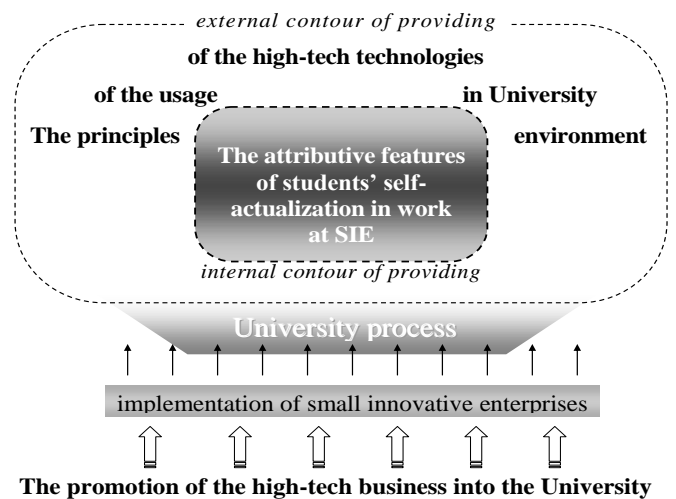


Figure 2. Design and psychological logic of modeling of small enterprises development in universities

This model includes two main humanitarian levels of the work of the SIE – subjective and normative. The first level is the central part of the model, reflecting the attributive signs of students' self-actualization and means the starting, **internal contour** of the conditions of their successful involvement into practical science and innovative activity in high-tech. The second level is built above the first, and it is the **external contour** of the model, introducing a set of the principles of the introduction of scientific and innovative technologies, aimed to students' self-actualization in high-tech business.

Below we briefly describe each of these contours that make up this model.

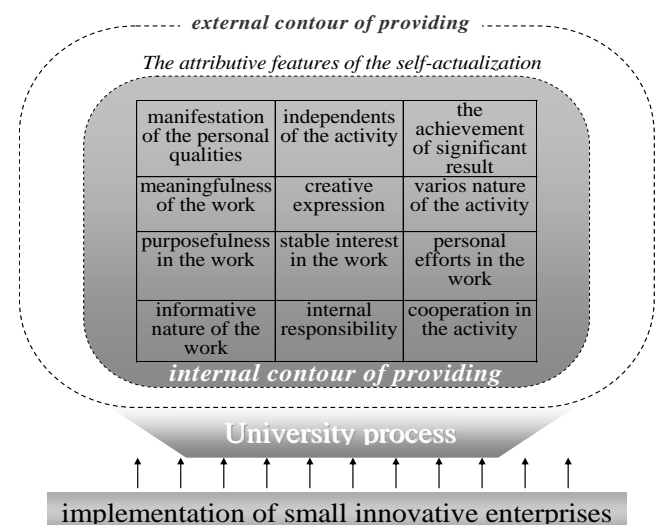


Figure 3. The internal contour of personal-centered model of small innovative enterprises implementation in universities

In the internal contour the phenomenon of students' self-actualization in the activity of the SIE concretized and

operationalized by means of its *attribute characteristics* that collected and summarized by us in the research [11]. The most important among them:

- the manifestation of the personal qualities, the ability to express themselves, discovering of their strong sides;
- the self-employed, the self-leadership and reliance on the internal capacity;
- the achievement of the subjective significant results in the activity, the desire and ability to be successful;
- the informative nature of the work, objectivity and specificity of the activity, the direction to the significant things;
- the meaningfulness of the work, the implementation of the semantic relations in the activity, the conscious approach to business;
- the creative element in the work, the possibility of the experimentation, the discovery of new knowledge, ways of knowing and activity;
- the various nature of the activity, flexibility and diversification of the innovative forms and methods of the scientific and the research work;
- the internal responsibility, the knowledge of the authorship and immersion in the business, the possibility of designing of the content of the work process;
- the purposefulness in the work, having the aim in life and the achievement of it by the training in university, scientific and innovative work;
- the stable interest in the work, the personal interest in the work, the desire to learn, to open and to make more;
- the personal efforts in the work, the willingness to overcome of the difficulties and the consequences of the work;
- the cooperation in the activity, the dialogical nature of communication, the pursuit of harmony and trust, the communication culture.

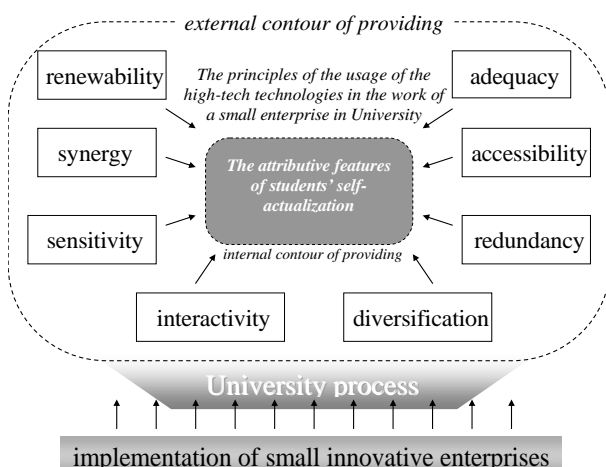


Figure 4. The external contour of personal-centered model of small innovative enterprises implementation in universities

The external contour of the represented model directly takes into account the above signs of students' self-actualization, reflecting the relevant requirements of the application for high-tech business. The quintessence of these requirements is reflected in the following *organizational principles*.

The principle of the adequacy supposes the matching of the innovative high technologies of the small business activity to the tasks and the content of students' professional training, their individual requirements, features and abilities, the level of the preparedness, the scientific specialization and others.

The principle of the accessibility provides an opportunity of the inclusion of each student into the process of unfettered access, high-tech activity, circulation and usage of the scientific, innovative resources and technologies in higher educational, scientific and industrial cluster, suggests of the usefulness of students' providing by the necessary volume of scientific, professional information and others.

The principle of the redundancy of the innovative high technologies means the optimality of their actions in the framework of the ensuring of the current needs of the students. The information, technologies and the innovative work methods, provided to students, shouldn't be confused and be overloaded them, but should to expand the range of their capabilities and help in the solution of the problems which they are interested in.

The principle of the diversification means the usage of the various types and forms of the scientific and innovative technologies (informational, communicative, electronic, multimedia, interactive, networked, virtual, etc.) as the components of the integral complex of stimulation and support of the innovative activity.

The principle of the interactivity means the possibility of the active interaction of students with the expert, scientific, referential community, the possibility of the mutual students' communication in the work of a small enterprise.

The principle of the sensitivity means that high technologies in the activity of small enterprises should take into account the requests and needs of students, corresponds to their current tasks of the development in the process of preparation.

The principle of the synergy of the high technologies requires their directly disposition on the educational system of university to the strengthening of the culture to prepare specialists. The high technologies should not be only interfaced with the terms and content of training, but also strengthen it, give a creative, active and substantive character to it.

The principle of the renewability of the high technologies assumes their regular review, correction, addition, renovation in the work of small enterprise in university. In terms of the increasing flow of new knowledge, know-how, discoveries and others the timely reflection and consideration of these changes in the sphere of scientific and technical activity is necessary.

CONCLUSION

In general, the development of a high-tech economy largely depends on the success of the work of small innovative enterprises in universities, in which the opportunities and conditions for student self-actualization are created, and first of all, the opportunity to make a personal contribution to scientific and practical work in the field of high technologies. The psychological conditions of students' self-actualization outlined in this article, can be considered as the components of the humanitarian activity of small enterprises, stimulating personal immersion of students into the high-tech activity, realization of their abilities and potential, social integration into the scientific-innovative process. The presented model of development of the small enterprises to activate of the attributive signs of students' self-actualization by the observance of the certain principles of the usage of the modern technologies of the innovative entrepreneurship in university, that allows to develop an educational space as an integrated environment of professional and personal formation of students in the sphere of high-tech business.

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