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**STUDY OF THE DEVELOPMENT OF THE VOLGA STATE UNIVERSITY OF
TECHNOLOGY (VSUT) AS AN ENTREPRENEURIAL UNIVERSITY TO
ESTABLISH THE REGIONAL ECONOMY AND ENGINEERING PERSONNEL
TRAINING**

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Abstract: *The paper deals with the issue of the condition and evaluation of the work of the Volga State University of Technology as an entrepreneurial institution and its contribution into the development of the region's economy. The basic entrepreneurial infrastructure objects development points and established by the University innovative enterprises are suggested. The preview of the engineering education to enhance the economic potential of the region and the country is given. The main problems of the engineer training, modern challenges to engineering education, entrepreneurial thinking and innovation activity and their tools development are considered. The appropriate recommendations to improve engineering education and to develop innovative business based on the university developments are given.*

Keywords: *university, business, economy, engineer, training.*

INTRODUCTION

Recently, there have been seen growing requirements both to the Russian universities and those in the foreign countries. These challenges resulted in the necessity to drift from budgetary funding (to eliminate the financial burden on the budgets, to make the universities be focused on earning money). This is one aspect to be connected with funds. The second aspect is still drawing would-be engineers, the university graduates to the real sector of economy, primarily to the industrial production, i.e. to train specialists for the corresponding area and to provide them with the opportunity to set up their own business when they graduate. In fact, it is project-based learning, which requires the development of the teaching staff's new competencies. Lately, we have been talking a lot about the knowledge-based economy to be the basis to create a new environment for business development and domestic production.

Therefore, the problem of transforming the universities into the innovative institutions, entrepreneurial universities, establishments being centers of economic development of the regions is becoming more and more urgent. The university administration should cooperate closely with the industrial sectors /1/ and set up their own infrastructure to meet these challenges /2/.

ANALYSIS OF THE UNIVERSITY ACTIVITY IN THE CONDITIONS OF THE MARKET ECONOMY DEVELOPMENT.

Burton R. Clark /3/ was the first to consider the theme of an entrepreneurial university. He proposed to evaluate the universities' activities in terms of an entrepreneurial activity. This conception has been hold on for the last decades by our university. The main tasks were the dynamic creation of the novel technological solutions and their introduction into the real sector of economy. Another problem was to earn funds. So, over the last 10 years, more than 60 new models of engineering and technology have been developed. As a result, the University was granted with public funds of over 1 billion rubles and private capital investment of 800 million rubles. This allowed us, first of all, to redo the scientists' thinking towards wider interaction with the customers, the consumers of the scientific products. The system was created starting from the student to the teacher to form the entrepreneurial thinking and the awareness of the importance of the

university's developments commercialization. This trend was also supported by the federal programs. So, due to the programs of the Innovation Support Foundation, the process of entrepreneurial thinking among the students was actively influenced by the youth program "UMNIK". Over 300 students received funds in the amount of 500 thousand rubles for each project /4/. The projects developed looked completed designs and were recommended for the introduction into the production sphere. The University began to establish its own innovative enterprises with its own participatory interest. The small-scale innovative enterprises established in this way allow us to create jobs for the University graduates. It should be emphasized that the strategic goal of the University is not only training engineers, but also the creation of business to be integrated into the overall economic system of the region. In recent years, these economic entities have produced the output of over 400 million rubles.

Today the University is a donor of the budget of the Republic of Mari El, primarily in terms of tax payments.

Thus wise, annually the University's revenues flowing to the local and the republican budget amount to 5 – 10% (about 300 million rubles). The analysis of the entrepreneurial activity suggests that the share of funds in the structure of the University's income generated from the scientific research is 20% and the task is to increase this figure to 50% over the coming years.

All this is facilitated by the development of the innovative infrastructure and the competency growth of the stakeholders. The university's innovative infrastructure includes over 20 items /5/. Some of them, such as the engineering center for automated machine building, the student design office, the shared knowledge centre provide higher university's profit element and labor productivity than the average in the region. The University, in fact, has become the centre of innovative and technological development of the Republic of Mari El.

The establishment of modern research laboratories by the institutes and institutions of the Russian Academy of Sciences influenced the quality of the scientific developments to have become the main product enhancing the entrepreneurial activity. There are 8 such laboratories.

At the same time, it is necessary to note the shortcomings, both in the quality of engineer training of the students of the University and in teachers' competencies growth within the strategic objectives of the entrepreneurial university. The main disadvantages of the graduates of the University are: extremely low efficiency and productivity of engineering work among graduates, the lack of knowledge, skills and experience of using high-performance integrated computer network design tools (CALS-technology); poor awareness of business processes and the features of the Russian business environment in general; the lack of business communication, negotiation, presentation skills. Young professionals lack the knowledge of laws and methods of creative solutions to engineering problems; motivation; focus on the professional development and career growth. Both the University and its teaching staff face threats related to the lack of aligned connections of the "Triple Spiral" (power - business - science); the lack of market trends understanding; the lack of a venture and a startup market in Russia; a small number of high-level scientific research; low level of entrepreneurial competency among the graduates.

IMPROVEMENT OF THE ACADEMIC PROCESS AND TRAINING OF SPECIALISTS (ENGINEERS) WITH DEVELOPED ENTREPRENEURIAL THINKING.

According to the recommendation of the Association of Engineering Education of Russia, to form the professional and personal competencies it is important to apply new tools /6/:

- use of the competency-based approach to develop and implement engineering study programs: the development of engineering study programs based on the professional standards; making the list of required competencies for bachelor, specialist and master-degree students; carrying out the real projects while training; inclusion in the curricula practical industrial and technological training at modern enterprises.

- use of practice and project-focused training technologies, the formation of new and exclusive competencies: the block-modular principle of the educational process; problem-solving and project-based training; formation of new and exclusive competencies. The implementation of practice-focused training allows us to form competencies to be in demand in the labor market: the ability to think critically, systematically and constructively (analysis); the ability to see contradictions, to identify and formulate problems, to justify their relevance; the ability to choose and clearly articulate the purpose of the work and the methods (tools) to achieve it (synthesis); the ability to evaluate the resources required to achieve the goal; to evaluate the social consequences of the work outcomes; the ability to plan the attainment of the project goal; the ability to work in a team and to have good communication skills and abilities.
- use of the potential of the industry to train engineers: establishment of basic departments at the enterprises to train engineers and master degree students in the field of engineering and technology ; use of the material base of the advanced industrial enterprises; bringing highly-qualified experts from the manufacturing sector to train engineers; organizing systematic internships of the university teachers at the advanced industrial enterprises; use of the potential of the advanced industrial enterprises for carrying out joint research and on-the-job training;
- -training specialists taking into account their abilities and inclinations: development of a methodology and systems to test the students' abilities and inclinations; arrangement of top-quality technical training; development and implementation of steering documents of the classroom disciplines with in-depth content in the field of engineering and technology (research, construction, TRIZ, technology, engineering entrepreneurship, etc.).
- training teamwork: development of a methodology and educational technologies to develop abilities to work in a team (brain storms, workshops, etc.); setting up interdisciplinary teams for real projects and research; training virtual team work.
- -management training: training of the new generation of university administrators; improvement of entrepreneurship study programs; development and implementation of study programs in engineering business; training a system approach, strategies and tactics in project and enterprise management.

Implementation of practice and project-focused study programs will result in: training specialists and implementing real innovative projects that ensure sustainable development and competitiveness of the economy of the regions and the country; the transformation of universities into the centers of innovative, technological and social development of the regions and the country /7/.

The key recommendations for the universities are as follows:

- to carry out expeditiously an independent, systematic analysis of the state of engineering, engineering education in Russia and the level of competency of Russian engineers
- to find out the systemic objective causes of problems in domestic engineering;
- to develop and implement the Comprehensive Program for Engineering and Technical Education Modernization;
- to start systematic activities to improve the legal and regulatory framework for engineering and engineering education in Russia and to ensure the implementation of this framework;
- to take systematic measures to enhance technological susceptibility and to reduce the innovative resistance of the society and the authorities;
- to adopt the program aimed at improving the prestige of the engineering profession;
- to establish by the universities' initiative the federal, regional and sectoral systems to forecast demand for engineering personnel and to develop the appropriate forecasts;

- to develop the system of legal and economic incentives to attract business to finance professional training and to participate in the training of engineering personnel;
- to promote the creation of temporary creative teams at the universities, academic institutions, engineering firms and manufacturing companies implementing the scheme "From the idea to the sales of products";
- to develop and implement the system of incentive measures for teams creating the domestic engineering products which are competitive on the world markets;
- to curb the level of bureaucratization of teaching, scientific and engineering activities.

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