



*Asesorías y Tutorías para la Investigación Científica en la Educación Puig-Salabarría S.C.  
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RFC: ATI120618V12

**Revista Dilemas Contemporáneos: Educación, Política y Valores.**

<http://www.dilemascontemporaneoseduccionpoliticayvalores.com/>

**Año: VII**

**Número: Edición Especial**

**Artículo no.:29**

**Período: Octubre, 2019.**

**TÍTULO:** Potencial de una universidad regional en la formación de estudiantes universitarios de ingeniería energética.

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**RESUMEN:** La experiencia del Instituto Yelabuga de la Universidad Federal de Kazan (Volga), Institución Regional de Educación Superior, se presenta en el artículo, así como los grupos de investigación, producción y educación de los docentes. Se eligen métodos de investigación como la generalización de mejores prácticas, observación de la actividad estudiantil, análisis de literatura científica, educativa, metódica, periódica, de recursos de Internet, de planes de estudio y programas de trabajo, la organización de experimentos y trabajos de laboratorio, y la implementación de proyectos de investigación en el campo del poder, el desarrollo y la transferencia de tecnologías. Los investigadores nacionales y extranjeros en el campo del poder y las capacitaciones profundizan en ideas sobre el perfil del poder durante su capacitación en EI K (V) FU y Alabuga SEZ, trabajar con jóvenes, estudiantes extranjeros y niños excepcionales.

**PALABRAS CLAVES:** Institución regional de educación superior, Alabuga SEZ, transferencia de tecnologías.

**TITLE:** Potential of a Regional University in training the Power Engineering Undergraduates.

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**ABSTRACT:** Experience of the Yelabuga institute of the Kazan (Volga) Federal University of Regional Higher Education Institution is presented in the article as well as teacher's research, production, and educational clusters. As research methods are chosen: generalization of the best practices, observation of student activity, the analysis of scientific, educational and methodical, periodic literature, Internet resources, curricula, working programs, the organization of experiments and laboratory works, implementation of research projects in the field of power, development and a transfer of technologies. Domestic and foreign researchers in the field of power, trainings, will be able to make deeper ideas on power profile during their training in EI K(V)FU and Alabuga SEZ, work with youth, foreign students, and exceptional children.

**KEY WORDS:** Regional Higher Education Institution, Alabuga SEZ, Transfer of Technologies.

**INTRODUCTION.**

At all times, Russia was strong and the regions were rich of natural subsoil, languages, cultures, and traditions of the people living in territories; one of them - Tatarstan, numbering more than 3 million people, including children, pupils, students of the cities and rural areas, toilers of social and economic, educational clusters.

By domestic, foreign scientists, it is noticed that through education, system of training, it is possible to operate reserves of society, to organize transfer (transfer) of technologies from science, educations to the sphere of production and back that, improves economic, and social life of society (Canning, 2015; Organisation for Economic Co-operation and Development, 2011; Europe, 2009).

The important place in this process is at federal, regional higher education institutions, where reserves of further wellbeing of Russia are covered, play her subjects, and their activities improve a situation in science, education, the industry, agriculture, and power.

Unfortunately, the phenomenon "regional higher education institution", training bachelors - power engineering specialists is poorly studied by domestic, foreign researchers. It represents a certain gap in knowledge concerning high school system, as professional activity of teachers, experience of preparation, retraining personnel, and other directions of development of society. It is important to track dynamics of changes of work of the regional higher education institutions which are part of federal universities, in particular, the Yelabuga Institute, as a part of the Kazan (Volga) Federal University [EI K(V)FU], considering the historical, and technological experience.

### **Materials and methods.**

K(V)FU, in the past - the Kazan State University (KSU) was founded in 1804 under the imperial Decree of Alexander I. It was the third largest higher education institution of the Russian Empire, after St. Petersburg (1725) and the Moscow (1755) universities. This status of KGU remained throughout all existence of the USSR, the contemporary history of development in Russia of the end of XX - the first decade of the 21st century.

Everything changed in 2011-2012, especially, since September 1, 2013 when, according to the new Law "About Education in the Russian Federation" KGU acquired the additional rights in the organization of research work, training. Having become K(V)FU, with its research institutes in Kazan, he acquired the right for inclusion in the structure of profile higher education institutions; for example, the Kazan state pedagogical university (the former KGPU), nowadays Institute of Psychology and Pedagogics of KFU, the KFU Inzhiringovy Center of Naberezhnye Chelny, the Yelabuga Institute of KFU (EI KFU), some other institutions became them. It enriched its influence on society, the education system of all country and its regions.

Of course, at the time of reforming the regional higher education institutions which entered K(V)FU, in particular, of EI KFU showed quite good results of the work, of which accumulation of empirical, research experience, introduction of innovative educational technologies was main.

Nowadays, the development strategy with introductions of innovations of EI KFU, is realized in "road map". Its essence - further training students - bachelors, masters in work with pupils of different age, professional development of mentors of youth, expansion of opportunities of KFU in global competitiveness.

It is in Psychology and Pedagogy the transfer of technologies referring social experience, realization of techniques of training, education of younger generation, and training for work in educational institutions of various type. This social order of society in work of regional higher education institution, naturally, affects specifics of scientific interests of teachers, and students; for example, this designing of diagnostic units on the basis of toys of domestic, foreign production (Samedov et al., 2015), the organization of subject training specialists of an education system, technology of teaching physical and mathematical and power disciplines (Shurygin & Krasnova, 2016; Ljubimova et al., 2015; Yulmetyev et al., 1995), the organization of work with exceptional children (Merzon et al., 2013; Merzon et al., 2014) and many other things.

For the Faculty of Mathematics and Natural Sciences, it is conceived the teaching of Physics, Mathematics, and the Information Technologies, power necessary for working with students and teachers of educational institutions and average professional education (Shurygin & Krasnova, 2016; Ljubimova et al., 2015; Yulmetyev et al., 1995).

The analysis of work of EI KFU will not be correct if in brief, not to address work of his main cofounder - K(V)FU. It is caused by many factors, main of which consists the perspective, the directions are implemented in the activity of federal university financed by the government of Russia and the Republic of Tatarstan in the beginning.

According to the Charter, K(V)FU includes a number of research, technical and teacher training colleges, versatile departments, and 150 scientific laboratories located in Tatarstan where more than 3 thousand academic employees work. The K(V)FU center – Kazan, includes 17 institutes and the higher schools, 3 independent faculties, 1 all-university department of physical training and sport, 2 specialized lyceums successfully working (IT - KFU lyceum boarding school and lyceum of N. I. Lobachevsky) for gifted school students, the Volga training center, professional retraining educators, and other divisions.

The substantial component of scientific and educational, social, technological programs of training, the K(V)FU innovative transformations is the domestic methodology reflecting the best achievements of the academic science, domestic, foreign scientists about formation of the creative, spontaneous person of the person, the market relations in Russia. Such algorithm of work is in details stated in "road map" of K(V)FU, all divisions covering the influence of various categories of citizens of Russia, a number of foreign countries, establishment and enterprise.

It is characteristic that conditions of their realization in Tatarstan constantly improve. They include system of institutions "a children's garden school - higher education institution - SPO" and the sphere of production where more than 50 industrial platforms, 14 resource centers, IT parks, the Alabuga SEZ work, regional business - incubators and other structures.

Nowadays, activity of K(V)FU covers all Volga and Kama region, exerting impact on training specialists of the Crimean peninsula, the Middle East, the republics of Central Asia, and China; other countries investigates their cultural, research and production, humanitarian, and technological activity that is reflected by "The strategy of social and economic development of Tatarstan till 2030".

**Results and discussions.**

These tendencies in activity of regional higher education institution and Transfer of Technologies, in particular of EI KFU, are especially noticeable. For more than 65 summer work in the region, our higher education institution (in the past, teacher's college about 1953 pedagogical university since 1993) accumulated vast experience of work with students, teachers of additional, professional education.

Now, in EI KFU, 7 faculties, 20 departments, 20 scientific training centers, and laboratories are created, the reading room, scientific library, the assembly hall, tens of educational offices equipped with modern appliances, 3 hostels, 6 modern sporting venues, and the year-round sports Petrel camp function.

For the organization of teaching and educational work with students of a day, in correspondence course (number more than 4200 people), more than 200 teachers from whom 70% have academic degrees of candidates, doctors of science are engaged, and cooperation with 12 foreign higher education institutions is organized (Merzon et al., 2014).

Teachers of the Faculty of Mathematics and Natural Sciences, Engineering and Technology, the departments of Physics, the general engineering training, mathematicians and applied informatics, some other are engaged in training power engineering specialists, technologists. In Kazan, the training of specialists is implemented according to the concept of the distributed training teachers with the center at Institute of Psychology and Education; in EI KFU, it is conducted according to the classical scheme. Its essence - realization of socially oriented, research, creative character in work with youth, and technical contents, there are natural, scientific, humanitarian and practical components, it is systematically updated.

Nowadays, it is combined with the formation of profile competences, knowledge, abilities, and skills of students of pedagogical, production area, acquisition of experience in the research, social and economic sphere, and close interaction with domestic experts, and other countries that allow ego-tripping to university education of Tatarstan in Russia and the world, to develop high technologies.

Moreover, questions of teaching technical, humanitarian disciplines in EI KFU closely intervene, repeatedly amplify. It is reflected, for example, when teaching national history, philosophy, professional pedagogics, psychology, Russian, foreign languages with objects of a physical and mathematical, power cycle in higher education institution, activity of student's associations. It includes:

1. Activation of work with domestic, foreign students with whom various teachers are involved of faculties, departments, laboratories, gifted youth, additional classes on Russian Tatar, and to foreign languages, scientific, technical disciplines are conducted; for example, organizing with students various types of occupations (lectures, seminars, practical works) at Faculty of Mathematics and Natural Sciences, involving them in systematic carrying out of research projects, laboratory works, participation in scientific conferences, carrying out pedagogical research.

Here, such subject matters are covered as: "Electric systems and networks", "Installation, adjustment of electric equipment of the enterprises and civil constructions", "Energy saving of systems of power supply and power consumption", and "Computer and information technologies".

A variety of student activity is implemented at the individual level, under the leadership of teachers, taking into account scientific interests, age, sex, social status and inquiries of the region that introduces the amendments at the organization of educational process.

2. Change of work with exceptional children, school students, and students and their mentors in several educational and scientific laboratories; in particular, on computer, and mathematical modeling all the year, as well as the work of "Children's university", "Summer physical and mathematical school", the Intelieto camp and many other things are organized (Merzon et al., 2014).
3. Orientation to creative development of the identity of the graduate where depth of knowledge, the practice-focused, technological experience have special importance. Here, individual (contact) work is combined with group, collective forms, covering teaching and educational process, and activity of student's community; it is shown when involving all the fellow students in research, social and pedagogical, productive and economic, art and creative activities. From now on, all students, foreign citizens in EI KFU are active participants and organizers in various national competitions, sports competitions, etc.

For this reason, future engineering, bachelors, and specialists, take active part in the international examinations in various educational disciplines, international subject Olympic Games, sports competitions, amateur performances, competitions of professional skill, etc.

4. Increase in skill of students and pedagogical shots, due to involvement of student's youth in hobbies, scientific work on power, and modern technologies. For its realization, on the basis of EI KFU, the student's design-technology bureau "Eureka", the scientific associations "PRO techno", "Ecotransport", and various scientific ideas; for example, to programming, and use of small-sized robots of the Robostart project are implemented successfully. For the same purposes, the cooperation with representatives of JSC PO ELAZ specializing on release of automotive special equipment, the equipment in the oil and gas industry and other enterprises is organized.

5. Continuous enrichment of experience of interaction of future bachelors' power engineering specialists with experts of the Alabuga special economic zone (SEZ) are turning out "import substitution" products, for example, - accumulators, various brands, the sizes and power. During practice, students get acquainted with operation of industrial robots, logistics, new production technologies, scales of use of the modern equipment, and opportunities for their realization. The youth inspires activity of directors of big, medium-sized and small enterprises, under the direction of residents of Tatarstan, and in such examples it is possible to give a set.

It is natural that the experience of interaction of students, teachers of EI KFU with workers of the Alabuga SEZ, become mass where the high-tech products are turned out, new jobs are created, and domestic and foreign experts work, implementing the ideas of involvement of youth to obtaining technical, power specialties, retraining of production, and pedagogical shots.

It is completely entered in the concept of realization of strategy "University 3.0" which provides simultaneous development of science, education, and a transfer of technologies, where EI KFU takes active part for what cooperation with representatives of the Nizhnekamsk hydroelectric power station, the Kama automobile plant (KAMAZ), foreign residents of the Alabuga SEZ becoming stronger.

## **CONCLUSIONS.**

As shown in our research, on the basis of regional higher education institution (EI KFU), the democratic, humane relations between teachers and students is the easiest established that is formed by the identity of younger generation, and their high professional qualities.

The main factors of such formation are:

- Variety of studies, kinds of student activity.
- Development of scientific interests, professional competences of student's youth.

- Formation of profound knowledge, skills; the need for receiving adjacent professions by youth (on full-time department).
- Strengthening of physical, mental health of the person needs for a healthy lifestyle.
- Close connection of higher education institution with modern production, technologies, domestic and foreign experts, etc.

In this process, the saved-up traditions, innovations of students, and teaching activity play the major, defining role; for example, for bachelors power engineering specialists this "immersion" in various fields of knowledge is held in occupations from higher mathematics, theoretical physics, operation of electric information networks, programming, before studying the fundamentals of professional pedagogics, social psychology, and technique of teaching power disciplines.

The implementation of scientific research projects, term/ final qualification papers, participation in scientific conferences, researches in the production and social sphere, and perspective directions of such interaction it: - "Development of alternative types of power", "Modern educational technologies", "Computer programming, robotics" where the problems connect with conditions of the country and opportunities of their realization are solved in practice.

In the regional higher education institution, its potential on training bachelors power engineering specialists, of course, raises many questions; as for example, without having own power capacities it is possible to train bachelors power engineering specialists.

As, any higher education institution, and regional in particular, it is urged to be engaged in the introduction of scientific achievements in practice, and training highly qualified personnel; it imposes additional duties on his employees. The development of advanced education information is promoted by carrying out a wide range of studies according to curricula, programs, the organization of master classes, lectures, and other forms of work with the involvement of domestic and foreign scientists.

As our experience proves, quality of such work increases if students participate in the organization of exhibitions of pedagogical, technological achievements of the Kama and Volga region of RT, all Russia, strengthening cooperation with experts of the Alabuga SEZ, and other enterprises participating in the development strategy "University 3.0".

### **Acknowledgements.**

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University.

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**RECIBIDO:** 5 de septiembre del 2019.

**APROBADO:** 14 de septiembre del 2019.