

## Factors of Appeal of Tatarstan's Prospects as a Region Suitable for Youth Technical Creativity and its Development

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### ABSTRACT

This article is devoted to the study of the attractiveness of the Republic of Tatarstan as a site for developing youth potential in a field of innovations. Modern approaches to the spread of scientific knowledge in the field of science and technology gave birth to synergies between the different structures in the development of scientific and technical creativity and successful implementation of the potential of children and youth in the Republic of Tatarstan. It creates the conditions to stimulate the interest of young people to high-tech solutions in the field of innovation of science and technology. The article presents the results of a survey conducted among young people engaged in technical creativity in the territory of the Republic of Tatarstan, practical work aimed at identifying the attractive factors of the Republic of Tatarstan youth, results of a poll helping to determine the level of attractiveness of the region and the main factors of further youth employment at the industrial sites of the Republic of Tatarstan.

### KEYWORDS

Scientific and technical creativity, engineer, successful potential, engineering and technical areas, engineering education, innovative development, engineering cluster.

### ARTICLE HISTORY

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## Introduction

Today, Russia moves through the path of innovative development and wide use of scientific achievements in the real economy. (Sumin, 2010). Today, the current trend of development of science shows a growing interest of children and young people to innovation, scientific and technical creativity, which, from the point of view of the authors, is a special kind of creative activities to create material products - hardware, including the generation of new engineering ideas and their realization as a creative project. To date, one of the most active

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subjects of the Russian Federation promoting development of scientific and technical creativity in the modern education system is Republic of Tatarstan, which is actively developing innovative infrastructure, promoting engineering and technical fields of innovative creativity: created 14 technical creation centers, which are the site for work with talented children and young people, equipped with latest technology machinery. (Minek RT,2016).

The purpose of this study is to identify the key factors for the attractiveness of the Republic of Tatarstan for the youth developing their potential in the field of science and technology, and to study of the necessary conditions and mechanisms for the promotion of technical creativity of the younger generation.

Results of the study will determine the proportion of children engaged in technical creativity in educational organizations and specialized sites on the territory of the Republic of Tatarstan and to identify the level of attractiveness of the region for the successful development of the young generation in building innovation.

### ***Technical Creativity as a Method of Formation of Human Resources in the Tatarstan Republic***

In 2012, the Russian Ministry of Economic Development has announced a competition for the organization of youth innovative creativity centers (YICC), and the Republic of Tatarstan was one of the first 13 winners of the regional competition, which led to the creation of 14 centers located in major cities and regions of the republic. (Minek RT,2016).

What is the center of youth innovative creativity? From the point of view of the authors, YICC is a platform for working with talented children and young people, consisting of a set of equipment, focused mainly on modern technologies.

Center for youth innovative creativity stimulates the interest of young people to high-tech solutions in the field of innovation, helps to identify talented young people, forms the basis for future engineering and technical personnel, as stated in strategy of regional development «Tatarstan-2030». These centers not only help prepare engineering staff, but also develop pupils' entrepreneurial skills - center is subsidized by entrepreneurs who can train pupils as effective managers on the basis of their businesses. Thanks to the knowledge and skills learnt children will be able to successfully implement advanced business ideas and develop the country's economy in the future (Minek RT,2016).

Activities of these centers are very different, for example, quadcopter project designed and manufactured by children with center equipment. Quadcopter is made of composite material, the frame is cut on a laser machine, mounting of the control unit elements are printed on a 3D printer. The most perspective fundamental industrial technologies including laser, composite and addition technologies, as well as programming and electronics are used while creating a product.

In 2015, one of these centers was created on the basis of Kazan State Technical University (KAI). The equipment is located in the one of the innovative schools of Tatarstan - KAI Engineering Lyceum. In order to unite all the centers of the republic in an effective network KAI has taken the initiative to become a methodological center. The initiative was supported by the Ministry of Economy of the Republic of Tatarstan.

Being methodical center, KAI has the following objectives: the formation of database of engineering projects, training, workshops for children and staff of the Center for Youth Innovation creativity, organizing competitions among the students, research projects support developed by IYCC pupils . YICC pupils have full access to high-tech equipment of engineering centers and the center of additive technologies.

Methodological approaches that provide effective training of children to high-tech creativity effectively combine online learning model with the basic approaches of a global initiative to increase technical education and theory of inventional problem solving. Center developed a new model of advanced development in the field of high-tech technical creativity of children.

It is worth noting that the projects are carried out in teams, which allows children to develop communication skills. Projects must pass peer review by representatives of the real economy sector before the implementation. Main stages of project work are development of ideas and analysis, expert evaluation, modeling, fabrication, assembly and testing (Minek RT,2016).

The Republic of Tatarstan is truly rich in talent, but the talent are needed to be found, developed and supported. Therefore youth innovation centers, children's technoparks, innovative schools are investment in the future of children. These investments are on of the main factor of region's competitiveness on the world market.

In this context, formation of innovation centers should be studied, from sociological experimentation before to implementing the center directly on a technological and organizational level. The results of the initial phase of the study are presented in the next section of this paper.

### **Survey Results**

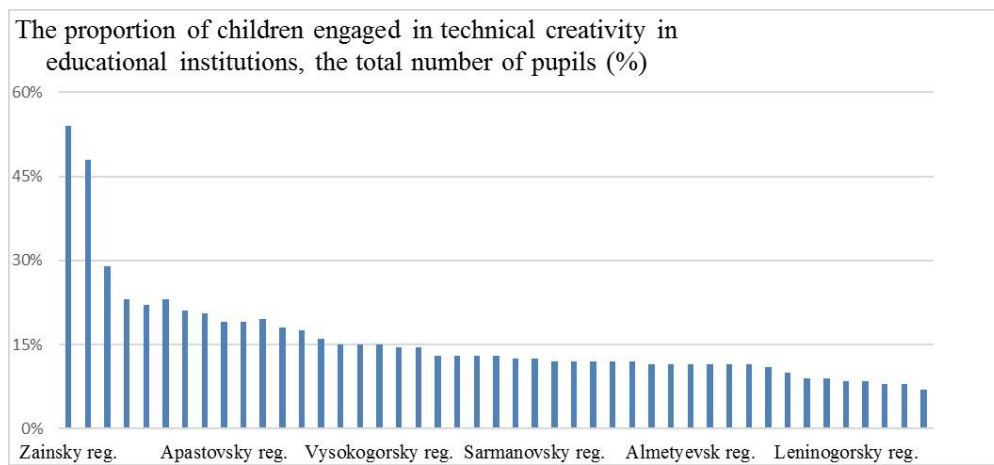
The development of technical creativity of children and young people allows to create the conditions for the innovative technologies implementation. It helps to assist the promotion of engineering and technical activity of the young generation and to increase its effectiveness of this technical creativity process. For the period of 2015 in the Republic of Tatarstan sum of 52.6 million rubles is invested in the development of additional education system. 34.7 million rubles from this sum is invested in the development of technical creativity of children, robotics development, development of technical competence. There are several festivals of municipalities to support and develop children's technical creativity. The final event of the festival was attended by more than 1,200 people, more than 2500 exhibits were presented at the exhibition. The proportion of children engaged in technical creativity can be clearly seen in Table 1 and Figure 1. (MInOBR, 2015)

**Table 1.** Technical creativity of children

Index	2010-2011 academic year	2011-2012 academic year	2012-2013 academic year	2013-2014 academic year	2014- 2015 academic year
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The proportion of children engaged in technical creativity in educational institutions, the total number of pupils (%)	7,0	7,5	9	11,2	12,9
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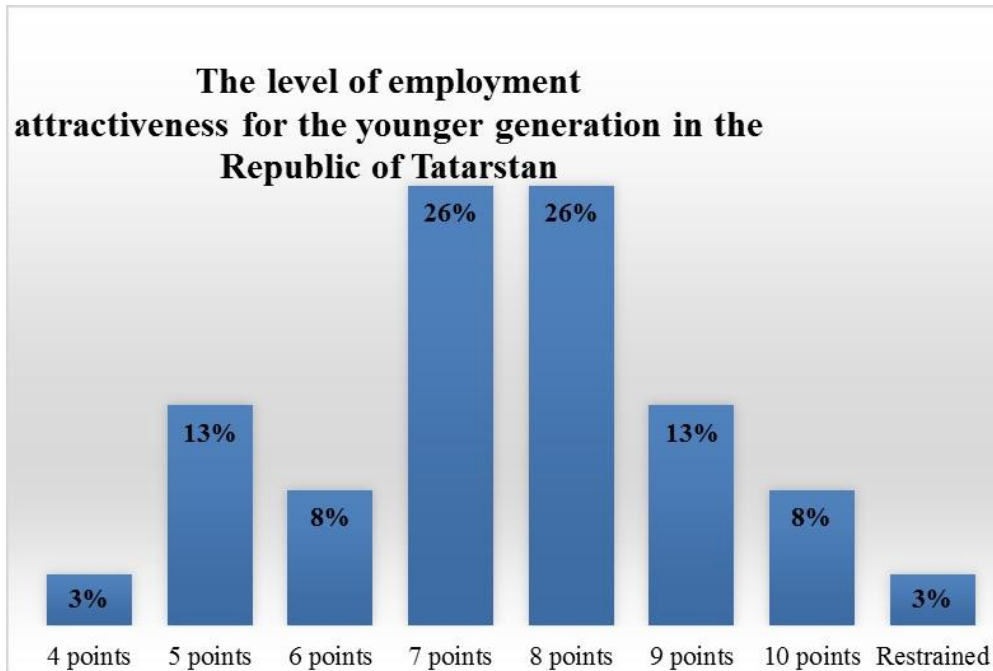


**Figure 1.** The proportion of children engaged in technical creativity in educational institutions, the total number of pupils (%) (MInOBR,2015)

Based on the survey results we can state that the innovative potential of the young generation is developing progressively. One of practical examples of the attractiveness of Tatarstan is survey results. Survey was held among the students of technical universities and colleges. Its subject was the attractiveness of Tatarstan republic in their future careers. Survey results are presented below.

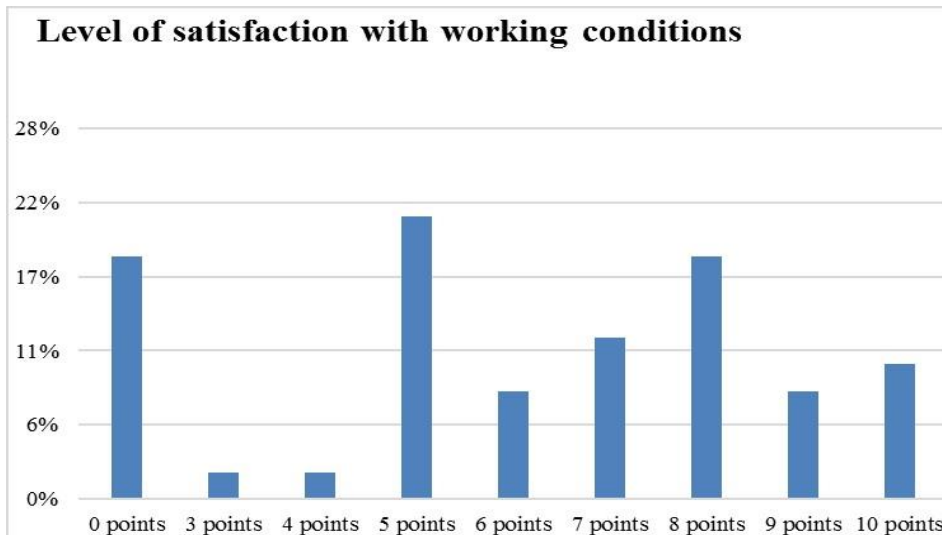
A positive aspect, from the point of view of the authors, it is a fact that 78% of respondents believe that the Tatarstan republic is an attractive region for investment in innovation and economic development, support of the small and medium enterprises in the scientific and technical sphere.

In addition, the authors found that 92% of respondents show interest in the field of scientific and technical creativity and planning to develop in this direction, on the territory of Tatarstan. The level of employment attractiveness for the younger generation in the Republic of Tatarstan was estimated as 26% at 7 and 8 points according to the 10-point scale (0 is the least attractive, 10 - the most attractive). The results are shown in Figure 2.



**Figure 2.** The level of employment attractiveness for the younger generation in the Republic of Tatarstan

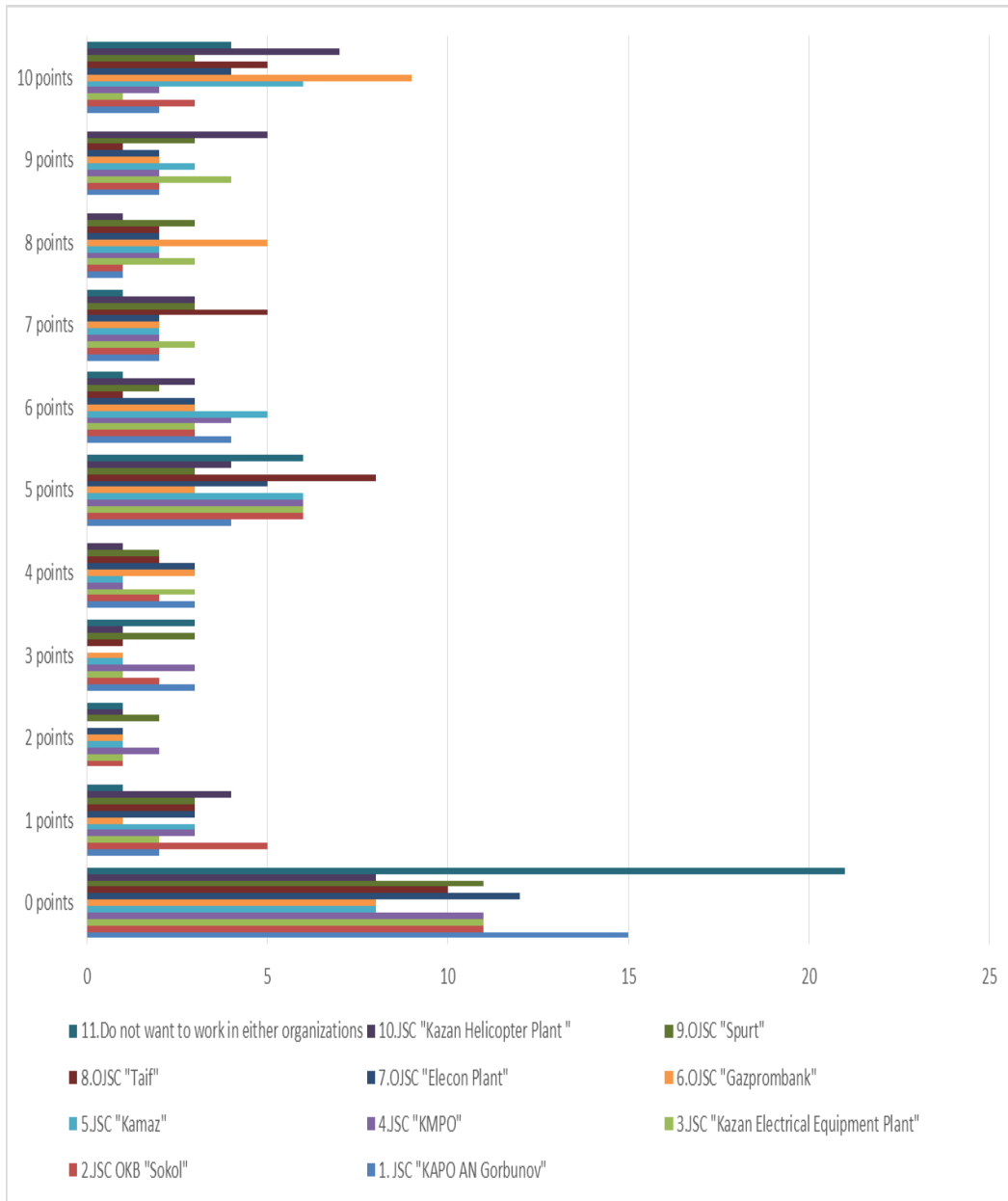
The study authors were able to determine the level of satisfaction with working conditions in the Republic of Tatarstan for the youth, where respondents' opinions differed tremendously. In the final result, 21% of respondents answer was 5 points, 19% - 8 points and 18% - 0 points according to a 10-point scale. (Figure 3).



**Figure 3.** Estimation of level of satisfaction with working conditions in Republic Tatarstan using 10-point scale.



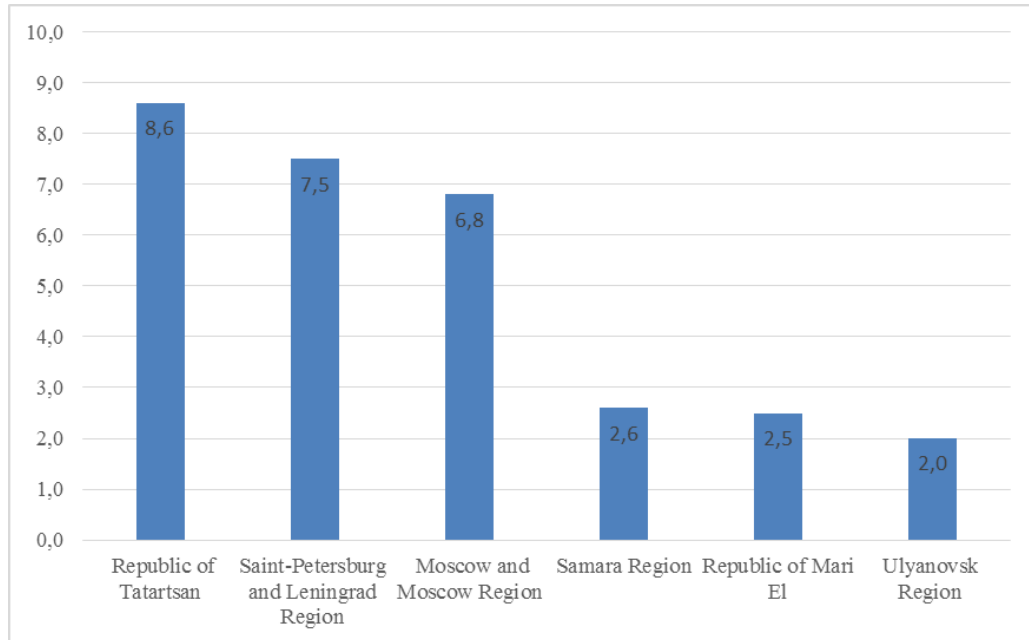
According to the authors, the most significant result of sociological research is an assessment of the Tatarstan Republic enterprises for the implementation of practical training and future employment on a 10-point scale (0 is the least attractive, 10 - very attractive). Respondents noted the company OJSC "Gazprombank" - 23.68%, and JSC "Kazan Helicopter Plant" - 18.42% of JSC "Kamaz" - 15.78% for 10 points. The average for the division by 5 points - company OJSC "TAIF" - 21.05%, and such companies as: JSC OKB "Sokol", JSC "Kazan Electrical Equipment Plant", JSC "KMPO", JSC "Kamaz" noted 15, 78% of respondents. Least promising Tatarstan enterprise is JSC «KAPO AN Gorbunov» - 39.47% in division 0 points, but, nevertheless, objected to the responsible position of "I do not want to work in any of these companies," and noted the 55.26% of «0 points» variant. The results are shown in Figure 4. (The scale in percent terms).



**Figure 4.** Estimation of the attractiveness of different Tatarstan enterprises for the goals of practical training and further employment (10-point scale)



According to the survey among young people in Tatarstan "Tatarstan attractiveness factors for youth", was received the following rankings of popularity of different regions among the youth (Figure 5).



**Figure 5.** Average estimation of the regions attractiveness

As a result of the survey among respondents were defined and the most significant factors of attractiveness of the region (Figure 6).



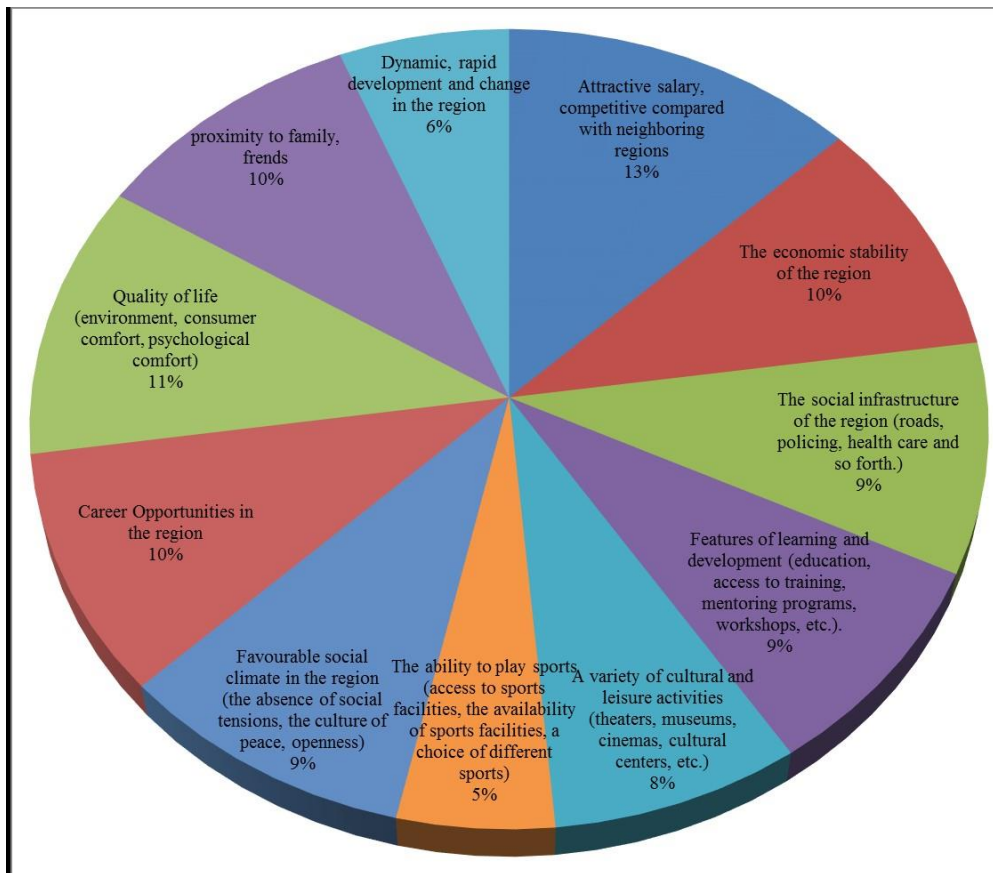


Figure 6. Factors of attractiveness of the region.



## Conclusion

An important priority of economic and social policy of the Tatarstan Republic is to attract young people into scientific and technical sphere of professional activity and increase the prestige of the scientific and technical professions - from workers to engineers. The qualitative leap in the development of new technologies has led to a society's need for people who are able to meet new challenges outside the box, make new content in all spheres of life. The important priorities of socio-economic policies today are attracting young people to the technical scope of professional activity and increase the prestige of the scientific and technical professions.

An important factor in the economic growth of municipalities is to ensure that the country's economy is provided with engineering and technical personnel to meet modern qualification requirements. Businesses and organizations of the republic also need to gradually upgrade the technical staff. Technical creativity of children and youth plays a special role in the education system. Mastering the basics of technical creativity will help future professionals to enhance their professional and social activity, and this, in turn, will lead to a conscious professional self-determination for the professions and technical sphere, improve productivity, quality of work, accelerating the development of scientific - technical sphere of production.

Analysis of the results of the survey of children and youth of the Republic of Tatarstan showed that for 2015:

1. 12.9% of children engaged in scientific and technical creativity in educational organizations;

2. 78% of respondents believe the Tatarstan Republic is an attractive region for investment in further research and innovation and economic development, to support small and medium enterprises in the scientific and technical sphere;

3. 92% of respondents show interest in the field of scientific and technical creativity and planning to develop in this direction, on the territory of Tatarstan;

4. According to the 10-point scale, 26% of respondents assessed the level of attractiveness of employment in the Republic of Tatarstan on 7 and 8 points; 21% of respondents identified the level of job satisfaction in the Republic of Tatarstan for 5 points, 19% to 8 points and 18% to 0 points.

5. According to the 10-point scale assessment of the maximum level of implementation of youth work experience and future employment in the Republic of Tatarstan received the following companies: OJSC "Gazprombank" chosen 23.68% of respondents, JSC "Kazan Helicopter Plant" - 18.42%, and OAO "KAMAZ" - 15.78%. Least promising now RT is of KAPO. Gorbunov that 39.47% of respondents rated at 0 points.

In view of the above, we can conclude that today, Tatarstan republic being a cluster of engineering education and scientific and technical activity, it is one of the most attractive regions for the support of young people and developing their potential.

## Implications and Recommendations

Implications and recommendations for future studies are that An important priority of economic and social policy of the Republic of Tatarstan is to attract

young people into scientific and technical sphere of professional activity and increase the prestige of the scientific and technical professions - from workers to engineers. Accordingly, the Republic of Tatarstan is one of the most attractive regions for the support of young people and realization their potential in the field of scientific and technical creativity.

### Disclosure statement

No potential conflict of interest was reported by the authors

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