Научно-исследовательская работа

Предмет

Иностранный язык

Тема работы

“Образование и наука. Сравнение Великобритании и России”

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I. Introduction

1.1. Choice of topic and its relevance.

These days education is becoming more and more popular both with the old and the young. Education plays an essential part in our life. It is one of the most valuable possessions a man can get in his life. Education develops all sides of human personality, reveals his abilities. Besides, it helps a person to understand himself, to choose the right way in this world. The civilized state differs from others in the fact that it pays much attention to the educational policy. Education brings people closer to each other, helps them to understand each other better. Today I would like to compare two greatest countries with regard to these spheres. So, the theme of my research work is "Science and education. Comparing United Kingdom to Russia."

1.2. Project goals

- Estimate the importance of education in todays' world.
- Compare Russian and British success in the field of science.
- Find out some extra information about these countries' cooperation in science and education.
- Compare Russian and British education system.

1.3. Determination of subject and object of study

State of education of our society doesn't leave me indifferent in this way. I decided to study and analyze the level of science in our society. So, the object of my work is science and education.

II. Main part.

"Science can be introduced to children well or poorly. If poorly, children can be turned away from science; they can develop a lifelong antipathy; they will be in a far worse condition than if they had never been introduced to science at all."

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To begin with, science and technology are the most important resource for economic growth and social progress, the basis of competitiveness and intellectual state capacity. Today, this area is facing with serious challenges, both global and intra-industry, which dictate new requirements for the organization of research and development and tools for their support.

Despite the long transformation period, Russia succeeded as a whole, to preserve the scientific and technological potential and even strengthen it, including in areas such as the nuclear industry, aircraft manufacturing, space exploration, nanotechnology and materials science, information and communication technologies.

The country occupies high positions in the scale of science - the sixth place in the world in the number of scientific personnel and the tenth - in terms of research and development costs. Since the 2000s years, the total cost of science at constant prices doubled, budget allocations for its development have grown fivefold. Due to inflow youth has improved the age structure of staff. The material and technical base is being strengthened, the participation of Russian researchers in international scientific collaborations is intensifying

2.1. Russian science.

Russian science is considered to be one of the most powerful in the history of mankind. At the start of the 18th century the reforms of Peter the Great who founded Russian Academy of Sciences and Saint Petersburg State University boosted development of science and innovation in Russia. The great scientist and writer Mikhail Lomonosov founded Moscow State University and made important contributions to literature, education, and science. Among his discoveries was the atmosphere of Venus. His spheres of science were natural science, chemistry, physics, mineralogy, history, innovation art, philology, optical devices and others. He suggested the wave theory of light, contributed to the formulation of the kinetic theory of gases, and stated the idea of conservation of matter. He demonstrated the organic origin of soil, coal, petroleum and amber. As a geographer, Lomonosov got close to the theory of continental drift, theoretically predicted the existence of Antarctica. Lomonosov was also a prominent poet, who created the basis of the modern Russian literary language.

The Russian mathematical school became one of the most influential ones in the world. It was represented by numerous figures who contributed greatly to different fields of mathematics, physics and computing sciences. In the 19th and 20th centuries the country produced a large number of great scientists and inventors. The famous mathematician and geometer Nikolai Lobachevsky founded the non-Euclidean geometry and gave the definition of a function. P. Chebyshev is known for his work in the field of probability, statistics and number theory. Andrei Markov developed the theory of Markov chains, playing a central role in information sciences and modern applied mathematics. Nikolai Zhukovsky, a founding father of modern aero- and hydrodynamics was the first to explain mathematically the origin of aerodynamic lift. Andrei Kolmogorov developed the foundation of the modern theory of probability and made other key contributions to broadest range of mathematical branches, such as mathematical logic, topology, differential equations, information theory, theory of algorithms, classical mechanics, mathematical linguistics, mathematical biology and applied sciences and many others.

In chemistry Dmitry Mendeleev invented the Periodic table, while Alexander Butlerov was one of the creators of the theory of chemical structure, playing a central role in organic chemistry. Nikolai Semyonov made major contributions to explanation of the mechanism of chemical transformation. Russian/Soviet physics in the 20th century was one of leading ones in the world. Nikolai Bogolubov and Lev Landau made fundamental contributions to many areas of theoretical physics. Nikolai Basov and Alexander Prokhorov were co-inventors of lasers and masers. Igor Tamm, Andrei Sakharov and Lev Artsimovich developed nuclear physics. In biology Dmitry Ivanovsky was the first scientist to discover viruses (1892). Ivan Pavlov widely known for describing the phenomenon of classical conditioning and using it for studying brain functions. Ilya Mechnikov was a pioneer in investigations of the immune system. Russian scientists won numerous prestigious awards in different fields of science, including Nobel Prizes.

Alexander Popov was among the inventors of radio. Pavel Yablochkov and Alexander Lodygin were pioneers of electric street lighting, and Mikhail Dolivo-Dobrovolsky invented the three-phase electric power system, widely used today.

The greatest Russian success is in the field of space technology and space exploration. Konstantin Tsiolkovsky was the father of theoretical astronautics his works had inspired leading Soviet rocket engineers such as Sergey Korolyov, Valentin Glushko and many others that contributed to the success of the Soviet space program.

Other technologies, where Russia historically leads, include nuclear technology, aircraft production and arms industry. The creation of the first nuclear power plant along with the first nuclear reactors for submarines and surface ships was directed to Igor Kurchatov. 'Lenin' was the world's first nuclear powered surface ship as well as the first nuclear civilian vessel, and 'Arktika' became the first surface ship to reach the North Pole.

2.2. British science

The United Kingdom has made a major contribution to the development of science. The country led the industrial revolution and has produced many scientists and engineers famous for important achievements. Sir Isaac Newton (17-18th centuries), the great physicist, mathematician and astronomer, discovered the laws of motion and created a theory of gravitation. Henry Cavendish (18-19th centuries) discovered hydrogen. In the 19th century, the renowned physicist and mathematician James C. Maxwell synthesized all observations, experiments and equations of electricity, magnetism and optics into a consistent theory and created classical electromagnetic theory. Michael Faraday, the famous English chemist and physicist contributed greatly to the fields of electromagnetism and electrochemistry. He studied the magnetic field around a conductor carrying electric current, and established the basis for the electromagnetic field concept in physics. He discovered electromagnetic induction and laws of electrolysis, and made electricity viable for use in technology.
In 1804 the steam locomotive was invented by Richard Trevithick and Andrew Vivian. The great English naturalist Charles Darwin established that all existing species have descended from common ancestors, and proposed the scientific evolution theory. In the 20th century, the world's first working television system, and colour television were invented John Logie Baird, the jet engine was invented by Frank Whittle, and the first practical telephone, by Alexander Graham Bell. Postage and modern postal service were created by Sir Rowland Hill.
In the 20th century, penicillin was discovered by the Scottish scientist and Nobel laureate Alexander Fleming, the structure of DNA was discovered by Francis Crick and others, and the World Wide Web was invented by Tim Berners-Lee.
These are some of the most important discoveries and inventions made by British scientists and engineers. Other advances pioneered in the UK include the world's first national railway transport system, modern bicycle, electric lighting, stereo sound, motion picture, the internal combustion engine, military radar, aeronautics, soda water, nursing, antiseptic surgery, vaccination, antibiotics, to name only a few.

2.3. UK-Russia Year of Science & Education 2017

The UK-Russia Year of Science and Education 2017 (YoSE) was agreed between Foreign Secretary Boris Johnson and Russian Foreign Minister Sergei Lavrov in November and officially launched on 27 January in Moscow. The decision – taken at a time of considerable political tensions between our two countries – recognizes that UK-Russia scientific co-operation is growing (collaborations have doubled since 2006) and together we should be doing more to capitalize on our joint scientific excellence.
The UK is now Russia's 4th largest external partner for joint papers and international citations double in number when UK and Russian scientists publish together. While top fields for collaboration feature traditional Russian scientific strengths such as physics, mathematics, chemistry, geosciences and space, there has also been an increase in joint work in areas identified by Nature in 2016 as 'rising stars 'such as life sciences.

What YoSE aims to achieve

While the Year aims to open up new opportunities for collaboration and bring more research teams and organizations into the orbit, an important part of it is about celebrating existing partnerships and building upon long-standing scientific links. The Year rolls out a broad programme of events and activities to be delivered by the FCO's Science and Innovation Network, the British Council, the Royal Society, and other partners.

So this year, five areas in particular will be in focus, namely:

- Facilitating UK access to Russian scientific excellence through an increased programme of researcher links,
- Encouraging scientists to work together on common scientific challenges,
- Supporting Russia's efforts to internationalize its science by launching a programme for young Russian researchers, running seminars on how to access international journals and encouraging University partnerships,
- Co-working on key policy challenges including the science of climate and antimicrobial resistance (AMR),
- Public celebration of our scientific links including a programme of lectures and events.

Here are a few examples *of what has been delivered so far:*

- A UK-Russia high-level roundtable on AMR, followed by a visit by Chief Medical Officer, Dame Sally Davies,

- A bilateral UK-Russia workshop on "100 Years of Black Holes" at Chicheley Hall (UK),
- Academic writing workshops for Russian researchers with the geography ranging from Arkhangelsk to Tuymen,
- UK-Russia conference on science diplomacy at Moscow State Institute of International relations (MGIMO),
- Ekaterinburg Science Cafe on ''How Myosin Motors Work and What They Do in Living Cells'' featuring experts from Cambridge University and the university's Institute for Medical Research.

Look-forward

- **Arctic:** We are working together with Russian scientific community to enhance UK-Russia collaborations on data analysis, permafrost, biodiversity research, climate research and impact of climate change on indigenous peoples. We are working to help launch a UK-Russia Arctic working group to enable more focused cooperation and intensify young researcher exchanges;
- **Life sciences & Agro-tech:** Russia has interest in precision agriculture and the use of UK R&D expertise to develop its agro-sector. We work with dynamic pharm and medical communities to counter antimicrobial resistance (AMR) and other global health challenges. SIN Russia are exploring opportunities for further engagement, for instance around development of new antibiotics and strengthening clinical pathways.
- **Science Festivals:** Russia has a growing interest in science popularization best practices and innovation in science, from robotics to big data. Several Russian science festivals run across the country throughout the year, including in Moscow and St. Petersburg. SIN Russia are working with the organizers to increase the number of prominent UK speakers and showcase the breadth and depth of UK expertise.
- **Links between UK-Russia institutions:** With the British Council, SIN Russia is exploring potential link-ups between UK and Russian institutions. During the YoSE the key activity will be an inward mission to Russia of UK Vice Chancellors to identify collaboration opportunities.

2.4. General Comparison

- Science and technology in the United Kingdom has a long history, producing many important figures and developments in the field. Major theorists from the United Kingdom of Great Britain and Northern Ireland include Isaac Newton whose laws of motion and illumination of gravity have been seen as a keystone of modern science and Charles Darwin whose theory of evolution by natural selection was fundamental to the development of modern biology. Major scientific discoveries include hydrogen by Henry Cavendish, penicillin by Alexander Fleming, and the structure of DNA, by Francis Crick and others. Major engineering projects and applications pursued by people from the United Kingdom include the steam locomotive developed by Richard Trevithick and Andrew Vivian, the jet engine by Frank Whittle and the World Wide Web by Tim Berners-Lee. The United Kingdom continues to play a major role in the development of science and technology and major technological sectors include the aerospace, motor and pharmaceutical industries.

- Science and technology in Russia have developed rapidly since the Age of Enlightenment, when Peter the Great founded the Russian Academy of Sciences and Saint Petersburg State University and polymath Mikhail Lomonosov founded the Moscow State University, establishing a strong native tradition in learning and innovation. In the 19th and 20th centuries, Russia produced many notable scientists, making important contributions in physics, astronomy, mathematics, computing, chemistry, biology, geology and geography. Russian inventors and engineers excelled in such areas as electrical engineering, shipbuilding, aerospace, weaponry, communications, IT, nuclear technology and space technology. More recently, the crisis of the 1990s led to the drastic reduction of state support for science and technology, leading many Russian scientists and university graduates to move to Europe or the United States. In the 2000s, on the wave of a new economic boom, the situation has improved, and the government launched a campaign aimed into modernization and innovation with mixed success. Russia occupies high positions in terms of generation of new knowledge (scientific publications, patents) and their acquisition (import of advanced technologies, acquisition of rights to results innovation, industry saturation, scientific staff), as well as the scale of the research sector and development. Weaknesses in Russia's innovative development are associated with low the effectiveness of knowledge dissemination processes (export of high-tech products and services, practical use the results of innovation) and their impact on the economy and society (the scale of production of high-tech and creative industries, etc.).

2.5. Comparison of educational systems

Russia vs UK education system has many similarities and many essential differences as well. What are they?

- Education Steps

In Russia the 1st level is preschool education, then there are primary and secondary schools. The finishing step is a higher education. Children come to school aged 6-7, with preliminary preparation included into the pre-school programme. Having finished the 9th year of learning one can apply to a college or to a technical secondary school to acquire profession, or do not leave school till the end of the 11th year and, having passed the unified state examination, to enter a higher education establishment based on its results.
In Great Britain the following education steps exist: junior and secondary schools and higher education. The scholarhood starts when the children are five, with mandatory attending preparatory courses before. General education lasts until a child is 16, after that he/she can work but also may optionally stay at school for two more years for applying to a higher education institution.

- Selection of Subjects

In Russia, certain number of hours is assigned at primary and secondary school for the subjects attended by everyone without exception. In schools specializing in humanities or mathematics the quantity of hours assigned to principal subjects may be larger. In the upper school there are some optional disciplines to be selected.
In Great Britain, the list of the mandatory subjects is not long and includes mathematics, English, music, etc. All other subjects may be selected as optional ones by a pupil according to his/her interests and plans as early as secondary school. As regards selection of subjects to be learnt, considering comparison of Russian and British education, the latter provides

more flexible conditions as early as at school for acquiring knowledge that will be required in the future.

- School Uniform

In Russia, the decision on mandatory wearing of a school uniform and on the outward appearance thereof is made individually by each educational institution.
In Great Britain, uniform is mandatory in most of public and private schools. In several educational institutions with great history a uniform is a symbol, which must be treated by pupils with respect and care.

- Higher education

The system of higher education in Russia and Great Britain has a lot of similarities, because it is built on the same major principles of the Bologna system. However, there are significant differences that make Russian education more specific and competitive. We can consider them due to comparison of Britain & Russia institutions and colleges.

- Education Stages

In Russia vocational education has two parts: specialized secondary education and higher (university). The first category includes colleges, technical schools where student can complete basic stages of secondary school and get a profession (service, cooking, mechanical and others). The higher (university) education is given by universities, different institutes (medical, financial) or academies. University alumnus get the Bachelor's, Master's or Doctor's degree and also can take postgraduate course to broaden knowledge within chosen field.
The vocational or secondary education in UK is regarded the highest, whether it is a college or an institute. Fields of Study In Russia universities are focused not only on academic knowledge but practical knowledge too. Graduates become complete specialists even after 4 years Bachelor's course. The main differ is that university alumnus can easier take managerial position and high-paid jobs than specialized secondary graduates. In Great Britain students can study for secondary in colleges where they get theoretical base and the profession. GB universities pay more attention to academic disciplines.

- Terms of Education and Tuition Fee

In Russia all degrees terms and it's classification is equal for the whole Russia. Bachelor's degree takes 4 years, Specialist – 5 years, the Master's degree is 2 years and study in some fields (for example, in medicine) take 6 years or 12 semesters. Education in Russia involves contract and free forms of education, the last one needs going through a larger competition, but if you have good marks, you can get a scholarship. It's given only for next semester and if you don't pass next semester exams, there will be no more scholarship for the next period.
In Great Britain Bachelor's degree basically lasts for 3 years, Honours degree – 4 years, Master's – 2 years and Doctorate 3 years Higher education in the UK is self-funded in any college or university for any student, regardless of his/her age and citizenship. The state banks provide a system of student loans, and the graduate should repay the loan and the interest only after the graduation and employment.

- Forms of Study

In Russia all colleges, universities and academies provide the intramural (full-time), extramural (part-time) and distance forms of study. The two last allow students to combine higher education in Russia with work activities.
In Great Britain college and university students are trained only full-time, so as not to be distracted from lectures, and focus on seminars and practical training.

2.6. Women attendance in science

Based on interviews with 11,500 girls and young women across Europe, it finds their interest in these subjects drops dramatically at 15, with gender stereotypes, few female role models, peer pressure and a lack of encouragement from parents and teachers largely to blame.

Not so in Russia.

In Russia, it's not unusual for girls to be interested in science and technology

According to Unesco, 29% of people in scientific research worldwide are women, compared with 41% in Russia. In the UK, about 4% of inventors are women, whereas the figure is 15% in Russia.

Russian girls view Stem far more positively, with their interest starting earlier and lasting longer, says Julian Lambertin, managing director at KRC Research, the firm that oversaw the Microsoft interviews.

Most of the girls from other countries had a slightly playful approach to Stem, whereas in Russia, even the very youngest were extremely focused on the fact that their future employment opportunities were more likely to be rooted in Stem subjects.

These girls cite parental encouragement and female role models as key, as well as female teachers who outnumber their male colleagues presiding over a curriculum viewed as gender neutral.

The differences don't stop there.

When the Department for Education asked a cross-section of British teenagers for their views on math and physics, five words summed up the subjects' image problem: male, equations, boring, formulaic, irrelevant.

But no such stigma exists in Russia

Russians really gone beyond that people are expected to perform well in these subjects regardless of gender.

III. Conclusion

Science is everything that surrounds us. Experimental science began hundreds of years ago, when men first started using the energy of fire and water. Being a rational creature, man has explored other mysteries of nature, which has gradually led to many new discoveries.
It seems that people nowadays have everything they need for everyday life, but science never stops developing. It is always keen on exploring the mysteries of the universe, on conquering land and air. This incredible lust for knowledge leads to constant raise of life standards.
However, other realms of science have also been developing. Medicine, biology, archeology and many other sciences have achieved great results. We do have everything to maintain a high quality of life now. Many processes have been automated and people have got rid of many unpleasant things and difficulties they used to face in the past.

In the field of theoretical science, Russia before Peter I lagged behind Europe. This is due to weak cultural ties with it, the insufficiently large influence of Byzantium, limited distribution of translated scientific works, cultural and social features.
Factory science in pre-revolutionary Russia, as in other major states, was at the stage of origin. At some large enterprises, laboratories and design bureaus were well equipped with equipment and scientific and engineering personnel.

British science in the XIX century was considered the leading in the world. In the XX century, it lost the lead to US science in importance. However, many important studies are still underway here. Most of the attention in the UK is traditionally given to the natural and technical sciences.
In the UK, many important inventions and discoveries were made: a steam locomotive, a modern bicycle, a propeller, a multi-stage jet steam turbine, an electromagnet, stereo sound, an internal combustion engine, photography, antibiotics, in vitro fertilization, HTML, HTTP and many others.
In the early Middle Ages, the accumulation of knowledge in England occurred within the framework of church views, as in the rest of Europe. This knowledge was systematized by monk scientists. In the XII-XIII centuries, the famous Oxford and Cambridge universities were founded. In the XV-XVI centuries, England successfully participated in the great geographical discoveries.
In the nineteenth century, British science took the leading place in the world. Mainly due to the fact that external stimuli for the development of natural and technical sciences (rapid progress in industry and agriculture, the study of natural resources in many countries of the world) acted in the country. The country occupied a dominant position in the global engineering industry, partly thanks to the achievements of science. Due to the growth of industry, new areas and cities began to appear. A need arose to improve communications.

Russia and Great Britain are similar in many respects: both Russia and Britain unite many different regions. The historical past of our countries laid the foundations of their current ethnic diversity. Like Britain, Russia attracts young people from other countries that promises the future wealth and diversity of its culture.

References

https://arxiv.org

http://www.globalscienceresearchjournals.org/gejst/articles

http://www.blue-ap.org/j/Global_Journal_of_Scientific_Researches/

Kostas Kampourakis “Science & Education. Contributions from History, Philosophy and Sociology of Science and Mathematics”

“National Geographic. Science Of Everything” (2013)

Science in Russia and Soviet Union (Cambridge Studies in the History of Science) Revised ed. Edition (1994)

“Why is Russia so good at encouraging women into tech?” Caroline Bullock /Technology of Business reporter/ (21 April 2017)