Scientific Potential of Russian Women: The Past and the Present

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Abstract---Based on historical analysis of the scientific literature, the paper demonstrates the role, importance, and necessity of developing the female scientific potential in the Russian state and society. The sphere of young students' scientific interests has been identified and substantiated with gender consideration. Similarly, possibilities of optimizing the potential of young students have been found with gender-specific aspects borne in mind. In the research, the authors used theoretical and empirical methods of collecting information about the scientific potential of Russian women. An entire range of problems (causes) has been found which prevent the potential of Russian women from being completely fulfilled in science. Principal conditions and mechanisms have been examined which help optimize the development of the scientific potential of young higher educational institution students with gender consideration. The obtained conclusions highlight the necessity of optimizing the female potential in the country's scientific activity in the most diverse focus areas.
**Introduction**

The research problem – the scientific potential of Russian women in science – is comprehensive, which requires its profound elaboration from various standpoints – philosophical, historical, genetic, and social ones. It has to be noted that the problem of the inclusion of women into science and supporting them in this respect is characteristic for all the developed countries of the world community.

Khamdamova (2019) writes that despite the interest in this problem manifested by politicians and scientists, nevertheless, "...what is observed throughout the world is the shortage of women scientists, the lack of women researchers and scientists at top managerial positions. The level of representation of women in the sphere of technical and natural sciences, the so-called STEM sphere, is especially low. Meanwhile, girls and women, particularly those coming from minority groups, rural and remote areas, and dysfunctional families, face numerous obstacles to win participation in STEM and, consequently, are forced to overcome more problems than their male peers are" (Khamdamova, 2019).

The contemporary situation enables one to notice certain subtle aspects within this problem. First of all, the problem concerning inclusion and support of Russian women in science does not get close attention on the part of the scientific and educational community; there are extremely few scientific works dealing with this range of problems (papers, monographs, theses, study courses, etc.), and they do not produce due impact on the social and political sphere of the Russian state and society – do not promote properly solving this problem. Secondly, the problem of supporting women’s potential in Russian science largely attracts representatives of the female scientific community rather than those of the male one. This circumstance is indicative of the implicit sociocultural attitude to gender-based roles and functions of men and women in the society which has been established and reinforced in the public consciousness of the Russian community historically (Mohan & Kumar, 2018; Žavolžič, 2021; Nyandra et al., 2018).

Thirdly, solving the problem of supporting women’s potential in science is a matter for the entire Russian community and, first and foremost, for the activity of the entire system of Russian education (with its professional level targeted in particular). It is here, at the professional level, that motivation for efforts associated with the scientific activity of young students (both young women and men) is formed.

**Literature Review**

As for the situation in Russia, analysis of the scientific literature shows that the range of problems under study agitates a certain part of Russian researchers exploring its most diverse focus areas. In particular, they discuss: Russian women scientists: the historical aspect (Bogdanova, 2004; Valkova, 2018); gender-based dimension in science and education (Martynova, 2005; Olga, 2017;...
women in fundamental science (Mirskaya & Martynova, 1993; Pushkareva, 2010, 2011; Khamdamova, 2019); Russian women in science and education (Vinogradova, Dunaeva & Ziatdinov, 2017; Ostapenko, 2011); modern problems in the social sphere and possible mechanisms for their solution, taking into account gender and other characteristics (Zamiralova et al., 2019; ROMANOVA et al., 2019; IVANOV et al., 2019; Akhtyan et al., 2018; Wolhuter & Chigisheva, 2020); the student science: gender-specific aspects (Saralieva & Balabanov, 2001; Sizova et al., 2016; Egorychev & Akhtyan, 2021); analysis of the scientific initiative of women in Russia (Bogomolova et al., 2015).

Burdukovskaya & Rvacheva (2008), note, "Introduction of the "gender" category into the pedagogical process is essential in meaning because many ideas about professional self-identification, life strategy, and access to resources and power which are based on social and sexual orientation are formed at higher school". It is to be noted that serious and in-depth fundamental research works on the problem of supporting Russian women in science which would suggest promising solutions are nearly nonexistent in Russia as of today. Alongside this, the history of Russia holds numerous artifacts of culture and pieces of evidence confirming women's significant contribution to the progress of their Motherland (in science, enlightenment, labor and military feats, state administration, etc.). For instance, to name just a few women scientists who have made an impressive contribution to the advancement of Russian science: S.V. Romanskaya, S.V. Kovalevskaya, M. Sklodovskaya-Curie, A.A. Karavaeva, B. Zeigarnik, O.A. Oleinik, I.G. Bashmakova, Z.V. Yermolyeva, L.S. Stern, N.K. Bari, O.A. Ladyzhenskaya, M.P. Pokrovskaya, F.A. Butaeva, N.P. Bekhtereva, I.G. Bashmakova.

The history of Russia also demonstrates that as early as in the 18th century, Russian women were extensively engaged into scientific and educational activity. Catherine the Great supported female education in the country. As noted by Valkova (2018), "The Empress, with the high society following, took quite a favorable view of women’s exercises in sciences". Although weak, this trend persisted in Russia up to the October revolution of 1917. Then, as early as in the first years of the Soviet power, major efforts were made to organize education for all the country's working people. So, the Council of People’s Commissars of the RSFSR prepared and published the Decree "On the rules of admission to higher educational institutions" dated August 2, 1918, clearly stating, "Each person arriving at the age of 16, regardless of their citizenship and sex, may enter any higher educational institution as a course participant without presenting a degree, diploma, or certificate of graduation from a secondary or any other school".

It is the Soviet period that is marked as one of the most active to support Russian women in science and education in the history of Russia and, probably, of the entire world. Russian historian Pushkareva (2010), notes quite fairly that "before 1917, so few as 10% of Russian women had an access to scientific work; meanwhile, over the brief span of half a century, the number of women scientists in our country increased fivefold" (p. 92). Owing to the positive processes fostered by Catherine the Great and, largely, to the policy conducted by the Soviet country, the proportion of Russian women studying in the system of higher education was equal to that of men and even started to surpass them by the early
21st century. So, according to the data of the All-Russian census of 2010 (the "Russia's men and women" collection by the Federal State Statistics Service, Source: https://issek.hse.ru/news/341451906.html/ Calculations of the ISSEK of NRU HSE), 58% of women (15975 thousand people) and 42% men (11556 thousand people) had higher education. Alongside this, women engaged in scientific domains turned out to be much fewer in number than men. According to the FSSS data for 2018, in Russia, research and development employ 136,4 thousand of women researchers, which is 39,2% of the total count of researchers (Gender-specific composition of the academic staff, 2021).

Nevertheless, as indicated by Russian researchers Bogomolova et al., (2015), in Russian science, there are more women as compared to other countries – about 50%; in Japan, the figure is 16%, in Great Britain – 23%, in Germany – 20%, in the USA – 36%, and in France – 28%. E.Z. Mirskaya and E.A. Martynova (1993) note that while in 1991 the quantity of women employed in science amounted to 51%, it was already 63% of all scientific workers by 2000. Evidently, in general, the indicators describing Russian women's presence in education and science are positive enough, yet there are some dark spots in the history of modern women scientists, too. First of all, this is the problem of the career advancement of women in science. So, Pushkareva (2011), notes that women are poorly presented in the authorities of science and higher school of Russia. They seldom head large scientific teams and hold the positions of faculty deans, let alone rectors of higher educational institutions. There are only 19% of women among heads of laboratories, 4% – among deputy directors, and 2% – among managers at large.

Based on the above, certain deductions can be made:

- The process of democratic transition of the Russian society is directly associated with the extent of feminization of women, their inclusion, and support in all social spheres, in the system of education and science, first of all;
- Russian women prevail in the sphere of education to a greater extent; the process of feminization of Russian education is slow but sure;
- At present, in the scientific sphere, the proportion of Russian women is much lower than that of men. What hinders the growth of women in the scientific sphere? Can this proportion be quite normal or can it demand solutions in favor of supporting women in science?

Let the attempt of studying the set questions be made.

**Materials and Methods**

This research is analytical including some empirical aspects. It relied on works of the well-known Russian scientists and pursued the following objective: to comprehend the problem of the necessity of supporting Russian women's potential in science and to elaborate the relevant promising lines for optimizing it. Research tasks were: a) to conduct analysis of the Russian scientific literature touching on issues of the role, importance, and necessity of developing the country's female scientific potential; b) to identify students' spheres of scientific interests in conditions of professional training at the university, with the gender-
based constituent taken into account; c) to analyze the condition and opportunities of optimizing the potential of young students in conditions of higher educational institution training with gender consideration (Singh & Zammit, 2000; Geusens & Dinant, 2007).

The toolkit of the research included the questionnaire form for surveying the students of Russian State Social University (RSSU) which consisted of 3 units: a) some information about the respondents; b) their professional training; c) scientific and research work. There were a total of 20 open-ended and close-ended questions in the questionnaire form. The sampling technique was as follows. To survey the young students of RSSU, the authors used the sampling model involving the age of the questioned ones of 18-25 years old, and the total sample counting ± 894 of the respondents, with 484 of them being young women, 410 – young men. The survey was conducted among the students of RSSU (14 faculties of the social and humanitarian profile, including master degree students of years 1 and 2). The study was conducted in the first half of the academic year 2020-2021.

Results

Theoretical analysis of the research problem

The work on accomplishing the first task has enabled the authors to reveal an entire range of current problems (causes) preventing Russian women’s potential from being completely fulfilled in science. Let the principal ones of them be outlined and commented on below.

- Russian society has a historically established sociocultural tradition involving a positive attitude to the male status and its manifestation in the affairs of the state and society while also maintaining the considerable disparagement of the female status and allotting secondary roles in all the spheres for women.
- The major concentration of female scientific potential in Russia falls for the sphere of social sciences and humanities, while physical and mathematical, natural sciences, engineering, and technical domains see significantly fewer women scientists.
- Russian women lack proper motivation for science and scientific research, which is associated with the rigid prevalence of men at all top levels of social spheres of the state and society and, first of all, in the scientific domain. They keep women scientists out of career advancement believing them to be incapable of competing with men in resolving complicated managerial and scientific issues.
- Although Russian women are considerably eager to participate in the scientific domain activity and research, what is observed is their lacking so much time for these efforts as they demand. Russian women are highly busy with problems of starting, maintaining, and keeping a family, various daily life tasks, having children, upbringing, and so on (the so-called “maternal drive”), which eats away at the time they have.
- Within the system of higher education, there is no proper system of professional outreach concerning the cultivation of the stable motivation for
scientific activity in young students, with the gender-based constituent taken into account.

**Empirical analysis of the research problem**

Among the 20 questionnaire form items, some were directly related to the research problem of the students' scientific potential and spheres of scientific interests with gender consideration. Let these questions be presented and commented on.

Question 1: What is your opinion: does the process of learning at the university help form researcher skills in the students? The following results have been obtained (see Table 1).

<table>
<thead>
<tr>
<th>Answer options</th>
<th>General results</th>
<th>Young men</th>
<th>Young women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>54,8</td>
<td>28,4</td>
<td>26,4</td>
</tr>
<tr>
<td>No</td>
<td>19,2</td>
<td>9,2</td>
<td>10,0</td>
</tr>
<tr>
<td>I have difficulty answering</td>
<td>26,0</td>
<td>11,8</td>
<td>14,2</td>
</tr>
</tbody>
</table>

Source: Compiled by the authors.

As it can be seen, half of all the surveyed ones (54,8%) believe the process of learning at the university helps form researcher skills in the students; 19,2% do not think so. Quite a large percentage of the young students – 26,0% – have difficulty answering the question. The distribution of the answers according to the gender attribute does not feature large variations; the answers of the young men and young women are almost in a balanced state (minimum variations are not taken into account) (Howes & Singh, 1995; Ponomarenko et al., 2019).

Question 6: How do you rate the extent of your involvement into scientific research work of the university? The obtained results are shown in Figure 1.

![Chart: results of the evaluation of the students' involvement in scientific activity](image)

Source: Compiled by the authors.
It can be seen that their own involvement into scientific research activity has not been rated very high by the young students: so few as 3.8% of the questioned ones rated it "very high"; 13.9% - "high". Around one third (37.7%) said they participated at the "medium" level, 19% – at the "low", and 13.9% – at the "very low" one. 11.7% of the students had difficulty answering this question.

Question 7. The findings characterize the distribution of the answers according to the gender attribute (see Table 2.).

Table 2
The young students’ extent of involvement in scientific research work (%)

<table>
<thead>
<tr>
<th>Answer options</th>
<th>General results</th>
<th>Young men</th>
<th>Young women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high</td>
<td>0.8</td>
<td>0.5</td>
<td>0.3</td>
</tr>
<tr>
<td>High</td>
<td>13.9</td>
<td>8.2</td>
<td>5.7</td>
</tr>
<tr>
<td>Medium</td>
<td>37.7</td>
<td>21.6</td>
<td>16.1</td>
</tr>
<tr>
<td>Low</td>
<td>19.0</td>
<td>9.5</td>
<td>9.5</td>
</tr>
<tr>
<td>Very low</td>
<td>13.9</td>
<td>6.0</td>
<td>7.9</td>
</tr>
<tr>
<td>I have difficulty answering</td>
<td>14.7</td>
<td>6.9</td>
<td>7.8</td>
</tr>
</tbody>
</table>

Source: Compiled by the authors.

The indicators characterizing the young students’ level of involvement in scientific research activity taking into account the gender attribute are controversial. The percentage of the young men rating their involvement at the "very high" and "high" levels exceeds the young women's indicators: the "very high" indicator by 0.2% and the "high" one by 2.5%. This seems to be explained by the genetically conditioned male domination stance. As a consequence, fewer young men noted the "very low" option, as compared to the young women (1.9% fewer).

Question 20. Provided all the necessary conditions are met, would you like to practice scientific activity at your university? The results obtained are given in Table 3.

Table 3
Willingness of the young students to practice scientific activity (%)

<table>
<thead>
<tr>
<th>Answer options</th>
<th>General results</th>
<th>Young men</th>
<th>Young women</th>
</tr>
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<tbody>
<tr>
<td>Yes</td>
<td>84.8</td>
<td>43.2</td>
<td>41.6</td>
</tr>
<tr>
<td>No</td>
<td>6.8</td>
<td>3.3</td>
<td>3.5</td>
</tr>
<tr>
<td>I have difficulty answering</td>
<td>8.4</td>
<td>3.9</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Source: Compiled by the authors.

This was the final item of the sociological survey. It can be seen that the bulk of the young students (84.8%) realize the importance of scientific work in the system of professional training. About the gender-based principle, the obtained answers do not show any difference in answers given by young men and young women. Minimum variations in their answers do not disrupt the "gender equilibrium" as far as findings of this survey are concerned (Ahmed & Moorthy, 2021; Suacana, 2016; Swamy, 2014).
Discussion

Analysis of the scientific literature on the research problem has demonstrated the ambivalent standpoint of Russian scientists on the problem of developing and supporting women’s scientific potential in Russia (its causes, trends, and features). However, Russia's figures are ahead of percentages of women's inclusion into science and education of many developed countries of the world community as of today. Originating in the 18th century, the trend of introducing Russian women into scientific and educational activity was maintained throughout the 19th century and got its bright expression in the 20th century (in the Soviet period). It is the Soviet power that created social conditions and mechanisms to enable Russian women not only to get the world’s best education but also pursue scientific research work in many social spheres on equal terms with men. The country's proper state support of women and non-discrimination policy allowed introducing Russian women alongside men to the activity in all economic spheres of the country (administration, science, education, etc.) in quite a brief historical span. This had a significant effect on the progress pattern of the young Soviet state and society over time (Bakhta & Lee, 2010; Deev et al., 1998).

Associated with engaging Russian women into science and education, this trend has also won support in the newest time (in the early 21st century); its incremental nature is maintained at present, too. Moreover, this process takes on a social and political nature. Certain deductions can be worded according to the results of the theoretical analysis conducted. Firstly, the possibility of Russian women's free accession to the world of science and education was created in Russia much earlier than in other developed countries of the world community. Secondly, in its gender-specific aspect and qualitative expression, the entry of Russian women in the world of science and education has turned out to be much more efficient (harmonious), as compared to the similar processes taking place in Western countries (Bray & Nettleton, 2007; Matukhin & Zhitkova, 2015).

Thirdly, although the positive historical trend is maintained, and favorable social and political processes in terms of Russian women's accession to science and education are gaining foothold in contemporary Russia, a certain “bias” in favor of men is still observed in the country. First and foremost, this is true for the process of minimum entry of Russian women scientists in the top circles of the scientific hierarchy. The above statements characterize not only the problem on hand but also the condition of the Russian society, its social policy, and the level of formed sociocultural trends, standards, and stereotypes about women. One thing is clear: in the coming information epoch, the scientific potential of Russian women is not fulfilled properly, which demands considering certain factors, creating relevant conditions, and elaborating sociocultural mechanisms for its optimization and support. One of the most essential mechanisms for optimizing and supporting women's potential in science is the activity of enhancing young students' motivation for scientific research work, with the gender-based constituent taken into account (del Moral & Maestre, 2013; Saifnazarov et al., 2021). The empirical collection of information concerning the condition and development of the students' scientific potential with gender consideration, its careful analysis, comparison, and generalization conducted by the authors have enabled them to identify certain nuances detailing the specific features of the
organization of the student science at the university, its advantages and disadvantages.

The following can be named among the advantages:

- In general, the young students of the university (young men and young women) are able to assess situations and processes pertaining to professional training at the university (including the necessity of the student scientific activity and their own participation in it) at the sufficient level of reality;
- The bulk of the university students (84.8%) are prepared to get extensively involved into the student scientific activity, provided that all essential conditions are met;
- With the gender attribute considered, results of evaluating various questions concerning the student science and their participation in it do not feature any significant variance between the young men’s and young women’s answers, which is indicative of the young students’ gender uniformity in the sphere of professional training and willingness to practice scientific activity.

As disadvantages, one can note:

- The low motivation level of the young students of both sexes to participate in the university scientific activity. Cumulatively, it is so few as (3.8%+13.9%=17.7%) who rate their participation in the student science as “very high” (3.8) and “high” (13.9). Meanwhile, 37.7% consider it to be “medium”, 19% – “low”, and 13.9% – “very low”;
- The indicator describing “disengagement” or “low level of understanding” of the young students of the university as for the question on enhancing their motivation for the scientific research work is alarming, because almost one third of the surveyed ones (26.0%) failed to word their attitude to that, marking the “I have difficulty answering” option.

Having scrutinized the theoretical and empirical research findings, the authors have arrived at the following generalizations concerning the problem under study. First, the problem of supporting Russian women’s scientific potential is of a comprehensive nature and requires elaboration from various standpoints (historical, philosophical, political, social and economic, sociological, anthropological, legal, psychological, pedagogical, and some others). It can be solved in a gradual, incremental manner completely interrelated with the way sociocultural processes of the Russian society unfold. Second, the issues concerning inclusion of Russian women into the country’s scientific and educational activity have in-depth historical and sociocultural reasons maintained by the immense stratum of history – their significant contribution to the progress of their Motherland (medicine, science, enlightenment, labor and military feats, state administration, etc.). Third, Russia possesses the vast historical experience (of the Soviet period) concerning the support of Russian women in science and education which has to be carefully analyzed, with all the best to be borrowed, adapted to the newest time conditions, and integrated into the country’s current social policy. Fourth, in the scientific sphere of present-day
Russia, the positive trend of supporting Russian women in science is maintained, although the percentage of women is considerably lower than that of men, especially in the top scientific managerial structures. Fifth, the paramount mechanism for optimizing the female potential in Russian science is the system of professional education which disposes of all resources for supporting it and cultivating the young students' motivation for practicing scientific activity, with gender-specific aspects considered. Sixth, as of today, outreach and educational programs for optimizing the student scientific potential while also taking into account the gender-based principle are carried out by Russian higher schools poorly.

**Conclusion**

Clearly, the female scientific potential acts as the most important constituent of Russia's innovation resource, and its optimization produces the direct effect on the advancement of the country, of all its social institutions and structures. The high educational and scientific potential of Russian women can have an immense influence on maintenance of traditional meanings and values of the Russian culture and on the entire course of development of the Russian statehood. The problem associated with having to support women's scientific potential in Russia is of an important state nature: it is connected to further democratic transition of the Russian society and to inclusion of the female potential into the most promising domains involved in Russia's social and economic, cultural progress – the system of education and the scientific sphere.

In Russia, support and development of women's scientific potential are rooted in the history of progress of its state and society; they represent its best traditions interwoven with mentality of the Russian people, meanings and values of its culture, historically formed system of its social relations. Russian system of higher professional education acts as the paramount factor and condition for forming solid bases of the current policy of supporting women's potential in science. It disposes of vast opportunities and resources associated with the formation of stable motivation in young students for practicing scientific activity, with the gender-based constituent taken into account.

Results of the research conducted are of both scientific and practical importance. They can be used for further scientific investigation within this range of problems, in the sphere of social policy while developing various state programs to support the scientific potential of Russian women, and in the system of higher professional education – in design of outreach and educational programs and study courses. This research has enabled the authors to reveal a number of important focus areas requiring elaboration: historical sociocultural foundations promoting the social establishment of Russian women; comprehensive evaluation of the role of women in the development of the Russian state and society; deontological principles in the scientific sphere with gender consideration; Russian gender policy as a factor and condition of support for women in science.
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References


