DEVELOPMENT OF STUDENT'S SCIENTIFIC POTENTIAL AS A PIVOTAL COMPONENT OF FUTURE SPECIALISTS' PROFESSIONAL COMPETENCE

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Abstract: The relevance of this research is associated with the preeminent role played by the system of professional education in the development of the modern Russian state and society. The objective of the research conducted consisted in identifying and substantiating the role of student scientific potential as the pivotal component in professional competence of the future specialists. The dialectical approach has enabled the authors to objectively analyze all factors and conditions underlying the successful functioning and development of Russian professional education system. The necessity of updating university students' creative potential is substantiated. Materials of the research are of interest both in terms of further scientific investigation on this line and in terms of their use in educational practice of academic training.

Keywords: students, academic research work, system of education, world community, sociocultural outlook, scientific potential.

1 Introduction

The selected research problem deals with the development of student scientific potential as the pivotal component in the future specialists' professional competence. Its relevance is determined by information technology processes and trends in the world community setting the outline for the future civilization. It is also driven by the increasingly important role for the system of professional education to play in the social and economic, sociocultural development of any state and society. Finally, it is associated with the requirements the modern times pose for specialists, regardless of their focus area and profile: they have to possess a high creative potential relying on the scientific framework.

This standpoint is confirmed by analysis of the world scientific literature where works published on the said problem occupy not an insignificant part. The analysis has shown that issues related to cultivating student scientific potential as the pivotal component in professional competence of the future specialists of any focus area and profile have attracted the attention of wellknown researchers for a long time. This is not surprising at all, as the problem of high-quality professional training of the future specialists depends on social progress processes and trends directly (i.e., on the established paradigm of the way human life is organized in the 21st century; on the powerful sociocultural and information outlook of the contemporary world; on the ongoing technological advance in all spheres of the human community; on the world globalization processes, etc.).

The modern scientific literature is actually inundated with various concepts, theories, provisions, and approaches related to organizing professional training at higher school. Analysis of numerous scientific works has shown that the efficient solution for the problem related to developing student scientific potential as the pivotal component in professional competence of the future specialists, regardless of their focus area and profile, is still far from being completed. Although modern professional education gets rather controversial estimates sometimes, nevertheless, many authors share the idea that the system of professional training of specialists at higher school needs consistent improvement. Both foreign and Russian researchers discuss this problem range. This circumstance reinforces the authors in adhering to the selected research line as the correct one.

2 Literature Review

Let the principal scientific focus areas be identified that are related to the problem of this study, to some extent or another:

- academic research work of bachelor and master degree students at higher educational institutions (Gavrin & Rebysheva, 2015; Beschasnaya & Shemchuk, 2018; Tamochkina, 2018; et al.);
- scientific research activities as the pivotal competency for graduates of postgraduate programs (Aleksandrov, 2018; Filippov, 2018; Chigisheva et al., 2017; et al.);
- competence and competency as an issue of concepts and terminology in modern education (Demchenkova, 2011; Kostrova, 2011; Bogacheva, 2012; Shaimova & Abdurazakova, 2013; Grigorov et al., 2017; Guzanov et al., 2018; et al.);
- the competency-based approach and its place in the system of modern education (Zimnyaya, 2006; Yarmakeev, 2010; Nagornova et al., 2018; Pevneva & Tabashnikova, 2019; Solovieva, 2019; Khakhonova, 2019; et al.);
- collection and analysis of data on scientometric indicators of the employees (Kvelidze-Kuznetsova et al., 2019; Strielkowski & Chigisheva, 2018; et al.);
- pedagogy and psychology of professional activities (Belozertsev et al., 2004; Tabashnikova, 2018; Shvatskiy, 2020; et al.);
- key competencies for Europe and assessment thereof (Hutmacher, 1997; Deardorff, 2006; Freidheim, 2012; et al.).

The said authors note that the modern era keeps setting yet new requirements for people, their professional knowledge, abilities, and skills. This has to translate not only into elaborating competencies within the system of professional education, but also in general – into its innovation development.

Analyzing Russia's existing system of professional education, B. N. Guzanov, O. V. Tarasyuk, and S. A. Bashkova (2018) note in their monographic study "Profile-specific competencies of vocational pedagogical university students": "In modern Russia, the relevance of the issue of training personnel within the system of professional education is governed by two principal factors. First, the personnel training level is not up to the structure of needs of the labor market. Second, the structure and content of professional education is being upgraded" (p. 10).

Analysis shows that this concerns the scientific aspect to a greater extent. So, Russian authors A. A. Beschasnaya and O. N. Shemchuk (2018) write: "Although the international opinions are united in realizing that higher professional education has to correspond to the current situation at the labor market, the system of higher education possesses another important content-related component. This is preparation and performance of scientific research. The said requirements are orchestrated by changing demands of the society, the needs of searching for new technological solutions in both the industrial and humanitarian spheres" (pp. 24-25).

A. S. Gavrin and L. V. Rebysheva (2015), too, note that it is difficult to envisage the modern Russian education upgrade process without such a component as the system of ensuring conditions for the future specialists' creative development at educational institutions. Manning the future scientific and technical elite from the student community is an essential social and economic task and a condition of the country's progressive development.

In their joint monograph "Professional competencies at higher school", A. Yu. Nagornova, L. G. Milyaeva, E. N. Bavykina, et al. (2018) reasonably opted for the standpoint dealing with the necessary innovation development of Russian education. Discussing the role of science in improving specialists' professional level, they consider it important to single out the following aspects in professional training: knowing the theoretical content of a given domain, possessing a worldview, a capacity for forecasting, knowing the essence of scientific research (goal-setting, reflection), recognizing one's direct mission, wishing to learn much, especially the ability to word one's standpoint.

Ultimately, analysis of sources on the said problem has shown that efficient functioning and development of higher professional education largely depend on the way students' creative activities are organized and they are introduced to practical and scientific activities within their future profession from the first year of studies. So, researcher O. A. Tamochkina (2018) writes correctly about the fact that cultivating the creative potential in higher educational institution students is a prerequisite for their further creative self-fulfillment in the future profession. This also means this process contributes to improving the quality of professional training at higher school.

Foreign researchers dealing with this focus area also note the existence of the problem associated with the development of innovation education, its correspondence to the modern times, and the necessity of upgrading educational competencies. So, back in 1996, a report was presented at the Symposium Berne (Switzerland) saying that an entire set of related issues underlie the question of key components. Both teachers and politicians have to take into account long-established curricula, teaching methods, and school conditions of the system of education (Hutmacher, 1996).

Many Western scientists are more concerned about questions associated with internationalization of education, the extent to which the intercultural competence corresponds to standards and requirements of the time, identification and assessment thereof (Deardorff, 2006; Freidheim, 2012; et al.).

3 Research Methodology and Methods

In terms of methodology, this study relies on dialectical comprehension of the essence of social phenomena and processes under analysis. Meanwhile, the systemic, axiological, ontological, and comparative culturological approaches are taken into account when assessing the way Russia's higher professional education functions and develops. Fundamentally, this study is based on scientific works (concepts, theories, and statements) of well-known Russian scientists having won recognition both in time and in social practice, and it is mostly analytical in character. The objective of the research is to identify and substantiate the role of student scientific potential acting as the pivotal component in professional competence of the future specialists. Its tasks are as follows: to identify principal factors on which the efficient development of the Russian higher professional education depends; to find out and summarize standpoints currently available in science that deal with understanding the importance of university student research activities; to substantiate the necessity of updating students' creative potential in the educational process of higher school. Methods of the research include: philosophical comprehension of social phenomena and processes in their systemic integrity; social and philosophical modeling of the subject under study; systemic analysis, synthesis, comparison, contrasting, and generalization of the scientific material on the research problem.

4 Results and Discussion

4.1 Factors Determining the Efficient Development of Higher Professional Education in Russia

Analysis of existing philosophical and scientific literature discussing social phenomena and processes in the development of the society, its institutions, and structures has allowed identifying the most important ones that determine the efficiency of functioning for higher professional education. In this case, they generate some causes hindering the development of the system of Russian higher professional education. Let three principal groups of factors be outlined that are the driving force and energy behind either advance or regression of the society and its institutions.

- 1. Political factors. Political instability, first of all, in the country's internal policy, affects functioning of all regions and settlements of the RF and instills lack of confidence about the future in citizens of the country. Due to these factors, the national educational policy cannot be elaborated and pursued efficiently; nor can the effective administration be formed both for Russia's entire system of education and for its higher school system. Political instability also makes it impossible to elaborate solid methodological framework for Russian education to develop on, with meanings and values of Russian culture taken into account.
- 2. Economic factors. They generate social tension in all subjects of education, preventing them from fulfilling the main and further educational programs and from organizing and conducting profile scientific research as far as necessary. These factors interfere with the policy of active academic exchange with leading universities of Russia and foreign countries; relevant assessment of work of the academic teaching staff (ATS) is hindered, too. Because of the said factors, they fail to organize student science efficiently and the scientific and technological support required for the educational process up to challenges of the era, among other things.
- 3. Social factors (social and political, managerial, personnel ones, etc.). They generate a high level of dissatisfaction in the ATS of the country's universities with the educational policy pursued by the Ministry of Science and Higher Education. Social factors also cause pessimistic sentiments as for personal career growth, professional well-being, and improvement prospects for the situation with the management system of Russian higher professional education. This is associated with the impossibility of complete creative self-fulfillment in working with young students, the high status of a Russian professor being lost in modern Russia, and so on.

4.2 Current Scientific Standpoints on Understanding the Importance of Research Activities of University Students

Scientific literature contains rather numerous materials addressing the development of scientific potential in students as the pivotal competency of higher educational institution graduates. The irreversibility of powerful trends in sociocultural and information technology processes taking place in the modern world community is understood and recognized. Proceeding from this, most authors share the viewpoint that it is the scientific constituent that acts as the necessary (profile) basis in professional training of the future specialists in virtually any focus area (Gavrin & Rebysheva, 2015; Filatova, 2015; Aleksandrov, 2018; Beschasnaya & Shemchuk, 2018; Tamochkina, 2018; et al.).

A group of Russian authors (Bezruchko et al., 2018) have attempted to identify the following clusters of competencies of the nearest future:

- 1. Ability to interact and co-operate with others. It makes up the first and largest cluster of "competencies of the future".
- Thinking and problem-solving. This cluster ranks second in size, incorporating 15 competencies.
- 3. Aptitude for learning and openness to the new. This one rounds out the above top three, respectively.
- Innovation and creativity. This set of competencies implies first of all braveness, readiness for experimenting creatively and making mistakes.
- 5. *Digital knowledge and skills*. This group includes programming, the knowledge of fundamental robotics, and the ability to understand and use new technologies.

6. Awareness and self-management. This involves the ability to control one's attention, find meaning in work and life, resilience, the ability to build one's own plans and to understand oneself in general.

The said authors note that "these six clusters encompass around 80% of "competencies of the future"... They are no individual skills to be "leveled up" quickly, but they are elements of one's personality".

As it can be seen, specialists have to seamlessly integrate the professional and the personal within themselves in the nearest future. According to the authors, this requires elaborating the new educational paradigm, new methodological framework in organization and fulfillment of the educational and upbringing process at higher school.

Alongside this, in spite of the most diverse estimates of the nearest future, one thing is clear: this future is completely bound with science and higher education, according to the genius insight of the great Russian scientist V. I. Vernadsky (1991).

Modern Russian researchers are also convinced of the necessity of updating the educational and upbringing process in the higher professional education, orienting it to building up the future specialists' research competency. L. B. Filatova (2015) expresses quite a clear opinion about this: "Academic research work is a professional activity, so it is important to consider the process of staged and consistent cultivation of specialists' research competency during their studies at higher school and postgraduate training" (p. 48).

O. A. Tamochkina (2018) notes, too, that training of highly creative specialists is unthinkable without involving creativity, creative self-fulfillment, and building up students' creative potential in conditions of higher school.

Discussing the future specialists' level of preparation for activities in the information technology society, A. S. Gavrin and L. V. Rebysheva (2015) are convinced that the said specialists have to possess not only the required total of basic and special knowledge, but also certain skills of creatively solving practical problems; they also have to continuously upgrade their qualification and quickly adapt to changing conditions. All these qualities have to be shaped at higher educational institutions by means of students' active participation in academic research work. The latter gains increasingly high importance at the present time and turns into one of the principal components in professional training of the future specialists.

Analysis of the array of scientific materials concerning the student science development problem allows making the following conclusion. In conditions of modern Russian higher educational institutions, professional training of the future specialists, regardless of their focus area and profile, requires the consistent and focused state policy. This policy has to be aimed at training the future specialists for scientific activities in their professional life. "In the modern conditions, the role of the state in developing science and education is a prerequisite for building up the spiritual, intellectual, scientific and technical, social and economic progress of the Russian society and state, as well as for maintaining its national security" (Gavrin & Rebysheva, 2015).

4.3 Necessary Update of Students' Creative Potential in the Educational Process of Higher School

The authors have carefully analyzed approaches presented in scientific literature concerning the functioning and development of modern higher professional education. In particular, they focused on the role of student scientific potential in professional training of the future specialists. This analysis has shown that despite the researchers' most diverse methodological standpoints, most of them agree that

 in its functioning and development, the modern system of higher professional education is driven both by general, inherent in the world community processes and trends and by its own country's particularities (economic, geographical, sociocultural ones, etc.);

- in spite of the upgrade and a number of reforms consistently organized and conducted, Russian system of higher professional education currently fails to meet the requirements of the modern times;
- among the principal factors and conditions determining the efficiency of professional training of the future specialists within the system of higher school, the issue of enhancing their scientific potential during professional training at universities requires imperative solution.

Although practice related to developing the creative potential of all educational process subjects at higher school has become dramatically relevant in the modern times, nevertheless, many researchers note the said potential level is insufficient. They believe that at Russian universities, this is the case in both students and the academic teaching staff, so their creative potential has to be cultivated on.

O. A. Tamochkina (2018) points out that building up the creative potential in higher educational institution students is a prerequisite for their further creative self-fulfillment in the future profession. This is why this process contributes to improving the quality of professional training at higher school.

V. N. Kormakova (2015) writes: "One of the important constituents of working with the future specialists at higher educational institutions is to include them into scientific research activities opening up broad opportunities for stimulating the learners' personal creative potential".

Researchers R. K. Seryozhnikova and O. Yu. Smachnaya (2015) share the firm standpoint expressed as follows: "...It is essential to look for ways to promote students' revealing their personal creative qualities as much as possible, based on taking into account their distinction. ...This implies rethinking the essence of the upbringing process at higher educational institutions in a qualitative manner. Meanwhile, the process has to be oriented to cultivating the experience of creative activities, emotional and value-based attitude to the world, which manifests itself in updating the individual creative potential" (p. 193).

Thus, the development of students' creative potential within educational process of higher school can be categorized with confidence as one of the priority tasks concerning professional training of the future specialists in the modern Russia.

5 Conclusion

Results of the research conducted enable the authors to word the following statements considered as findings:

- 1. Russia and the world community form the united space for mankind to survive and develop in, with all its processes and emerging trends making up the basis for all states and national communities of the planet Earth to function and evolve upon. Regardless of the harsh political antagonism witnessed in the world politics, one can speak of the fact that currently, one country's successful progress causes all the rest ones to improve, too. This is where the world globalization effect manifests itself. At present, any country develops successfully only if its system of education, in particular, higher professional school, is efficient. In their seamless integration, the principal factors (political, economic, and social) determining the efficient development of Russia's higher professional education create the necessary conditions for its scientific, economic, and social breakthrough in the 21st century.
- 2. Understanding how important science is for the development of the early 21st century human civilization leads to a positive change in the public consciousness of Russia's scientific and educational community. They have come to realize the fact that the scientific and technological advance of Russia is only possible if the priority in professional training of the future specialists within higher

education is given to the scientific constituent. This circumstance makes Russian scientific and educational community ratchet up their efforts searching for the efficient support to be provided for the research constituent in terms of methodology, practices, and technologies (considering the said constituent within the process of the future specialists' professional training in conditions of universities).

- 3. Having to update students' creative potential within the educational process of higher school is a phenomenon and practice of paramount importance for the development of Russia, for its competitiveness at the world market. Efficient inclusion of students into scientific research activities demands, first of all, revising the methodological framework for professional education, which implies the following measures:
- a broad set of academic research work lines and activities for higher educational institution students have to be organized, starting with their first year of studies; meanwhile, in mastering the future activities profile, the said research activities have to be a compulsory unit;
- highly efficient mechanisms for involving students into R&D have to be designed and implemented into the educational process of universities, taking into account specific features and capacities of the latter; similarly, performance assessment for student research activities to cover the entire period of learning (awards, scholarships, recommendation for admission to postgraduate studies, etc.) has to be elaborated and implemented;
- efficient material and technological support has to be developed; this is about extensively involving the academic teaching staff into both supervising student research activities and assessing them.

The results of this research are of both scientific and practical importance; they can be used in studies of this focus area and in organizing student research activities at higher educational institutions.

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