

AKKORK

Agency for Quality Assurance in Higher
Education and Career Development

Approved by

Chairman of the Advisory Council

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REPORT

**on the results of an external evaluation of the postgraduate
educational program for the training of scientific and pedagogical
personnel "Chemistry"
in the field of study 04.06.01 "Chemical Sciences"
St. Petersburg State University**

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SUMMARY OF THE PROGRAM

The main postgraduate educational program of higher education "*Chemistry*" for training of scientific and pedagogical personnel is implemented in the field of education 04.06.01 "Chemical Sciences" by the Institute of Chemistry of the St. Petersburg State University (hereinafter - SPBU, HEI) and leads to the award of the qualification "Researcher. Research teaching fellow" The management of the program is carried out by the Head of the educational program of postgraduate school, Valentin Semenov, doctor of physical and mathematical sciences, professor.

As part of the external evaluation of the educational program a site visit was carried out by AKKORK experts from September 17 to September 18, 2019.

Strengths of the program under evaluation

1. The postgraduate program is well designed with a wide selection of disciplines, with a highly qualified and enthusiastic teaching staff, that ensures high quality education. Budapest descriptors and the EuChemS Code of Conduct are applied.
2. The university leadership has high demands for the quality of educational and methodical activities of the educational units, which results in a high level of quality of the developed documentation for the program.
3. The unit responsible for the implementation of the program is the Institute of Chemistry. It has the necessary material and technical resources, including modern equipment for implementing the program at a high modern level, which allows achieving the international competitiveness of the educational program and its graduates.
4. The program is implemented in a separate campus with all the necessary infrastructure.
5. The educational process is conducted using foreign languages and leads to the formation of competencies related to foreign language communication.
6. The teaching staff of the program conducts research and development at a world level.
7. Postgraduate students have the opportunity to go on foreign work trips and internships.
8. Postgraduate students are given maximum of opportunities for thesis research preparation and its successful defense.
9. Due to the significant participation of employers in the development of the educational program, all graduates have the opportunity to find jobs in large Russian companies.

Weaknesses of the program under evaluation

1. The specificity of the program is not as well defined in comparison with similar programs of other universities in the region. When developing an educational program development strategy, it is necessary to achieve a

clear positioning in the educational services market through a detailed analysis of external and internal factors (for example, building an expanded matrix of *SWOT analysis*).

2. At the program level, insufficient attention is paid to the formation of “soft skills”.
3. The existing safety management system in the laboratories has flaws.
4. In the educational process, archaic methods and technologies are mostly used although this does not result in a decrease in the level of education. For example, on one the lectures of Inorganic chemistry that the experts visited, the blackboard was the only visual aid available, which, nevertheless, provided the accessibility of the material. On another lecture (Theory basics of Organic chemistry) the teacher’s inaccurate illustrations on the blackboard (maybe a literal error) conflicted with the slides shown, which wouldn’t have happened if the teacher didn’t use spontaneous graphic illustrations.
5. Not enough attention is paid to the monitoring of the students’ opinions on the organization of the educational process and other internal processes.

The main recommendations for the program under evaluation

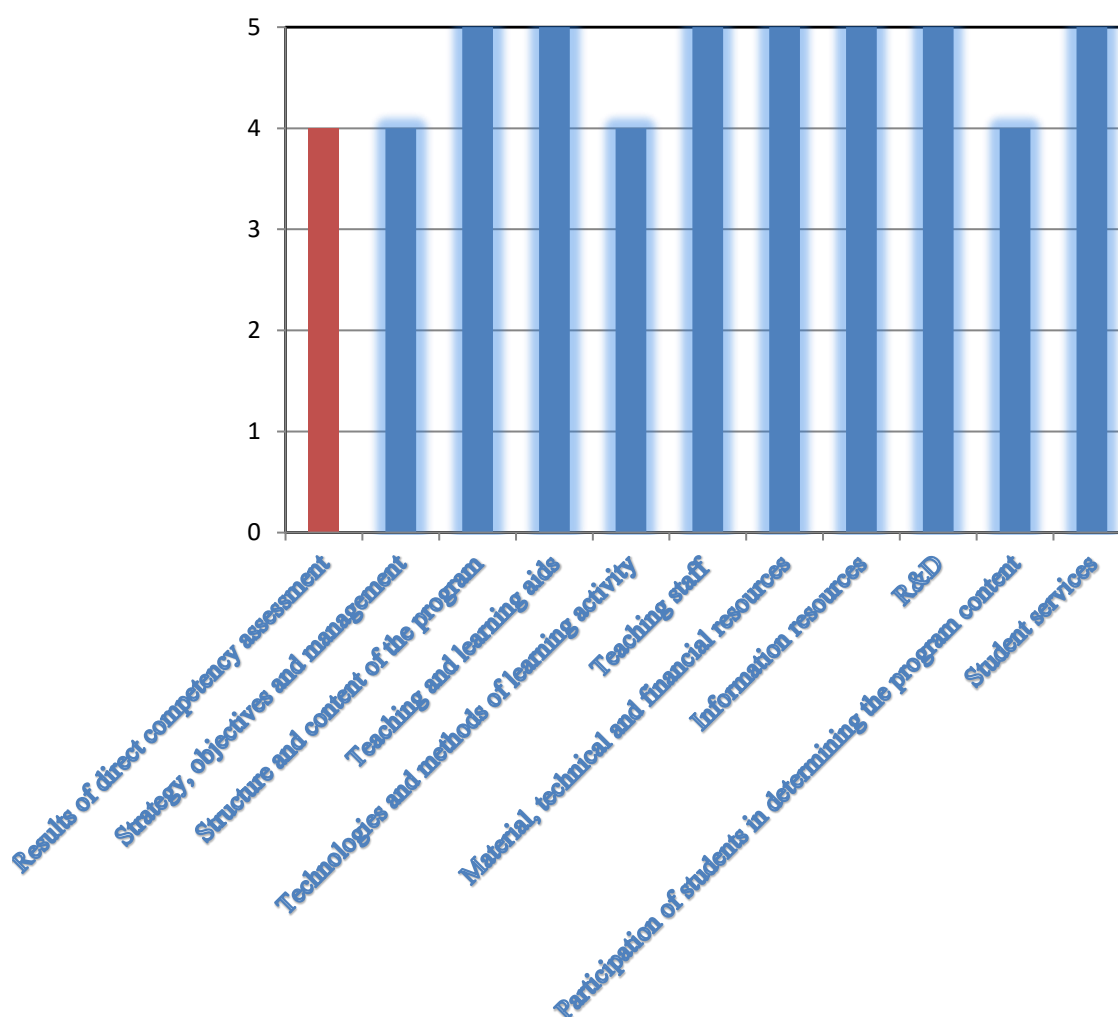
1. Consider the possibility of developing and implementing additional disciplines (modules) in the educational process aimed at the formation of "soft skills" of graduates.
2. Consider the possibility of increasing the workload on disciplines related to chemical technology.
3. Continue updating the strategy of the development and promotion of the educational program.
4. Take measures to modernize the educational process in terms of applied methods, technologies and techniques.
5. Guarantee the safety of the training sessions and the implementation of research activities.
6. Provide regular continuing education for the teaching staff.
7. Consider the possibility of modernizing the educational infrastructure from the point of view of increasing its accessibility for students with disabilities, including those with limited mobility.

Assessment of learning outcomes and quality assurance of education

No.	Criterion		Assessment
<i>I</i>	<i>Quality of learning outcomes</i>		
	1.	Results of direct competency assessment	4

<i>II</i>	<i>Education quality assurance:</i>		
	1.	Strategy, objectives and management	4
	2.	Structure and content of the program	5
	3.	Teaching and learning aids	5
	4.	Technologies and methods of learning activity	4
	5.	Teaching staff	5
	6.	Material, technical and financial resources	5
	7.	Information resources	5
	8.	Research activity	5
	9.	Participation of students in determining the program content	4
	10.	Student services	5

Assessment of learning outcomes and education quality assurance



QUALITY OF LEARNING OUTCOMES

According to the list of competencies formed and the volumes of the components of the learning process, the curriculum is in full compliance with the current standard of St. Petersburg State University and the Federal State Educational Standard (hereinafter - FSES). The duration of the postgraduate study program is 4 years and has a volume of 240 credits. Training consists of the basic and variable parts, at that, the basic part is focused on 1 course. Teaching practice is implemented in the 2nd year. Industrial practice is implemented in the 3rd year. Final certification completes the training and awards 9 credits. For studying disciplines (modules) - 30 units of which 9 units relate to the basic part, 21 units - to the variable part. The disciplines of the basic part involve the study of the history and philosophy of science (4 units), as well as a foreign language (5 units).

The competency of PCA-1 is formed as part of the online course Pedagogy and Psychology of Modern Higher Education, as well as in the course of teaching practice. The competencies of PCP-1-PCP-3 are formed in the course of research and industrial practice. The formation of competencies UCA-1-UCA-8 is ensured through research and study of disciplines (modules).

The set of disciplines proposed in the curriculum for studying in conjunction with research work fully guarantees the formation of predetermined competencies. The range of disciplines offered for the study allows to prepare a modern scientific and pedagogical worker of the highest qualification within the chosen field of education.

1. Direct competency assessment by experts

Criterion grade: 4

During the direct assessment of graduates' competencies, control and evaluation materials prepared by experts were used. To analyze the development of competencies, the experts selected the following:

- Assessment of competencies characterizing the personal qualities of a person, which are an integral part of his professional competence:

UCA-7 Able to plan and solve problems of one's own continuous professional and personal development

- Assessment of competencies aimed at the development, maintenance and improvement of communications:

UCA-5 Able to organize and carry out scientific communication using modern methods and technologies in the state language of the Russian Federation, presenting the results of one's research activities in scientific

reports and texts of a scientific orientation, as well as materials intended for non-specialists

- Assessment of professional competencies ("core competency") including competencies that reflect the need (requirements) of the regional and/or federal labor market depending on the main consumers of the program graduates:

PCP-1 Able to carry out research activities

To assess the level of formation of these competencies, the experts applied the technology of solving cases. Students were offered to solve situations of future professional activity and episodes of planning of their own personal and professional development.

Case 1 (**UCA-7**). Describe your professional development plan for the next 5-10 years, taking into account the desired result and your own ideas about the necessary measures to achieve it.

Case 2 (**UCA-5**). Give an interview about the topics of the research work of your Chair to the hosts of the "Morning of Russia" program or tell your next of kin about your work.

Case 3 (**PCP-1**). Tell about the progress of your research work over the past three years to professional experts of the international commission evaluating the work of the university in which you are studying, or to members of the dissertation council in which you will defend your thesis for the degree of Candidate of chemical sciences.

According to the results of a direct assessment of competencies of four graduate students of 4 years of study (Petukhova Julia, Kalinin Stanislav, Apraksin Rostislav, Glukharev Artem), the experts revealed the following results in the corresponding quantitative expression:

Level Percent of students	Sufficient level (80% of the proposed tasks were correct)	Acceptable level (50 to 79% of tasks were correct)	Low level (the percentage of solved tasks is less than or equal to 49%)
The results of a direct assessment of competencies characterizing the personal qualities of a person, which are an integral part of his/her professional competence (UCA-7)			
50 %			+
25 %	+		
25 %		+	
Results of a direct assessment of competencies aimed at the development, maintenance and improvement of communications (UCA-5)			
75 %		+	

25 %	+		
Results of a direct assessment of professional competencies (the “core competency”), including competencies that reflect the needs (requirements) of the regional and / or federal labor market, depending on the main consumers of the graduates of the program (PCP-1)			
75 %	+		
25 %		+	

When conducting the assessment of education quality, the experts got acquainted with 19 Graduate qualification works (hereinafter - GQW), which amounted to 100% of the final works of the last year in this field of education. The experts concluded that the examined GQW comply with all the requirements stated below:

GRADUATE QUALIFICATION WORK

N o.	Objects of evaluation	Comments of experts
1.	The topic of GQW corresponds to the field of degree and the current level of development of science, equipment and (or) technology in the field of the program.	Correspond - 100%
2.	The tasks and contents of the GQW are aimed at confirming the competencies formation of the graduate.	Correspond - 100%
3.	The degree of use of the materials collected or received during the pre-graduation practical training and the preparation of term papers in the independent research units of the GQW.	Correspond - 100%
4.	The topic of GQW is defined by the requests of the production organizations and the tasks of the experimental activity solved by the teachers of EI.	Correspond - 100%
5.	The results of GQW find practical application in production.	Correspond - 100%
6.	The degree of use of the results of the research of the Chair, faculty and third-party research and production and/or research organizations in the performance of independent research parts of the GQW.	Correspond - 100%

Conclusions and recommendations of experts **Conclusions**

Experts noted a high level of demand for graduates of the program on the labor market. The program is highly recognizable at the regional, federal and international levels. 4th year postgraduate students have significant experience in communicating with potential employers and are reasonably convinced of the favorable prospects of finding a job in their specialty, while they highly appreciate the quality of education and preparation for professional activity. The level of training of postgraduate students, confirmed by representatives of potential employers, indicates a high level of competitiveness of the program in comparison with similar programs in the region.

At the same time, it has been noted that at the level of implementation of the educational program, insufficient conditions have been created for the maximum formation of all competencies stated in the curriculum. Thus, the competency UCA-7 implies the ability to plan and solve the tasks of one's own continuous professional and personal development. At the same time, a direct assessment of competencies shows that some graduates are not able to formulate a plan for their immediate and medium-term development at the end of their studies, or formulate only an approximate development plan, but are not aware of the amount of required effort, or are convinced of a long-term demand on the labor market with no extra effort on their part.

The competency UCA-5 implies the ability to organize and carry out scientific communication using modern methods and technologies in the state language of the Russian Federation, presenting the results of one's research activities in scientific reports and texts of a scientific orientation, as well as materials intended for non-specialists. At the same time, the attempts of postgraduate students to describe the results of their research, as well as that of colleagues in a language that non-specialists would understand, is largely unsuccessful, since the speech of graduates is replete with highly specialized terms that impede communication with an unprepared audience.

A small number of 4th year postgraduate students (1 of 4) also demonstrate an insufficient level of progress in the preparation of the Graduate qualifying work, but at the same time he demonstrates a reliable plan of immediate actions for the successful completion of training on the program.

Recommendations

Based on a direct assessment of competencies, experts recommend considering the possibility of adjusting the program in the direction of creating opportunities for students to form and consolidate soft skills related to competencies in solving problems of professional and personal development in the medium and long-term after completion of training, as well as self-presentation skills and presentation of work results to a wide range of stakeholders who do not have special knowledge in the field of chemistry. The formation of soft skills among students is required in accordance with the Budapest descriptors.

EDUCATION QUALITY ASSURANCE

1. Program strategy, objectives and management

Criterion grade: 4

Program strengths

The educational program has a significant success story, which contributes to a stable tendency towards the upward accelerated development of both the program and the Institute of Chemistry as a whole. The program management has a clear understanding of the need to provide the educational process with a modern educational environment, including modern equipment, the availability of relevant scientific and methodical materials, the organization of special communications, the possibility of testing studies, etc. The Resource Center of the Institute of Chemistry, the library that includes means of access to electronic library systems and scientific databases, as well as providing opportunities for professional internships, and the efforts of the teaching staff create all the conditions for postgraduate students to receive fundamental education.

The use of Budapest descriptors, which provides effective student mobility; the implementation of the EuChemS Code of Conduct has a positive effect on the program implementation.

Recommendations

1. When developing and updating the development strategy of the educational program, taking into account the specifics of St. Petersburg State University as a classical university, it is necessary to associate it with the advantages of graduates of the program compared to graduates of similar programs in other universities, including industry research ones (St. Petersburg State Polytechnical University, St. Petersburg State Technical University, St. Petersburg Polytechnic University named after Peter the Great, Russian State Pedagogical University named after A. Herzen et al.) in terms of future employment. This is necessary for students to understand their future competitive advantages on the labor market and high career orientation, and at the training stage to concentrate on the formation of especially important competencies. For example, the advantage of a graduate of the Institute of Chemistry of St. Petersburg State University, perhaps, is considerable experience of work with modern analytical equipment and the competence of independent work at the corresponding facilities formed through this. Or the advantage is the knowledge of a foreign language at the C1 level, which makes it easy to prepare articles for publication in international rating scientific journals. In experts' opinion, using modern strategic planning techniques (with the participation of employers, graduates, other universities of the region, students, teaching staff, the administration), it is necessary to understand the exceptional specifics of the professional characteristics of the graduate of the

Institute of Chemistry of St. Petersburg State University, his/her career prospects and, as a result, outline a path for identifying and updating key competencies.

2. The development of management of the educational program must be associated with the specifics of its implementation, in this case, the chemical specificity. So, during a tour of the Institute's laboratories, it was found that the necessary safety measures were not implemented in the classes (there were no targeted safety briefings for students, there were no safety briefing books, there were no signs with the names of those responsible for fire safety, incomplete first-aid kits and other). There was no laboratory assistant at the lesson. Moreover, the structure established at the university does not allow the Institute's administration to achieve the fulfilment by laboratory assistants of duties that are natural in chemical education, since laboratory assistants are employees of a structural unit separate from the Institute. This can be achieved by distributing responsibilities between the personnel in the internal hierarchy system, which will guarantee the achievement of the required level of safety during specific chemical works, including fitting with the necessary equipment (safety showers, first-aid kits, color differentiation of pipes, etc.), ensuring the availability of the rules for its use (safety rules), the availability of guaranteeing documentation and the rules for its maintenance (safety briefing books, the appointment of people responsible for fire safety). It is also necessary to harmonize the functions of the teaching support staff, on the one hand – the teaching staff, and administrative personnel - on the other, taking into account the specifics of chemical education.
3. The opening of the specialized Chairs of leading employers at the Institute is an important point of growth, as well as a way to achieve a higher demand for graduates and increase the practice-oriented education and training.
4. Opening on the basis of enterprises that are key consumers of the graduates of the program, representative offices of the university (departments or the like) is desirable and can provide higher quality postgraduate support for graduates.
5. It is necessary to strengthen the systematic informational promotion of the status of a diploma of a candidate of sciences of the sample of St. Petersburg State University. The current situation, accompanied by the desire of graduates to defend their theses according to several standards, does not contribute to the saturation of the labor market with specialists positioning themselves as candidates of sciences according to the standard of St. Petersburg State University, and, therefore, prevents the growth of the authority of this status. One of the solutions to the problem could be the development and implementation of a university policy promoting the standard of St. Petersburg State University with details to the Major group of specialties (SWOT analysis, stakeholder analysis, problematization, goal setting, SMART tasks, roadmap of events).

6. It is recommended to discuss with employers the possibility of attracting additional funding for the Institute of Chemistry at the expense of employers, given that the Institute of Chemistry is a supplier of highly qualified personnel.

Additional material

During the site visit, key employers were interviewed, who confirmed a consistently high level of quality of education for graduates of the program. It is important to note that 100% of the surveyed employers point out that graduates with the widest range of general competencies, while possibly not having deep specialization in any narrow branch of chemical knowledge or practice, are in highest demand for them.

During the site visit, interviews were conducted with key teachers involved in the implementation of the program, as well as with the head of the educational program, based on which a generally high level of teachers' satisfaction with the personnel policy and the current motivation system was recorded.

2. Structure and content of the program

Criterion grade: 5

Program strengths

The postgraduate program is well designed with a wide selection of disciplines, with a highly qualified and enthusiastic teaching staff, which ensures high quality education.

The competency model of the graduate, developed by the Institute of Chemistry, is in full compliance with the demands of the labor market, as well as the current requirements for a highly qualified scientific and pedagogical worker with the level of development of chemical science and chemical education. At the same time, strong ties with key chemical enterprises in the region and the high demand for graduates of the program testify to the consideration of regional needs for highly qualified scientific personnel. The competencies of graduates in the competency model are focused on deep development of the skills of independent planning and implementation of research and teaching activities, as well as the formation of the necessary personal qualities for this, including the ability to organize effective communications, and entrepreneurial skills. It is important that the content of the program is formed and updated during its implementation, taking into account the wishes of employers, teaching staff and students. An important feature of the educational environment is the participation of all students in scientific communities that contribute to the formation of interdisciplinary skills and metacompetencies.

Recommendations

1. Thanks to the well-formed competency model of the graduate of the program compared to those of graduates of other universities in the region and the country

(paragraph 1 of the recommendations on the criterion “Strategy, objectives, and management of the program”), the Institute of Chemistry of St. Petersburg State University will help to justify the amount of staffing needs in the industry, which may become an argument in discussions with the founder (responsibility center) on the issue of allocating more volumes of admission control digits, including through targeted training of graduates for other regions, in which organizations of chemical education do not have such a high educational potential.

2. Consider the possibility of increasing the workload on disciplines related to chemical technology. During the interviews with the graduates of the program, a possible shortage of knowledge, skills, and competencies related to the applied aspect was revealed, although this deficit does not contradict the declared competency model of the program. Compensation for this possible deficit would help expand the circle of potential employers and increase the demand and, accordingly, the graduate's confidence on the labor market. At the same time, this recommendation may not be applicable if such an approach is unacceptable within the framework of the chosen program positioning model (paragraph 1 of the Recommendations according to the criterion “Strategy, objectives and management of the program”).

Additional material

During the site visit, experts held meetings with students of the program being evaluated. One of the issues discussed was the correspondence of the structure and content of the program to the expectations of the direct consumers of the program (students). According to the results of the meetings, experts concluded that the postgraduate students were highly satisfied with the structure and content of the educational program.

From the point of view of ECTN members and specialists of the Tuning project (a project on the correlation of various educational systems), credits system for the postgraduate program should be abandoned, since most of the time is spent on the scientific work preparation and experimentation.

3. *Teaching and learning aids*

Criterion grade: 5

Program strengths

The development of projects of educational and methodical documentation is carried out by pedagogical, scientific and pedagogical workers on behalf of the rector or an official authorized by him/her or on his/her own initiative. Each pedagogical, scientific and pedagogical worker of the University has the right to initiate consideration of the draft teaching and learning documentation prepared by him/her on his/her own initiative, by sending it to the corresponding chairman of the Teaching and learning commission (hereinafter - TLC) of the faculty, the

chairman of the Methodical council or the Head (deputy Head) of the Department of Educational programs.

100% of teaching and learning materials (hereinafter - TLM) are agreed with key partners representing the labor market, external representatives of the scientific community. The council of the educational program consists mainly of representatives of the employers. In the 2018-2019 academic year, the TLC of the field 04.00.00 Chemistry included representatives of two employers: A. Sedov, Candidate of Chemical Sciences, Deputy Scientific Director, SPC Standart and E. Podolskaya, Candidate of Chemical Sciences, Senior Researcher in the Research Institute of Hygiene, Occupational Pathology and Human Ecology, FMBA of Russia. The TLM developed and used have all the necessary qualities required for modern TLM and make it possible to ensure the achievement of a high level of education. Classes are conducted by teachers who are executors of scientific research (hereinafter - R&D) and grants, for the implementation of which it is necessary to use modern achievements of science, technology, modern technologies and management methods.

Syllabi of all disciplines and practices are publicly available on the Blackboard system.

Recommendations

1. It is recommended to plan the individual assignment for pedagogical practice in such a way that the student could use the results of his/her research work to develop pedagogical skills.
2. It is recommended that the program includes elements of postgraduate internships in other organizations specializing in the training of higher education teachers, to familiarize postgraduate students with the best achievements of modern pedagogical schools. This will allow postgraduate students not to be limited in their ideas to the methods of the educational process organization that are traditional for the Institute of Chemistry.

4. Technologies and methods of learning activity

Criterion grade: 4

Program strengths

The formation of the competencies declared in the competency-based curriculum (CBC) of the program “Chemistry” is achieved through the use of both traditional forms of conducting classes and classes using active and interactive technologies (online courses, electronic / distance learning) and teaching methods. The professional competencies of postgraduate students are formed to a greater extent as part of the implementation of practices and research (201 units of 240). The high level of formation among graduates of the program of professional competencies is evidenced by the reviews of organizations on the program, of employers’ surveys, reviews of Graduate qualification works.

Pedagogical practice takes place at St. Petersburg State University (stationary), which helps students achieve the skills stated in the program and allows them to work out the basic formats of pedagogical activity used at the Institute of Chemistry.

Recommendations

1. The range of pedagogical technologies and methods used in working with graduate students, as well as the types of training sessions, should be expanded through the use of modern interactive formats (trainings, games, discussions, joint lectures, lectures with embedded errors, etc.), since one of the tasks of the postgraduate school is to prepare teachers of higher education.
2. It is recommended to increase the number of workshops and other educational events held by various employers, as well as the number of employers involved in these processes. It is recommended that such master classes be held for student flows of programs of different levels, especially graduation and pre-graduation courses. In this case, questions asked by postgraduate and Master students are an additional incentive to motivate Bachelor students. Increasing the frequency of master classes from employers and expanding their circle should help to increase the students' focus on employment as the goal of education. Moreover, the specific frequency of the workshops is not as important as the achievement of regularity, expectation and reflectivity of this type of educational event.
3. To involve graduate students in the educational process as teaching assistants (conducting classes, consulting students, checking students' assignments) for the development of the pedagogical component in the competence structure of a future candidate of science, as well as with the aim of using the “fresh eye” of postgraduate students on the use of audio-visual tools or other modern methods in the learning process. At the same time, postgraduate students can actually begin to fulfil the function of a mentor, which will contribute to the implementation and development of the system of division of pedagogical work in the educational institution, which, in turn, will have a significant impact on the level of pedagogical training of themselves.
4. It is recommended to ensure the necessary level of safety (fitting with equipment necessary for safety rules application (showers, first-aid kits, color differentiation of pipes, etc.), ensuring the availability of the rules for its use (safety precautions), the availability of guaranteeing documentation and rules for its maintenance (safety briefing books, appointment of persons responsible for fire safety).

Additional material

During the site visit, the experts did not have the opportunity to attend classes for postgraduate students, since during the visit they were not provided by the schedule.

5. *Teaching staff*

Criterion grade: 5

Program strengths

The program is characterized by the involvement of a very high level teaching staff in its implementation. Teachers education fully corresponds to the profile of the taught disciplines. Teachers undergo continuing education in accordance with the existing regulations at St. Petersburg State University, have a high degree of communication skills, including foreign language skills, organize the educational process in conditions of goodwill and sufficiently contribute to unlocking the potential of students.

Recommendations

1. The percentage of teachers who have undergone continuing education in the past three years is not high enough. It is recommended to ensure a more uniform professional development of teaching staff within the period of the program, which can be achieved by planning advanced training not only for the structural unit as a whole, but for the team participating in the implementation of a specific program.
2. It is recommended to provide a deeper support of young teachers involved in the work of the Institute by organizing visits and discussing lectures and classes.

5. *Material, technical and financial resources*

Criterion grade: 4

Program strengths

Experts noted a high level of the program's provision with material, technical and financial resources. To implement the program, the resources of the St. Petersburg State University Research park, scientific library, and electronic information and educational environment are used. The program is equipped with all the necessary licensed software. Students have access to the university clinic of St. Petersburg State University.

Recommendations

1. It is recommended to consider the possibility of upgrading the infrastructure of the Institute of Chemistry building from the point of view of increasing its

adaptability to the training of persons with disabilities, in particular, those with limited mobility.

2. A rather low level of satisfaction of the faculty with the quality of the premises of the Institute has been noted. It is recommended to identify premises requiring cosmetic and / or major repairs or other improvements, and plan their repair.

3. It is recommended to analyse students' satisfaction with the quality of the premises and take measures depending on the results of the analysis.

4. To increase the operating time of the Resource Center of the Research Park of St. Petersburg State University to 20:00, which will allow more students to engage in scientific research after the main educational process.

During the site visit to the educational organization, the expert team examined the material and technical base. Laboratories, classrooms and other rooms were fitted with all necessary equipment, but the improvements required are described above in paragraph 2 of the recommendations on the criterion “Strategy, objectives and management of the program”.

6. *Information resources of the program*

Criterion grade: 5

Programme strengths

In the implementation of the educational program at St. Petersburg State University, a unified electronic information and educational environment is used for educational, scientific, expert activities, providing access for students and teaching staff to the information and educational resources of St. Petersburg State University. Much attention is paid to ensuring access for students and employees of SPBU to scientific periodicals of domestic and foreign publications, which include leading world and Russian scientific journals in various fields of knowledge; to educational and scientific publications of Russian and foreign authors, as well as to scientometric databases. St. Petersburg State University has access to 181 electronic resources, including 82,880,580 sources.

Recommendations

It is recommended to consider the possibility of using the existing unified electronic information and educational environment at the university for methodical support provided by experienced teachers to novice teachers, including those conducting classes in the framework of the postgraduate program, as well as graduates who start teaching activities.

7. *Research activity*

Criterion grade: 5

Program strengths

The Institute of Chemistry of St. Petersburg State University is a world-class research center. Applications formation, research support and research results analysis are carried out in the information and analytical system of support for research activities of St. Petersburg State University and since 2017 in the Pure system of St. Petersburg State University, developed on the basis of the Pure Elsevier B.V. software. Regular scientific research is carried out at the expense of internal funding (internal grants of St. Petersburg State University), as well as by attracting a variety of external sources.

In the postgraduate study program, research is a prerequisite of GQW, both for teachers and students. The research work of postgraduate students becomes the basis of their Graduate qualification works and, subsequently, theses. All teachers according to the employment contract are obliged to conduct research in the framework of grants / projects / contracts and publish the results of these works in periodical peer-reviewed journals indexed by abstract databases of Web of Science and / or Scopus. In addition, teachers are regularly re-elected on a competitive basis, where the main criterion for the competition is publication activity. Between 2017 and 2018 the staff of the Institute of Chemistry carried out 70 research projects according to the profile of the program, at the request of organizations of various profiles.

Recommendations

It is recommended to consider the possibility of creating conditions (including a system of requirements) for more active participation of postgraduate students in scientific grants (currently the share of winners is 5.9%, which probably balances on the verge of a statistically insignificant result). It may be possible to increase the activity of postgraduate students in grants by normalizing the application activity of postgraduate students, tutoring activity of teachers and promoting this type of activity in the information field. In any case, the achieved result of 5.9% requires reflection and formulation of the attitude on the part of the program management.

8. Participation of students in determining the program content

Criterion grade: 4

Program strengths

Students take part in monitoring, as a result of which personnel decisions are made for the next year, new disciplines are introduced, workload and distribution of hours are changed, changes are made to the curricula of the disciplines. The Institute has an extensive system of student self-government in compliance with reasonable standards of representation of interests. A virtual reception room at St. Petersburg State University is available for all students, allowing one to file appeals, complaints, etc.

Recommendations

1. It is recommended to consider the possibility of expanding the range of applied measures of intangible incentives for students who are actively involved in determining the content of the program and the organization of the educational process.
2. It is recommended to provide the possibility of taking into account the views of postgraduate students in assessing the conditions created for independent work.
3. It is recommended to complete the survey analysis, and publish the results of studying of the degree of influence of students on the organization and management of the educational process.
4. It is recommended to strengthen the role of postgraduate students in the process of updating of educational materials, including Bachelor and Master programs.
5. It is recommended to provide students with the opportunity to assess the workload of the educational program and change its normative complexity.

Additional material

An analysis of the self-examination report, as well as direct interviews with the program management and students, allows experts to establish that work is currently being conducted at the Institute of Chemistry to study in more detail the students' opinions on the quality of education in the program. A comprehensive analysis of the results of the survey is currently a conscious growth point for the educational organization and is of interest for further study.

9. Student services at the program level

Criterion grade: 5

Program strengths

Experts noted the high level of development of infrastructural, environmental and organizational mechanisms aimed at the formation of personal and social competencies of students, the organization of leisure and recreation of students. The necessary information about scholarships, social benefits, about the procedure for providing places in dormitories, about student Academic Olympiads and competitions, about announcements of events and reports on their conduct, University news and other useful information are posted on SPBU portal. A trade union organization of students and postgraduate students and the Student Council operate at St. Petersburg State University, at the meetings of which topical issues affecting the interests of students are discussed. Students are given the opportunity to participate in the activities of a wide network of student associations and clubs, which contributes to their socialization, leisure and recreation.

Recommendations

It is recommended to assist in expanding the network of student associations and clubs to increase their attractiveness to postgraduate students. The need for such a solution is connected with the isolation and territorial distance of the Institute of Chemistry from the center of St. Petersburg, as well as other buildings and structures of the university. There is a risk of over-immersion of students in professional subjects or, conversely, their idleness in their free time. It is advisable to support the creation and development of student clubs related to creativity, culture and art, volunteering, politics and public life, the media sphere, civic-patriotic education, ecology, support for people with disabilities, as well as people who find themselves in difficult life situations.

SUMMARY OF EXPERTS

Name of expert: Mikhail Solovyov

Job location, title	HE "Nizhny Novgorod State Pedagogical University named after Kozma Minin", Vice-Rector for Network Cooperation and Social Partnership
Academic rank and degree	PhD in Chemistry
Honored titles, degrees	No
Education	Higher (Yaroslavl State Pedagogical University named after K. Ushinsky, Yaroslavl, 2002)
Professional achievements	Organization of an innovative self-organizing system of educational, cultural, educational and leisure extracurricular activities at the university
Area of expertise	Synthesis and study of the structure of six-membered nitrogen-containing heterocycles containing an endocyclic sulfamide fragment
Practical experience in the field of the program under examination	2002-2009: Assistant, Research Fellow, Senior Lecturer, Associate Professor, Head of the Laboratory for Fine Organic Synthesis, Deputy Director of the Institute of Chemogenomics Problems.

Name of expert: Pavel Marmysh

Job location, title	Cherepovets branch of Training center PhosAgro, Director
Academic rank and degree	No
Honored titles, degrees	No
Education	Federal State-Funded Educational Institution of Higher Professional Education "North-West Academy of Public Administration", manager in the specialty "State and Municipal Administration"; Federal State-Funded Educational Institution of Higher Professional Education "Vologda State Technical University", engineer specializing in "Automation of technological processes and production"; Non-State Educational Institution of Further Professional Education "Training Center PhosAgro", professional retraining program "Specialist in the field of labor protection"; Non-State Educational Institution of Further Professional

	Education "Humanitarian National Research Institute" NATCRAZVITIE", training program" Education and Pedagogy"; National Agency for the Development of Qualifications, continuing education program "Training Program for Expert Centers for Qualification Assessment and Examination Centers"
Professional achievements	Formation of the existing system of training workers in working professions at the Cherepovets site of Apatit company, optimization of preparation for certification on safety issues
Area of expertise	Vocational training, additional adult education
Practical experience in the field of the program under examination	Training for workers in the chemical industry since 2015

Name of expert: Pavel Drazar

Job location, title	Chairman Label Comitee ECTN, Lecturer and Researcher, University of Chemistry and Technology (Prague, Czech Republic)
Academic rank and degree	Doctor, Professor
Honored titles, degrees	Scientific Secretary of the Czech Association of Science and Technology Societies
Professional achievements	Professor Drazar is the author of 38 patents in various fields of chemistry, as well as the author of 16 books and more than 250 scientific publications. He served as president of ECTN and has also been a member of the European Chemical Society (EuChemS)
Area of expertise	Chemistry of natural compounds. Super build chirality.