

IFTE 2016 : 2nd International Forum on Teacher Education

Self-Development of the Future Teacher of Chemistry, through Bilingual Education, in Accordance with New Requirements of Professional Standards

Svetlana S. Kosmodemyanskaya^{a*}* Corresponding author: Svetlana S. Kosmodemyanskaya, svetlanakos@mail.ru^aKazan (Volga region) Federal University, Kremlyovskaya Street, 35, Kazan, Russia, svetlanakos@mail.ru,
+79050200813

Abstract

<http://dx.doi.org/10.15405/epsbs.2016.07.51>

The article defines the goals, objectives and readiness of students and future teachers of chemistry, to bilingual teaching in accordance with the requirements of the educational standard. Currently, a growing number of experts reveal the expansion of bilingual linguistic borders and citizens, and sometimes their multilingualism. A competitive specialist is considered as a person who not only meets the needs of the labor market in their professional, psychological, moral, and other qualities, but also possesses a quick adaptability to the changing conditions of life, and is able to make decisions and take responsibility for them. The local schools are increasingly trying to implement a system of bilingual education, in order to use more effective methods of learning, contributing to the further development of the cognitive competence of students. The problem of the study is the lack of methodical preparation of teachers of chemistry, as well as students, and future teachers of chemistry, in the use of bilingualism in teaching chemistry in modern educational institutions in the framework of self-development and self-improvement. Of particular importance is the domestic personnel policy - the release of young professionals. The relevance of the study is due to an increasing necessity of chemistry teachers to learn foreign languages, the problem of the organization working with migrant children, as well as the new requirements of the professional standard for teachers.

The applied nature of the significance of this brief article is enhanced with practical recommendations on the formation of the trend towards self-development and self-improvement of students, and future teachers of chemistry, through bilingual education.

© 2016 Published by Future Academy www.FutureAcademy.org.uk

Keywords: State Standard, self-learning, self-development, chemistry, chemistry education, teacher, student, multilingualism, bilingualism.

1. Introduction

Currently, a growing number of experts reveal the expansion of bilingual linguistic borders and citizens, and multilingualism. There is a theory that by 2020, most of the inhabitants of civilized countries would possess two (or more) languages and become bilingual (or multilingual). The problem



of study is a lack of methodical preparation of teachers of chemistry, as well as students, and future teachers of chemistry, in the use of bilingualism in teaching chemistry in modern educational institutions. Currently, there is a discrepancy between the social demands of society on training, responsive to emerging changes in the development of the country, and classical-conservative system of teacher training, focused on a certain stability in the outside world (Osipov PN, 2010, 2015). This topic has now become quite relevant for the training of future teachers of chemistry. With this concept, chemistry teachers would be available at schools, in areas touched by the migration of people and students to schools, when they begin to engage in the classroom with foreign nationals (Kosmodemyanskaya, 2015).

Currently, the main indicators of the quality of education in Russia are determined by the achievement of learning outcomes of meta-subjects, one component of which is the formation of universal educational actions, which established set of key competencies of graduates. Analysis of the results of the implementation of certain public projects (National Doctrine of the Russian Federation, the GEF 3rd generation, the program "Development of Education for the period 2013-2020." And others.) Shows the relevance of the issue of teacher training in accordance with the requirements of modern society, as a customer of educational services. In accordance with the new paradigm of education as set out in the "Concept of the Federal target program of education development for 2016-2020 years" results were summed for the previous concept (2011-2015), and goals and objectives were defined for the implementation of long-term program of development of national education. It also focuses on the development of competencies of teachers, who are able to work with children of different levels of training, with the HIA (disabilities), and a of certain nationalities. The recommendations of the new professional standard for teachers of the Russian Federation, refers not only to the above requirements, but also the knowledge of foreign languages.

Shaping the future teachers of chemistry is different, because the profession is based on planned and systematic self-education and self-development specializations.

2. Statement of the Problem

This research problem was identified by us in 2011, when the chemistry students according to the curriculum were having their teaching practice, based on bilingual teaching of chemistry in Kazan educational institutions. Our study involved students of Kazan (Volga) Federal University and chemistry teachers, students refresher courses of the Republic of Tatarstan.

Thus, the formulation of the study includes the determination of the level of preparedness of students, future teachers of chemistry, and current chemistry teachers, to have a desire to self-improvement and self-development through bilingual education, since only a successful teacher can shape the identity of the successful student.

3. Research questions

Research questions includes: determining the level of preparedness of students and chemistry teachers to bilingual teaching of chemistry, as well as human resources training for students of pedagogical high school to self-development and self-improvement through the study of bilingual education.

The purpose of the study is to determine the level of readiness to the use of bilingualism in teaching chemistry to students, in accordance with modern requirements of the society, which contributes to further self-development and self-education. This system allows students and future teachers of chemistry, to generate value and meaning installation, ensuring a certain independence and competence in later life. The principles of a bilingual culture are based on the basic provisions of the methodological and methodical development of researchers as Bondarevskaya EV Borisenkova VP, Dmitrieva GD, Bibler VS, Huizinga, J. et al. This problem of self and self teaching staff is represented in the works of O. Anisimova, Krutetskaya VA Osipova PN Beshpal'ko VN, Markova AK, BG Ananiev, Grebenkina LK and others.

4. Results

A study of students, future teachers of chemistry, and chemistry teachers with work experiences, took place in two stages (266 respondents). The first part (2014-2015), we conducted a study on the issue of self-studying, during undergraduate and postgraduate trainings and self-development (126 respondents). After analyzing the responses of teachers of chemistry in Tatarstan schools (31 persons) of the first and highest qualification category, it revealed that majority of the respondents indicated to the use of self-tools in enhancing knowledge competencies. These tools included; printed product (74%), the Internet and electronic educational resources (81%). Almost half of respondents drew attention to the need for synthesis and exchange of experience (48%). Preparing for the exam and the OGE (10%) and, unfortunately, training on refresher courses (7%) were low. Participation in professional competitions ("Teacher of the Year", etc.) is practically not seen as a variant of self-improvement and self-development (97%). Education language courses were not considered by teachers at all. This is probably due to the fact that teachers do not feel the need for self-realization due to lack of methodological support.

Further, in the study (95 respondents), we used a real survey of 69 students of 1-4 courses of Kazan (Volga) Federal University and a survey of 26 students using remote means (Naberezhnye Chelny Institute of socio-pedagogical technologies and resources). The students appreciated the opportunity to educate themselves not only in the classroom but also extracurricular work, during the training period. Interestingly, even the junior students confidently noted the possibility of using the results of self-education in the school pedagogical work (1st year - 52%, 2nd year - 67% of respondents). Professional self-education of students as future teachers of chemistry involves the study of information (subject journals, Internet resources - websites, community groups and teachers in social

networks); attendance of open lectures, participation in seminars, trainings, and conferences; attendance of open classes and extra-curricular activities and their subsequent analysis; and the generalization of his own experience. Also, the possibility of self-development and self-pedagogical orientation of students can be attributed to obtaining a second higher education (eg, psychology), training in special courses (foreign language courses), and being active in the pedagogical (student pedagogical force) or other student associations (institutes, dormitories). Observations and pedagogical experiments show that students should take into account; self-selection techniques and methods of work, time management, self-control, self-esteem, and self-management, since it is a prerequisite not only for his career and success, but also for the development of students.

Next we conducted a research on the identity formation of students as future teachers of chemistry - "self-regulation". Analysis of questionnaires on students' readiness for pedagogical activity revealed a certain proportion of fear of the classroom. At the end of the teaching practice, students conducted a final survey, which complements the written analysis of activities in the "Diary of pedagogical practice." We noted that the teaching students: focuses on students' complex issues using a variety of instructional techniques and elements of educational technology, used methodical organization of feedback, motivated students, used more frequent demonstration of chemical experiments, etc. These answers determine the relationship of the process of training in chemistry and self-development. But practice shows that it is easier for a student to organize methodically good lessons, if you give him quality introspection. Therefore, we focus on the correct organization of pedagogical reflection in further pedagogical practices for chemistry teachers professional development (Kosmodemyanskaya SS, Smirnov SP, 2015).

Thus, the gradual emergence of chemistry teachers, goes through self-education, and the opportunity to build personal trajectory of success, contributes to a student's personality as a future teacher of chemistry. In the second part of the study (2015) students of 1-4 courses of the Chemical Institute named after .A.M.Butlerova at Kazan (Volga) Federal University, were involved, as well as teachers of the Republic of Tatarstan schools. In total we had 140 respondents. According to information received, an overwhelming number of students were willing to work with migrant children, using bilingual learning, but that could not be said about the teachers

At the top mark, the work of chemistry teachers (in the simulation this situation) were rated by 32% - "4" and "3", respectively, by 37% and 24% of the respondents. The results of self-preparedness to work with children of migrant teachers in RT schools were more objective: 29% of the respondents gave "4" and "5" points - respectively, 24% and 23%. The main reason was noted by respondents, as a result of ignorance of foreign languages (at a good conversational level, 60%).

We analyzed the responses of students and teachers of chemistry in RT schools and found that the majority of respondents do not have sufficient methodological training for the use of bilingualism in its educational activities in accordance with the new requirements of society. To address this, the formation of the problem must be approached comprehensively, from the society. We suggest that this work can be carried out at the school in the form of lesson discussions, lessons, games, movie analysis etc. on chemistry lessons and outside school hours. You should also pay attention to special training for teachers of chemistry to work with migrant children. For teachers with experience, there should be a

methodological training course in working with children from other countries. We suggest putting a new criterion for the ownership of a foreign language (different level of ownership - with the dictionary, so reading can be explained) in estimating the readiness of teachers to certification and recertification. This, in turn, will contribute to the further development and establishment of self-education for chemistry teachers.

Of particular importance is the psychological, pedagogical, and methodological preparation in the framework of university education, which should not be limited to theoretical study materials. On the methodological lessons to teach chemistry, we should consider using an element of introducing bilingualism into the subject – chemistry, through creative tasks in preparation for the chemistry lessons and extracurricular activities. It begins with the work of the first semester of the first course, in the classroom for didactic games in teaching chemistry, as well as its development in the process of preparing and carrying out extra-curricular activities in the framework of the traditional Festival of Chemistry for students in the city of Kazan. The urgency of the problem determines the need for further action for a smooth immersion of young teachers in bilingual learning chemistry environment. We offer:

1. Implementing jobs in English chemistry lessons. In this case, the children will achieve some success in chemistry and in the language, and the teacher self-develops, using a variety of teaching methods.
2. To introduce the practice of the use of bilingual jobs for students coming from other countries.
3. Enter the definition of the level of foreign language knowledge (different levels of knowledge), as one of the criteria for teacher certification.

Analyzing the organization and conduct of teaching practice of students in chemistry, we concluded that the small number of immigrant children in basic schools in Kazan, would be defined as a baseline for the passage of pedagogical practice. The experience of chemistry lessons in the classroom, where there are foreign students on exchange showed that, the students had their own programmes, and tried to assimilate new materials in chemistry, based on these programmes. That is, these students were just in the classroom, but occupied a separate programme. Our study reveals that, an increasing number of foreign students studying in Russian universities, receive initial training on Russian language courses before they commence study. But practice shows that the situation is different in the translation of foreign nationals for 2 or 3 courses - the students often do not pass the exam on the Russian language. Training for such multilingualism, accompanied by certain difficulties in understanding the teacher's speech in the classroom, as well as in the performance of independent work on the study of the discipline, leads to this failure. In our work, we use electronic educational resources (ESM) - "Methods of training and education (in chemistry)", "The theory of teaching chemistry" and "Methods of chemistry." Practice has shown that students do not always clearly understand the job that they need to fulfill, and this also leads to a violation of the rules of time allotted for the study of the course topics. The greatest difficulty is holding fragments of lessons and extra-curricular activities in chemistry, as the need to demonstrate the ability to organize the work of "students" (at the moment - a group of students) according to the plan drawn up, notes or routing chemistry lesson. In this demonstration lessons, we took fragmental accounts of the following: the method of compliance with safety regulations in carrying out chemical experiments demonstration; the ability to organize work with

students ("feedback", pedagogical management, etc.); and the organization of work with elements of variant learning tools; the ability to shape students' critical thinking and ACU (universal training activities) in order to achieve the learning outcomes in meta-subjects. All of these criteria for self-evaluation and evaluation by other students, designed an accordance for the modern requirements of the teacher's professional standard (for the CRP and the GEF).

We noted that a special concern of foreign-language students is the language barrier that prevents these students from feeling safe and comfortable during the lesson. The passage of students in chemistry teaching practice, which according to the curriculum should take place in educational institutions of Kazan, comes in two options - a student holds the teaching practice as usual (but the lessons would be very arbitrary to force a certain uncertainty of the student in the formulation of correct sentences in Russian), or a student leaves for his country (for example, Uzbekistan, Turkmenistan, Tajikistan) to conduct lessons in a more comfortable environment. Our experience in managing teaching practices in chemistry students; Specialty (5 years) and Bachelor's (4-year), showed that students usually choose the second option for the passage of pedagogical practice. These students are invited to make movies and lessons for further evaluation of their activities. Despite the fact that students speak their own language (Uzbek, Turk-men, etc.). These movies are one of the basic elements of the students reporting on the results of teaching practice for students multilingual passing practice, on an individual schedule.

Thus, there is a need to develop bilingual chemistry teaching, for further self-education and self-development as the students, future teachers of chemistry, and teachers themselves, should have a certain experience (Kosmodemyanskaya SS, Darzemanova DL 2015). The method of teaching chemistry in high school (Kosmodemyanskaya SS 2015), shows that young teachers holding pedagogical management, solve the main issues for the structuring of the learning process of the algorithm in the pedagogical practice of chemistry in accordance with the requirements of the new generation of GEF. Self-development and self-improvement of the student includes the steps of:

- Training - the very preparation and conduction of chemistry lessons using technological approach for intra- and inter-subject relationship, getting meta-subject learning outcomes in the study of chemistry teaching material;
- Material and technical base - is the development and implementation and demonstration of student chemical experiments, as well as the use of visibility systems (video clip, a multimedia presentation, a virtual chemistry laboratory, 3D models, etc.);
- The use of innovation - using elements of modern educational technologies for the construction of the memory materials in chemistry classes, holding pedagogical experiment for a more complete correction of his activities, as a teacher, and researcher;
- Personnel analysis through the use of individually-differentiated approach to teaching chemistry to motivate students for a full and in-depth study of science;
- Accounting - a relentless pedagogical activity of the teacher of chemistry to record and analyze the quality of learning of students in chemistry.

Formation of critical thinking activity is defined as a factor in student readiness for the teaching profession. Many researchers pay attention to the leading role of the evaluation of students

practice. Horny O.G. (2010) notes that the low level of organization of valuation practices, and the absence of its cultural treatment and reflective results, do not give a proper student self-determination in their professional activities.

5. Conclusions

The urgency of the problem determines the necessity of selecting complex further action for self-development and self-improvement of students, future teachers of chemistry, through bilingual education. To address this important for the formation of the problem must be approached comprehensively, and to start from the society. We believe that this work can be carried out in schools in the form of non-traditional occupations and types, with the additional program in the teaching of chemistry. We should also pay attention to special training for teachers of chemistry to work with migrant children. Teachers with experience should be introduced to methodological training courses in working with children from other countries. Of particular importance is the psychological-pedagogical and methodological preparation in the framework of university education, which should not be limited to theoretical study material. Extracurricular activities carried out in Kazan schools in the framework of the traditional Festival of Chemistry Department of Chemical Education Chemical Institute im.A.M.Butlerova CFI (responsible - Kosmodemyanskaya SS), contribute to the development of communicative competence of the future teachers of chemistry and student staff schools.

We came to the conclusion that, there is a special role played by the university human resource capacity to create conditions conducive to increasing the desire of students, and future teachers of chemistry to self-education and self-improvement in the language space. This is the basis for the formation of personal methods of teaching chemistry, in accordance with the requirements of the GEF. All this contributes to the proper organization of teaching self-management in a new generation of GEF, forming the student portfolio as an alternative way of presenting his achievements (Sakhiev RG, Gil'manshin SI Kosmodemyanskaya SS et al., 2015), and should be represented by; teaching mobility, professional competence, commitment to effective work and self-development. All this creates a deeper preparation of students as future teachers of chemistry in a new generation of state educational standards.

Acknowledgments

The author expresses gratitude to the administration of Kazan (Volga) Federal University, for the opportunity to conduct this research.

References.

Gil'manshin S.I. Sagitova R.N., Kosmodemyanskaya S.S., Khalikova F.D., Oxalic N.G., Valitova G.F., Motorygina N.S.. Professional Thinking Formation Features of Prospective Natural Science Teachers Relying on the Competence-Based Approach *Review of European Studies* Vol 7, No 3 (2015) R.341-349 ISSN 1918-7173 (Print) ISSN 1918-7181 (Online) DOI: 10.5539 / res.v7n3p341

- Gil'manshin S.I. Kosmodemyanskaya S.S., Khalikov F.D., Sklar D.P., Vagizova I.F. Value-oriented targets in the higher pedagogical education: the development of creative qualities of the future teachers of chemistry *International Journal of Experimental Education*. Number 4. 2014 s.83-84.
- Horny O.G. Professional-pedagogical orientation of the profile disciplines of teacher training *Bulletin of the Herzen University*. №1 (75). 2010 s.93-98.
- Kosmodemyanskaya S.S. Formation of the success of the future teachers of chemistry in the conditions of pedagogical university. *Author. diss. for the degree of Candidate of Pedagogical Sciences*, 2007. 38 p.
- Kosmodemyanskaya S.S., Kudryavtsev Y.U. Pedagogical consciousness as a factor in the development of chemistry teachers skills in the process of training *Kazan science*. Number 3. 2014. s.12-15.
- Kosmodemyanskaya S.S. Electronic educational resources and case technology as a means of formation of the future teachers of chemistry *Bulletin of Kazan Technological University*. - T.17, №17. 2014. s.281-284.
- Kosmodemyanskaya S.S. From a successful student - a successful teacher. *Kazan pedagogical journal*. № 5 (47). 2006. p. 31-36.
- Kosmodemyanskaya S.S. Using the principle of integrity of education in the training of teachers of chemistry. *International Journal of Experimental Education*. Number 4. 2014. s.139-141.
- Kosmodemyanskaya S.S. Self-education and self-development of the student as the basis of formation of the person of the future teacher of chemistry. *Education and self-development*. № 1 (39). 2013. s.157-161.
- Kosmodemyanskaya S.S. Future teachers of chemistry and polilingvalnost *Mat. Internat. scientific-practical. Conf. «Academic science - problems and achievements»*. Vol.1, CreateSpace 4900 LaCross Road, North Charleston, SC, USA, 2015.
- Kosmodemyanskaya S.S. Formation of pedagogical management and self-management in the preparation of the teacher of chemistry *Kazan pedagogical journal*. 6 № (101). 2013 s.61-66.
- Kosmodemyanskaya S.S., Petrova E.I. Methodical features of training the young teacher for the lesson of chemistry. *Mat. Internat. scientific-practical. Conf.* Ufa. 2014. 219 p.
- Kosmodemyanskaya S.S., Valieva B.H. Readiness of the future teachers of chemistry to inclusive education *Mat. Proc. scientific-practical. Conf. Kazan, 2015*. 196 p.
- Kosmodemyanskaya S.S. Darzemanova D.L. Analysis of training of the future teachers of chemistry to work with migrant children. *International scientific review of the problems and prospects of modern science and education*. London. № 8 (9). 2015. 79 p
- Kosmodemyanskaya S.S., Smirnov S.P. Samoobrazovanie future teacher of chemistry. Issues of social work and professionalism of a teacher in the information society *Materials of the international scientific conference*. 2015. Prague. 95 p
- Kosmodemyanskaya S.S. The development of self-education of the future teacher of chemistry through its formation of pedagogical management. *Sat. scientific. articles*. Brest (Belarus). 2015 s.75-78.
- Lapin E.V. Mezinov V.N., Obukhov L.A. Theoretical and methodological foundations for the development of professionally significant values in the system of teacher training. *Eurasian Union of Scientists*, №10 - 4 (19). 2015.
- Osipov P.N. Education and self-education of competitive specialists as a priority of modern education *Bulletin of Kazan Technological University*. №16. 2013. p. 198-204.
- Shafrikova A.V. Multicultural approach in training and educating students *Abstract*. - Kazan, 2008. - 26 p.
- Osipov P.N. Ziyatdinova YN Managing the internationalization of education at the institutional level *Education and self-development*. №9. 2015.s. 4-14.
- Razumovsky V.G. The scientific method of knowledge and personal orientation of education *Pedagogy*. Number 6. 2004. p. 3-10
- Sakhiev R.G., Gil'manshin S.I., Gil'manshin I.R., Kosmodemyanskaya S.S., Akchurina I.R., Sagitova R.N. A Portfolio as an Alternative Means of Presenting the University Student? *S Achievements / Asian Social Science*; Vol. 11, No. 3; 2015. P. 162-167. ISSN 1911-2017 (Print) E-ISSN 1911-2025 (Online). DOI: 10.5539 / ass.v11n3p162-167.
- Stepanenko E.V. The approaches to the organization of educational process for foreign citizens with higher education, at the stage of pre-university training *International scientific review* № 3 (4), 2015., S.57-59. .