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FOREIGN LANGUAGE COURSE FOR DOCTORAL STUDENTS AT TECHNOLOGICAL UNIVERSITY

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Abstract

The paper presents the experience of Kazan National Research Technological University in developing new Foreign Language Course content for doctoral students conducting research in the field of Chemistry and Engineering. Nowadays, doctoral education aims at training researchers who will possess both hard and soft skills required for solving complex scientific tasks at Russian and international levels. One of the problems of engineering education in Russian universities is the lack of special courses providing soft skills. Therefore, we need to update the content of the existing courses to meet the requirements of the new scientific generation. The authors propose the new content of the English language course developed according to the analysis of the best international practices in developing doctoral programs. The course focuses on developing such communicative skills as academic writing and speaking. These skills are essential for successful dissemination of research results by doctoral students. The interdisciplinary approach, based on the cooperation of research supervisors of doctoral students and professors from the Department of Foreign Languages for Professional Communication, was applied to combine the content of special research courses and the Foreign Language Course. Such cooperation resulted in individual approach to training doctoral students in accordance with their specific research.

Keywords: Doctoral education, foreign language, soft skills

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1. Introduction

Recent years have witnessed a number of changes in Russian higher education, which also affected doctoral education. Further successful development of the Russian economy is impossible without scientists who are able to conduct research at the international level. Therefore, the development of doctoral programs is of great importance for university education. Currently, there is a large number of issues related to the content and structure of doctoral programs.

Doctoral education in the Soviet period focused on the development of research skills (Shageeva et al., 2020). Nowadays, it is not enough to develop only professional, scientific skills, which relate to hard skills. There is a need to develop soft skills required for the academic mobility of doctoral students (Bezrukov et al., 2018; Kraysman & Valeeva, 2014). The combination of hard and soft skills will allow doctoral students to find their place in a multicultural world and successfully develop themselves in modern interdisciplinary fields of science and engineering (Patterson et al., 2019).

Kazan National Research Technological University (KNRTU) is one of the leading chemical and petrochemical universities in Russia. The University offers a wide range of doctoral programs in chemistry and chemical engineering. All doctoral programs are run according to the Federal State Educational Standards where the expected educational outcomes of doctoral students are listed.

Each doctoral program provides students with teaching courses, including Foreign Language Course. The content of the course needed to be updated according to new requirements of Federal State Educational Standards and a new language learning approach applied to training university students (Bezrukov & Ziyatdinova, 2014).

The paper presents the experience of the Department of Foreign Languages for Professional Communication in the development of new English course content for doctoral students conducting their research in Chemistry and Chemical Engineering.

2. Problem Statement

The last decade has seen tremendous changes in the Russian higher education including modernization of doctoral programs which are the third level of the university education. The main aim of doctoral study is to train researchers who will possess hard and soft skills required for solving difficult scientific tasks both at Russian and international levels. New requirements differ significantly from the ones of the traditional Soviet system of doctoral training focused on developing only research skills. Nowadays, a researcher also is to be ready to present scientific results at international conferences, write and publish scientific articles in highly rated journals and apply for various grant programs. One of the problems of engineering education in Russian universities is the lack of special courses providing these skills. Therefore, we need to update the content of the existing courses to meet the requirements of the new scientific generation.

3. Research Questions

To identify the main elements of the Foreign Language Course content, the appropriate soft skills are to be selected for doctoral students engaged in chemical research. The analysis of foreign university

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practices in developing special courses aimed at fostering these soft skills is to be carried out. The course content is to meet the requirements of the Federal State Educational Standards and contain professionally focused foreign language vocabulary required for successful scientific and professional development of a doctoral student.

4. Purpose of the Study

The purpose of the study is to develop new content of the Foreign Language Course for doctoral programs at KNRTU. The course is included in the curriculum for training doctoral students engaged in research in the field of chemistry and chemical engineering. The course content is to provide doctoral students with special skills required for successful dissemination of their research results in the English language at Russian and international levels.

5. Research Methods

The new content of the Foreign Language Course for doctoral programs at KNRTU was developed according to the analysis of foreign experience in training of doctoral students at universities in Europe, Great Britain and the United States. The analysis was carried out through the study of international scientific papers, as well as the international training programs organized within the framework of grant project Erasmus + focusing on the modernization of doctoral education in science.

The comparative analysis of the traditional Russian system of doctoral education and modern requirements of new Russian educational standards allows us to create a Foreign Language course for developing both hard and soft skills for doctoral students.

The interdisciplinary approach, based on the cooperation between research supervisors of doctoral students and professors from the Department of Foreign Languages, was applied to combine the content of special research courses and the Foreign Language Course. This cooperation resulted in individual approaches to training doctoral students in accordance with their specific research.

6. Findings

Nowadays, Kazan National Research Technological University provides doctoral training for sixteen profiles which include more than forty programs specializing in a wide range of sciences. Each doctoral program is run according to the Federal State Educational Standards. The period of doctoral study is four years including 240 credit units. Each year contains courses which aim at developing skills and competences required for future professional and scientific careers of doctoral students. According to the Federal State Educational Standards, these competences are divided into universal, general professional and professional competencies (Shageeva et al., 2013).

During the first year of the study, doctoral students attend the Foreign Language Course, at the end of which they take an exam. The grade of the exam is included into the student's CV and announced during the viva. The course is developed for 72 contact hours and 36 hours of student's individual work. The course aims at developing the following competences:

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1. capabilities of using modern methods and technologies for academic communication both in Russian and English;
2. capabilities of oral and written communication using academic and professional terminology.

Until 2019, the foreign language course for doctoral students included the following teaching modules:

Module 1: Studying foreign language grammar.

Module 2: Reading and translating English scientific papers.

Module 3: Introducing oneself in a foreign language.

The main idea of this course was to develop reading and translating skills required for analyzing foreign scientific papers. Doctoral students could understand the foreign information but could not speak and present their scientific results in a foreign language.

Nowadays, in the period of globalization and internationalization the needs of the new generation of scientists have changed. To meet the requirements of young researchers and new Russian educational standards we faced the problem of developing new content of the Foreign Language Course that would combine the professionally focused English training and best international practices in developing soft skills (Kraysman et al., 2015).

Traditionally, Russian students study English, French or German, depending on their choice. Currently, most students choose English, which is the main language of international communication. Therefore, further we will discuss the English language.

According to the analysis of international papers focusing on the problems of developing programs for doctoral education (Gardner et al., 2007; Valeeva et al., 2020), three main types of soft skills were selected:

- personal skills;
- communication skills;
- skills required for successful career growth.

English communication skills of doctoral students are the most important ones for solving specific professional and scientific problems. In addition, they are in a good agreement with the competencies specified for the Foreign Language Courses in the Federal State Educational Standards. What are the main principles of communication skill development at foreign universities?

One of the most important communication skills at foreign universities is academic writing and presenting research results in international scientific journals and at conferences. European and UK universities have developed special courses for training doctoral students to write scientific articles and abstracts for international conferences, prepare presentations and make reports, apply for scientific grants and work in interdisciplinary and international environment (Nerad & Evans, 2014).

American universities have organized special writing centers aimed at developing and fostering academic writing skills. These centers are available for students during the whole period of their study. Students learn to write and edit various types of written texts such as essays, CVs, business letters, motivation letters for grants, scientific papers and thesis (Simpson et al., 1997).

These skills are the most important for doctoral students conducting their research in the field of Chemistry and Engineering and for the commercialization of their research results in the international

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market (Shageeva et al., 2018). Therefore, the content of the Foreign Language Course for doctoral students at KNRTU was created to develop and foster professional and academic writing and speaking in English and it included the following teaching modules:

- Introduction.
- Academic writing.
- Presentation skills.

The first module 'Introduction' focuses on training students to introduce themselves as researchers. At the end of the module students are to prepare CVs which include information about their educational background, their scientific interests and a brief description of their research supervisors. Also, the module provides students with useful information about different scientific grant programs and teaches them to prepare grant documents in English:

- motivation letter;
- recommendation letter.

The content of the module was developed in collaboration with representatives of American universities and specialists from International Affairs Office at KNRTU.

The second module 'Academic writing' includes:

- Linguistic retrieval on the Internet and computer programs for translating special terminology in the field of chemistry and engineering.
- Library Internet resources for information and analytical search of scientific articles in international journals.
- International journals on chemistry and engineering and their requirements.
- Translation of an English paper into Russian.
- Translation of a Russian scientific abstract and paper into English following the structure of IMRAD (Introduction, Methods, Results and Discussions) and requirements of an international journal.
- Preparation of a reference list according to international rules.

To introduce this module into the educational process, a study guide was developed and published that includes a description of the structure of an experimental scientific paper starting with the formulation of the title of the article and ending with the acknowledgements and design of the list of references in English. The study guide was created for doctoral students conducting their research in chemical and engineering fields of science. It provides students with some grammatical, lexical and stylistic features of the scientific and technical style in English.

The third module 'Presentation skills' aims at teaching doctoral students to present themselves and their research projects to a large audience in English using well-known international rules for oral presentations and preparation of scientific reports.

The module includes:

- Structure of the presentation and slides (presentation title page, introduction, main body, and conclusions).
- Public speaking rules for communicating with the audience (introduction, main and final parts of the report; question management, objections and complaints; style of reports).

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- Lexical, grammatical and stylistic features of the English-language presentation.

To introduce this module into the educational process, a study guide "How to Present a Research Project?" was developed and published. The study guide includes some lexical, grammatical and stylistic features of the English language presentation focusing on presenting mathematical operations, physicochemical formulas, tables, graphs, chemical elements, compounds and reactions, physical and chemical parameters and units, technological and experimental processes, flows and schemes in English.

All three modules overlap each other and represent a logical sequence of teaching a foreign language, including English writing and speaking for academic and professional purposes.

The cooperation of professors from specialized departments and professors from the Department of Foreign Languages for Professional Communication allows the Foreign Language Course content to be updated (Osipov & Ziyatdinova, 2015). Research supervisors of doctoral students take an active part in preparing scientific papers and presentations concerning problems and questions of PhD theses. This interdisciplinary approach allowed us to solve the problem of multidisciplinary doctoral programs and to teach doctoral students according to their specific research areas.

At the end of the course, doctoral students collect a portfolio containing their CV, scientific abstract and article, grant documents, a presentation and report in English, as well as Russian-English vocabulary related to their research.

7. Conclusion

The Foreign Language Course is one of the most important subjects for successful adaptation of researchers in the international academic environment and dissemination of their scientific results in English. In addition, the English language is becoming one of the main components of successful business international cooperation and promotion of new technologies to the foreign market.

The Foreign Language Course, included in all doctoral programs at KNRTU, was chosen as a subject for the formation of soft skills, which are indicated in the Federal State Educational Standards. The selection of soft skills which are appropriate for the course was based on the analysis of the experience of foreign universities in developing doctoral programs.

The teaching modules of the course are aimed at developing academic writing, presentation skills and scientific grant application writing in English. The new English language course content allows us to teach doctoral students to publish scientific papers in foreign journals, present research results at international conferences and successful apply for scientific grant programs. The course is developed to meet the individual scientific requirements of each doctoral student because it contains professionally focused vocabulary related to a specific research area of a student. These communicative and writing skills in English are essential ones for professional and academic development of doctoral students.

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