

Development of Metacompetencies in University Students in the Process of Scientific Research in a Foreign Language

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Abstract: The work is an attempt to generalize the theory and practice of developing metacompetencies in university students, which are interpreted by the authors of this study as supra-subject bases determining the effectiveness of further self-realization of a university graduate in a certain professional field of activity. The results of a pedagogical experiment conducted at the Siberian State University of Railway Engineering are presented. The experiment is aimed at studying the influence of research work in a foreign language on the formation of metacompetencies in students. A model for the organization of students' research work, including the levels of perception, analysis, and synthesis of scientific information, is proposed. The content of each level in the organization of students' research work is described and analyzed. The authors pay special attention to the formation of academic writing skills necessary to increase the publication activity of various groups of researchers taking into account international rules and norms, as well as the skills of public scientific presentation in a foreign language, allowing to present the results of the study at the international level.

1. Introduction

In a situation of uncertainty in the economy and social sphere, which is currently observed, the internationalization of education [1], more and more requirements are placed on the professional competence of specialists in the modern labor market. Such necessary qualities as adaptability, stress resistance, self-discipline, autonomy, self-organization, i.e., everything that provides a certain basis for the development of professional competencies of a specialist, come to the fore. In this regard, the problem of the formation of metacompetencies of university students seems relevant, since they are the basis for the subsequent formation of a certain career path [2, 3]. We interpret the term "metacompetence" as the ability to productively manipulate acquired knowledge, the readiness to form new skills in ourselves with the goal of achieving individual effectiveness. This interpretation is formulated, taking into account the analysis of the scientific literature and many years of experience in teaching foreign languages at the Siberian Transport University (STU). It can also be interpreted as the setting "learn how to learn." So, in the study of S. A. Mikhaylichenko, metacompetencies are understood as certain superstructures that are necessary for the development and formation of new competencies [4]. E. V. Rezchikova additionally notes that metacompetencies are supra systemic and super subjective; they can be positioned as competencies of the highest (creative) level [5]. *Soft skills* deserve special attention. They are super-professional skills not related to the job responsibilities of a person [6].

We believe that the basis for the formation of metacompetencies of university students is a carefully planned and effectively organized research work of students (NIRS) in a foreign language. The target setting of this work is the transformation of the carrier-receiver model of information in the direction of independently producing new knowledge. The experience of such an organization in STU (Department of English language) is summarized and presented in the form of a diagram (Fig. 1). The diagram is a three-level processing pyramid with three next levels. The first level of information perception is the receipt by students of the theoretical foundations of research activity. The second level of information analysis is the

organization of the context-oriented project activities of students, which we interpret as the subject-subject interaction of the participants in the educational process. The last one is of a research nature and aimed at the effective solution of modeled and real problem professional situations using a foreign language. The third level of synthesis of information is directly a research activity of students in a foreign language, which has signs of fundamental and universal. The necessary conditions for this activity are the formed skills of academic writing and the skills of a public scientific presentation.

2. Materials and Methods

To solve the tasks, a complex of various research methods was used, including the analysis of psychological, pedagogical, methodological, specialized literature and sources on the topic of research. Other methods include generalization, systematization, modeling, surveys, questionnaires, conversations, interviews about changes and results of the formation of metacompetencies in university students. The authors also studied the students' research papers and analyzed teaching experiences obtained from the teachers of higher education.

3. Results and Discussion

The sample set of the studied amounted to 614 students of STU, such training areas as “Economics,” “Management,” “Customs,” “World Economy,” “Finance and Credit,” “Crisis Management,” and such master’s programs as “Foreign Economic Activity,” “Anti-Crisis Business Regulation,” “Finance and Credit,” as well as graduate school. The results of the study showed positive dynamics in such aspects as students' awareness of various forms of participation in research work in a foreign language, as well as the number of students actively participating in research work (from 7% to 18% over three years of research). The data obtained as a result of the pedagogical experiment also indicate an increase in the level of formation of metacompetencies of students engaged in research work (the level of autonomy increased by 15%, and by such an indicator as “self-organization and self-discipline,” it increased by 24%).

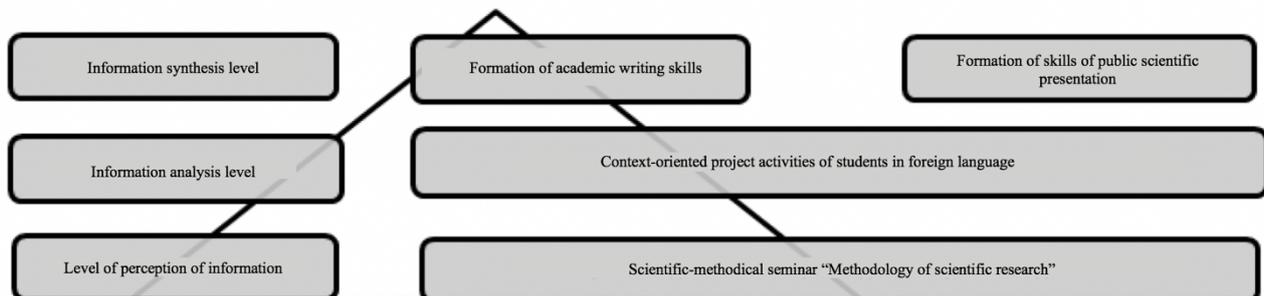


Fig. 1. Model of the organization of the research work of students in a foreign language.

We believe that the foundations of a culture of written and oral scientific communication should be laid already in the first year of study at the university (bachelor's degree, specialty), encouraging students' creative approach to research activities and the formation of an author's point of view. There is not enough knowledge of professional terminology in a foreign language and general language literacy. The formation of the ability to analyze, systematize and interpret information, put forward and justify their ideas, as well as present all this in the form of a structured, logically ordered text is more important. In particular, this also applies to the text of a public speech, in which each word, sign, each table, and each list have a specific purpose. The seminar "Methodology of Scientific Research" is designed to acquaint bachelors with the following material: with stages of scientific research; sources that should be used in the preparation of scientific texts; requirements for the design of scientific research in a foreign language, accepted in international practice; recommendations for the design of support for the report (Power Point Presentation, Prezi.com), as well as the scientific ethics of plagiarism, correct citation of sources, etc.

The experience of organizing students' project activities of students in a foreign language (the stage of information analysis, Fig. 1) at the English language Department also confirms its importance in the formation of metacompetencies of students. In particular, they develop the following skills in students: students' readiness to understand, theoretically substantiate, and practically solve professional problems; students' ability to independently and efficiently use modern sources of information, and also use scientific

approaches to fulfill their professional functions. At the same time, the need for specialists with a qualitatively new level of training, owning the technology of scientific research, is constantly increasing. The experience of organizing project activities of students in a foreign language is described in a number of works by teachers of the department [7; 8; 9]. In this article, we consider it appropriate to focus on the third level of the organization of students' scientific and research activities, namely the formation of academic writing skills and public scientific presentation in a foreign language.

We have to admit that there is a problem of developing a culture of scientific (international) speech in Russian universities, which is especially acute in terms of academic writing skills. This is expressed in the contradiction between the need to increase the publication activity of faculty, researchers and students in leading Russian and foreign indexed journals (RSCI, Scopus, Web of Science) and the lack, firstly, of specialized courses on the specifics and norms of written scientific communication in state and foreign languages. Second, this is due to the lack of teaching aids focused on the formation of students' ability to present the results of scientific activities in writing in scientific publications, when working in Russian and international teams. Many researchers note a problem with writing scientific texts not only in a foreign language but also in Russian [10; 11].

In this regard, along with the development of practical foreign language skills for professional purposes, including participation in project activities, preparing presentations, conducting business correspondence, conducting discussions in the academic and professional environment, phased implementation of elements and genres of academic writing should occur. So, at the undergraduate, it is important to introduce students to such a basic genre of academic writing as *an essay*. An essay is a short prose composition on a given topic, having its varieties and structural features. At the next level of training, in the master's program of a modern university, the emphasis is on teaching annotating and abstracting professional texts in a foreign language using practical examples (from the original literature) and exercises. Students need to familiarize themselves with the characteristic lexical, grammatical, structural, and compositional features of the *abstract* and the *highlights* of the scientific work. Studying the above genres of academic writing allows you to prepare young scientists for writing their works and dialogue in a foreign language in graduate school and their further research and professional activities.

Today, the priority of strengthening the research component in higher education for the successful integration of university graduates into the international scientific and professional environment has contributed to the allocation of academic writing in a foreign language in a separate discipline in graduate school. Although, this discipline belongs to the block of electives in a number of linguistic and non-linguistic universities of the country. This suggests an entirely different approach to the subject. In this regard, in the second year of postgraduate study at STU, the course "English in the field of international scientific communication" is taught. The purpose of mastering the discipline is to improve the foreign language communicative competence of young scientists in terms of the skills to present the results of scientific activities in writing in a foreign language (writing a scientific article "*IMRAD: Introduction, Methods, Results, and Discussion*").

Graduate students get acquainted with the generally accepted requirements for the design of scientific articles in a foreign language, the peer-review procedure, and the ranking of scientific journals (indicators of "rating" of journals. When taking this course, graduate students learn how to structure the text correctly (a step-by-step algorithm for writing sections of the article is proposed), use lexical and grammatical means that are adequate to the goal; study examples from the original literature in the direction of training. The result of this work is the presentation of a real scientific article or its template in a foreign language in a group of students, as well as the preparation of a *cover letter* for it. The knowledge gained in the field of foreign language scientific speech opens up new opportunities for future specialists when working in Russian and international research teams.

In general, scientific communications are considered as processes, mechanisms, and tools for disseminating and promoting scientific knowledge and ideas both within the academic community of scientists and beyond. Initially, this term was called communication between researchers, that is, publications in scientific journals, speeches, and communication at conferences and symposia. Then, the expansion of the boundaries of this concept took place, and scientific communications began to include communication between scientists and society using a variety of tools, such as social media, media, lectures.

Therefore, along with the development of academic writing skills, the formation of public scientific presentation skills is becoming increasingly relevant in both traditional and modern discourses.

At the initial stage of preparation for a public speech, one needs to realize what barriers a speaker may encounter during his/her public speech. This is necessary in order to predict the likelihood of their occurrence, and therefore to prevent the presence of obstacles or to be prepared to remove them in the event of their spontaneous occurrence. Barriers of this kind can be divided into two broad categories: obstacles in communication with the audiences of one's culture (universal) and with the audiences of another culture (specific). Professional affiliation, social status, degree of awareness of the subject of discussion, as well as external factors of the environment in which the event is held, including the quality of the equipment used and background noise, can serve as examples of universal barriers. The universal barriers are supplemented by specific ones that involve communication in an international context. Possession of the basics of cross-cultural communication and adaptation of the performance to the cultural characteristics of the audience help to overcome specific barriers.

In order to develop public speaking skills in terms of presenting the results of scientific activities orally in a foreign language, students of all levels of education receive an idea of how to formulate general (informing and convincing) and specific (including identifying potential usefulness for the audience) goals; working out ways to compose an associative *mind map*. Students acquire the following skills. They can (1) learn to prepare and present deep and compelling content on a given topic using the SUCCEs model (*be Simple, Unexpected, Concrete, Credible, Emotional and tell Stories*) [12]; (2) master the basics of visual literacy, namely the principles of working with text, fonts, color, images, videos, that is, the tools that are necessary for a competent and memorable presentation [13]; (3) edit and adjust multimedia presentations both in the form of quasi-professional exercises and assignments, as well as materials of their own presentations. As a result, students conduct public scientific speeches of professional orientation in student groups, participate in interuniversity, regional, all-Russian, and international conferences, as well as competitions in oratory and public speaking. Possession of the skills of public speaking, in general, and open scientific speaking, in particular, is one of the key factors that provide a competitive advantage to graduates and applicants at all stages of career development.

4. Conclusion

The relevance of the study is due to the need for the following: (1) the formation of metacompetencies of students, which form the basis for professional self-realization of a university graduate; (2) to improve the quality of research carried out in the modern university in general and of publication activity of students and faculty members in particular.

The theoretical significance of the study is to clarify the content of the concept of “metacompetence,” to deepen theoretical knowledge in the field of the formation of metacompetencies of students in the process of research work in a foreign language, to evidence-based study of the conditions for the effectiveness of the organization of research work that ensure the implementation of the developed model. Modeling the process of students' research work made it possible to systematize and generalize the requirements for its organization, taking into account relevant international requirements for the contents of the report, the design of scientific articles in a foreign language, the specifics of peer-reviewed papers and the ranking of scientific journals, indicators of the publication activity of scientists, organizations.

The practical significance of this study lies in the use of the results obtained in the organization of research work in a foreign language of students of STU studying in all areas of training and profiles related to the department of “English language.” The results of the study are reflected in the educational-methodical complex of the linguistic discipline “English in the field of international scientific communication” of graduate school, as well as the educational-methodical manual “Organization of research projects on economics in a foreign language” published at this university.

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