THE FORMATION OF MEDICAL STUDENTS' RESEARCH SKILLS IN TEACHING PROFESSIONAL ENGLISH

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ABSTRACT: The mastery of research methods, the ability to understand effectively English medical terminology, to quickly process and analyze new information, use it productively for optimal treatment of patients provide increased competitiveness of family physicians. The article focuses on the diagnostics of the future family doctors' research skills using testing methods and expert assessment of the level (high, medium, low). Among the main research skills of medical students, we have identified such as formation of purpose, hypothesis, choice of effective methods; analysis of sources, systematization of scientific information; organization of the experiment; conversations with scientists; argumentation; generalization of the results; presenting the new research results; analysis of positive and negative experience; characteristics of the individual difficulties in organizing the experiment. The assessment followed by the formation of these skills was organized on the basis of Cherkasy Medical Academy and Odessa National Medical University. In addition, a system of tasks for the formation of students' research skills in teaching professional medical terminology in English is presented. The future family physicians were involved in different kinds learning activities that were aimed at expanding their knowledge of medical terminology and mastering research skills in the educational component "English for Professional Purposes", and involved working in the student research laboratory and student science club.

KEYWORDS: research, skills, family, physician, English, professional, terminology, medical, students, tasks

In the face of social and economic challenges caused by the COVID-19 pandemic situation, the mission of doctors, first of all, family physicians, who are at the forefront of saving lives of people, becomes especially important. Under given conditions, the problem of the formation of medical students' ability to independently master knowledge, experience using both native and foreign languages, becomes especially relevant. It is necessary to pay attention to the fact that, on the one hand, today's doctor, especially a family physician, must be able to communicate with representatives of different nations, speak foreign languages, in particular, English. Mastery of foreign language competence, fluency in English medical terminology helps not only to communicate with foreigners, but also to get acquainted with the latest achievements in medical science in specialized sources. On the other hand, it should be emphasized that research activities contribute to the development of the creative potential of future family doctors, as well as their intellectual skills. Today, as never before, scientific activity is an important component in the family physicians' profession. This activity allows expanding not only theoretical knowledge, solving practical problems, introducing innovations but contributes to the development of the medical students' profound knowledge, critical thinking, and effective interaction with professionals from different countries.

At the same time, the problem of using the potential of educational component "English for professional purposes", namely English medical terminology, to form the future family doctors' research skills requires a deeper study. Taking into the consideration the information mentioned above, the article focuses on evaluating the research skills of future family physicians, as well as on presenting the system of tasks to form the students' research skills in teaching specialized English. In our research we consider it essential to conduct testing and expert assessment of the level of formation of students' research skills.

In their article Z. E. Davidson and C. Palermo highlight that "health professionals must first understand research methodology to enable informed critique of relevant evidence" (Davidson, Palermo, 2015, p. 1). These requirements are presented in educational programs for family physicians' professional training. Analysis of these sources suggests that the family physicians must have ability to abstract thinking, analysis, synthesis, and the skills to adapt and transfer knowledge to new situations. Moreover, family physicians must demonstrate a well-formed ability to planning the content of their work, to participate in the implementation of state and regional targeted medical programs, to introduce new methods of modern diagnostics, to improve the professional level through self-training, using information and communication technologies. In addition to the listed knowledge and skills, medical students must be capable to process foreign language scientific works, to communicate in written and/or oral speech with foreign researchers, to draw up in writing in a foreign language own professional work for the purpose of its presentation to the general public (Voronenko, Shekera, Tkachenko, Medvedovska, Krasnov, 2014).In order to improve the efficiency of future specialists' training for research activities, the scientists considered this problem from different aspects, among which the main ones are systematization of skills, their diagnosis, and the formation of students' research skills in teaching English professional terminology. Attention should be paid to the fact that scientists have developed the model of interdisciplinary research competence (Thiel, Böttcher, 2014), the model of the students' research competence (Kniazian, Mushynska, 2019; Ryndina, 2011; Yarullin, Bushmeleva, Tsyrkun, 2015), the system of diagnostic criteria of students' research skills (Agricola, Prins, Schaaf, Tartwijk, 2018), the three main groups of researcher's competences (Jamet, 2010). As for the future doctors' professional training, the problem to form their research skills was considered in such areas as the systematization of research skills (Lamblin, Etienne, 2010), their structuring in the research competence (Abreu, Peloquin, Ottenbacher, 1998; Davidson, Palermo, 2015) and research activities (Cleary, Freeman, 2005; Taylor, 2009). First of all, it should be noted that the system of research skills has been widely considered in the context of the competence paradigm. For instance, P. Lamblin and C. Etienne point out 20 research competencies that determine the effectiveness of professional activities. The proposed competencies are classified into three groups: "scientific competencies (scientific knowledge; ability to learn and adapt; ability to formulate a research issue; capacity for analysis and grasp of sophisticated IT tools; ability to work in an interdisciplinary environment; ability to incorporate existing knowledge); project and team management skills (ability to work in a team; ability to develop a network; communication skills; ability to assess; language skills; business culture and management skills; project management skills; ability to manage and steer teams; awareness of the pertinence of the research and its impact on the environment); personal aptitudes / interpersonal skills (creativity; open-minded approach; motivation / involvement; adaptability; ability to self-assess)" (Lamblin, Etienne, 2010, p. 6). Generalization of these scientific positions convinces that the future family physicians' research skills allow expanding their scientific knowledge, forming analytical thinking, scientific creativity, research culture, which helps to apply them independently in future professional activities and promotes the ability to find ways to solve pressing problems of medicine and health, and navigate freely in modern sources of information (also written in English). That is why, at the initial stage of professional training of bachelors of medicine, the system of research skills contains such groups that are described below: development of the researcher's organizational platform (defining the final purpose of scientific research, formation of a hypothesis and the choice of effective methods to prove or disprove it); formation of theoretical basis (analysis of sources, comparison, systematization, generalization of scientific information, etc.); data collection (interviewing, questioning, testing; organization of the experiment; combination, classification of data, statistical analysis); consulting with experienced specialists on the problem (conversations with scientists on the organization of an empirical experiment); argumentation (choosing strong arguments and facts to support own opinion); generalization of the results and forecasting the prospects in the field of family medicine; presenting the new research results (reports at conferences, presentations at webinars, publication of results in articles); self-evaluation of results (analysis of positive and negative experience; characteristics of the individual difficulties in organizing the experiment).In order to reliably assess the above skills, we used such methods as expert assessment, testing, which made it possible to identify the initial level of the students' research skills.

Assessment of the level of formation of research skills was conducted in Cherkasy Medical Academy, and Odessa National Medical University. The experimental work covered 84 students. The experiment involved 40 first-year students, 27 second-year students and 17 third-year students (Table 1).

Table 1 Number of students who took part in the experiment

Year of study	Number of students		Total
	Cherkasy Medical Academy	Odessa National Medical University	
The first year of study	24	16	40
The second year of study	16	11	27
The third year of study	9	8	17
Total	49	35	84

The analysis of scientific works proved the expediency of using a scientific approach of N. Kalugina, H. Girevaya, Y. Kalugin, I. Varlamova to assess the level of formation of students' research skills. We determined the level of mastery of the above research skills of students in accordance with the criterion of correctness of their performance.

The following formula was used

$$k_a = \frac{n}{N},$$

where k_a − the coefficient of the action, n – the number of actions that were performed correctly; N – is the total number of actions that need to be performed in a certain group (Kalugina, Girevaya, Kalugin, Varlamova, 2015, p. 1; Kniazian, Mushynska, 2019, p. 91). The high level was shown by those students who had correctly performed actions in tasks from 75% to 100%; in this case, 2 points were assigned. If the number of correct actions was from 50% to 74%, then 1 point was assigned; in this case, it was the medium level. The low level (0 points) was assigned if the student performed correctly from 33% to 49% of the actions. Based on the data obtained for each group of research skills, the average score of research skills was calculated for 84 students of the first, second and third years of study (Table 2).

Table 2 Results of the formation of the future family physicians' research skills

No	Research Skills	The first year of study	The second year of study	The third year of study
1.	Development of the researcher's organizational platform	0,42	0,77	1,35
2.	Formation of theoretical basis	0,45	0,82	1,24
3.	Data collection	0,47	0,78	1,23
4.	Consulting with experienced specialists	0,48	0,81	1,18
5.	Argumentation	0,47	0,78	1,23
6.	Generalization of the results	0,55	0,74	1,12
7.	Presenting the new research results	0,43	0,89	1,18
8.	Self-evaluation of results	0,50	0,70	1,29

The students of the first year of study have the greatest difficulties in developing the researcher's organizational platform (0,42), presenting the research results (0,43), and formation of theoretical basis (0,45). A higher level of formation of the skills to generalize the results of research activities (0,55) and to conduct self-assessment (0,50) was found. On the contrary, second-year students demonstrated that they have the ability to present research results (0,89) and to form the theoretical basis of research activities (0,82). Sufficiently high results were also obtained in the aspect of the formation of the skills to consult with experienced specialists (0,81), to argue ideas (0,78) and to collect data (0,78).

At the same time, third-year students indicated a fairly high level of all research skills, in the first place, the ability to develop the researcher's organizational platform (1,35), assess themselves (1,29), form a theoretical basis for the activities (1,24), collect results (1,23) and argue their own ideas (1,23). The most significant dynamics is observed in the aspect of development of the researcher's organizational platform. If in the first year it is difficult for future family physicians to define the final purpose of scientific research, form a hypothesis and choose effective methods to prove or disprove it, then in the third year these skills are formed better than others (from 0,42 to 1,35). Active dynamics can be traced in relation to mastering the ability to analyze sources, systematize and generalize information (from 0,45 to 1,24), to collect data (from 0,47 to 1,23) and to evaluate the results (from 0,50 to 1,29). The obtained results also allowed determining the total number of students (in %) who have low, medium and high levels of research skills for each year of study (Table 3).

Table 3 Diagnostics of students' research skills

The Levels of Research Skills	The first year of study	The second year of study	The third year of study
High	1,30%	8,00%	37,30%
Medium	45,90%	62,90%	45,00%
Low	52,80%	29,10%	17,70%

The analysis of these results shows that the number of students with a high level of research skills in the third year has significantly increased (from 8,00% to 37,30%), the difference is 29,30%. Compared to the first year, this difference is 36,00%. Logically, there is a dynamics of reducing the number of students with a low level: from half (52,80%) in the first year to a third (29,10%) in the second year; the difference is 23,70%. The number of students diagnosed with a low level of research skills in the third year (17,70%) significantly decreased. In comparison with the results of first and second year students, this difference is 23,70%, and first and third year students – 35,10%. Regarding the dynamics of the medium level, we first observe an increase in the number of second-year students (from 45,90% to 62,90%), and then their decrease again to 45,00%. The obtained results indicate the dynamics of mastering research skills, but still there is a significant number of third-year students who have a medium level of formation of these skills. For the purpose to effectively form the future family physicians' research skills in teaching professional English, we have introduced a system of tasks aimed at developing each group of skills. First of all, in order to form the first group of skills in teaching medical terminology in English, students conducted a study on "Determining the impact of physicians' emotions on patients and their relatives". To solve this problem, the students analyzed the sources in English on this topic, chose the terms, on the basis of which they should define the purpose of research, to form a hypothesis and to choose the methods to prove it. Moreover, the students were entrusted with the task to eleborate a research plan. After that, we proposed tasks aimed at comparing different scientific concepts, approaches, positions, presented in articles in English, their systematization. These activities was carried out on the basis of such topic as "The Chernobyl disaster: social and medical consequences". In addition, due to the fact that students have difficulty in data collection, we have implemented in English diversive tasks for processing collecting the results of socio-medical research. For example, students interviewed Ukrainian women and men about their requests to the family doctor for weight change. Future family physicians had to collect and systematize the results, analyze them using the methods of mathematical statistics, translate the information into English for self-preparation for the discussion "How to prevent weight gain?". Moreover, in order to form the ability to communicate with experienced professionals, we invited students to consult with scientists about the organization of an experiment on the topic "Chemical composition of smoke. The effect of tobacco smoke on the well-being of preschoolers". Performing this task, students had two models of activity: they had to interview in English professors who teach medical disciplines in this language, or interview in Ukrainian experts on this issue, and then present this information in English with correct using professional terminology. In order to get ready for the discussion on the problem of ensuring the safety of daily physical activity, students selected the terminology, arguments, facts, statistics on the topic "Dangers during training. Risk management". Each student had to choose the most effective argument and correct terms to prove their own viewpoint in English. In addition to the enumerated activities, the implementation of brainstorming

helped us to identify the prospects for the study of the proposed problem and allowed us to form in future doctors the ability to forecast multivarious ways to study these problems in medicine.

Thus, all of the above tasks were aimed at expanding knowledge of the English terminology in the field of medicine and the formation of research skills. To make it possible for the students to couch their ideas in medical terms and research skills as a system, we implemented a strategy of "creative precedents" (Kniazian, Mushynska, 2019, p. 92) in the course "English for Professional Purposes". The proposed strategy provided the introduction of research professionally oriented tasks of increased complexity at the initial stage of learning. The "creative precedents" is designed to perform a number of functions: give students the opportunity to feel like a researcher at the initial stage of their preparation in high school; independent discovery by future family doctors of methods that are relevant in the research process; stimulating interest in the medical profession, demonstration of originality, multivariate deployment of his work; identification of their own shortcomings of creative work, which the student should work on. We developed an algorithm for sequential research, which focused on broader issues, such as "Toxicological, biochemical and hygienic segments of chemical safety", "Problems of changing homeostasis during diets", "The impact of gadgets on vision", "Influence of nicotine and ethanol on brain activity": formulate in English the main objective, aims and hypothesis of this research with the exact use of terms, develop a system of methods to prove it; make a list of scientific sources of Internet publications in English on this topic, analyze and compare different positions of scientists, systematize them, develop a generalized scheme of these scientific positions. For example, on the topic "The impact of gadgets on vision", the future family physicians had to do the following: to analyze the latest scientific sources in English, interview well-known experts on how to reduce the negative impact of gadgets on the eyesight of children and adolescents; to analyze and classify the data; to suggest ways to solve this problem and find arguments to support them; to summarize all the information and formulate prospects for future research in this area; to design new knowledge in the form of expert reports, essays, power point presentation in English; to analyze the skills, qualities, competencies that have been formed during this study. We offered students to deepen their knowledge of medical terminology in English and master research skills not only in the course "English for Professional Purposes", but also in various activities in extracurricular time, for instance, in student research laboratory and student science club.

At the format of the student science club the future family physicians had to examine the problem "Iron is an element of the wild". In particular, first and second year students had to analyze the scientific literature in English on issues such as "Quantitative determination of iron in blood", "The role of enzymes containing iron for the body", "How does the amount of iron in food affect human health?", "Is it possible to increase the amount of iron in the body with a balanced diet?". We asked students to research these issues in small study groups. After that, each group presented the results of the study: a list of terms most often used on this topic; a list of scientific papers that have been analyzed; critical review of articles. The review of the articles was demonstrated in a presentation, the contents of which were discussed by members of other groups. Based on the results of the research and discussion, the students made brochures "Why is iron important for the body?" in English and in Ukrainian; then the future family physicians distributed them among the patients of the health care institutions. Thus, formation of theoretical basis, data collection, consulting with experienced specialists, argumentation of scientific position, generalization of experimental results, presenting the new research results, self-assessment are the main research skills of future family physicians. As a result of the study, a predominantly low level of research skills was revealed among first-year students (52,80%) and a medium level among second-year students (62,90%) and third-year students (45,00%). The effectiveness of the formation of these skills in the process of mastering English medical terminology lies in the fact that students simultaneously expand their vocabulary, practice using it, performing various research tasks. We offered students such tasks such as, for example, comparison of different scientific concepts and approaches, data collection and analysis, communication with experienced professionals, selection of terminology, arguments, statistics. In the educational process at the initial stage of learning, were also introduced research tasks of increased complexity ("creative precedents"). Besides, the students' research skills were formed both in the course "English for Professional Purposes", and in the format of a student research laboratory and student science club. Prospects for the formation of future doctors' research skills involve the study of

methods for increasing the effectiveness of students' scientific work in the process of professional training of masters of family medicine.

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