PROJECT-ORIENTED TRAINING AT THE SCHOOL OF PUBLIC HEALTH AND BIOMEDICINE

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Abstract

Background. This article presents results of the project-oriented learning method implementation in the educational process of the 3rd year "General medicine" students with different study languages at the Department of Public Health, Karaganda Medical University.

Aim. To analyze the project-oriented training results at the School of Public Health and Biomedicine.

Materials and methods. A database with the results of current academic performance and interim control (students' project work presentation). Statistical and analytical research methods were applied in the study.

For comparative analysis, 2 independent samples were formed according to the training language. The 1st sample included 89 students from 8 groups with Kazakh and Russian languages of training. In the 2nd – 89 students of the international medical faculty from 8 groups with English as the language of training.

Results. The average score in the 1st sample (89 students with Russian and Kazakh language of training) was 88.58±5.03 points, minimum - 65, maximum - 95 points. The same indicator in the 2nd sample (89 students with English language of training) was 80.24 ± 7.79 points, the score varies from 65 to 95 points.

The average score for a scientific project among students with Russian and Kazakh language of training was significantly higher (p=0.000) than among students with English language of training. The 95% confidence interval for the difference of the average 2 samples ranged from 6.40 to 10.28 points.

Conclusions. 1. The hypothesis of the study about the equality of average grades in groups with Russian/Kazakh languages and groups with English language of training was not confirmed.

2. The average score for a scientific project among students with Russian and Kazakh language of training was significantly higher (p=0.000) than among students with English language of training. The 95% confidence interval for the difference in the mean of 2 samples ranged from 6.40 to 10.28.

Keywords: effective education, educational process, project-oriented learning, Research-Based Learning (RBL), Team Based Learning (TBL).

Резюме

ПРОЕКТ-ОРИЕНТИРОВАННОЕ ОБУЧЕНИЕ В ШКОЛЕ ОБЩЕСТВЕННОГО ЗДОРОВЬЯ И БИОМЕДИЦИНЫ

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Актуальность. В данной статье представлен результат работы преподавателей Школы общественного здоровья и биомедицины Карагандинского медицинского университета по применению проект-ориентированного подхода в изучении модульной дисциплины «Пациент и общество» (общественное здравоохранение и биостатистика) студентами 3 курса, с различными языками обучения, специальности «Общая медицина».

Цель. Проанализировать результаты проект-ориентированного обучения Школы общественного здоровья и биомедицины.

Материалы и методы. База данных с оценками текущей успеваемости и промежуточной аттестации (оценивание постерного доклада проектной работы студентов). Были использованы статистический и аналитический методы исследования.

Для сравнительного анализа были сформированы 2 независимые выборки по языку обучения. В 1-ю выборку вошли 89 студентов из 8 групп с казахским и русским языками обучения. Во 2-ую - 89 студентов международного медицинского факультета из 8 групп с английским языком обучения.

Результаты. Средняя оценка в 1-й выборке (89 студента с русским и казахским языком обучения) составила 88,58±5,03 балла, минимум - 65, максимум - 95 балл. Этот же показатель во 2-й выборке (89 студента с английским языком обучения) составил 80,24±7,79 балла, оценка варьирует от 65 до 95 балла.

Средняя балл оценки за научный проект у обучающихся с русским и казахским языком обучения был значительно выше (р=0.000), чем у обучающихся с английским языком обучения. 95% доверительный интервал для разности средних 2-х выборок составил от 6.40 до 10.28 балла.

Выводы. 1. Гипотеза исследования о равенстве средних оценок у групп с русским/казахским языками и групп с английским языком обучения не подтвердилась.

2. Средняя оценка за научный проект у обучающихся с русским и казахским языком обучения была значительно выше (р=0.000), чем у обучающихся с английским языком обучения. 95% доверительный интервал для разности средних 2-х выборок составил от 6.40 до 10.28.

Ключевые слова: эффективное образование, образовательный процесс, проект-ориентированное обучение, Research-Based Learning (RBL), Team Based Learning (TBL).

Түйіндеме

ҚОҒАМДЫҚ ДЕНСАУЛЫҚ ЖӘНЕ БИОМЕДИЦИНА МЕКТЕБІНДЕ БАҒЫТТАЛҒАН ОҚЫТУДЫҢ ЖОБАСЫ

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Өзектілігі. Бұл мақалада Қарағанды медицина университетінің Қоғамдық денсаулық сақтау және биомедицина мектебінің оқытушыларының «Жалпы медицина» мамандығы бойынша әртүрлі тілде оқытатын 3 курс студенттерінің «Пациент және қоғам» (қоғамдық денсаулық сақтау және биостатистика) модульдік пәнін оқуда жобалық-бағдарлы тәсілді қолдану бойынша жұмысының нәтижесі берілген.

Мақсаты. Қоғамдық денсаулық және биомедицина мектебінің жобаға бағытталған оқыту нәтижелерін талдау.

Материалдар мен әдістер. Ағымдағы үлгерім және аралық аттестаттау бағалары бар деректер базасы (студенттердің жобалық жұмысының постерлік баяндамасын бағалау). Зерттеудің статистикалық және аналитикалық әдістері қолданылды.

Салыстырмалы талдау үшін оқыту тілі бойынша 2 тәуелсіз іріктеме қалыптастырылды. 1-ші іріктемеге қазақ және орыс тілдерінде оқитын 8 топтан 89 студент қатысты. 2-ші-89 Халықаралық медицина факультетінің ағылшын тілінде оқытылатын 8 топтағы студенттері қатысты.

Нәтижелері. 1-ші іріктеудегі орташа баға (орыс және қазақ тілінде оқитын 89 студент) 88,58±5,03 баллды құрады, минимум - 65, максимум - 95 балл. Дәл осындай көрсеткіш 2-ші іріктемеде (ағылшын тілінде оқитын 89 студент) 80,24±7,79 баллды құрады, бағалау 65-тен 95 баллға дейін өзгереді.

Орыс және қазақ тілдерінде оқитын білім алушылардың ғылыми жоба бойынша орташа балл бағасы ағылшын тілінде оқитын білім алушыларға қарағанда едәуір жоғары болды (р=0.000). Орташа 2 үлгінің айырмашылығы үшін 95% сенімділік аралығы 6.40-тан 10.28 балға дейін болды.

Тұжырымдар. 1. Орыс / қазақ және ағылшын тілінде оқытатын топтардың орташа бағаларының теңдігі туралы зерттеу гипотезасы расталмады.

2. Орыс және қазақ тілдерінде оқитын білім алушылардың ғылыми жоба бойынша орташа бағасы ағылшын тілінде оқитын білім алушыларға қарағанда едәуір жоғары болды (р=0.000). Орташа 2 үлгінің айырмашылығы үшін 95% сенімділік аралығы 6.40-тан 10.28-ге дейін болды.

Түйінді сөздер: тиімді білім беру, білім беру процесі, жоба-бағдарлы оқыту, Research-Based Learning (RBL), Team Based Learning (TBL).

Introduction

Professional standards and requirements for the modern training of future professionals in the field of medicine should be at the highest level. From compliance with regulations to business correspondence skills, everything matters in ensuring the quality of medical care in the future during work. The developed discipline "Patient and Society" (Public Health) is aimed at ensuring that the student masters and applies the skills of assessing health indicators, i.e. preparing a project to analyze the burden of a certain disease on public health, applying the knowledge and skills of this subject and previously mastered socio-political disciplines, informatics, the foundations of evidence-based medicine (all prerequisites). During the study of the discipline, we sought to develop the skills of systemic and critical thinking, an analytical approach to posing a scientific question, searching and making decisions, working with reliable literary sources and medical and statistical information, conducting medical and social research, processing and interpreting the results. All of the above are elements of the upcoming postgraduate continuing education and professional practice.

Today, professional competence is the main criterion for the quality of training in an academic institution (higher education). The triad of science, education, and new technologies at a medical university should provide the student with professional knowledge and skills that will allow him to be in demand and competitive in the regional, national, and global healthcare market. Following the example of leading foreign universities, many medical universities in Kazakhstan strive to obtain the status of research universities, enter the world university rankings [2,6].

There is practically no university that would not support the research activity of students, their rational and creative initiatives, and participation in academic mobility programs, master classes, and scientific presentations. But at the same time, only a small part of students is involved in research activities. Elements of science-oriented education as project technology are used in leading Western medical universities. Researchers F. Levy and R. Petrulis conducted interviews with university students, the purpose of which was to study their experience of research-based learning. Main conclusions: students like the interaction with their mentors in the preparation of scientific projects within the studied disciplines, and they emphasized the productivity of solving research problems with this approach [7, 10, 14].

As for the skills inherent in students as researchers, M. Shah, a professor from the University of Central Florida, notes that students have less difficulty completing a dissertation if they were previously involved in research activities at the initial stages of their studies - students need to develop critical thinking, generate ideas, time planning, working with information, numbers and graphs, literacy, presentation, public speaking and communication skills, the ability to ask questions, knowledge of methodology, seeing the big picture [10].

Perhaps, in order to interest a student in research, to instill a love for science, the teacher should be a role model. He can show by example the stages of his development as a professional, share positive experience of participating in scientific projects, show how he thinks creatively, has the ability to plan and organize research work. Through Research Based Learning (RBL), students can be encouraged to find non-standard solutions, take initiative for projects, develop students' independent and team work skills [3, 6, 12].

The authors of Chulaporn Sotaa and Karl Peltzer report not only on the scientific nature of the educational process, team and independent work in the implementation of RBL, but also on the development of cognitive abilities, mindfulness and creativity in students, and also emphasize the effectiveness in achieving educational goals [13] The cornerstone of this technology is responsibility. Students learn how to correctly compose keywords for information search, plan all the elements for success, understand the importance of each member's assigned area of work, and communicate with the internal and external environment of the project. And a important role in this is assigned to the coordinator, facilitator, inspirer, mentor, i.e. responsible teacher when students take their first steps in research work [1, 2, 4, 5, 9, 11, 12].

Aim. To analyze the results of project-oriented training (POT) of the School of Public Health and Biomedicine (PH&B). In accordance with the purpose of the study, the following purposes were set:

1. Explore results of the POT. H (0) Research hypothesis - the average score for the project work of groups with English as the language of instruction does not differ from the average score for groups with Russian and Kazakh as the language of instruction. H (1) - the average scores are different.

2. Compare results of POT among students.

Materials and Methods. Database with assessments of current progress and intermediate evaluation (assessment of the project work poster report of students). Statistical and analytical research methods were used.

For comparative analysis, 2 independent samples were formed according to the language of instruction. The 1st sample included 89 students from 8 groups with Kazakh and Russian languages of instruction. In the 2nd - 89

students of the international medical faculty from 8 groups with English as the language of instruction.

Inclusion criterion: 3rd year students of the specialty "General Medicine", who performed project work at the School PH&B in the discipline "Patient and Society", with Kazakh, Russian and English languages of instruction. The mean (±SD) score for the poster presentation was calculated. To test the hypothesis about the equality of the mean scores a T-test for independent samples (two sided significance) was used. Statistical analysis was performed using SPSS version 22.0.

Results and Discussion.

In the autumn semester of the 2021-2022 academic year, 314 students in the 3rd year of the "General Medicine" educational program (28 groups: 9 groups with the Kazakh language of instruction, 6 groups with the Russian language of instruction, 13 groups with the English language) were trained in the modular discipline " Patient and Society" based on the School of PH&B. Students studied this discipline at the Public Health Department and the Biostatistics Department.

The course of the modular discipline "Patient and Society" included sections: "Comprehensive assessment of public health", "Legal foundations of public health", "Health organization" and "Statistics in biomedical research" with a volume of 4 credits or 120 hours. Current performance was assessed using testing, tasks, and answers to questions when discussing the topic of the section. The form of the final control is a public presentation of a scientific project (poster presentation/report).

The culmination of the module was the completion of a team project. The implementation of the scientific project included the following stages:

The first stage is the formation of a team of 3-4 people. Appointing a supervisor for the team (usually the team teacher).

The second step is choosing a topic. At the same time, freedom of choice of topic was provided. Only the direction was set - the analysis of the burden of a certain nosology on public health in the Republic of Kazakhstan or India. Examples of scientific projects carried out at the PH&B School: "Knowledge of the issues of occupational injury prevention among miners of the Karaganda region", "The incidence of Dengue fever in India: a comparison of the situation in the states of Rajasthan and Uttar Pradesh", "Analysis of the incidence and mortality from colorectal cancer in the Republic of Kazakhstan during 2010-2019", "The burden of Coronavirus infection in the Republic of Kazakhstan", etc.

The third stage is the definition of the aim, purposes, materials and methods of research.

The fourth stage is drawing up a plan for reviewing sources, identifying key words, conducting a review in

Russian, Kazakh, and English. Recommended databases with national/institutional subscription: Web of Science, Science Direct, Wiley, SpringerLink, Cochrane Library, E-Library, Web-Irbis library resource.

Fifth stage - planning of medical and sociological research: determination and calculation of the sample (volume, inclusion and exclusion criteria), research bases, compilation and approval of the sociological research tool

The sixth stage is the collection, copying of statistical data and the conduct of a sociological study.

The seventh stage is analysis, statistical processing of data (selection of an appropriate statistical method) and their interpretation.

The eighth stage is the formulation of conclusions and recommendations.

The ninth stage is the design of the project poster.

Students carried out a scientific project under the guidance of the faculty of the department. In the Practical and Self-work of student with a teacher classes students analyzed each stage of the development and implementation of a scientific project. The leader played the role of a mentor and facilitator and not just a source of knowledge and skills.

The final form of POT control was a poster session, where each project was evaluated by the teaching staff of the PH&B School on a 100-point scale, according to the criteria indicated in Table 1. Also, all works were tested for the similarity index through the "Turnitin" system. A total of 76 poster presentations/reports were presented.

Table 1.

Poster Evaluation Criteria.

Poster session:	Score
Relevance, justification of the topic	15
Logical structure of the study, content	10
Correct design of tables, graphs, signature of figures	15
Compliance with time regulations and deadlines for the delivery of the project	10
Description of the results obtained, their interpretation	15
Accuracy in wording, absence of errors (including grammatical ones), speech construction	15
Completeness, reasoning of answers to questions	20
Total:	100

The average score in the 1st sample (89 students with Russian and Kazakh as the language of instruction) was 88.58±5.03 points, minimum - 65, maximum - 95 points. The same indicator in the 2nd sample (89 students with English as the language of instruction) was 80.24±7.79 points, the score varies from 65 to 95 points. (Table 2).

Table 2.

Descriptive sampling statistics.

Sample	N	Mean (in points)	Standard Deviation (in points)	RMS error of the mean
1 (students with Russian and Kazakh language of study)	89	88,5843	5,02903	0,53308
2 (students with English language of study)	89	80,2472	7,79318	0,82608

The mean score for the research project for students with Russian and Kazakh as the language of instruction was significantly higher (p=0.000) than for students with English as the language of instruction. 95% confidence interval for the difference between the means of 2 samples was from 6.40 to 10.28 points (Table 3).

Table 3.

Criterion for independent samples.

	Levine's test for equality of variances		t-test for equality of means							
	F	p-value	T	ст.св.	p-value (2 sides)	Mean difference	RMS difference difference	95% confidence interval for difference	
								lower	higher
Mark Equal variances assumed	28,044	0,0001	8,480	176	0,0001	8,337708	0,98314	6,39	10,27735
Equal variances not assumed			8,480	150,460	0,0001	8,337708	0,98314	6,39	10,27963

Based on the results of the analysis of the poster session, typical mistakes or inaccuracies that students made in the process of performing and presenting a poster report were identified. More often such inaccuracies were typical for students of the international faculty. We have identified some aspects for consideration and proposed the following recommendations for both students and teachers (Table 4). In addition to the points listed below, we also recommend that you consider the possible preparation and dissemination of handouts for your project. This is not a requirement, but such work can be a nice bonus or help the audience better understand the results of your project.

Table 4.

Remarks and recommendations.

	Rule/Requirement	Inaccuracy/error	Recomendation
1.	Correctly sign the sent file	Ignoring the proposed file signature format: "Group Number_Sender_Name_Subject" was often not respected	During classes, when performing tasks, work out this issue, developing this habit as an element of professional business ethics.
2.	Compliance with the rules of speech	Violation of the time limit.	The presentation of a poster, report, of course, requires a rehearsal of the speech with control and cut-off time intervals for each element of the presentation.
3.	Readability of information on the poster/presentation	Unsuccessfully selected background, font, size. A different font style exacerbated by the overload of textual information.	Focus during class on the example of your (teacher's) presentations, how you use the background, fonts, conciseness.
4.	No grammatical errors	The presence of grammatical and stylistic errors.	Read the final material yourself, give it to your colleagues for proofreading.
5.	No terminological errors	Mistakes, inaccuracies in terms. Inability to decipher abbreviations, etc.	Make a separate list of terms, complex scientific expressions, abbreviations that you will learn before the speech.
6.	Correct design of tables, graphs, signature of figures	Errors in the graphical representation of absolute numbers, intensive and extensive indicators in charts, tables. Using low quality images	During classes, you should pay increased attention to the correct use of charts, tables. Display a low quality image on the screen, emphasizing the unreadability / pixelation of the image.
7.	Conciseness of the answer	Answers to questions with time delay, not in essence, with unnecessary information	Think through and discuss possible issues with the team. Focus on the quality of the answer, not the volume.
8.	Discipline	Late, request to reschedule the event, unavailability	Send/bring material in advance, arrive 15 minutes before the start of the event, make sure everything works.
9.	Work with a poster, presentation to the public	Emphasizing elements in a presentation or poster using a hand, finger, etc.	Use a laser pointer or a regular pen. If the demonstration goes through a computer, then the cursor can be turned into a laser pointer.
10	The correctness of speech, its construction	Monotony of speech, ill-conceived pace of information presentation	Test performance, training in front of colleagues will help to identify such shortcomings. Also pay attention to intonations, gestures, postures - all this can affect the perception of the work.

Conclusion

Active research activity testifies to the scientific potential of the university and has a positive effect on its reputation. Research students gain valuable experience and also become "image or reputation agents" for the organization they represent. The participants in the active development of science, research at the university are students, and teachers, and research teams, and even employers who can maintain a "nutrient environment and reap the benefits." The first steps into the scientific environment may be the study of disciplines with a project-oriented component.

In the process of project preparation, communication skills and work with team members are applied and improved - this is noted by the POT participants [5, 8, 14].

The difference in the average performance of students in groups with different languages of instruction in POT is an indicator that depends on many factors. This can be influenced by: the qualifications of the teacher, the quality of student training, including at previous levels of study (school, elementary courses of the university), the conditions of the educational process, etc. - all these are materials for further analysis and research. The indisputable advantage of this method is the possibility of simultaneous effective training of several small groups in one classroom. At the same time, teamwork allows you to actively exchange information between students, as well as between students and the teacher. Thanks to the PBL method, students learn to cooperate, distribute responsibilities among team members, jointly solve tasks, actively participate in team discussions, and also defend a team decision in front of the entire audience.

Conclusions

1. The hypothesis of the study about the equality of average marks in groups with Russian/Kazakh languages and groups with English as the language of instruction was not confirmed.

2. The mean score for a research project for students with Russian and Kazakh as the language of instruction was significantly higher (p=0.000) than for students with English as the language of instruction. 95% confidence interval for the difference between the means of 2 samples was from 6.40 to 10.28.

Литература:

1.*Алышева Н.О., Бейсекова М.М., Омарова А.О.* Внедрение элементов Research-Based Learning (RBL) в учебный процесс // Сборник научных работ 47-й Международной научной конференции Евразийского Научного Объединения. Москва, январь, 2019. Москва, 2019. С. 177-178.

2.*Бегайдарова Р.Х., Стариков Ю.Г., Алшынбекова Г.К., Девдариани Х.Г., Дюсембаева А.Е., Золотарева О.А., Насакаева Г.Е.* Использование методики RBL (Research-Based Learning) в учебном процессе на кафедре детских инфекционных болезней // Международный журнал прикладных и фундаментальных исследований. 2018, 2, С. 175-179.]

3.*Джайнакбаева Г.Т.* Применение метода проектов на уроках истории Казахстана // Вестник КазНПУ им. Абая, серия «Исторические и социально-политические науки». 2016, 1, С. 277-281.

4.*Жумабекова Г.С., Дюсембаева Н.К., Ажиметова Г.Н., Оразбаева Б.С., Каммерер Л.А., Ким М.А., Касиханкызы А.* Формирование научно-исследовательской компетентности у студентов старших курсов медицинского вуза // Медицина и экология. 2018, 3, С. 76-78.

5.*Казимирова О.В., Пахомова Д.К., Горбунова А.В., Дундукова Р.С.* Анализ качества компетентностного преподавания в КГМУ на примере научноориентированного обучения // *International Scientific and Practical Conference "WORLD SCIENCE"..* 2017, 5, пп. 36-38.

6.*Кемелова Г.С., Газалиева М.А., Ахметова Н.Ш., Макаренко Т.В., Наджарян Л.К.* Научно-ориентированное обучение в медицинском образовании // Международный журнал прикладных и фундаментальных исследований. 2015, 12, пп. 1866-1869.

7.*Куандыков Е.К., Махатова В.К., Тажиева А.Д., Куандыкова А.К.* Поиск путей интеграции Research-Based Learning (RBL) в образовательныы процесс // Вестник КазНМУ. 2018, 1, С.. 354-356.

8.*Махамбетова С.Б., Мирманова Г.К.* Внедрение результатов научно - исследовательской работы студентов в учебный процесс, как способ активизации знаний и умений по иностранному языку // Медицинский журнал Западного Казахстана. 2010, 2, С. 133-135.

9.*Педагогические стратегии. Проектно-ориентированное обучение. URL http://eduspace.pro/project-based-learning* (Дата обращения: 12.01.2022).

10. *Сапожникова К.Е. Роль исследовательской деятельности студентов в образовательном процессе* // Наука сегодня: глобальные вызовы и механизмы развития материалы международной научно-практической конференции: в 2 частях. Научный центр «Диспут». 2017, С. 72-73.

11. *Тулебаев Ж.А.* Проектная работа, как способ организации самостоятельной работы студентов на уроках английского языка в медицинских вузах // Вестник КазНМУ. 2014, 1, С. 380-382.

12. *Хожаев А.А.* Командно-ориентированное обучение в качестве технологии проведения практических занятий у студентов 4 курса // Вестник КазНМУ. 2016, 3, С. 234-236.

13. *Chulaporn Sotaa, Peltzerb Karl* The Effectiveness of Research Based Learning among Master degree Student for Health Promotion and Preventable Disease, Faculty of Public Health, Khon Kaen University, Thailand // Procedia - Social and Behavioral Sciences. 2017, 237, pp. 1359-1365.

14. *Levy Philippa, Petrulis Robert.* How do first-year university students experience inquiry and research, and what are the implications for the practice of inquiry-based learning? // Studies in Higher Education. 2012, 37, pp. 85-101.

References: [1-12].

1. Alysheva N.O., Beysekova M.M., Omarova A.O. Vnedrenie elementov research-based learning (RBL) v uchebnyi protsess [Introduction of elements of research-based learning (RBL) into the educational process]. *Sbornik nauchnykh rabot 47-i Mezhdunarodnoi nauchnoi konferentsii Evraziiskogo Nauchnogo Ob"edineniya.* [Collection of scientific papers of the 47th International Scientific Conference of the Eurasian Scientific Association]. Moscow, 2019. pp. 177-178. [in Russian]

2. Begaydarova R.Kh., Starikov Yu.G., Alshynbekova G.K., Devdariani Kh.G., Dyusembaeva A.E., Zolotareva O.A., Nasakaeva G.E. Ispol'zovanie metodiki RBL (Research Based Learning) v uchebnom protsesse na kafedre detskikh infektsionnykh bolezney [Using the RBL (Research Based Learning) methodology in the educational process at the Department of Children's Infectious Diseases]. *Mezhdunarodnyi zhurnal prikladnykh i fundamental'nykh issledovanii* [International Journal of Applied and Fundamental Research]. 2018, 2, pp. 175-179. [in Russian]

3. Dzhaynakbaeva G.T. Primenenie metoda proektov na urokakh istorii Kazakhstana [Application of the project method in the lessons of the history of Kazakhstan]. *Vestnik KazNPU im. Abaya, seriya «Istoricheskie i sotsial'no-politicheskie nauki»* [Bulletin of KazNPU named after. Abai, series "Historical and socio-political sciences"]. 2016, 1, pp. 277-281. [in Russian]

4. Zhumabekova G.S., Dyusembaeva N.K., Azhimetova G.N., Orazbaeva B.S., Kammerer L.A., Kim M.A., Kasikhankyzy A. Formirovanie nauchno-issledovatel'skoi kompetentnosti u studentov starshikh kursov meditsinskogo vuza [Formation of research competence among senior students of a medical university]. *Meditsina i ekologiya* [Medicine and Ecology]. 2018, 3, pp. 76-78. [in Russian]

5. Kazimirova O. V., Pakhomova D. K., Gorbunova A. V., Dundukova R. S. Analiz kachestva kompetentnostnogo prepodavaniya v KGMU na primere nauchnoorientirovannogo obucheniya [Analysis of the quality of competence-based teaching at KSMU on the example of research-oriented education]. *International Scientific and Practical Conference "WORLD SCIENCE".* 2017, 5, pp. 36-38.

6. Kemelova G.S., Gazalieva M.A., Akhmetova N.Sh., Makarenko T.V., Nadzharyan L.K. Nauchno-orientirovannoe obuchenie v meditsinskom obrazovanii [Research-oriented teaching in medical education]. *Mezhdunarodnyi zhurnal prikladnykh i fundamental'nykh issledovanii* [International Journal of Applied and Fundamental Research]. 2015, 12, pp. 1866-1869. [in Russian]

7. Kuandykov E.K., Makhatova V.K., Tazhieva A.D., Kuandykova A.K. Poisk putey integratsii Research-Based Learning (RBL) v obrazovatel'nyi protsess [Search for ways to integrate Research-Based Learning (RBL) into the educational process]. *Vestnik KazNMU* [Bulletin of KazNMU]. 2018, 1, pp. 354-356. [in Russian]

8. Makhambetova S.B., Mirmanova G.K. Vnedrenie rezul'tatov nauchno - issledovatel'skoi raboty studentov v uchebnyi protsess kak sposob aktivizatsii znanii i umenii po inostrannomu yazyku [Implementation of the results of scientific research work of students in the educational process as a way to activate knowledge and skills in a foreign language]. *Meditsinskii zhurnal Zapadnogo Kazakhstana* [Medical Journal of Western Kazakhstan]. 2010, 2, pp. 133-135. [in Russian]

9. *Pedagogicheskie strategii. Proektno-orientirovannoe obuchenie* [Pedagogical strategies. Project Based Learning] URL http://eduspace.pro/project-based-learning (accessed: 12.01.2022).

10. Sapozhnikova K.E. Rol' issledovatel'skoi deyatel'nosti studentov v obrazovatel'nom protsesse [The role of research activities of students in the educational process]. *Nauka segodnya: global'nye vyzovy i mekhanizmy razvitiya materialy mezhdunarodnoy nauchno-prakticheskoy konferentsii: v 2 chastyakh. Nauchnyy tsentr «Disput»* [Science today: global challenges and development mechanisms materials of the international scientific and practical conference: in 2 parts. Scientific center "Dispute"]. 2017, pp. 72-73.

11. Tulebaev Zh.A. Proektnay rabota, kak sposob organizatsii samostoyatel'noi raboty studentov na urokakh angliiskogo yazyka v meditsinskikh vuzakh [Project work as a way of organizing students` independent work in English lessons at medical universities]. *Vestnik KazNMU* [Bulletin of KazNMU]. 2014, 1, pp. 380-382. [in Russian]

12. Xozhaev A.A. Komandno-orientirovannoe obuchenie v kachestve tekhnologii provedeniya prakticheskikh zanyatii u studentov 4 kursa [Team-oriented learning as a technology for conducting practical classes for 4th year students]. *Vestnik KazNMU* [Bulletin of KazNMU]. 2016, 3, pp. 234-236. [in Russian]

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