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METHODS OF FORMING STUDENTS' RESEARCH COMPETENCY OF THE EDUCATIONAL PROGRAM «PHYSICAL EDUCATION AND SPORT»

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Methods of forming students' research competency of the educational program «Physical education and sport»

Abstract. The presented work discusses the methods of forming students' research competency of the educational program "Physical education and sport". The article analyzes psychological and pedagogical literature of Kazakhstani and foreign researchers. A survey was conducted according to the method of A.A. Karmanov "Goal – Means – Result", quantitative data analysis was carried out with SPSS Statistics program. In order to determine the most effective methods for the formation of future physical education teachers' research competency, 69 3rd year students of Pavlodar Pedagogical University named after Alkey Margulan participated in the experiment. The study presents the materials of the discipline of the university component "Fundamentals of research activities and academic writing". During the lectures and practical classes, the authors applied the methods of problem-based learning and the method of projects as the most effective methods for the formation of students' research competency. Experimental data confirm the need to include future physical education teachers in the research process for the formation of key and subject competencies.

Key words: research competency, physical education, problem-based learning, project method, survey.

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«Дене шынықтыру және спорт» білім беру бағдарламасы бойынша студенттердің зерттеушілік құзыреттілігін қалыптастыру әдістері

Аңдатпа. Ұсынылған жұмыста «Дене шынықтыру және спорт» білім беру бағдарламасы бойынша студенттердің зерттеушілік құзыреттілігін қалыптастыру әдістемесі қарастырылған. Мақалада қазақстандық және шетелдік ғалымдардың психологиялық-педагогикалық әдебиеттеріне талдау жасалды. А.А. Карманов «Мақсат – құрал – нәтиже» және SPSS Statistics көмегімен мәліметтердің сандық талдауы жүргізілді. Болашақ дене шынықтыру мұғалімдерінің зерттеушілік құзыреттілігін қалыптастырудың тиімді әдістерін анықтау мақсатында экспериментке Әлкей Марғұлан атындағы Павлодар педагогикалық университетінің 3 курсының 69 студенті қатысты. Зерттеу жұмысында университеттің «Ғылыми-зерттеу қызметі және академиялық жазу негіздері» компоненті пәнінің материалдары берілген. Дәрістер мен практикалық сабақтарда авторлар студенттердің зерт-теушілік құзыреттілігін қалыптастырудың ең тиімді әдістері ретінде проблемалық оқыту әдісі мен жобалар әдісін қолданды. Эксперименттік деректер болашақ дене шынықтыру мұғалімдерін негізгі және пәндік құзіреттіліктерді қалыптастыру үшін ғылыми-зерттеу процесіне қосу қажеттілігін растайды.

Түйін сөздер: зерттеушілік құзыреттілігі, дене шынықтыру, проблемалық оқыту, жобалық әдіс, сауалнама.

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Методы формирования исследовательской компетенции студентов образовательной программы «Физическая культура и спорт»

Аннотация. В представленной работе рассматриваются методы формирования исследовательской компетенции студентов образовательной программы «Физическая культура и спорт». Проанализирована психолого-педагогическая литература казахстанских и зарубежных ученых. Проведен опрос по методике А.А. Карманова «Цель – Средство – Результат», для количественного анализа данных использована программа SPSS Statistics. С целью определения наиболее эффективных методов формирования исследовательской компетенции будущих учителей физической культуры в эксперименте участвовали 69 студентов 3 курса обучения Павлодарского педагогического университета имени Әлкей Марғұлан. В исследовании представлены материалы дисциплины вузовского компонента «Основы научно-исследовательской деятельности и академическое письмо». Авторами статьи на лекционных и практических занятиях были применены методы проблемного обучения и метод проектов как наиболее эффективные методы для формирования исследовательской компетенции студентов. Экспериментальные данные подтверждают необходимость включения будущих учителей физической культуры в исследовательский процесс для формирования ключевых и предметных компетенций.

Ключевые слова: исследовательская компетенция, физическая культура, проблемное обучение, метод проектов, анкетирование.

Introduction. The quality of training in higher education institutions is determined not only by the acquired subject knowledge, skills and experience in the professional field, but also by the availability of research skills. Students of the educational program "Physical education and sport" should have the ability to maintain the required level of physical fitness, apply the methods of physical education, use the methods of cognition, teaching and research. Universities create research environment for future physical education teachers, including scientific schools, publications in research journals, participation in conferences and subject Olympiads. In this way, the environment is set up for students to develop their research skills. Competency is regarded as the level of readiness that a person must have in order to perform various tasks [1]. The implementation of the research competency of the future teacher is considered by V. Lamanauskas and D.V. Augiene to be formed at two levels: theoretical – during the educational process and practical – during the passage of pedagogical practice by students [2].

R.Zh. Aubakirova and N.Yu. Fominykh note in their study that students of all specialties should be able to identify important research questions, plan and develop a project, analyze literature, assess the outcomes of their activities, and carefully collect, store, and analyze data [3].

According to A.K. Mynbaeva, students' research activities are consistently formed. The study of scientific literature, writing straightforward scientific papers such as abstracts, reviews, graduation work, and technologies for writing mini-research projects are the first steps in developing knowledge, skills, experience, and technologies for research activity. Later, students develop experience in scientific communication and grant writing [4]. Researchers recommend using the project method, which is based on the use of the student's personal experience, the possibility of independent topic selection, and planning and selecting the research trajectory [5, 6]. In order to solve problems and organize students' mental activity during group work, the problem-based learning approach should be used [7, 8].

Researchers write about the need for future teachers to master the cycle of psychological and pedagogical disciplines, elective courses to deepen understanding of the specifics of modern pedagogical research, the formation of a basic set of research competencies [9]. Students of the educational program "Physical education and sport" of the Pavlodar Pedagogical University named after Alkey Margulan have the discipline "Fundamentals of research activities and academic writing" in the curriculum. This discipline is studied in the 5th semester, in the 3rd year of study. Students learn the organization and planning of scientific research in the field of physical education and sport, design, presentation and evaluation of results, mathematical and statistical processing of the data obtained.

The purpose of this work is to determine the most effective methods of forming students' research competency of the educational program "Physical education and sport".

Methods and organization of research. An analysis and generalization of research works on the study of students' research competency were conducted in order to describe the theoretical underpinnings of our study. A survey, pedagogical experiment, and data analysis were used to diagnose the level of the 3rd students' research competency. The "Goal – Means – Result" questionnaire, created by A.A. Karmanov [10] was utilized to gauge a researcher's level of research proficiency. Processing statistical data was done using SPSS Statistics software.

The respondents of our study were students of the educational program "Physical education and sport" of Pavlodar Pedagogical University named after A. Margulan. The study was conducted in the 1st semester of 2022-2023 academic year, the total number of respondents is 69 students.

Research results and their discussion. At the ascertaining stage of the pedagogical experiment, the presence and level of research competency of 3rd year students of the educational program "Physical education and sport" were assessed using the online questionnaire "Goal – Means – Result", which reflects the key elements of research activity.

The results of the questionnaire from the ascertaining stage of the study for the experimental group (35 students) and the control group (34 students) using the "Goal – Means – Result" methodology are shown in Figures 1 and 2.

The questionnaire's results were interpreted in accordance with the table of responses [10]. According to the analysis of the "Goal" scale's indicators, 21 students (61.8%) from the control group (CG) and 22 respondents (62.9%) from the experimental group (EG) struggle to set healthy goals for themselves, and their motivations are not systemic. The goals are not stable in 10 students (29.4%) from the CG and 9 (25.7%) from the EG, and the actions are not always practical. When choosing a goal, students turn to advice from others

and use hints. Only 3 (8.8%) of the CG students and 4 (11.4%) of the EG students set reasonable objectives and are only concerned with the end result; their motivations are systematic.

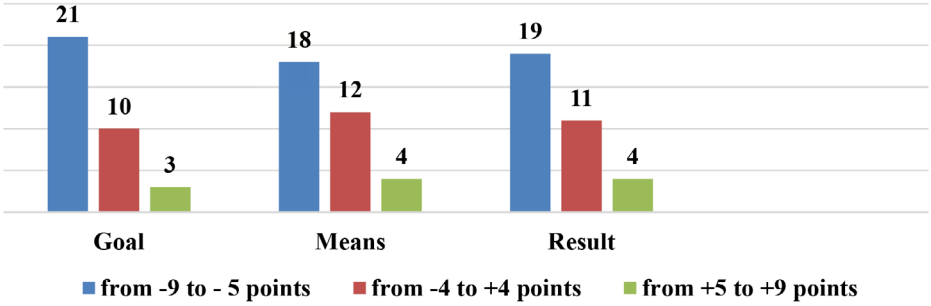

Figure 1 – The results of the questionnaire according to the method «Goal – Means – Result» of the control group

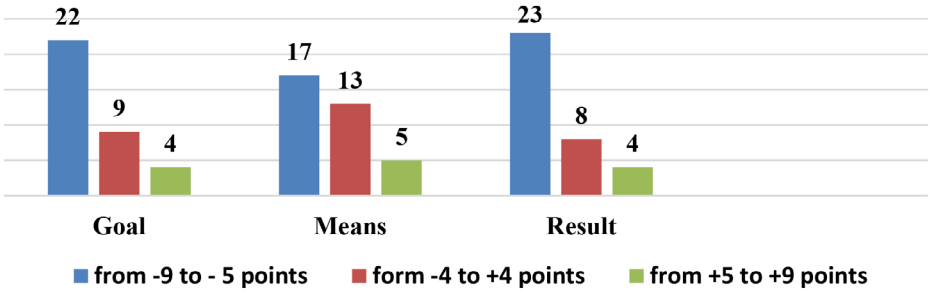

Figure 2 – The results of the questionnaire according to the method «Goal – Means – Result» of the experimental group

The 'Means" scale indicator revealed that 18 students (52.9%) from the CG and 17 (48.6%) from the EG lacked the resources necessary to accomplish their objectives. This group of students exhibits conformity and situational dependence, which prevents them from reaching their full potential. Due to the absence of a positive objective, 12 students (35.3%) from the CG and 13 students (37.1%) from the EG occasionally struggle to make decisions regarding means. The optimal number of points was achieved by 5 students from the EG and 4 students from the CG, respectively, representing freedom in means selection, spontaneity in behavior, and situational responsiveness.

According to the scale indicator "Result", 19 of CG students (55.9%) and 23 of EG respondents (65.7%) tended to overestimate the outcomes of their work, personal growth is unpredictable, and the subjects were interested in their inner lives. 8 students (22.9%) in the experimental group and 11 students (32.4%) in the control group honestly evaluate who they are and what they have accomplished. For 4 respondents (11.7%) from the CG and 4 (11.4%) from the EG, personal growth is dynamic. Both groups undervalue the outcomes of their efforts and are critical of themselves.

The ascertaining experiment with the students of the educational program "Physical education and sport" was followed by the start of the formative stage of the pedagogical experiment. Future physical education teachers were trained in research skills not only during class hours but also after class hours.

Lectures and seminars on the subject matter of the university component "Fundamentals of research activities and academic writing" for 3rd year students had some issues. Teaching strategies that foster independent thought, creativity, the capacity for students to articulate their points of view, and everything else that helps students develop research competency were utilized in practical classes. Students of the educational program "Physical education and sports" were taught to use project-based learning in addition to the problem-based learning approach.

The main goal of problem-based learning is to help students develop their critical and then creative thinking skills. It indicates that by structuring the educational process, which includes the development of problem situations under the management of a teacher, and the organization of students' independent activities, their capacity for critical thought is enhanced. Problem-based learning's target orientations include strengthening previously acquired knowledge, independent work, the development of research skills and abilities. The creation of a problem situation, which is a sense of mental difficulty, is a crucial step in problem-based learning. The key to problem-based learning is that a teacher assigns students a task, engages them, and challenges them to find a solution, leading to the acquisition of new knowledge and ensuring that each student is actively engaged.

Using search and problem-solving techniques in the educational process, project-based learning enables to combine educational and research activities and create new things. Project-based learning teaches students how to think critically on their own, how to work with information, how to base their decisions on facts and scientific principles, how to draw logical conclusions, how to work in a team, collaborate, and how to play a variety of social roles. Students will be able to improve their research skills by applying project activities to the educational process and producing a finished item in the form of a report, presentation, or final project.

Examples from research experiments on the ways to develop students' research skills:

– create a mind map for the various research projects. What kinds of research projects are you aware of? Complete the mind map;

– read the scientific article "Professional competence of a teacher as a factor in the training of physical education specialists" in the journal "Theory and Methods of Physical Education" Volume 67, Issue 1 (2022), and write down 5-6 key words from it;

– select and read a scientific article in the journal "Theory and Methods of Physical Education" and then write an annotation to this article;

– read the article "Professional portrait of a twenty-first-century educator" from Bulletin of the KazNPU with the series "Pedagogical Sciences" Review the main points of this article;

– exercises to improve the capacity for problem-solving:

1. The "Continue the story" task fosters the ability to view the same phenomena and events from various angles. For instance, "Almost all of the fifth graders showed up to physical education class without a uniform". Continue the narrative by examining the situation from the viewpoints of the supervisor, the school psychologist, the physical education teacher, their classmate, and a trainee student at a pedagogical university.

2. Make up a tale with this resolution of educational context: "When the lesson's bell rang, fifth-grader Aidos remained standing beneath the basketball hoop. Understanding what occurred at the beginning and why it ended that way is necessary. The presentation's originality and logic are assessed;

– what traits a teacher in the XXI century should possess on a professional and personal level. Write an essay;

– browse Znanium.com and Lan' digital resource libraries which include newspapers, magazines, scientific journals, tutorials, lesson plans, videos and digital learning resources. Familiarize yourself with the Znanium.com electronic library system (Figure 3).

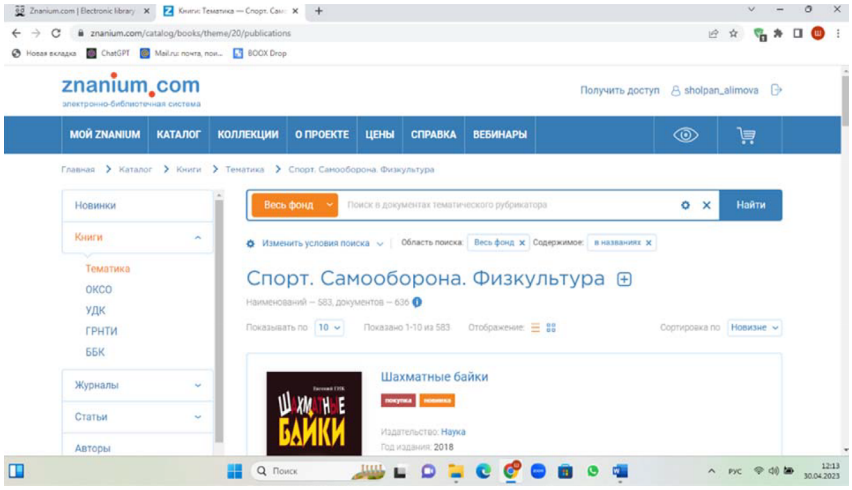

Figure 3 – Electronic library system «Znanium.com»

– create a bibliographic list for students enrolled in the specialty/educational program "Physical education and sport" using electronic library systems and online resources;

– conduct scientific research at the university. Complete the table. What jobs do teachers and students have in the scientific world? What distinguishes research activities from both educational and scientific? Fill your response in table 1.

Table 1 – The difference between educational and scientific research activities

Comparison criteria	Educational research activities	Scientific research activities
Purpose of activity		
Organization of activities		
The degree of students' independence		
Results presentation forms		
Significance of the study results		

- informing plays a huge role in attracting students to research activities. In your opinion, which of the proposed methods of informing students is the most effective and why?

1) announcement;

2) speech at the parent meeting;

3) sending information by e-mail;

4) campaigning through social networks (Facebook, Instagram, Twitter, VKontakte, LinkedIn).

5) information on the official website of the university;

6) open day;

7) presentations;

8) SMS or WhatsApp mailing;

9) a tour of the libraries and laboratories of the university;

10) leaflets;

– make a three-part diary of one of the parts of the article "Professional competence of a teacher as a factor in the training of physical education specialists" in the journal "Theory and Methods of Physical Education", Volume 67, Issue 1 (2022) in Table 2:

Table 2 – Three-part diary

Favorite Quote	My comments	Questions that have arisen

- present a project of an extracurricular activity for students. It is necessary to take into account the relevance of the topic of the event, the subject area, the goal, tasks, stages of the project and the possibility of using the results obtained in pedagogical practice. For example: "Sports dynasties of our university", "Physical education teacher of the 21st century", "Health-saving technologies in physical education lessons".

The management of students' problem-based learning was figured out in the classrooms with students. There were several factors taken into consideration, including the creation of informative tasks, the development of students' motor skill knowledge, pedagogical control over the assimilation of the material taught, the correction of teacher and student actions, the development of skills that encourage independent performance of physical exercises, and the demonstration of a new level of task completion in physical education.

The results of the questionnaire according to the "Goal – Means – Result" method of the control group and the experimental group after the formative experiment are shown in Figures 4 and 5.

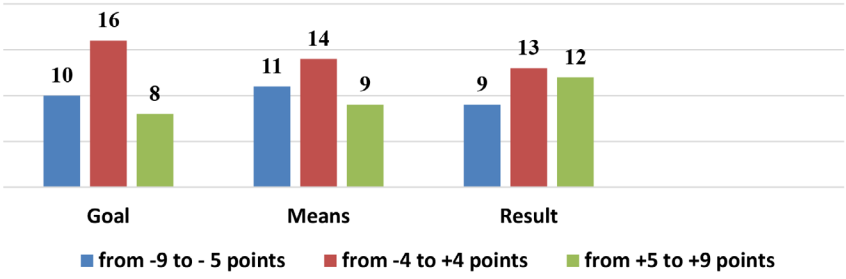

Figure 4 – The results of the questionnaire according to the method «Goal – Means – Result» of the control group after the formative experiment

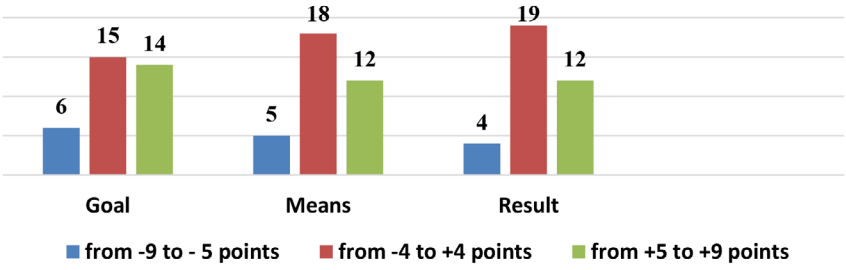

Figure 5 – The results of the questionnaire according to the method «Goal – Means – Result» of the experimental group after the formative experiment

The indicators on the "Goal" scale after the formative experiment show the following outcome: setting goals is difficult for 10 students from the CG (29.4%) and 6 students from the EG (17.1%). When choosing a goal, 16 students (47%) from the CG and 15 (42.9%) from the EG offered assistance. Goal-setting occurs independently for 8 students (23.6%) from the CG and 14 students (40%) from the EG.

The "Means" scale indicator shows that 5 (14.3%) of the experimental group's respondents and 11 (32.3%) of the control group's respondents lack the resources they need to reach their objectives. Periodically, 14 students (41.2%) of the control group and 18 students (51.4% of the EG) have trouble selecting means. The outcome of 9 students (26.5%) from the CG and 12 students (34.3%) from the EG shows flexibility in means.

The questionnaire results in terms of "Result" show that 4 students from the EG (11.4%) and 9 students from the CG (26.5%) overestimate the outcomes of the work completed. A proper evaluation of the outcomes of their activities was made by 13 students (38.2%) in the control group and 19 students (54.3%) in the experimental group. 12 respondents from the CG (35.3%) and 12 respondents from the EG (34.3%) constantly strive to improve their daily activities.

Students can manage educational content by using the project-based learning method, problem-based learning, and the developed course "Fundamentals of research activities and academic writing" for them, which increases their independence and responsibility for their learning. After completing the course, students in the educational program "Physical education and sport" have honed their ability to use databases, charts, and graphs in research projects and extracurricular communication, as well as search and process information from electronic library systems.

Conclusions. As a result, it can be said that, in comparison to the control group, students in the experimental group have significantly improved their level of research skills. The experimental group of students received instruction using project-based learning and problem-based learning techniques during the "Fundamentals of research activities and academic writing" lessons, while the control group received conventional instruction.

To successfully develop research skills for students of the educational program "Physical education and sport" first is necessary to guide the process of preparing students to use the method of problem-based learning and the method of projects.

Second, to arrange for student interaction during research activities. Third, establish a connection between research and learning. The use of diagnostics for the growth of students' abilities and research skills each year of study is the most crucial the educational process.

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