

Investigating the Didactic System of Research Competence Formation for Prospective PE Instructors

Nataliia Kononets^{1*}, Svitlana Nestulya², Iryna Soloshych³, Valeriy Zhamardiy⁴, Vladislav Odokienko⁵

¹Department of Pedagogy and Social Sciences, Higher Educational Establishment of Ucoopspilka, Poltava University of Economics and Trade, Poltava, Ukraine

²Department of Personnel Management, Labor Economics and Economic Theory, Higher Educational Establishment of Ucoopspilka, Poltava University of Economics and Trade, Poltava, Ukraine.

³Department of Ecological Safety and Natural Management, Kremenchuk Mykhailo Ostrohradskiy National University, Kremenchuk, Ukraine

⁴Department of Physical Education and Health, Physical Therapy, Ergotherapy with Sports Medicine and Physical Rehabilitation, Ukrainian Medical Stomatological Academy, Poltava, Ukraine

⁵Department of General Pedagogy and Andragogy, Poltava V. G. Korolenko National Pedagogical University, Poltava, Ukraine

ABSTRACT

The current article defines the terms «system,» «didactic system,» as well as «research competence.» the Didactic System of Research Competence Formation for prospective PE Instructors identified by sincerity, the elements' plurality, the association among them, hierarchy, meaning, the opportunity of performing and managing, is reliably confirmed. The scientific novelty of the given didactic system rests with forming a brand-new content of each of its blocks and building an association. The didactic system's motivation-targeted, conceptual, semantic, activity, control-evaluation blocks, and components are focused on and verified in the system-component study. The didactic requirements of the formation of research competence of prospective PE teachers in professional training and feasible means of their achievement are taken into account. This study's outcomes should be applied in the educational process of prospective PE teachers.

Key words: Didactic system, Research competence, Physical culture, Prospective teacher

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Corresponding author: Nataliia Kononets

e-mail ✉: natalkapoltava7476@gmail.com

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INTRODUCTION

One of the leading tasks of training of highly qualified and competitive physical education teachers is the formation of research competence (RC), which is characterized by the ability and willingness to self-development, self-realization, and the ability to find solutions in unusual professional situations. Therefore, it is necessary to provide a qualitatively new level of training for future teachers of physical education, which necessitates the development and justification of an appropriate didactic system. It should be noted that modern pedagogical education has accumulated some experience, which covers various aspects of professional training of future teachers of physical education. In particular, the development of

their professional training was studied by Karchenkova et al. [1], formation of research competence was considered by others revealed the issues of developing a didactic system in their works. However, even though in recent decades much attention has been paid to the training of future physical education teachers, the problem of developing a didactic system for the formation of their research competence remains unsolved.

MATERIALS AND METHODS

The aim of the study is to create a scientifically comprehensive didactic system for the formation of research competence in future physical education teachers.

Research methods: theoretical: analysis and generalization of modern philosophical, psychological-pedagogical and educational and methodical literature, normative-legal documents, for clarification of the state of elaboration of

the problem of formation of research competence in future teachers of physical culture, development and introduction in educational process of didactic systems; synthesis, modelling, which made it possible to systematize and generalize information about the object of study, to form a terminological apparatus, to develop a didactic system for the formation of research competence in future teachers of physical education; empirical: questionnaires, testing, pedagogical observation in the process of educational and research activities of students in order to diagnose the level of formation of their research competence; interviews, surveys, pedagogical testing, expert evaluation to determine the most important indicators of the formation of research competence in future physical education teachers; pedagogical experiment (organizational, ascertaining, formative); mathematical statistics: for processing experimental data, their quantitative and qualitative analysis.

Experimental verification of the didactic system was conducted of the following universities: Higher Educational Establishment of Ucoopspilka «Poltava University of Economics and Trade», Kremenchuk Mykhailo Ostrohradskyi National University, Poltava National Pedagogical University named after V. G. Korolenko.

RESULTS AND DISCUSSION

The subject of our research is the didactic system of formation of research competence of future physical education teachers, which we consider as a mandatory component of professional training. Based on the research of Ptashenchuk et al. [2] under the research competence (RC) of the future physical education teacher we understand the fundamental integrative qualitative characteristic of the student, which combines professional knowledge, skills and abilities, motivational and personal qualities and the ability to carry out own research activities while studying in tertiary education institutes, and while carrying out future professional activities (scientific and pedagogical research in improving the quality of the learning process of students within the discipline «Physical education», improving the physical development of students and their health preservation). Undoubtedly, the process of formation of such a multicomponent phenomenon as the RC of the future physical education teacher is purposeful and systematic.

The concept of «system» is a core of developing a didactic system for the formation of research competence of future teachers of physical education. The analysis of scientific sources allows us to conclude that under «system» it is necessary to understand the following: «the set of elements» which communicate with each other and make something whole many elements that are closely interconnected and form a whole in functioning and structure [3], the sum of elements, the fixed properties of which determine the ways of realization of certain relations [4], cooperation plurality of components, which are designed to extract a beneficial

final result [5]. Thus, we interpret the concept of «system» in our work as a set of ordered elements that are closely related to each other, forming a holistic unity.

In order to form the RC of future physical education teachers, the concept of «system» is considered as a didactic system that belongs to the pedagogical system. For a clearer understanding of the concept of «pedagogical system», we generalized the work of scientists who interpret it as follows: a set of scientific statements, the use of which aims to establish links between pedagogical factors and their coordination [6] a set of interconnected means, methods, and processes necessary to create an organized and purposeful pedagogical influence on the formation of personality with assumed qualities [7], etc.

According to our study, based on the developments of Bepalko, an assumed quality is a formed RC of future physical education teachers. Based on the views of researchers, we establish that the concept of «didactic system» also has no unambiguous interpretation, which is: a component of the pedagogical system, i.e. its subsystem, aimed at managing the learning process [7] internal holistic structure based on the unity of goals, organizational principles, content, forms and methods of teaching [8] holistic education, which is formed according to certain criteria and is characterized by the internal integrity of structures created through the unity of goals, organizational principles, content, forms and methods of teaching [9] a set of didactic components that are interdependent and interconnected [10,11].

As a result of the analysis of scientific and pedagogical literature, the didactic system shall be understood as a set of interconnected, interdependent, and interacting components that constitute single whole elements of the pedagogical process, which include purpose, objectives, content, principles, forms, methods and teaching aids. We have defined the system of formation of research competence of future physical education teachers as didactic because it is characterized by integrity, a plurality of elements, connection between components, hierarchy, purpose, and interaction with the environment, ability to function and manage.

Within the study, the didactic system of formation of research competence of future physical education teachers appears as a didactically verified set of interconnected components (blocks) that reflect the process of organization and implementation of targeted didactic influences that ensure the effectiveness of this system and enable results as identification of the appropriate level of formation of research competence of students, taking into account the possibilities of creating an appropriate set of didactic conditions.

System-component analysis of the problem of developing a didactic system of formation of RC in future physical education teachers allowed us to identify and justify its blocks: motivation-targeted, conceptual, content, activity, and control-evaluation blocks (Figure 1).

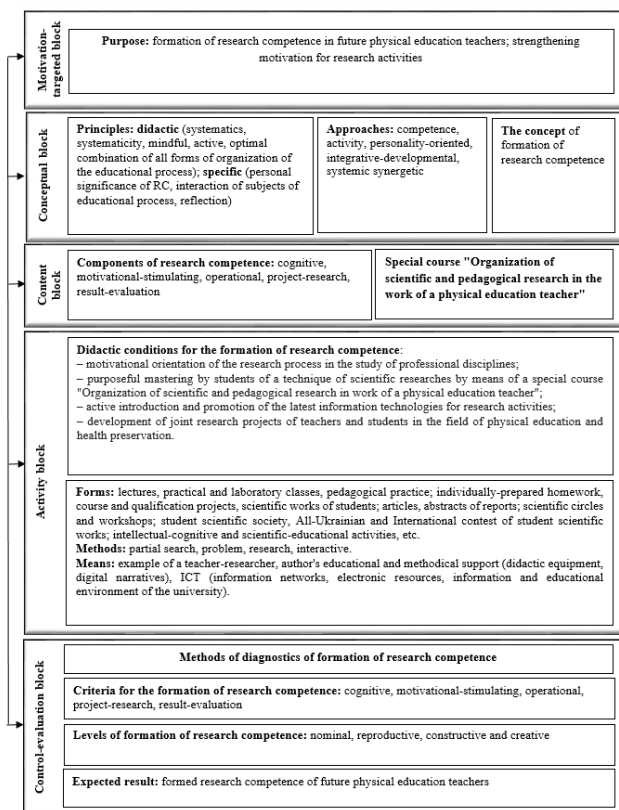


Figure 1: Didactic system of formation of research competence in future physical education teachers.

In particular, the implementation of the motivation-targeted block involves identifying the factors influencing the goal of the didactic system—the formation of research competence of future teachers of physical education and increase motivation for research. The teacher sets a goal, such as to promote the formation of research competence of students, whereas the presence of their internal motivation allows them to focus their efforts on its achievement. The aforementioned block manages the others.

The conceptual block is based on the methodological principles of the process of RC formation of the future physical education teachers: principles, scientific approaches and concepts. In the process of research, the following generalization is made: when forming the RC of future physical education teachers it is important to adhere to general didactic principles (systematics, systematicity, mindfulness, activity, optimal combination of all forms of educational process) and specific (personal significance of RC, interaction of subjects of educational process, reflection).

The realization of the purpose of the didactic system involves taking into account the leading approaches based on which the educational process is based, and therefore there is effective training. According to our research (questionnaires, surveys of teachers of pedagogical universities, focus group interviews, narrative method), the most effective approaches that have contributed to the formation of the RC of future physical education teachers are competence, activity,

personality-oriented, integrative and developmental, systemic-synergetic approaches.

The competency approach is aimed at forming in future teachers of physical education the ability to creatively apply the acquired knowledge and skills in professional non-standard situations. The activity approach provides students with practical experience of professional work by involving them in active research activities. The personality-oriented approach allows building learning so that students are consciously involved in the search for new independent, original scientific solutions in accordance with their own abilities during the implementation of research activities at the university. The integrative-developing approach by means of didactic substantiation and transformation of actually existing communication between concepts and phenomena allows implementing the ideas of integration in the system of abilities development to perform research activities by future physical education teachers. The systematic nature of professional pedagogical education necessitates the application of a systematic synergetic approach in the formation of RC of future physical education teachers, which allows to obtain systematic information and provides trans disciplinary understanding of the deep and open relationship of all elements of the didactic system.

An important component of the didactic system of RC formation in future physical education teachers was the content block, which reflects the unity of cognitive, motivational-stimulating, operational, project-research, result-evaluation components of RC formation in future physical education teachers. The cognitive component is aimed at mastering the system of professional knowledge by future physical education teachers, the formation of their scientific worldview and the acquisition of methodological knowledge about the structure, methods and functions of research, development of critical and creative thinking.

Motivational and stimulating component contributes to: development of future physical education teachers' interest in research activities and awareness of its importance in professional work; acquisition of such personal qualities as self-development, self-improvement and others. The operational component helps students to master the methods and skills of research: identify the problem and put forward a research hypothesis; select methods; conduct research and analyze the data obtained; draw conclusions and present the results of the study. The project-research component involves the development of students' ability to independently carry out project activities from goal formulation to the implementation of project operations, from project implementation to self-monitoring and self-assessment.

A necessary component of readiness for research is the ability to evaluate its results, so the result-evaluation component reveals the self-analytical activity of future physical education teachers as the presence of skills and abilities of self-assessment, self-development to improve their professional qualities. An important component of

the content block is the developed electronic educational and methodical complex of the special course «Organization of scientific and pedagogical research in the work of a physical education teacher», the study of which helps future physical education teachers to master theoretical knowledge on the organization of scientific research in pedagogy and sports. Discussion of the stages of pedagogical experiments, primary processing and presentation of results provides an opportunity to gain the necessary experience for further research.

Our analysis of scientific sources allows us to link the content block with the didactic conditions that affect the implementation of the didactic system in terms of maintaining the optimal organization of the educational process (activity block).

We have identified a number of didactic conditions necessary for the formation of the RC of future physical education teachers: motivational orientation of the research process in the study of professional disciplines; purposeful mastering by students of a technique of scientific researches by means of a special course «Organization of scientific and pedagogical research in the work of a physical education teacher»; active introduction and promotion of the latest information technologies for research activities; development of joint research projects of teachers and students in the field of physical education and health preservation.

The defined didactic conditions occupy one of the key places in the didactic system developed by us, correlate with the components of the formation of RC of future physical education teachers, which were mentioned above and are the result of purposeful selection, construction and application of content elements, forms, methods and tools. The implementation of certain conditions was facilitated by the following selections: forms – lectures, practical, laboratory classes, pedagogical practices, individual design and research tasks, course and qualification projects, scientific works of students, scientific circles and problem groups, student scientific society, etc. methods – partial search, problem, research, interactive; tools – an example of a teacher-researcher, author's educational and methodical support (didactic equipment, digital narratives), ICT (information networks, electronic resources, information and educational environment of the university).

The control-evaluation block reflects a number of requirements related to the process of formation of the RC in future physical education teachers. In the realm of this block the diagnostic device is developed. On the basis of it the diagnostics methods, criteria and levels of formation of research competence have been defined and developed.

Using the research of Kononets, and in solidarity with their position [10], we are convinced that the didactic system of formation of research competence of future physical education teachers is a complex, dynamic, manageable system, which is likely to be characterized by a number of properties:

- Motivation-targeted, conceptual, semantic, activity and control-evaluation blocks of this system are in interconnections and interactions with each other and the didactic system as a whole;
- The nature of the relationships and interactions between certain blocks and their number (5 blocks) significantly determine and influence the complexity of the didactic system and its overall characteristics;
- Interaction and interrelations between all blocks of the developed didactic system enable achievement at its implementation of system effect when the result of functioning of didactic system as a whole is not equal to simple set of results of functioning of its separate blocks, and means, optimum functioning of each block systems as a whole;
- Motivation-targeted, conceptual, semantic, activity and control-evaluation blocks of the system and the didactic system in general interact with the environment, educational environment of each individual institution of higher education, and options for such interaction ideally distinguish between open and closed systems;
- The functioning of a particular unit of the didactic system depends on the functioning of other isolated units and the system as a whole;
- The complexity of the didactic system of formation of research competence of future teachers of physical education also depends on the stability, stability and variability of its blocks and connections between them.

Therefore, our proposed didactic system of formation of research competence in future physical education teachers involves the implementation of a set of its components that ensure the development of their motivation for research and, consequently, to the mastery of RC. It is open, so in the case of the formation of RC at the nominal or reproductive levels there is an opportunity to increase them through the impact on the student and the correction of the learning environment.

CONCLUSIONS

In the developed didactic system the interconnected and interdependent blocks and their components of process of formation of RC of future teachers of physical education are defined: motivation-targeted-goal, strengthening motivation for research activities; conceptual-principles, approaches, concept; semantic-components; activity-didactic conditions, forms, methods, means; control and evaluation-criteria, levels of formation. The blocks of the system are united by the common purpose of functioning (features and nature of their interaction with each other and with the environment) and the unity of management (create the internal structure and hierarchy of this system). It is established that only the comprehensive introduction into the educational process of all components of the developed didactic system makes it possible to form the research competence of future physical education teachers and can be tested in the process of professional training of students.

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