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**FORMATION OF PROFESSIONAL COMPETENCIES OF THE FUTURE  
TEACHERS BY MEANS OF A COMPUTER-BASED METHODOLOGY:  
INVESTIGATIONAL APPROACH**

**Abstract.** The article validates feasibility of the investigational research of the problem of formation of the future teachers' professional competencies by means of a computer-based methodology; it determines the author's approach to the interpretation of the essence of the computer-based methodology for the formation of professional competencies of the future teachers; it specifies the structural components of the computer-based methodology of formation of professional competencies of the future teachers: goals (objectives) of learning, content of learning, forms of educational process organisation, methods and tools of learning; it specifies the most effective traditional and computer-based forms, methods and tools of learning of Pedagogical disciplines for the students obtaining a Bachelor's degree. This article discusses the interconnectedness of open source education and tools of the computer-based methodology for the formation of professional competencies of the future teachers; it reveals the structural components of professional competencies (subject-learned area, information and digital, communicative, personality, creativity) of the future teachers; works out the criteria (motivation-based and goal-setting, professional and cognitive, vocational and cognitive, reflexive and evaluational components), indicators, and levels (based on the analysis level, elementary (reproductive) level, creative (advanced) level) of formation of professional competencies of the future teachers in the settings of educational process at higher education institutions; highlights a complex of general scientific theoretical, empirical and statistical methods and consolidated results of a pedagogical investigation (analytics and search, experimental (ascertaining and formative) and bottom-line and correctional stages) on the study of the problem of the formation of professional competencies of the future teachers by means of the computer-based methodology in the settings of learning the disciplines of Pedagogy.

**Keywords:** computer-based methodology; professional competencies; future teachers; computer-based tools; professionalism-related training of the future teachers.

## 1. INTRODUCTION

**Problem briefing.** Against the background of Ukraine's integration into the international scientific and educational space, it is becoming exceptionally important to resolve the issues related to informatization of the national system of higher pedagogical education, in particular the use of the computer-based tools regarded to be a direction of innovative educational development. The relevance of this aspect is based on the fact that there is currently observed a consistent correlation between successes in learning, professional self-realization of the students and the level of their awareness in applying information and communication technologies (ICT), their ICT competency.

Therefore, the introduction of the computer-based tools in higher education institutions (HEI) should be aimed at training of a qualified specialist of the appropriate level and profile, competitive, competent, mobile, able to meet world professional standards, being ready for continuous professional improvement throughout their life [1, p. 273-274]. According to monitoring studies of IC teachers' competence (UNESCO International Survey, UNICEF, UNDP, OECD on teaching TALIS and others) [2], European Union reports on ICT in education (Country Report on ICT in Education), professionals in the educational sphere, especially philological specialties, are supposed to be dedicated special attention in the view of specifics of their professional training as the computer studies are an extra curriculum discipline for them.

**Overview of recent research and publications.** Having conducted the analysis of best practices in psychological and pedagogical areas, we discovered that the problems of incorporation of the ICT in the educational process and the formation of a computer-based learning environment in higher educational institutions are thoroughly studied in Ukraine.

Accordingly, the topical aspects of these problems are covered in the publications of V. Yu. Bykov, V. I. Bobrytskaya, M. I. Zhaldak, T. I. Koval, S. G. Litvinova, N. V. Morse, Yu. G. Nosenko, O. V. Ovcharuk, O. P. Pinchuk, S. O. Semerikova, O. M. Sokolyuk, O. V. Spivakovsky, O. M. Spirina, Yu. V. Trius, M. P. Shishkina, M. Collins, M. Simonson, D. Stockly, A. Thompson and others. However, the investigational studies of the problem of the formation of professional competencies of the future teachers by means of the computer-based methodology were conducted fragmentarily, which substantiates the relevance of this research.

**The objective of this article** is to analyse the results of a pedagogical investigation for the formation of professional competencies of the future teachers by means of the computer-based methodology used at HEI. With regard to the objective of this article, it seeks to address the following tasks: 1) to validate the methodology of the study of the problem of formation of professional competencies of the future teachers by means of the computer-based methodology; 2) to specify the structural components of the computer-based methodology of formation of professional competencies of the future teachers; 3) based on the specified structural components, to work out the criteria, indicators, and levels of formedness of professional competencies of the future teachers in the settings of educational process at HEI; 4) to highlight the consolidated results of a pedagogical investigation on the study of the problem of the formation of professional competencies of the future teachers by means of the computer-based methodology.

## 2. RESEARCH METHODS

A variety of general scientific theoretical, empirical and statistical methods were used for the purpose of conducting this investigational study of the problem of the formation of professional competencies of the future teachers by means of the computer-based methodology, namely: *theoretical methods* to perform analysis of scientific, pedagogical and normative sources in order to stipulate the research areas of a particular problem: *analysis of both domestic and foreign best practices* to work out the features of the structure of professional competencies of the future teachers to be developed, *consolidation and systematization* to develop the computer-based methodology for the formation of professional competencies of the future teachers; *empirical methods*: exploratory methods: pedagogic surveys, expert interviews, interviews with participants to the educational process of HEI; *scaling, ranking* to work out the criteria, indicators and levels of formation of professional competencies of the future teachers in the settings of the use of the computer-based methodology; *experimental methods*: ascertaining and formative experiments to verify the

hypothesis of the study; *statistical methods*: quantitative and qualitative analysis of experimental work results, their graphical and analytical interpretation, evaluation of statistical significance of research results.

The pedagogical investigation involved performing analytics and search, experimental (ascertaining and formative), and bottom-line and correctional stages. Here we provide a brief outline of the content of each stage of the study.

*Analytical and search stage* (problem analysis, research feasibility validation, goal setting, methods and investigational basis selection) lasted from 2011 to 2012. At this stage, the further outlined research activities were performed: 1) *study and analysis* to examine the theoretical dimensions of the research problem under investigation, a theoretical comparative insight into both domestic and international best practices of training of the future teachers at HEI, analysis of the content of currently valid syllabi of the disciplines for the professional training of the future specialists; 2) the study of the conceptual and categorical structure of the research; formulation of a hypothesis, goals and objectives of the study; 3) specification of the methodological principles of the use of the computer-based methodology of formation of professional competencies of the future teachers; 4) *validation feasibility of the experimental methodology*, research blueprint; deciding on quantitative and qualitative entry list of the participants of the investigation; conducting surveys, interviews with teachers and students of HEI in order to elucidate the role of modern computer-based tools and their components in the educational process of HEI and professional activity of the future teachers.

*The experimental* (both ascertaining and formative aspects) *research stage* continued during 2012-2013, 2013-2014 and 2015-2016 academic years. At this stage we performed experimental verification of the hypothesis of the study, piloted the content as well as teaching and methodological support for the computer-based methodology of development of the professional competencies of the future teachers in the process of learning the subjects of the pedagogical cycle, theoretically validated and designed the computer-based methodology of the professional competencies, whose components are the purpose, content, forms, methods and means of development of the future teachers; we specified, validated and elucidated the pedagogical conditions of the use of the computer-based methodology for the formation of professional competencies of the future teachers (the provision of a professional context; flexibility in the selection of forms and methods in the process of application; the involvement of the future teachers in the process of mastering computer-based tools regarded as an activity that simulates various aspects of their future professional activities; performing the monitoring of the quality of the educational process); we specified the structure of professional profile competencies of the future teachers (major-related one, informative and digital one, communication one, personal one, creative one); we specified the criteria (motivation-based and goal-setting criterion, vocational and cognitive criterion, vocational and functional criterion, reflexive and evolutionary criterion), their indicators and levels of formedness of professional competence of future teachers in the learning of the Pedagogical disciplines (elementary, basic, advanced); we designed the learning and teaching guidelines for the application of the computer-based methodology for the formation of professional competencies of the future teachers, improved the model of the use of a computer-based methodology for the formation of professional competencies of the future teachers in the educational process of HEI, performed the analysis of interim results of check sections along with the correction of investigational approaches.

*The bottom-line and correctional stage* of the research lasted from April 2016 until March 2018. At this stage, the following research activities were carried out: the collected investigational data were consolidated in order to analyze them (rejection, encoding, summary of open responses, data entry in the PC); mathematical processing of the obtained information was carried out; data validation was performed on validity (significance); the conclusions and

prospects for further research on the problem of the computer-based methodology used for formation of professional competencies of the future teachers were formulated.

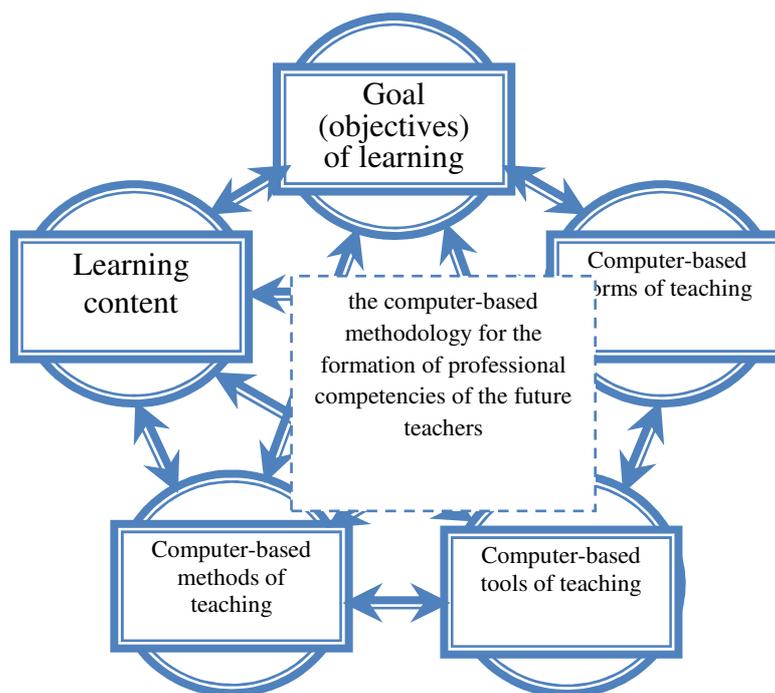
### 3. FINDINGS OF INVESTIGATION

The demand of a society for highly skilled competitive, computer literate, competent teachers promotes the development of effective mechanisms for the use of computer-based forms, methods and tools, the whole complex of which we define as the computer-based methodology for the formation of professional competencies of the teachers in the educational process of the modern HEIs [3]. In a feasibility validation of the general concept of the problem studied, it was important to work out the author's approach to the interpretation of the essence of the computer-based methodology for the formation of professional competencies of the future teachers.

The starting point for resolving the above problem was to explore the structure of the phenomenon under investigation, which, in our opinion, has a component pattern as follows: the methodology; the methodological system of training; the computer-based methodological system of training.

V. Yagupov's approach appeals to us as he interprets the term 'methodology' as a specific set of principles, forms and means of using methods which help to achieve a deeper knowledge of various educational problems and the ways to resolve them. In the scientist's view, the methodology should contain a description of the set of methods, the system of techniques and tools used for the study of various educational phenomena, and answer the question: "How or in what way is one supposed to organise and conduct the research?"; the main function of methodology is to organise the research itself [4, p. 83]. A. Pyshkalo's publications are important for our scientific research [5] because there we find a claim that at the heart of the methodological system of learning is a model in which all components of the educational process form a single unit with specified internal connections. As this model suggests, the orderly system of learning is a set of hierarchically related components: learning goals, content, methods, means and forms of learning process organisation, forming a single integral functional structure focused on the achievement of educational goals. An important comment was made by Yu. Trius, who defines the term "the computer-based methodological system of learning"(CBMSL) as a methodological system of learning, which forms the basis for providing a purposeful process of acquiring knowledge, acquiring skills and abilities, mastering the cognitive activity skills by the subject of learning process and developing one's creative abilities on the basis of multi-purposeful use of ICT [6].

The analytical overview of the above scientists' views gives grounds for the interpretation of the essence of the concept of "the computer-based methodology for formation of professional competencies of the future teachers" as a set of hierarchically related components: goals (objectives), content, computer-based forms, methods and tools aimed at developing professional competencies of the future teachers in the educational process of modern HEI [7] (Fig.1.).



*Fig. 1. The structure of the computer-based methodology for forming professional competencies of the future teachers*

Given the above, we are to give a brief overview of the essential characteristics of the structural components of the computer-based methodology for the formation of professional competencies of the future teachers on the example of students of philological specialties.

In the research we used the subject field of the disciplines of the pedagogical cycle (“Pedagogy Integrated”, “Pedagogy”, “Pedagogical Creative Work”, “History of Pedagogy”, “Methodology of Educational Work”, “Pedagogy for Higher School”), which belong to the cycles of general and vocational training.

*The goal (objectives) of learning:* the formation of professional competencies of the future teachers (students’ major-related aspect; informative-digital aspect, communicative aspect, personal aspect, creative aspect).

*The learning content:* the educational material for the disciplines of Pedagogy, as an example, for the students of the Bachelor’s degree programmes, specialisation reference details are 014 “Secondary education”, 035 Philology: Knowledge Areas reference details: 01 Education, 03 Humanitarian sciences (by majors “Philology” (Language and Literature (German Language)”, “Philology” (Language and Literature (French Language)”, “Philology” (Language and Literature (Spanish Language)”, “Philology” (Language and Literature (Italian Language)”, “Philology” (Language and Literature (Japanese Language)”, “Philology” (Language and Literature (Chinese Language)”, “Philology” (Language and Literature (English Language)” full time mode of study).

*Forms of educational process organisation:* classes (lectures, seminars, workshops, trainings and face-to-face classes, tutorials); self-study work; practical-experience-to-gain classes; monitoring arrangements. Taking into account the specifics of communication interaction between the teacher and the students and between the students themselves, among the general forms (modes) of organization of study are considered teacher-up-front style of instruction, cooperative learning, team learning, pair-based, individual, as well as those with a varying composition of students.

*Methods of teaching:* the project-based learning method, cooperative learning, *interactive methods:* computer-based learning, methods of computer-based monitoring of

students' preparedness for studies, computer-based methods of learning process monitoring and self-control.

When specifying the *learning tools* we found valuable scientific findings of V. Bykov and I. Mushka [8], who managed to schematically present the interconnectedness of open source education and tools of the computer-based methodology for the formation of professional competencies of the future teachers (Fig. 2).

The general aspects and terminological explanation of each of the teaching aids are revealed in the studies of foreign scholars, in particular D. Stockly [11] offers e-learning combined with other training methods.

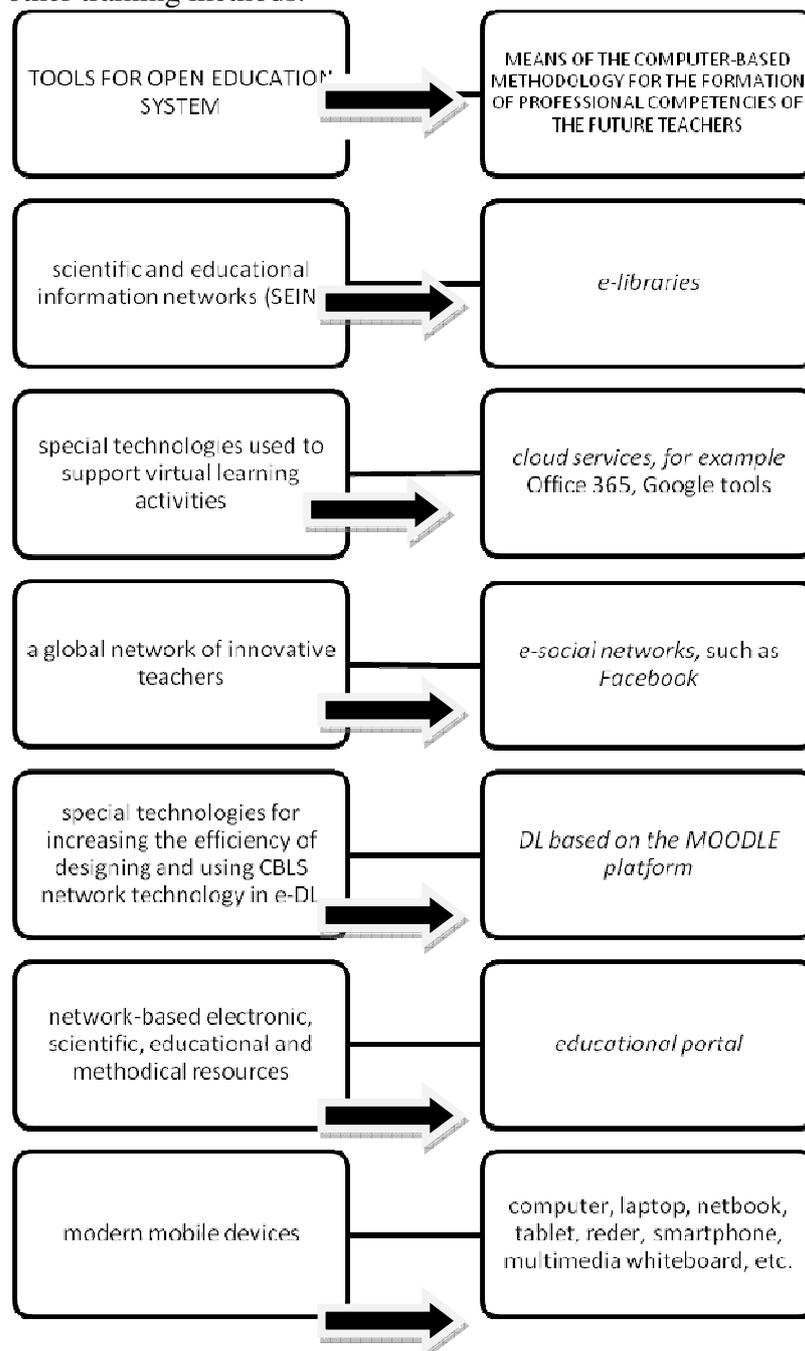


Fig. 2. The interconnectedness of open source education and tools of the computer-based methodology for the formation of professional competencies of the future teachers.

For the purpose of resolving the research tasks, it was important for us to work out the answer to the question: Does it make sense to combine the traditional and computer-based

forms, methods and means of learning in the process of formation of the professional competencies of the future teachers? The analysis of publications of Yu. Trius [6] and our own experience of teaching at HEI, made it possible to distinguish the most effective traditional and computer-based forms, whose rational combination, in our opinion, will significantly contribute to the positive dynamics of the formation of the phenomenon under investigation (Table 1).

Table 1.

**Traditional and computer-based forms, methods and means of organization of learning process of the future teachers at HEI**

Components of the computer-based methodology for the formation of the professional competencies	Traditional ones	Computer-based ones
<b>Forms of organization of the learning process</b>	Lectures, classes, seminars, tutorials, self-study work, teacher-up-front style of instruction, collaborative work, pair work, self-study work or collaborative research work, practical-experience-to-gain classes, on job training, monitoring arrangements: – tests, – modular assessment, – pass/fail exams, end of the course exams.	Computer-based lectures, seminars and workshops, tutorials; Computer-based scientific work; computer-based testing, modular assessment papers, etc; distance learning forms – e-learning courses (ELC): – chat (textual and graphic ones); – interactive forms of the seminars delivery, running the workshops and laboratory works, tutorials and etc; – computer-based pass/fail exams, end of the course exams.
<b>Methods of teaching (by the source of obtaining knowledge)</b>	<b>Verbal methods of teaching/learning</b>	
	Lecture; narrative report; explanation; discussion; course book-based work, reference, scientific and educational literature	Work with electronic course-books, e-libraries, repositories; work with the information obtained through the Internet; Interactive methods: computer-based teaching/learning
	<b>Visual methods of teaching/learning</b>	
	Demonstration experiment; self-sufficient observation	Interactive methods: Computer-based methods for teaching/learning monitoring and self-monitoring
<b>Teaching tools</b>	<b>Practical-experience-to-gain classes</b>	
	Performing laboratory work; performing case studies; resolving the expediently selected tasks	Project-based learning; learning in cooperation; interactive methods: the methods of computer-performed monitoring of students' preparedness for involvement in the training process
<b>Teaching tools</b>	Visual and technical teaching tools; textbooks and manuals; didactic materials; reference materials and other literature on methods of teaching	<b>Equipment aids:</b> – modern mobile devices; <b>software:</b> – e-libraries, – cloud services, – e-social networks, – computer-based systems of educational purpose and technology of a net e-distance learning, – educational portal

The research specifies the structure of professional competencies of the future teachers which comprises the following constituents: 1) a subject-learned area component (ability to independently acquire new knowledge and skills in the specialty area, ability to solve problems, ability to plan, ability to work out and implement plans and personal projects); 2) an information and digital component (ability to appropriately apply information technologies; the ability to find information; the ability to systematize, summarise it; the ability to critically perceive information provided by mass media and advertising agencies; the ability to apply knowledge and information literacy); 3) a communicative component (ability to properly apply a set of verbal and non-verbal means of communication; the ability to get engaged in communication for the purpose of understanding); 4) a personality component (ability for independent cognitive activity: setting and resolving of cognitive tasks; unconventional solutions, problem situations, that is, creating and solving them; productive and reproductive cognition, research, intellectual activity; the ability to study lifelong; striving for excellence in professional activity); 5) a creativity component (ability for unconventional, creative activity)[9].

Based on the analysis of the structure of professional competencies of the future teachers, we worked out the criteria and indicators of the formation of professional competencies of the future teachers in the settings of education in HEI, in particular: a motivation-based and goal-setting criterion (occurrence of a developed cognitive motivation arising from the professional interests; striving for the professional self-development); a professionalism and cognitive criterion (proving to have the profound knowledge necessary for future professional activities); a vocational and cognitive criterion (preparedness for independent application of the obtained knowledge and skills in different situations, ability for creative functioning in different situations of the professional sphere); a reflexive and evolutionary criterion (the students' ability to self-organise, self-assess their activities and to constantly self-improve, to achieve a high level of professionalism). Let us briefly run through overview of each them.

Elementary (reproductive) level addresses students' passive attitude to the use of computer-based tools, which include: e-libraries, cloud services, e-social networks, computer-based education systems and networks of e-distance learning technology, an educational portal, modern mobile learning tools at HEI; lack of interest in finding how to creatively use computer-based tools in their occupational training; the fragmentary nature of the formation of a complex of knowledge in the Pedagogy disciplines; an insufficient level of awareness of how to use computer-based tools; deficient attitude towards the solution of typical pedagogical tasks through the use of computer-based means; lack of creative adaptation of acquired communication skills of the use of the computer-based tools to their professional training process; an immature ability to appreciate the possibilities and evaluate consequences of the use of the computer-based tools for study process at HEI and in the future job.

A basic level or level of analogy refers to students' passively positive attitude to the use of the computer-based tools; an interest in finding how to creatively use the computer-based tools in their occupational training; formedness of a complex of knowledge, which requires systematisation, in the Pedagogy disciplines; a basic level of awareness of how to use the computer-based tools in resolving typical pedagogical tasks and situational tasks of educational and professional activity, for which additional justification is required (frequently externally provided ones) regarding their appropriateness; a passively positive attitude to solving typical problems using educational computer-based tools; the occurrence of a search-and-reproduction level of adaptation of acquired communication skills of using computer-based means in their professional training process; the ability to appreciate the possibilities and evaluate the consequences of using the computer-based tools for educational purposes at HEI and in the future professional activities.

Creative (advanced) level is characterized by active and positive attitude to the use of the computer-based tools; a systemic interest in finding how to creatively use the computer-based tools in their (students') occupational training; formedness of a complex of knowledge in the Pedagogy disciplines; an advanced level of awareness of how to use the computer-based tools in resolving typical pedagogical tasks and situational tasks through the use of the computer-based means; an action-based attitude towards the solution of typical pedagogical tasks through the use of computer-based means; the occurrence of creative approaches to a search of the options of adaptation of acquired communication skills of using computer-based tools in their professional training process; the systemic ability to appreciate the possibilities and evaluate the consequences of using computer-based tools for educational purposes at HEI and in the future professional activities.

The objective of the investigational work was to validate the research hypothesis stating that the formation of professional competencies of the future teachers through the means of the computer-based methodology in the process of studying Pedagogy disciplines at a modern HEI becomes effective if theoretical and methodological principles of that methodology reflect the structure of the professional competence of a specialist-to-be in the pedagogical sphere, criteria of formedness of the professional competence and take into account the specifics of the training process of the future teachers, which is in evidence of its focus on forming a dynamic combination of professional knowledge, skills and abilities, ways of thinking, views and values, and other personal qualities that determine students' ability to successfully perform their educational and pedagogical activities.

The investigation involved 779 people: 753 1st, 2nd and 3rd-year-students of the Bachelor's degree programme, specialisation reference details are 014 "Secondary education", 035 Philology: Knowledge Areas reference details: 01 Education, 03 the Humanities (by majors "Philology" (Language and Literature (German Language)), "Philology" (Language and Literature (French Language)), "Philology" (Language and Literature (Spanish Language)), "Philology" (Language and Literature (Italian Language)), "Philology" (Language and Literature (Japanese Language)), "Philology" (Language and Literature (Chinese Language)), "Philology" (Language and Literature (English Language)) and others) and 26 HEI lecturers, in particular, from Borys Hrinchenko Kyiv University, National Pedagogic University named after M. P. Drahomanov and Rivne State Humanitarian University, which were selected to be experimental research bases.

It is important to point out that when conducting the research a natural experiment was applied, which was carried out through introducing investigational structures (the model of using the computer-based methodology of forming professional competencies of the future teachers in the educational process at HEI) [10] into ordinary settings of the educational process at HEI involved in the investigation.

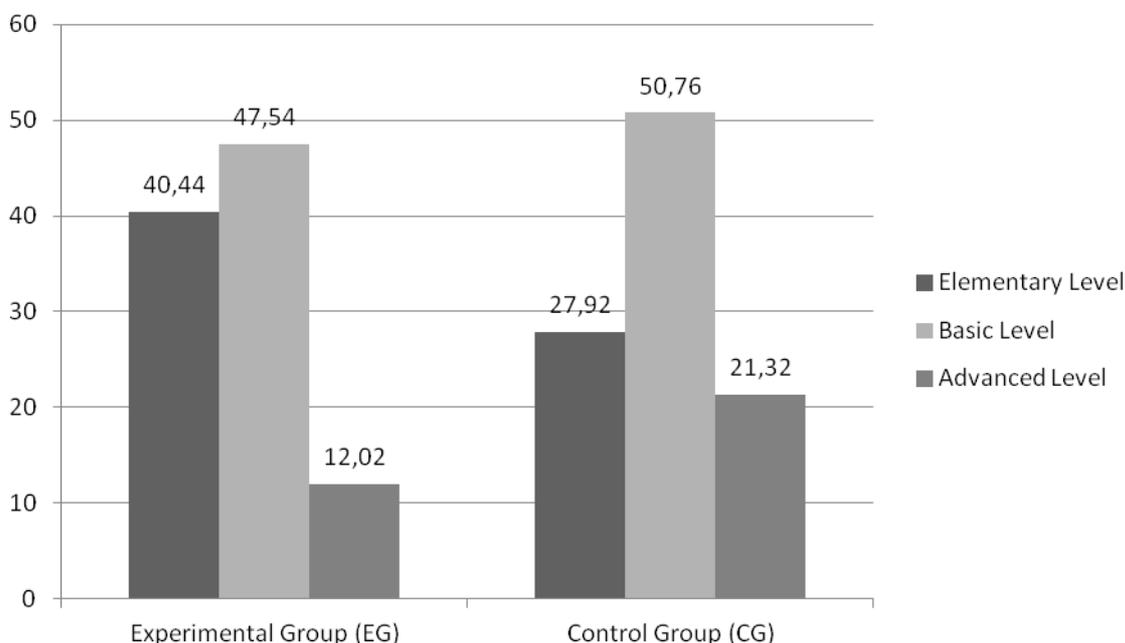
In the course of the forming stage of the investigation, study of Pedagogy disciplines ("Pedagogy Integrated", "Pedagogy", "Pedagogical Creative Work", "History of Pedagogy", "Methodology of Educational Work", "Pedagogy for Higher School"), being a part of the curriculum for the above-mentioned specialties, was decided to be the pre-set condition, namely, the experimental factor. This condition was managed and controlled by the experimenter and acted as an independent variable characterised by relative autonomy, constancy and influence on the object of the research. The dependent variable, which, in this study, was the introduction of the computer-based methodology as a factor in the formation of professional competencies of the future teachers in the educational process of HEI, was changing under the influence of an independent variable.

When analysing the results of the comparative study of the data of the exploratory and forming stages of the investigation, there was discovered a qualitative difference in the dynamics of the formation of professional competencies of the future teachers through

application of the computer-based methodology by such indicators as: the motivation-based and goal-setting, the professional and cognitive, the professional activity-related, the reflexivity and evaluation, before and after experimental work.

In addition to this, a generalised analysis of the results of the forming stage of the pedagogical investigation showed that the quantitative and qualitative indicators of the formation of professional competencies of the respondents in experimental groups (total number of participants was 197) show statistically significant differences from those in the control groups (total number of participants was 183), which was due to the introduction of the computer-based methodology regarded as a factor of the formation of the phenomenon under study.

It was revealed that in 40,44% (74 people) of students of the CG, corresponding professional competencies were formed at the elementary level, in 47,54% (87 people) they matched the basic level, in 12,02% (22 people) they appeared to be at the advanced level, while for the students of the EG, the elementary level figure reduced to 27,92% (55 people), the figure for the basic level was 50,76% (100 people) and the advanced level figure increased reaching 21,32% (42 people) (Fig.3).



*Fig. 3. Dynamics of the level of formation of professional competencies of the future teachers-philologists of the experimental (E) and control (C) groups, specified during the formation stage of the investigation.*

Thus, the outcome of the implementation of the investigational method validates the hypothesis of the study: the effectiveness of the formation of professional competencies of the future teachers increases with the application of the computer-based methodology at HEI.

#### 4. CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

The above stated makes it possible to draw some theoretical generalised conclusions:

1. While specifying the goals and objectives of the investigational work, it was proved that its aim was to test the research hypothesis. Having considered the fact that a pedagogical investigation is a complex set of specifically organized scientific and theoretical, methodological and organizational approaches, there were defined and substantiated such

stages of its implementation, namely: 1) an analytical and exploratory one; 2) an investigational (summative and formative) one and 3) a bottom-line and correctional stage.

2. In the process of justification and development of the computer-based methodology for the formation of professional competencies of the future teachers, component composition was identified as follows: goals (formation of professional competencies of the future teachers), the content (training of the future teachers in the process of studying the Pedagogy disciplines), modes of teacher-student interactions (seminars, case studies, self-study work), methods (the project-based method, collaborative learning, interactive methods) and tools (e-libraries, distance education based on the MOODLE platform, electronic social networks, cloud services, teacher's educational portal, mobile devices).

3. Specification of the structural components of professional competencies of future teachers (the subject-learned area, the information and digital, the communicative, the personality, the creativity) made it possible to work out the criteria (a motivation-based and goal-setting, a professional and cognitive, a vocational and cognitive, a reflexive and evaluation).

4. The consolidated results of the pedagogical investigation provided the proof that the formation of the professional competencies of the future teachers with the application of the computer-based methodology in the process of learning Pedagogy disciplines at HEI showed to be effective if its theoretical and methodological principles matched the structure of professional competence of a specialist in the pedagogical sphere as well as the criteria of its formedness and took into account the specifics of learning of the future teachers, which revealed itself through forming a dynamic combination of professional knowledge, professional skills and abilities, ways of thinking, views and values, and other personal qualities determining students' ability to successfully conduct educational and professional activities.

We see the prospects for further scientific research in the design of the component-based structure of the computer-based methods for the formation of professional competencies for the students of various educational programs of modern HEI.

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## ФОРМИРОВАНИЕ ПРОФЕССИОНАЛЬНЫХ КОМПЕТЕНТНОСТЕЙ БУДУЩИХ УЧИТЕЛЕЙ СРЕДСТВАМИ КОМПЬЮТЕРНО ОРИЕНТИРОВАННОЙ МЕТОДИКИ

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**Аннотация.** В статье обоснована общая методика экспериментального исследования проблемы формирования профессиональных компетентностей будущих учителей средствами компьютерно ориентированной методики; определены авторский подход к толкованию сущности понятия "компьютерно ориентированная методика формирования профессиональных компетентностей будущих учителей"; выделены структурные компоненты компьютерно ориентированной методики формирования профессиональных компетентностей будущих учителей: цель обучения, содержание обучения, формы организации образовательного процесса, методы и средства обучения; выделены наиболее результативные традиционные и компьютерно ориентированные формы, методы и средства обучения дисциплинам педагогического цикла для студентов 1-3 курсов образовательного уровня "бакалавр", и представлены взаимозависимость инструментов систем открытого образования и средств компьютерно ориентированной методики формирования профессиональных компетентностей будущих учителей; обоснованно структурные компоненты профессиональных компетентностей будущих учителей (предметная, информационно-цифровая, коммуникативная, личностная, творческая), определены критерии (мотивационно-целевой критерий, профессионально-когнитивный критерий, профессионально-деятельностный критерий, рефлексивно-оценочный критерий) и показатели, уровни (элементарный (репродуктивный) уровень, базовый уровень (или уровень аналогии), творческий (углубленный) уровень) сформированности профессиональных компетентностей будущих учителей в условиях обучения в учреждениях высшего образования; раскрыто комплекс общенаучных теоретических, эмпирических и статистических методов проведения экспериментального исследования и представлены обобщенные результаты педагогического эксперимента (аналитико-поискового, экспериментального (констатирующего, формирующего) и итогово-корректирующего этапов) по исследованию проблемы формирования профессиональных

компетентностей будущих учителей средствами компьютерно ориентированной методики в условиях изучения дисциплин педагогического цикла.

**Ключевые слова:** компьютерно ориентированная методика; профессиональные компетентности; будущие учителя; компьютерно ориентированные средства; профессиональная подготовка будущих учителей.

## **ФОРМУВАННЯ ПРОФЕСІЙНИХ КОМПЕТЕНТНОСТЕЙ МАЙБУТНІХ УЧИТЕЛІВ ЗАСОБАМИ КОМП'ЮТЕРНО ОРІЄНТОВАНОЇ МЕТОДИКИ**

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**Анотація.** У статті обґрунтовано загальну методику експериментального дослідження проблеми формування професійних компетентностей майбутніх учителів засобами комп'ютерно орієнтованої методики; визначено авторський підхід до тлумачення сутності поняття "комп'ютерно орієнтована методика формування професійних компетентностей майбутніх учителів"; виокремлено структурні компоненти комп'ютерно орієнтованої методики формування професійних компетентностей майбутніх учителів: мета навчання, зміст навчання, форми організації освітнього процесу, методи і засоби навчання; виокремлено найбільш результативні традиційні і комп'ютерно орієнтовані форми, методи й засоби навчання дисциплін педагогічного циклу для студентів 1-3 курсів освітнього ступеня "бакалавр", та представлено взаємозалежність інструментів систем відкритої освіти та засобів комп'ютерно орієнтованої методики формування професійних компетентностей майбутніх учителів; обґрунтовано структурні компоненти професійних компетентностей майбутніх учителів (предметна, інформаційно-цифрова, комунікативна, особистісна, творча); визначено критерії (мотиваційно-цільовий критерій, професійно-когнітивний критерій, професійно-діяльнісний критерій, рефлексивно-оцінювальний критерій) та показники, рівні (елементарний (репродуктивний) рівень, базовий рівень (або рівень аналогії), творчий (поглиблений) рівень) сформованості професійних компетентностей майбутніх учителів в умовах навчання у закладах вищої освіти; розкрито комплекс загальнонаукових теоретичних, емпіричних та статистичних методів проведення експериментального дослідження та представлено узагальнені результати педагогічного експерименту (аналітико-пошукового, експериментального (констатувального, формувального) та підсумково-корегувального етапів) з дослідження проблеми формування професійних компетентностей майбутніх учителів засобами комп'ютерно орієнтованої методики в умовах вивчення дисциплін педагогічного циклу.

**Ключові слова:** комп'ютерно орієнтована методика; професійні компетентності, майбутні учителі; комп'ютерно орієнтовані засоби; професійна підготовка майбутніх учителів.



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