УДК 378.016:[004:37:001.891]:378.22:373.3

Liudmyla H. Havrilova
Dr. hab. in Pedagogics, Associate Professor, Head of the Primary Education Theory and Practice Department
SHEE "Donbas State Pedagogical University", Sloviansk, Ukraine
ORCID ID 0000-0003-1814-5323
lusjamuz64@gmail.com

Yana V. Topolnik
PhD in Pedagogics, Associate Professor of the Higher School Pedagogy Department
SHEE "Donbas State Pedagogical University", Sloviansk, Ukraine
ORCID ID 0000-0001-7885-9454
yannetkatop@gmail.com

Liudmyla O. Kuhar
PhD in Pedagogics, Associate Professor of the Computer Engineering and Educational Measurements Department
National Pedagogical Dragomanov University, Kyiv, Ukraine
ORCID ID 0000-0003-0093-4877
l.o.kuhar@npu.edu.ua

Liudmyla A. Matviychuk
PhD in Pedagogics, Associate Professor of the Informatics and Computer Science Department
National University of Chernihiv Collegium named after T. Shevchenko, Chernihiv, Ukraine
ORCID ID 0000-0002-2046-6153
matviychuk2012@gmail.com

CONTENT AND STRUCTURE OF THE COURSE "INFORMATION AND COMMUNICATION TECHNOLOGIES IN PEDAGOGICAL STUDIES"

Abstract. The article describes the content and structure of the discipline "Information and Communication Technologies in Pedagogical Studies", which was introduced into the curriculum of training future Doctors of Philosophy in the field of knowledge "Education". The course consists of two modules: 1) theoretical basis of using information and communication technologies in pedagogical studies; 2) using information and communication technologies at different stages of pedagogical study. In addition, the topics of lectures, general content of practical classes and independent work are given. The content of practical classes contains work in cloud services, checking scientific materials for plagiarism, organizing and conducting questionnaires and testing, creating websites, blogs, etc. Among the tasks of independent work: the creation of a distant course in Moodle, work in MS Excel, the statistical recording of the pedagogical experiment data, the creation of presentations (MS Power Point, Prezi). The results of the implementation of the course in the training of future Doctors of Philosophy in the field of education were monitored; the levels of formation of their ICT competence were. The authors used survey methods, testing, creative tasks, etc. In particular, they described the testing procedure, which was conducted in compliance with all the necessary requirements for designing tests, which ensured the reliability and validity of the monitoring. The authors proved the urgency of implementing the mentioned course into the future scholars' training, which corresponds to the modern tendencies of education informatization. The course "ICT in Pedagogical Studies" reveals a complex of opportunities and prospects of using computer technologies during scientific and pedagogical research, provides quality training of the specialists with a new type of thinking, promotes the efficiency of their research and pedagogical activity, which is confirmed by the results of implementing the course into the training of the future Doctors of Philosophy in the field of knowledge "Education".

Keywords: information and communication technologies; scientific and pedagogical research; training Doctors of Philosophy.

© Liudmyla H. Havrilova, Yana V. Topolnik, Liudmyla O. Kuhar, Liudmyla A. Matviychuk,2018.

1. INTRODUCTION

The problem statement. The processes of globalization and informatization of modern society, the implementation of digital technologies in different spheres substantially change the requirements for the professional training of the scientific and pedagogical staff of higher qualification, in particular Doctors of Philosophy. Forming professionally competent specialists who are fluent in information and communication technologies (ICTs) and use them during scientific and pedagogical studies is relevant.

The use of ICT today becomes an essential part of scientific and pedagogical research and provides the creation of an e-Science Information Space, within which the global cooperation of representatives of research communities of different branches of science, laboratories, organizations and countries appears, the creation of virtual research teams, the common use of scientific resources and their exchange, distance use of computing and scientific equipment, open access to scientific data and publications that reflect the results of research activities take place [1]. Since 2013, through the European Programme Horizon 2020, the conceptual apparatus of modern science has been enriched with the term "digital science". The new programme provides the comprehensive support for digital technologies, the development of e-infrastructures, and the implementation of various research activities. Even radical transformation of the science nature and innovations, their democratization through the integration of ICTs into the research process is foreseen: the emergence of new research methods, the provision of free access to resources, transparency and reproducibility of research, interaction with society, etc. [2]. As the scientists (M. Zhurovskyi, O. Petrenko [3]) accurately point out, new tools and new research methods of digital science make it much more effective to conduct research, to create new types of science and research, more open, global, creative, and close to society.

In addition, in recent years, scientific communication has included the concept of "information and communication support of scientific activity", which involves assisting and promoting the subjects of scientific activity in the promulgation, dissemination and use of scientific results by tools of ICT (S. Ivanova [4]).

In order to provide the effective IC-support of research in the field of education the course "Information and Communication Technologies in Pedagogical Studies" has been implemented into prospective PhDs' curriculum at the State Higher Educational Establishment "Donbas State Pedagogical University", in particular for the specialties 011 "Education Sciences", 013 "Primary Education", 015 "Vocational Education", 016 "Special Education". Future academics in the educational field must master a number of modern tools, methods and technologies that will ensure successful accomplishment of research tasks, effective entry into the general informational educational space of modern pedagogical science and information and communication educational environment of higher educational establishments, development and introduction of scientific products using ICT.

Analysis of recent studies and publications. The use of information and communication technologies in scientific and pedagogical research is of interest to many modern scholars, including V. Bykov, R. Hurevych, S. Ivanova, M. Kademiia, L. Kartashova, M. Leshchenko, L. Luparenko, O. Spirin, A. Yatsyshyn, foreign scholars Th. Daccord, H. Demirkan, D. Delen, B. Drushel, A. McFarlane, A. November, J. Reich, V. Scott, S. Sakellariou and many others.

O. Spirin and others [5] analyse the expediency of using electronic open access systems for informational and analytical support of pedagogical studies, in particular, such systems as Connexions/Rhaptos, DiVA (Digitala Vertenskapliga Arkivet), GNU EPrints, DPubS, Open Journal System, Hyperjournal, Topaz. The scholars determine the major issues related to their systematic application: creating a university electronic library, creating and implementing the

information systems for planning research in the field of education, using electronic journal systems, scientometric and information and analytical systems, etc. [5, p. 137 – 138]

Peculiarities of the application of modern computer technologies during the scientific and pedagogical experiment at various stages is studied by M. Shyshkina [6]. The role of cloud information and analytical technologies, on the basis of which the informational and analytical competence of future Doctors of Philosophy is formed, is outlined in the work of O. Spirin and O. Odud. The authors have studied in detail the peculiarities of using scientometric databases in research activities, both the commercial ones, which are accessed via subscription (Web of Science, SciVerse Scopus, Mendeley, etc.), and the free ones, which are openly accessible (Google Scholar, Academia.edu, Index Copernicus, etc.) [7].

The problem of using ICT in scientific studies is in the centre of attention of A. Hritchenko [8], who offers an analysis of various categories of software for scientific activity and the presentation of its results (specialized, interactive, intelligent, expert calculation and logical systems, spreadsheets, Web-sites, etc.), as well as publishes his own experience of using the course "Modern Information Technologies in Scientific Research" in undergraduates' training at universities, which is especially relevant for our study.

It is worth paying attention to the work of S. Ivanova [9], in which the support of scientific research by means of ICT is considered in two contexts: information and communication on the one hand and information and analytical on the other. According to the author, the information and communication support of scientific activity involves the assistance to the subjects of scientific activity in the dissemination and use of scientific results by means of ICT, and covers such basic tools as software platforms for creating scientific electronic libraries; web technologies for collaborative work of scientists on the Internet; software systems for distance learning and others. At the same time, analytical support includes systems for checking scientific works for plagiarism; scientific indexing systems; systems of statistical analysis for web resource visiting [9].

Among the foreign studies on the use of ICT tools to support scientific research, the work of H. Demirkan and D. Delen [10] is remarkable. The scholars have studied service-oriented decision support systems that can be adapted for scientific and pedagogical research. An interesting point is the view of A. McFarlane & S. Sakellariou [11] about two models of ICT education support that provide some empirical and theoretical research.

Consequently, the use of ICT to support the development and enhancement of the effectiveness of scientific activity is a characteristic feature of Ukrainian science in line with global trends, since in recent years a number of government documents have emerged that provide legal support for education in the information society. In addition, the amount of scientific research, publications, printed and electronic scientific sources facilitating an active exchange of experience in using ICT to support the educational process and scientific activity has increased considerably.

Implementing the course "Information and Communication Technologies in pedagogical studies" into the curriculum of PhD of the branch "Education" is timely and relevant.

The purpose of this article is to prove that the developed structure of the course, the logic and the sequence of the content modules and topics enable future researchers to fully master the information and communication technologies necessary for successful organising and conducting scientific and pedagogical research at all stages.

2. THE THEORETICAL BACKGROUNDS

The methodological basis for the implementing "Information and Communication Technologies in Pedagogical Studies" into the training of Doctors of Philosophy in the field

of “Education” is the conceptual provisions of the competence, systemic, acmeological and synergetic approaches.

Competence approach, focused primarily on the learning outcomes, provides axiological, motivational, reflexive, cognitive, operational and activity and technological indicators and involves assimilation of relevant knowledge and skills, and personal experience. The systemic approach carries out the function of organization of a stable ordering and logic of the course construction, its systematic implementation into all types of scientific and pedagogical activity of future PhDs. The acmeological approach, which provides guidance to the individual and professional development of a scientist, focuses on their constant self-improvement and the ability to carry out self-realization, self-regulation and self-organization. The synergetic approach is realized in attracting future researchers to search and research activities, in building a flexible learning environment.

3. RESEARCH METHODS

For the conducted research, a set of methods was used, in particular, analysis and generalization of scientific literature and state legal documents on the content of the concepts of “digital science”, “ICT-support of scientific research”, “ICT-competence”, etc. To disclose the effectiveness of the implementation of the course “Information and Communication Technologies in Pedagogical Studies” and find out statistically significant differences in the levels of ICT competence development of the students of the course (30 people) and respondents of the control group (33 people), the methods of questioning, testing, checking statistical hypotheses were used.

4. THE RESULTS AND DISCUSSION

4.1. Educational content of the course “Information and Communication Technologies in Pedagogical Studies”

The inclusion of the course “Information and Communication Technologies in Pedagogical Studies” in the professional training of future Doctors of Philosophy corresponds to the modern tendencies of education informatization and provides high-quality training of specialists with a new type of thinking, promotes the efficiency of their scientific and pedagogical activity.

The study of the course “Information and Communication Technologies in Pedagogical Studies” reveals a complex of opportunities and prospects for the use of ICT during the scientific and pedagogical research of the future scholars of the educational branch (specialties 011 “Education Sciences”, 013 “Primary Education”, 015 “Vocational Education”, 016 “Special Education”). The course study is oriented primarily at forming the information and communication competence of researchers and teachers.

Future Doctors of Philosophy, mastering the course, are supposed to know:

– international open-access science centred systems used for searching and disseminating scientific works as IC-support for scientific activity;

– principles of generating a common information base in Google Scholar; basic approaches to scientometrics, obtaining statistical data on information resources;

– specificity of working in a cloud environment, requirements and features of construction of cloud-oriented training facilities;

– software for conducting testing, questionnaires, presentations of scientific research results; the environment for organizing distance learning and the basic requirements for creating a distance course, etc.

Future Doctors of Philosophy at the end of the course are supposed to demonstrate the ability to carry out the scientific and research activity in the information and communication pedagogical environment, in particular:

– to work with the systems Google Scholar and "Bibliometrics of Ukrainian Science" as a user; to create their own scientometric profile in various science-based databases; place their scientific achievements in science-centred systems with the use of cloud information and analytical services to evaluate their significance;

– to analyse information about their own scientific rating and rating of other scientists on the basis of the Hirsch Index and the I10-index and to use it according to the needs of personal and professional development;

– to search and select the scientific journals for the placement of materials on the problem under study; to publish, disseminate and use the results of scientific activity;

– to create a personal learning cloud-oriented environment; to use Internet services for testing, questionnaires, creation of interactive posters, intellectual maps, infographic tools; to develop high-quality presentations in PowerPoint, Prezy, etc.;

– to use statistical methods of processing the results of a pedagogical experiment, etc.

Let's distinguish the competences that should be formed and improved as a result of the course "Information and Communication Technologies in Pedagogical Studies" (Table 1).

Table 1

Formation of competencies in the course "Information and Communication Technologies in Pedagogical Studies"

Competence	Content
general	– ability to critically analyse and evaluate modern scientific achievements, generate new ideas in solving research and practical problems; – readiness to search, process, analyse and evaluate scientific information from various sources of information, interpret scientific research results; – mastering the computer and information culture, awareness of the value of subjective position in the information space.
general and professional	– mastering modern methodology and methods of scientific pedagogical study, in particular using ICT; – ability to carry out spiritual and intellectual self-development, readiness for continuous self-knowledge, personal qualities development, forming the culture of scientific thinking.
special	– readiness to model the innovative educational environment and to design content, forms, methods and tools of teaching in a modern school (comprehensive and higher); – the ability to choose and effectively use ICT to ensure personal and professional development; the ability to navigate information and Internet sources, work with electronic library collections, and critically address the information received; – readiness for use of ICT in scientific and professional activities; – ability for self-improvement and self-development through mastering Internet services, cloud technologies and inclusion in digital humanistic pedagogy.

Here is a general structure of the course "ICT in Pedagogical Studies" (Fig. 1, 2.).

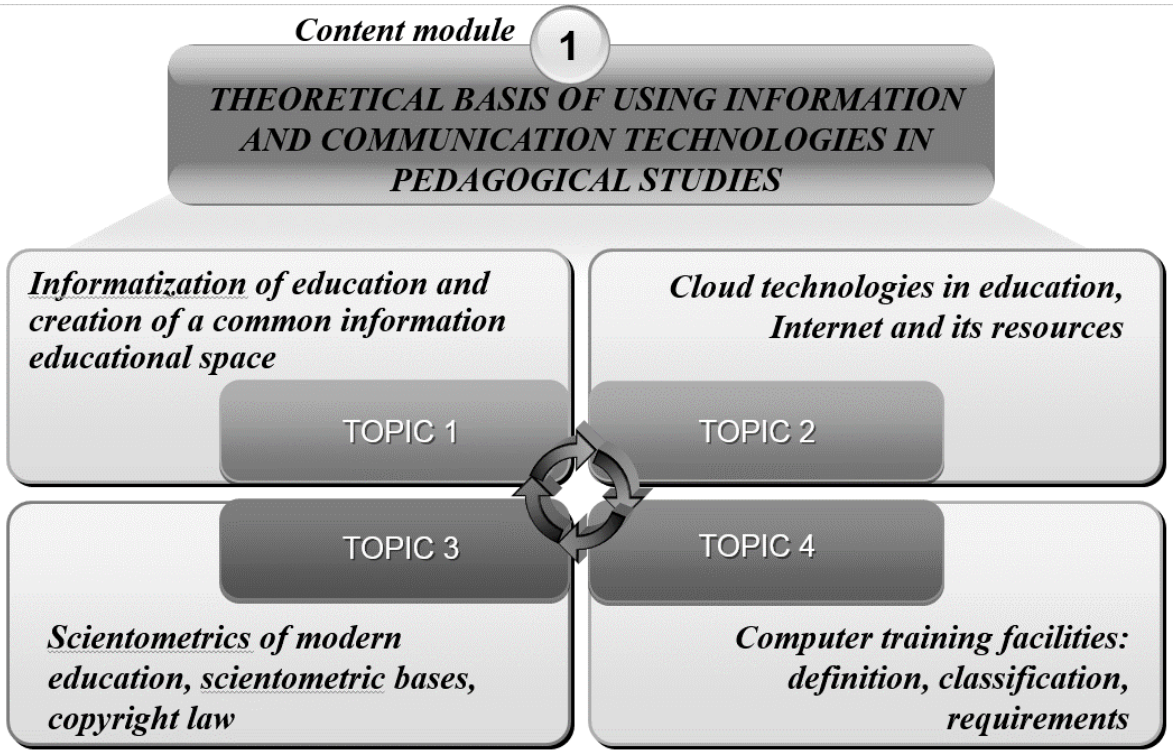

Fig. 1. The structure of content module 1 of the course "ICT in Pedagogical Studies"

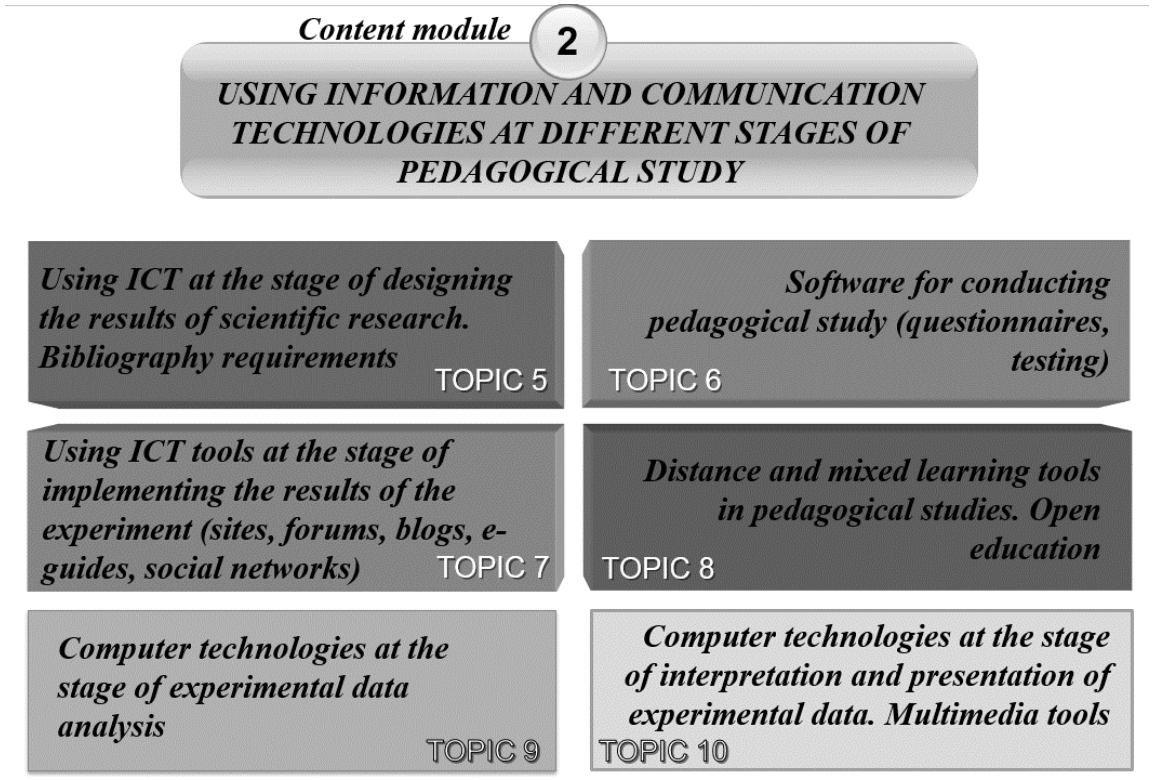

Fig. 2. The structure of content module 2 of the course "ICT in Pedagogical Studies"

The content of practical classes in the course "ICT in Pedagogical Studies" included the work in the following areas (Fig. 3):

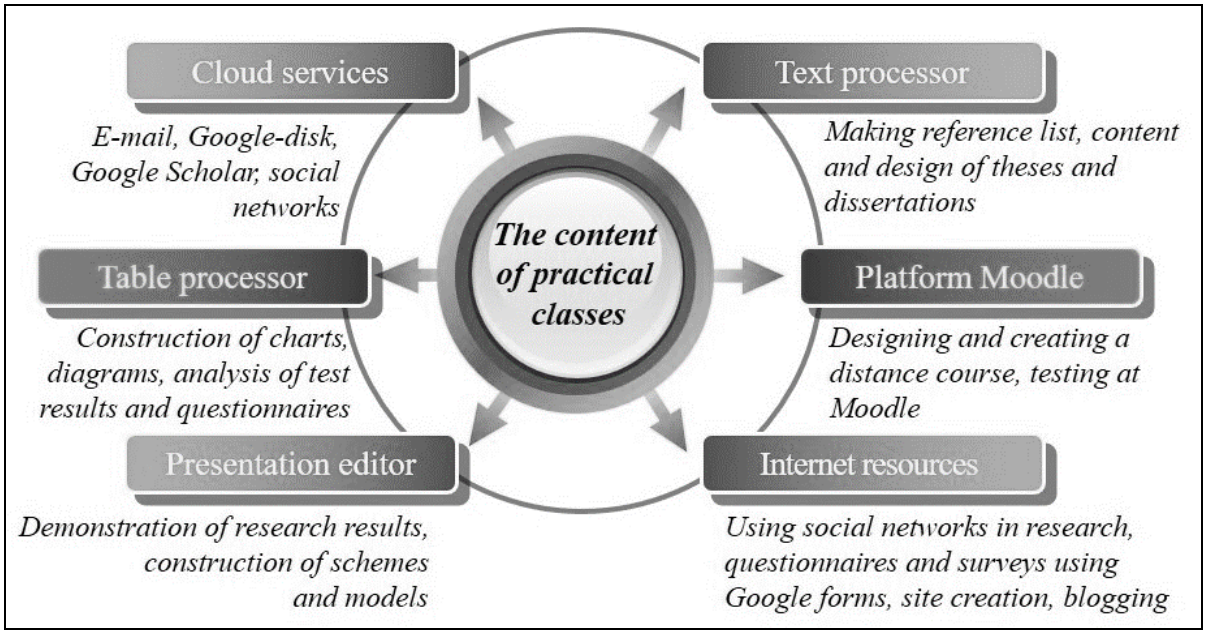

Fig. 3. The content of practical classes of the course "ICT in Pedagogical Studies"

Independent work of future PhDs in the field of education in the course of "ICT in Pedagogical Studies" can be reflected in the following tasks (Fig. 4):

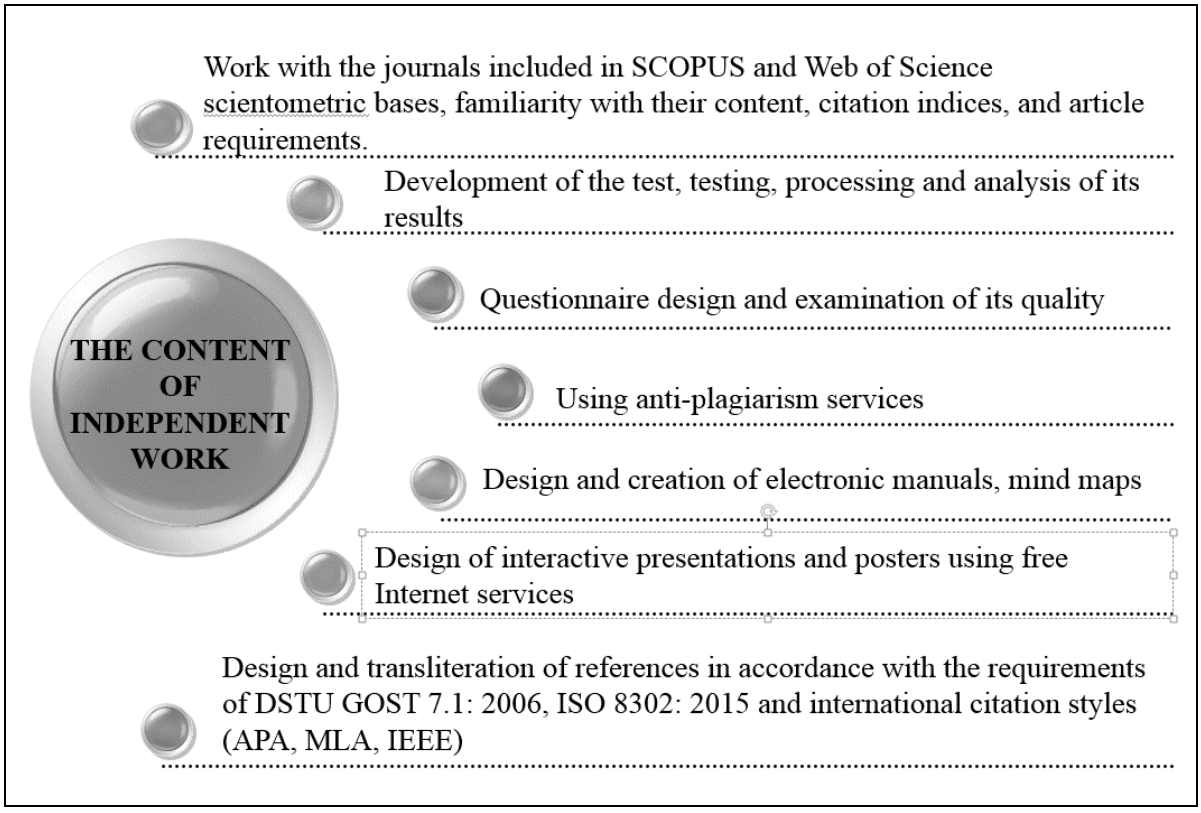

Fig. 4. The content of independent work in the course "ICT in Pedagogical Studies"

4.2. Analysis of the results of implementing the course "Information and Communication Technologies in Pedagogical Studies" into the training of future Doctors of Philosophy in the field of education

To determine the effectiveness of implementing the course "Information and Communication Technologies in Pedagogical Studies", diagnostic procedures were conducted to define changes in the levels of ICT competence components of future Doctors of Philosophy. Monitoring was conducted taking into account the principles of complexity, validity, and multi-vectoring procedures [12]. The experimental group (30 students) included respondents who studied the discipline "Information and Communication Technologies in Pedagogical Studies" according to the curriculum (future Doctors of Philosophy of specialties 011 "Education Sciences", 013 "Primary Education", 015 "Vocational Education"). Members of the control group (33 people) are graduate students of other specialties, Candidates of Science, who defended their theses during the last two years and did not study the proposed discipline, but completed a postgraduate course.

Initially, a test was conducted aimed at identifying residual knowledge and skills in computer science and the possibilities of using computer technologies in pedagogical studies. The test was designed to meet all the requirements for testing, which ensured its reliability and validity, and contained 30 tasks of different formats and levels of complexity. The matrix of the test was developed, which details the thematic correspondence of the test tasks and the taxonomic levels (the fragment of the matrix is in Table 2).

Test tasks of different types and levels of difficulty were developed according to the specific template. Here are examples of the test tasks of various cognitive levels created by the template [13].

Table 2

A fragment of the test matrix for controlling the knowledge and skills of using ICT in the scientific and pedagogical research of future Doctors of Philosophy

Names of content modules and themes		Knowledge	Understanding	Application	Analysis	Synthesis	Evaluation	Total
Topic 1. Informatization of education and creation of a common informational educational space.		**10**	**4**	**2**	**4**	**1**		**21**
1.1.	Regulatory and legal provision of education informatization.	2		1				3
1.2.	The common information space of modern education.	3	2		2			7
1.3.	Digital pedagogy and digital competence of modern education.	2		1				3
1.4.	Creation of informational educational environment	3	2		2	1		8

Test task to choose the correct answer

Instruction	Choose the one best answer
Condition (task)	What modern phenomenon often identifies the digital culture?
Right answer	media culture
Distractors	– computer design; – electronic music; – computer communication.
Cognitive level	Understanding
Complexity (from 1 to 4)	2
Time to run	45 sec
Criteria for evaluation	1 mark

Test task to set the correspondence

Instruction	Set the correspondence between concepts and their definitions
Condition (task)	Find the wording for the cloud services “forum”, “blog” and “website”.
Right answer	1. Forum is an online resource that offers a set of sections for discussion and is a popular form of communication on the Internet. 2. Blog is an Internet service, which allows any user to write records on a certain subject. 3. Website is a set of logically linked hypertext information, executed in the form of individual pages and available on the Internet
Distractors	e-learning resource, located in the web space of the Internet
Cognitive level	Analysis, synthesis
Complexity (from 1 to 4)	3
Time to run	2 minutes
Criteria for evaluation	1 – 3 marks

Before the test, a questionnaire was conducted using the Google-form, which made it possible to analyse the composition of the groups (gender, age, work experience in education).

Table 3

Questionnaire

№	Question	Possible answers					
1	**Gender**	m		f			
2	**Age**	up to 25		27 – 35		older than 35	
3	**Work experience in education**	up to 5 years.		5 – 10 years		more than 10 years	
4	**Self-assessment of the computer literacy level**	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10					

At the second stage of the monitoring study, which took place six months after the completion of the course by the students of the experimental groups, it was proposed to perform a series of tasks which demonstrate the readiness of future PhDs to use ICT in their pedagogical studies and the level of their ICT competence.

The students were asked to:

– perform the formatting of scientific work in accordance with the requirements of the HAC (creating the content, joining the references, drawing up tables, figures and models, etc.);
– organize a survey, work out its results and formulate the conclusions.

It should be noted that graduate students who studied the course "ICT in Pedagogical Studies", completed the tasks of formatting scientific work much faster and more efficiently (for creating the content they used the styles for creation of automated contents; cross references were used to create a link to literature, which greatly facilitates working with a list of references, etc.), while others did it "manually", spending much more time and effort.

Regarding the organization of the survey, we note that respondents from both groups developed very good questionnaires, but the practical implementation varies considerably. Participants in the experimental group used the opportunities of cloud services (Google-forms), surveys were posted on social networks, which attracted a wide audience of respondents. All results were instantly displayed on charts, which allowed them to be analysed. Participants in the control group offered to send the completed questionnaire by mail and work out the results manually by constructing diagrams using MS Excel spreadsheets. That is, the computer technology was used in the control group to organize the survey and work out its results, but in the experimental group their application was more effective.

The results of the study made it possible to establish and analyse how the study of the course "ICT in Pedagogical Studies" influenced the developing ICT competence of the future Doctors of Philosophy. Indicators of diagnostic sections at the final stage proved that the future Doctors of Philosophy, who had studied the proposed course and completed the whole complex of practical tasks, demonstrated a significantly higher level of ICT competence.

Table 4

Results of the study

Levels	Low				Sufficient				High			
Groups	Contr.		Exp.		Contr.		Exp.		Contr.		Exp.	
	Pers.	%	Pers.	%	Pers.	%	Pers.	%	Pers.	%	Pers.	%
Level of ICT competence	12	36,3%	5	16,4%	14	42,6%	12	40,3%	7	21,1%	13	43,3%

The indicators are presented in the form of a diagram below (Fig. 5).

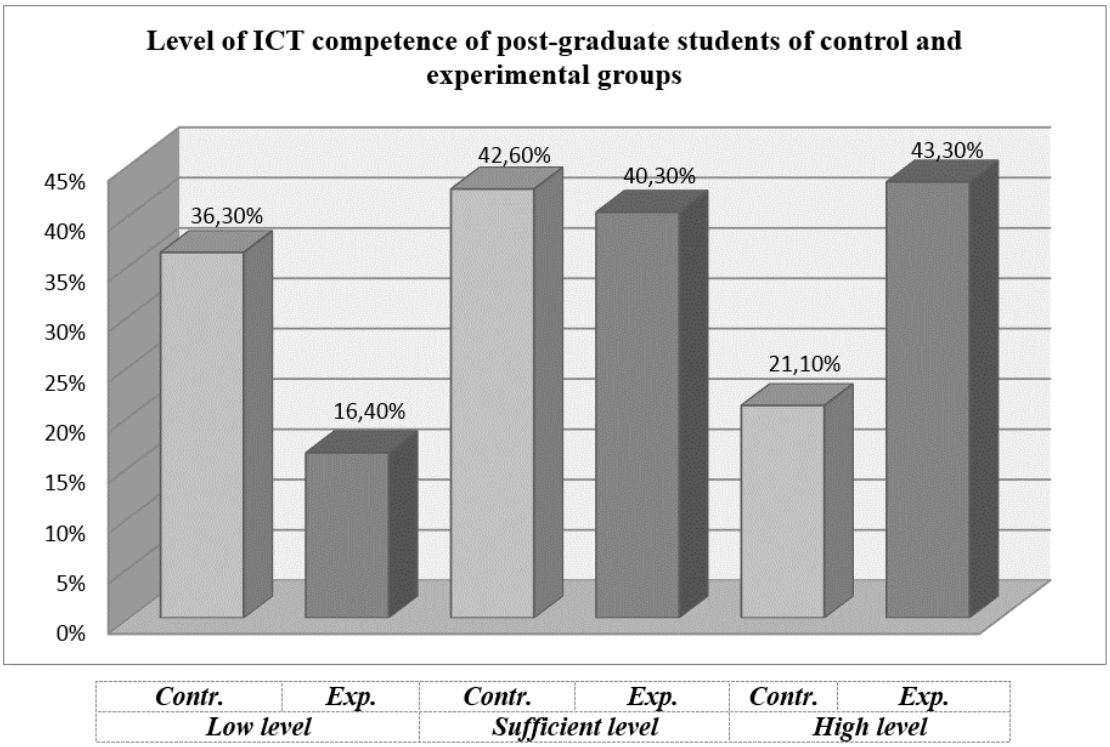

Fig. 5. Analysis of the results of experimental research

4. CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

The developed course “Information and Communication Technologies in Pedagogical Studies” covers the basic scientific and theoretical approaches of modern pedagogical science, primarily based on the competence approach as one of the strategic directions of state policy in the educational sphere, which is oriented towards the achievement of a certain educational result. Systemic, acmeological, synergetic approaches which ensure the successful implementation of scientific and pedagogical research are relevant in future PhDs training. The important theoretical basis for the creation of the course “Information and Communication Technologies in Pedagogical Studies” is foreign and domestic concepts, modern initiatives in the field of globalization and informatization of education, scientific research on creation and application of ICT tools in pedagogical activity.

The study of the results of implementing the course “Information and Communication Technologies in Pedagogical Studies” into the training of future Doctors of Philosophy in the field of knowledge “Education” allows us to talk about significant positive results in forming ICT competences and recommend it to future Doctors of Philosophy who study in other specialties.

REFERENCES

[1] L. H. Havrilova, L. O. Kukhar, and Ya. V. Topolnyk, *Information and communication technologies in pedagogical researches: educational and methodical manual for students of higher pedagogical educational institutions.* Sloviansk, Ukraine: Publ. B. I. Matorin, 2017. (in Ukrainian).

[2] "Open science | Digital Single Market" [Online]. Available: https://ec.europa.eu/digital-single-market/digital-science. (in English).

[3] M. Z. Zghurovskyi, and A.I. Petrenko, "Digital science in Programme "Horizon 2020". *System research & informational technologies,* no 1, pp. 7 – 20, 2015. [Online]. Available: http://dspace.nbuv.gov.ua/bitstream/handle/123456789/86126/01-Zgurovsky.pdf?sequence=1/. (in Russian)

[4] S. M. Ivanova, "Using EPrints system as a means of information and communication support for scientific activity in the field of pedagogical sciences", Ph. D. Thesis, NAPS of Ukraine, Kyiv, Ukraine, 2015. (in Ukrainian).

[5] O. M. Spirin, A. V. Iatsyshyn, S. M. Ivanova, A. V. Kilchenko, and L. A. Luparenko, "The using of the electronic systems of open access for information and analytical support pedagogical research". *Information technologies and learning tools,* vol. 55, no. 5, pp. 136–174, 2016. [Online]. Available: http://journal.iitta.gov.ua/index.php/itlt/article/view/1501. (in Ukrainian).

[6] M. Shyshkina, "Information and communication technologies in pedagogical investigation", *Information technologies and learning tools,* vol. 6, no. 2, 2008. [Online]. Available: http://journal.iitta.gov.ua/index.php/itlt/article/view/130. (in Ukrainian).

[7] O. Spirin, & O. Odud. "Content of educational material special seminars "Cloud information-analytical technologies in the research process". *Information technologies and learning tools,* vol. 52, no. 2, pp. 108–120, 2016. [Online]. Available: https://journal.iitta.gov.ua/index.php/itlt/article/view/1374 (in Ukrainian).

[8] A. Gritchenko, "Modern information technologies in scientific studies", *Information technologies and learning tools*, vol. 28, no. 2, 2012. [Online]. Available: http://journal.iitta.gov.ua/index.php/itlt/article/view/654/499. (in Ukrainian).

[9] S. Ivanova. "Information and analytical support for scientific activities in the field of educational sciences". *Information technologies and learning tools,* vol. 49, no. 5, pp. 165–175, 2015. [Online]. Available: https://journal.iitta.gov.ua/index.php/itlt/article/view/1299. (in Ukrainian).

[10] D. Delen & H. Demirkan. "Leveraging the capabilities of service-oriented decision support systems: Putting analytics and big data in cloud". *Decision Support Systems,* 55, pp. 412–421, 2013. (in English).

[11] A. McFarlane & S. Sakellariou. "The Role of ICT in Science Education". *Cambridge Journal of Education*. vol. 32, Issue 2, pp. 219–232. (2002). [Online]. Available: https://www.tandfonline.com/doi/abs/10.1080/03057640220147568 (in English).

[12] O. Ishutina, "Prospective Primary School Teachers' Foreign Language Sociocultural Competence: Monitoring Principles", *Professionalism of the Teacher: Theoretical and Methodological Aspects*, vol. 3, pp. 178–189, 2016. [Online]. Available: http://pptma.dn.ua/index.php/uk/arkhiv-vipuskiv/za-2016-rik/vipusk-3-2016/284-inshomovna-sotsiokulturna-kompetentnist-majbutnogo-vchitelya-pochatkovoji-shkoli-printsipi-monitoringu. (in English).

[13] L. H. Havrilova, L. O. Kukhar, and Ya. V. Topolnyk, *Information and communication technologies in pedagogical researches: practical tasks for students of higher pedagogical educational institutions,* Sloviansk, Ukraine: Publ. B. I. Matorin, 2018. (in Ukrainian).

Text of the article was accepted by Editorial Team 01.04.2018

СОДЕРЖАНИЕ И СТРУКТУРА КУРСА «ИНФОРМАЦИОННО-КОММУНИКАЦИОННЫЕ ТЕХНОЛОГИИ В ПЕДАГОГИЧЕСКИХ ИССЛЕДОВАНИЯХ»

Гаврилова Людмила Гавриловна
доктор педагогических наук, доцент, заведующая кафедрой теории и практики начального образования
ГВУЗ «Донбасский государственный педагогический университет», г. Славянск, Украина
ORCID ID 0000-0003-1814-5323
lusjamuz64@gmail.com

Топольник Яна Владимировна
кандидат педагогических наук, доцент кафедры педагогики высшей школы
ГВУЗ «Донбасский государственный педагогический университет», г. Славянск, Украина
ORCID ID 0000-0001-7885-9454
yannetkatop@gmail.com

Кухар Людмила Александровна
кандидат педагогических наук, доцент кафедры компьютерной инженерии и образовательных измерений
НПУ имени М. П. Драгоманова, г. Киев, Украина

ORCID ID 0000-0003-0093-4877
l.o.kuhar@npu.edu.ua

Матвейчук Людмила Анатольевна
кандидат педагогических наук, доцент кафедры информатики и вычислительной техники
Национальный университет «Черниговский коллегиум» имени Т. Г. Шевченко, г. Чернигов, Украина
ORCID ID 0000-0002-2046-6153
matviychuk2012@gmail.com

Аннотация. В статье описано содержание и структура учебной дисциплины «Информационно-коммуникационные технологии в педагогических исследованиях», которая включена в образовательно-научную программу подготовки будущих докторов философии в сфере образования в Государственном высшем учебном заведении «Донбасский государственный педагогический университет» (специальности 011 «Науки об образовании» , 013 «Начальное образование», 015 «Профессиональное образование», 016 «Специальное образование»). Курс структурирован в два модуля: «Теоретические основы использования информационно-коммуникационных технологий в педагогических исследованиях» и «Использование информационно-коммуникационных технологий на различных этапах педагогического исследования». Предложена тематика лекций, содержание практических занятий и самостоятельной работы. Практические занятия курса включают работу в облачных сервисах, проверку научных материалов на плагиат, организацию и проведение анкетирования и тестирования, создание веб-сайтов, блогов и пр. Среди заданий самостоятельной работы: создание дистанционного курса в Moodle, работа в MS Excel, статистический анализ данных педагогического эксперимента, разработка презентаций (MS Power Point, Prezi). Осуществлен мониторинг результатов внедрения курса в подготовку будущих докторов философии в области образования, изучены уровни сформированности ИКТ-компетентности будущих ученых. Использованы методы анкетирования, тестирования, творческих заданий и др., в частности, описана процедура тестирования, которая проводилась с соблюдением всех необходимых требований к конструированию тестов, что обеспечило надежность и валидность мониторинга. Авторами доказана эффективность внедрения названного курса в подготовку будущих ученых, что полностью отвечает современным требованиям информатизации высшего образования. Курс «ИКТ в педагогических исследованиях» раскрывает комплекс возможностей и перспектив использования компьютерных технологий при проведении научно-педагогических исследований, обеспечивает качественную подготовку специалистов с новым типом мышления, способствует эффективности их научной и научно-педагогической деятельности, что подтверждают результаты внедрения курса в подготовку будущих докторов философии в сфере образования.

Ключевые слова: информационно-коммуникационные технологии; научно-педагогические исследования; подготовка докторов философии.

ЗМІСТ І СТРУКТУРА КУРСУ «ІНФОРМАЦІЙНО-КОМУНІКАЦІЙНІ ТЕХНОЛОГІЇ В ПЕДАГОГІЧНИХ ДОСЛІДЖЕННЯХ»

Гаврілова Людмила Гаврилівна
доктор педагогічних наук, доцент, завідувач кафедри теорії і практики початкової освіти
ДВНЗ «Донбаський державний педагогічний університет», м. Слов'янськ, Україна
ORCID ID 0000-0003-1814-5323
lusjamuz64@gmail.com

Топольник Яна Володимирівна
кандидат педагогічних наук, доцент, доцент кафедри педагогіки вищої школи
ДВНЗ «Донбаський державний педагогічний університет», м. Слов'янськ, Україна
ORCID ID 0000-0001-7885-9454
yannetkatop@gmail.com

Кухар Людмила Олександрівна
кандидат педагогічних наук, доцент кафедри комп'ютерної інженерії та освітніх вимірювань
НПУ імені М. П. Драгоманова, м. Київ, Україна

ORCID ID 0000-0003-0093-4877
l.o.kuhar@npu.edu.ua

Матвійчук Людмила Анатоліївна
кандидат педагогічних наук, доцент кафедри інформатики та обчислювальної техніки
Національний університет «Чернігівський колегіум» імені Т. Г. Шевченка, м. Чернігів, Україна
ORCID ID 0000-0002-2046-6153
matviychuk2012@gmail.com

Анотація. У статті описано зміст і структуру навчальної дисципліни «Інформаційно-комунікаційні технології в педагогічних дослідженнях», уведеної до освітньо-наукової програми підготовки майбутніх докторів філософії галузі знань «Освіта» ДВНЗ «Донбаський державний педагогічний університет», зокрема зі спеціальностей 011 «Науки про освіту», 013 «Початкова освіта», 015 «Професійна освіта», 016 «Спеціальна освіта». Курс структуровано у два модулі: «Теоретичні засади використання інформаційно-комунікаційних технологій у педагогічних дослідженнях» та «Використання інформаційно-комунікаційних технологій на різних етапах педагогічного дослідження». Наведено тематику лекцій, загальний зміст практичних занять і самостійної роботи. Практичні заняття курсу передбачають роботу у хмарних сервісах, перевірку наукових матеріалів на плагіат, організацію та проведення анкетування й тестування, створення веб-сайтів, блогів тощо. Серед завдань самостійної роботи: створення дистанційного курсу в Moodle, робота в MS Excel, статистичний аналіз даних педагогічного експерименту, створення презентацій (MS Power Point, Prezi). Здійснено моніторинг результатів впровадження курсу у підготовку майбутніх докторів філософії в галузі освіти, вивчено рівні сформованості їхньої ІКТ-компетентності. Використано методи опитування, тестування, творчі завдання та ін., зокрема, описано процедуру тестування, яка проводилася з дотриманням усіх необхідних вимог до конструювання тестів, що забезпечило надійність і валідність моніторингу. Авторами доведено ефективність впровадження названого курсу у підготовку майбутніх науковців, що відповідає сучасним тенденціям інформатизації освіти. Курс «ІКТ в педагогічних дослідженнях» розкриває комплекс можливостей і перспектив використання комп'ютерних технологій під час проведення науково-педагогічних досліджень, забезпечує якісну підготовку фахівців з новим типом мислення, сприяє ефективності їхньої наукової та науково-педагогічної діяльності, що підтверджують результати впровадження курсу в підготовку майбутніх докторів філософії галузі знань «Освіта».

Ключові слова: інформаційно-комунікаційні технології; науково-педагогічні дослідження; підготовка докторів філософії.

СПИСОК ВИКОРИСТАНИХ ДЖЕРЕЛ

[1] Л. Г. Гаврілова, Л. О. Кухар, та Я. В. Топольник, *Інформаційно-комунікаційні технології в педагогічних дослідженнях : навчально-методичний посібник для студентів вищих педагогічних навчальних закладів*. Слов'янськ, Україна: Видавництво Б. І. Маторіна, 2017.

[2] "Open science | Digital Single Market" [Online]. Available: https://ec.europa.eu/digital-single-market/digital-science.

[3] М. З. Згуровский, та А. И. Петренко, «Цифровая наука в программе «Горизонт 2020», *Системні дослідження та інформаційні технології*, № 1, с. 7–20, 2015. [Електронний ресурс]. Доступно: http://dspace.nbuv.gov.ua/bitstream/handle/123456789/86126/01-Zgurovsky.pdf?sequence=1/.

[4] С. М. Іванова, «Використання системи EPrints як засобу інформаційно-комунікаційної підтримки наукової діяльності в галузі педагогічних наук», автореф. дис. канд. пед. наук, НАПН України, Київ, Україна, 2015.

[5] О. М. Спірін, А. В. Яцишин, С. М. Іванова, А. В. Кільченко, та Л. А. Лупаренко, «Використання електронних систем відкритого доступу для інформаційно-аналітичної підтримки педагогічних досліджень», *Інформаційні технології і засоби навчання,* Том 55, № 5, с. 136–174, 2016. [Електронний ресурс]. Доступно: http://journal.iitta.gov.ua/index.php/itlt/article/view/1501.

[6] М. Шишкіна, «Інформаційно-комунікаційні технології у педагогічному дослідженні», *Інформаційні технології і засоби навчання*, Том 6, № 2, 2008. [Електронний ресурс]. Доступно: http://journal.iitta.gov.ua/index.php/itlt/article/view/130.

[7] О. Спірін, О. Одуд. Зміст навчального матеріалу спецкурсу «Хмарні інформаційно-аналітичні технології у науково-дослідному процесі». *Інформаційні технології і засоби навчання,* Том 52, № 2. с. 108–120, 2016. [Електронний ресурс]. Доступно: https://journal.iitta.gov.ua/index.php/itlt/article/view/1374

[8] А. Г. Грітченко, «Сучасні інформаційні технології у наукових дослідженнях», *Інформаційні технології і засоби навчання*, Том 28, №2, 2012. [Електронний ресурс]. Доступно: http://journal.iitta.gov.ua/index.php/itlt/article/view/654/499.

[9] С. Іванова. «Інформаційно-аналітична підтримка наукової діяльності в галузі педагогічних наук», *Інформаційні технології і засоби навчання,* Том 49, № 5. с. 165–175, 2015. [Електронний ресурс]. Доступно: https://journal.iitta.gov.ua/index.php/itlt/article/view/1299.

[10] D. Delen & H. Demirkan. Leveraging the capabilities of service-oriented decision support systems: Putting analytics and big data in cloud. *Decision Support Systems,* 55, pp. 412–421, 2013.

[11] A. McFarlane & S. Sakellariou "The Role of ICT in Science Education". *Cambridge Journal of Education*. vol. 32, Issue 2, pp. 219–232, 2002. [Online]. Available: https://www.tandfonline.com/doi/abs/10.1080/03057640220147568.

[12] O. Ishutina. "Prospective Primary School Teachers' Foreign Language Sociocultural Competence: Monitoring Principles", *Professionalism of the Teacher: Theoretical and Methodological Aspects,* Vol. 3, pp. 178–189, 2016. [Online]. Available: http://pptma.dn.ua/index.php/uk/arkhiv-vipuskiv/za-2016-rik/vipusk-3-2016/284-inshomovna-sotsiokulturna-kompetentnist-majbutnogo-vchitelya-pochatkovoji-shkoli-printsipi-monitoringu

[13] Л. Г. Гаврілова, Л. О. Кухар, та Я. В. Топольник, *Інформаційно-комунікаційні технології в педагогічних дослідженнях : практикум для студентів вищих педагогічних навчальних закладів*. Слов'янськ, Україна: Видавництво Б. І. Маторіна, 2018.

This work is licensed under Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License