Міністерство освіти і науки України
Харківський національний педагогічний університет
імені Г. С. Сковороди

«До друку та в світ дозволяю»

_____

проректор з наукової, інноваційної
і міжнародної діяльності
професор С. В. Бережна

Sobchenko T.M., Vlasenko Ya.V.

DIGITAL SERVICES IN SCIENTIFIC RESEARCH

Methodical recommendations
for applicants (foreign citizens) of the third (educational and scientific)
level of higher education to the organization
independent educational and research work,
field of knowledge 01 – Education/Pedagogy, specialty 011 – Educational,
pedagogical sciences, specialty 015 – Professional education

Затверджено редакційно-видавничою
радою Харківського національного
педагогічного університету
імені Г. С. Сковороди
протокол № 5 від 17 травня 2023 р.

Харків – 2023

Ministry of Education and Science of Ukraine
Kharkiv National Pedagogical University named after H. S. Skovoroda

Department of Education and Innovative Pedagogy

Sobchenko T.M., Vlasenko Ya.V.

DIGITAL SERVICES IN SCIENTIFIC RESEARCH

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Kharkiv 2023

УДК 378.046-021.68:004

Укладачі: Собченко Т.М., Власенко Я.В.

Рецензенти:

Доценко С.О. доктор педагогічних наук, професор, завідувач кафедри технологій дистанційного навчання та цифрової дидактики в дошкільній освіті Харківський національний педагогічний університет імені Г.С. Сковороди;

Ворожбіт-Горбатюк В.В. доктор педагогічних наук, професор, старший науковий співробітник відділу дослідження проблем кримінально-виконавчого права НДІ ВПЗ імені академіка В.В.Сташиса НАПрНУ.

С81 Digital services in scientific research

. Методичні рекомендації для здобувачів (іноземних громадян) третього (освітньо-наукового) рівня вищої освіти до організації самостійної навчальної і науково-дослідної роботи / Укладачі: Собченко Т.М., Власенко Я.В. Харків. 2023. 33 с.

Методичні рекомендації містять опис вибіркової навчальної дисципліни «Цифрові сервіси в наукових дослідженнях», зміст завдань до самостійної, навчальної і науково-дослідної роботи здобувачів та її критерії оцінювання.

У методичних рекомендаціях подано корисні джерела, посилання на інформаційні ресурси, зокрема на бібліотеки та інші наукові ресурси, глосарій.

Content

Introduction

Independent work of applicants for higher education plays a significant role in the process of training a future specialist and occupies a significant place in the system of modern higher education. The designated type of educational activity, aimed at independent study of educational material, provides an opportunity to significantly improve the level and quality of knowledge, independently obtain and apply knowledge in professional activities, contributes to the effective formation and development of a set of skills, creates conditions for the disclosure of individual's own abilities.

Independent work completes the tasks of all other types of educational activities and ensures the transition from executive reproductive activity of applicants to search, research, creative at all stages of the educational process.

Independent work of applicants for higher education of the Kharkiv National Pedagogical University named after G. S. Skovoroda is carried out in accordance with the Regulations on the organization of the educational process in the Kharkiv National Pedagogical University named after G. S. Skovoroda (http://hnpu.edu.ua/sites/default/files/files/Normat_dokum/Piojenn/Pro_organisaziyu_osvitnogoz_procesy.pdf).

Independent work of the applicant is the main means of mastering the educational material during the time free from mandatory training sessions. The academic time allocated for independent work of the applicant is regulated by the working curriculum, and must be not less than 50%and not more than 67% of the total amount of academic time of the applicant allocated for studying a particular discipline.

Independent work of the applicant on the assimilation of educational material on a specific academic discipline can be performed in the university library, classrooms, computer classes (laboratories), as well as at home.

If necessary, this work is carried out in accordance with a pre-arranged schedule, which guarantees the possibility of individual access of the applicant to

the necessary didactic tools. The schedule is communicated to applicants at the beginning of the current semester.

The training material of the discipline provided for in the working curriculum for assimilation by the applicant in the course of independent work is submitted for final control along with the training material that was developed during the classes.

PURPOSE, TASKS, LEARNING OUTCOMES.

The purpose of the selective academic discipline "Digital services in scientific research" is to promote the formation of the ability of applicants of the third (educational and scientific) level of higher education to solve complex problems in conducting scientific research, which implies the acquisition of theoretical knowledge and practical skills in the effective use of digital services, as well as improving their digital literacy.

The tasks of the selective academic discipline "Digital services in scientific research" are the formation of the following competencies:

ZK3 (ЗК3) – the ability to use in research / professional activities the leading principles of professional ethics and academic integrity adopted by the world scientific community;

ZK6 (ЗК6) – ability to perceive, analyze and interpret new educational information from scientific sources in Ukrainian / foreign languages, summarize it and make a reasoned presentation in a coherent form during the testing of research results;

FK13 (ФК13) – the ability to plan, implement and correct a consistent process of thorough scientific and pedagogical research with logical compliance with the relevant scientific approaches and principles of academic integrity;

FK22 (ФК22) – the ability to select, structure the content of educational material, competently build your own scientific and methodological texts.

Learning outcomes.

As a result of studying the selective academic discipline "digital services in scientific research", applicants of the third (educational and scientific) level of higher education are able to:

PRN3 (ПРН3) – conduct a dialogue and polylogue based on the principles of professional ethics of the scientific community; apply the terminology of the branch of scientific research, translate and annotate texts in accordance with the principles of academic integrity;

PRN4 (ПРН4) – demonstrate knowledge of lexical, grammatical, and stylistic structures that are necessary for adequate expression of relevant ideas and concepts in author's scientific texts (orally and in writing)

PRN9 (ПРН9) – possess pedagogical reflection to identify their resource capabilities, build an individual educational trajectory, design strategies for self-development and professional growth, and lifelong education;

PRN10 (ПРН10) – optimize the choice of forms, methods, and technologies of teaching and upbringing in the Institution of Higher Education, taking into account the updating of educational programs.

THEMATIC PLAN OF THE ACADEMIC DISCIPLINE

MODULE 1. Theoretical foundations of using digital services in scientific research

Topic 1. Information and digital technologies: terminological apparatus, role and place of digital services in modern science.

The essence of the concepts "technology", "informatization", "digitalization", "information and digital technologies", "information system", "digital services". Stages of development of information and digital technologies.

Tasks of informatization of education:

1) improving the quality of training of specialists based on the use of information technologies in the educational process;

2) implementation of active teaching methods, increasing the creative and intellectual component;

3) integration of various types of educational activities;

4) adaptation of learning technologies to the individual characteristics of students;

5) development of new learning technologies that promote the activation of cognitive activity of all students, increase motivation based on ICT tools and methods to use them in professional activities;

6) ensuring continuity and continuity in training;

7) development of training materials for distance learning;

8) improvement of software and methodological support of the educational process;

9) introduction of information technologies in the process of special professional activity of specialists of various profiles.

At the present stage of development of the educational process, trends are:

1) formation of a lifelong learning system;

2) creation of a single information space;

3) synthesis of traditional teaching tools and methods with information and communication technologies;

4) active introduction of new teaching tools and methods that are focused on the use of ICTs;

5) creation of a system of advanced training.

Directions and concepts of digital technologies in education. Negative impact of the implementation of information and digital technologies. Artificial intelligence, "machine learning". Distance education. Mobile training. Mixed learning. Mobile educational content. The role and place of digital services in modern education and science. The main directions of future technologies. Organization of pedagogical scientific research through the use of applied programs.

Topic 2. Digitalization as a new reality in Ukraine.

Regulatory framework of Ukraine, draft laws, laws of Ukraine in the field of informatization and digitalization: Sustainable Development Strategy "Ukraine-2020 "(ed. 2015), State Strategy of Regional Development for 2021-2027 (ed. 2019), Law of Ukraine "On Innovation Activity" (ed. 2012), Law of Ukraine "On Priority Directions of Innovation Activity in Ukraine" (ed. 2012), "Digital Agenda 2020 Ukraine" (ed. 2016), "Regulations on the procedure for implementing innovative educational activities" (ed. 2017), National Development Strategy in Ukraine for the period up to 2021 (ed. 2013), "Concepts for the development of the digital economy and society of Ukraine for 2018-2020" (ed. 2020), "Concept of the development of digital competences and approval of the plan of measures for its implementation" (ed. 2021), "Concept of digital Transformation of Education and Science for the period up to 2026" (project 2021), "Description of the Digital competence framework for citizens of Ukraine" (2021), etc.

Digitalization of all spheres of life. The concept of "digital literacy", "digital competence". Digital platform "Diya". Educational series. Test for passing "Digigram" for Ukrainian citizens, teachers.

Challenges, prospects, and trends in the development of digitalization in Ukraine. Opportunities for digital transformation. Information warfare and its components. The danger of digitalization in the 21st century.

Topic 3. Modeling tools for scientific and pedagogical research.

Types and classification of scientific research. Structure and conceptual and categorical apparatus of pedagogical research. Logic of pedagogical research. Selection of effective tools for modeling scientific and pedagogical research. Creating a UDC, author's sign, and anti-plagiarism program.

Topic 4. Scientific and metric databases, open information platforms, and electronic resources for scientific research.

Theory of open electronic resources. Using open electronic resources for pedagogical research. Information and analytical support for scientific research based on electronic open systems.

Create a profile in Google Academy, citation in Google Academy, Orcid.

Modern bibliographic and abstract databases. Scientometric platforms (Scopus, Web of Science, Publons). Using open library and journal systems as a source base for scientometrics and altmetrics.

Topic 5. Protection and security of scientific information on the Internet.

Protection of scientific information in web networks as a problem. Application of scientific research methods based on the principles of academic integrity. Use of anti-plagiarism systems-checks for identifying matches, identities, and similarities in the texts of works on web access in online mode (Unicheck). Information security, tools for protecting personal and professional data. Cybersecurity in scientific activity. Ethics of electronic communication. Network etiquette for forum and chat participants. Critical thinking for evaluating information.

MODULE 2. Practical approaches to using digital services in scientific research.

Topic 1. Opportunities for using Google's digital tools. Using the cloud-service “Google Docs” for processing research results (text documents, spreadsheets, presentations). Cloud storage, access control, and file sharing. Using the Google Docs for processing research results in text format. Using the Google Docs for processing research results in spreadsheet format. Using the Google Docs for processing research results in presentation format. Create Google Sheets, questionnaires, and presentations. Creating Moodle, Kahoot, and Google tests).

Topic 2. Information search tools for scientific research. List of Ukrainian libraries. Resources of the V. I. Vernadsky National Library of Ukraine, V. G. Korolenko Library. Search and order literature. Online order form. Online digital libraries. Electronic catalog of dissertations. Repositories of higher educational institutions. Repository of G. S. Skovoroda KHNPU. Social networks, scientific platforms, scientific groups and societies in the social networks Facebook, Telegram.

Topic 3. Modern means of visual presentation of scientific research results. Rules for creating and designing a poster presentation (Piktochart, Venngage, etc.) Visual.ly, Easel.ly), creating infographics (Canva), creating presentations, screencasts, and podcasts. Using interactive whiteboards (Padlet, Miro). Create interactive worksheets (IRL).

Topic 4. Creating documentation in Word. Features of the “I love PDF” program. Design of literary sources, citation. Design of tables, figures, diagrams, and histograms in scientific research. Creating a list of literary sources. Bibliographic description. National Standard of Ukraine DSTU 8302: 2015 "Information and documentation. Bibliographic reference. General terms and

Conditions". References – transliteration. APA style. Transliteration (in Ukrainian). Transliteration (in Russian).

STRUCTURE OF THE ACADEMIC DISCIPLINE

Topic name	Full-Time Education			External Form of Education		
	Lect.	Pr.	Ind.	Lect.	Pr.	Ind.
MODULE 1. Theoretical foundations of using digital services in scientific research						
Topic 1. Information and digital technologies: terminological apparatus, role and place of digital services in modern science.	2	2	8	2		10
Topic 2. Digitalization as a new reality in Ukraine.	2	2	8	2		12
Topic 3. Modeling tools for scientific and pedagogical research	2	2	8		2	12
Topic 4. Scientific and metric databases, open information platforms and electronic resources for scientific research.		4	8		2	12
Topic 5. Protection and security of scientific information on the Internet.	2	2	8			14
Total for module 1	**8**	**12**	**40**	**4**	**4**	**60**
MODULE 2. Practical approaches to using digital services in scientific research						
Topic 1. Opportunities for using Google's digital tools	4	4	8	2		11
Topic 2. Information search tools for scientific research	2	2	8	2		11
Topic 3. Modern means of visual presentation of scientific research results	2	4	12	2		11

Topic 4. Creating documentation in Word.		2	12		2	11
Total modulo 2.8	**8**	**12**	**40**	**6**	**2**	**44**
Total	**16**	**24**	**80**	**10**	**6**	**104**

CONTENT OF INDEPENDENT WORK

Module 1. Theoretical foundations of using digital services in scientific research

Topic 1. Information and digital technologies: terminology, role and place of digital services in modern science

Self-study questions:

1. Negative impact of the introduction of information and digital technologies.
2. The role and place of digital services in modern education and science.
3. The main directions of future technologies.

Topic 2. **Digitalization as a new reality in Ukraine.**

Self-study questions:

1. The concept of "digital literacy", "digital competence".
2. Digital platform "Diya".
3. Prospects and trends of digitalization development.

Topic 3. Modeling tools for scientific and pedagogical research.

Self-study questions:

1. Types and classification of scientific research**.**
2. Structure and conceptual and categorical apparatus of pedagogical research**.**

Topic 4. Scientific and metric databases, open information platforms and electronic resources for scientific research.

Self-study questions:

1.Information and analytical support for scientific research based on electronic open systems.

2. Using open library and journal systems as a source base for scientometrics and altmetrics.

Topic 5. Protection and security of scientific information on the Internet.

Self-study questions:

1. Using open electronic resources for pedagogical research.

2. Information and analytical support for scientific research based on electronic open systems.

Module 2. Practical approaches to using digital services in scientific research.

Topic 1. Opportunities for using Google's digital tools.

Self-study questions:

1. Using the Google Docs for processing research results in presentation format.

2. Create Google Sheets, questionnaires, and presentations.

Topic 2. Information search tools for scientific research.

Self-study questions:

1. Repositories of higher educational institutions.

2. Online order form.

Topic 3. Modern means of visual presentation of scientific research results.

Self-study questions:

1. Creating and designing a poster presentation (Piktochart, Venngage, Visual.ly, Easel.ly).

Topic 4. Creating documentation in Word.

Self-study questions:

1. Design of literary sources, citation.

2. Design of tables, figures, charts, and histograms.

TASKS FOR INDEPENDENT WORK

№ n/a	Topic	Topic Tasks
1	Information and digital technologies: terminology, role and place of digital services in modern science	Writing an essay "Negative impact of the introduction of information and digital technologies"
		Compiling a dictionary of basic concepts
2	Digitalization as a new reality in Ukraine	Compiling vocabulary of basic concepts
3	Modeling tools for scientific and pedagogical research	Study recommended literature and prepare a presentation on a specific topic
4	Scientific and metric databases, open information platforms and electronic resources for scientific research	Registration in ORCID
5	Protection and security of scientific information on the Internet.	Drawing up a memo (infographic)
6	Opportunities for using Google's digital tools	Creating a Google Sheet
		Creating a Google Test
7	Information search tools for scientific research	Registration in the repository

8	Documentation processing in Word.	Reviewing scientific literature on specific issues

Evaluation criteria

№ n/a	Topic	Number of hours	Forms of control	The maximum number of points
1.	Information and digital technologies: terminology, role and place of digital services in modern science	10	Essay text	3
			Dictionary text	1
2	Digitalization as a new reality in Ukraine	10	Test results	2
			Dictionary text	1
3	Modeling tools for scientific and pedagogical research	10	Written work (synopsis)	3
			Verbal report with presentation	3
4	Scientific and metric databases, open information platforms and electronic resources for scientific research	10	Verbal report, registration screenshots	3
5	Protection and security of scientific information on the Internet.	8	Memo (infographic)	2
6	Opportunities for using Google Digital Tools Google's digital tools	8	Google Sheet	2
			Google Test	2

7	Information search tools for scientific research	8	Scan (screen) of registration results	2
8	Modern means of visual presentation of scientific research results	8	Poster presentation	3
9	Creating documentation in Word.	8	Abstract/Report	3
	Total	80		30

FORMS AND TYPES OF INDEPENDENT WORK

The main types of independent work of applicants are the following:

- study of current material based on notes and recommended literature;
- performing individual tasks.
- preparation for seminars.

The main forms of independent and individual work are: :

- oral response.
– written work (synopsis, essay);
–abstract;
– presentation;
– poster presentation;
- infographics.
– compiling a dictionary of basic concepts.

A written work or abstract is a systematically, logically linked entry that combines a plan, abstract, or both types of abstracts. Entries should be brief and contain not only the main points and conclusions, but they should be supplemented with examples, illustrations, proofs, facts, because what, at first glance, seems unimportant, secondary, may eventually become significant.

An essay (from the French essai "attempt, trial, essay") is a literary genre of prose writing of small volume and free composition, expressing individual impressions and considerations on a specific occasion or question and obviously not claiming to be an exhaustive answer.

The essay consists of an introduction, a main part, and conclusions. The introduction contains the rationale for the chosen problem, the problematic task, and the answer to the question posed. Throughout the essay, it is necessary to emphasize the connection of the presented facts with the thesis.

The main part of the essay is designed to convince the reader. To do this, the author of the essay must use weighty arguments. First, you should outline the main ideas and facts that will support examples of these ideas. * The essay must contain a voiced ending. At the same time, it does not matter at all whether the end is a statement of something, a question, or rather incomplete reflections. The use of aphorisms and quotations is considered a good way to complete the essay

The author independently decides how many theses he needs to prove. The number of arguments should not be less than 2-3. A large number overloads research, and a smaller number looks frivolous for scientific work.

Requirements for the structure and content of the essay

1. Volume – 1-2 pages of text (120-200 words).

2. The essay should be perceived as a complete work, the idea of which is strict and clear.

3. Each paragraph of the essay reveals a single point.

4. It is necessary to write briefly and clearly. The essay should not contain anything superfluous, it should only contain information necessary to reveal the idea of the essay and the author's own position.

5. The essay should have a clear compositional structure and be logical in structure. In an essay, as in any work, an internal logic should be traced, which is determined, on the one hand, by the author's approach to the issue under discussion, and on the other – by the question itself. It is necessary to avoid sudden jumps from one idea to another, the idea should be revealed consistently.

6. The essay should show that its author knows and meaningfully applies theoretical concepts, terms, generalizations, and ideas.

7. The essay should contain a convincing argumentation of the problem raised.

Abstract - is a written summary of scientific literature on the topic, teaching, content of the book, etc. It also provides a report on this topic, including an overview of scientific and other sources on the selected topic or a presentation of the content of scientific work.

It is important to note that the abstract should not only highlight the relevant information, but also show your attitude to it. The abstract demonstrates the erudition of the researcher, his ability to independently analyze, systematize, classify and summarize essential scientific information.

The subject of the abstract should be correctly formulated; the title of the abstract should clearly define the scope of consideration of the topic; the title should reflect the content (i.e., the content of the abstract should reveal the topic).

The content should consist of: introduction, main part, conclusions, list of sources used.

The introduction contains a brief justification of the relevance of the topic of the abstract, the purpose and tasks that need to be solved to achieve the goal, a brief review of the literature, an analysis of various views and trends.

The main part must have at least ten pages. This part should also contain the material selected for consideration of the problem, distributed in paragraphs; reveals the methods that are used to prove the results; contains the author's personal opinion and independently formulated conclusions based on the facts presented.

The conclusion logically combines the conclusions of the paragraphs (answers and tasks set in the introduction that follow from the main part, understanding the main part of the abstract; draws attention to the fulfillment of the goals and tasks set in the introduction.

The list of sources used contains the literature used alphabetically, indicating the author, title, place of publication, publisher's name, and year (i.e., in compliance with the requirements for the list of literary sources).

The abstract should be an independent, completed work that reflects the author's research interests, knowledge, skills, and abilities. The main goal of the abstract work is to consolidate, deepen, expand, systematize theoretical knowledge and develop skills for self-solution of academic discipline issues and work with special literature.

A presentation - is a set of slide pictures on a specific topic that are stored in a special file format. Each slide can contain any text, graphic, video information, animation, or stereo sound, either synthesized or recorded from a microphone. According to the structure of the presentation, it is divided into linear and branched ones. Linear presentations are created for consistent presentation of the material using multimedia tools. They should contain only the main points of the message that help you understand its meaning, and illustrations. Presentations that can be used during the generalization and systematization of knowledge and to determine the level of academic achievement of students, due to the hypertext link, most often have a branched structure.

Presentations are created using programs:

- ❖ PowerPoint
- ❖ Canva - https://www.canva.com/
- ❖ Google presentation – docs.google.com/presentation
- ❖ Prezi – https://prezi.com/trial-start/
- ❖ Genially – https://genial.ly/

Poster presentations are one of the most effective forms of rapid communication of scientific data using visibility.

Poster presentation is a presentation of a scientific message, it is a way of presenting the results of work in a limited space by combining text and illustrative design of certain information.

A poster report consists of a poster (poster, stand) that contains the materials of a scientific study and an oral report-commentary.

The structure of the poster includes the following mandatory elements: title, abstract (summary of the entire work), material, methods, results of implementation; conclusions; literature; acknowledgements.

Verbal communication should be delivered within the time suggested by the event organizers (usually 3-5 minutes).

A poster report contains 50% of the text, 50% of the text illustrations, infographics, etc. Suggestions are simple, illustrative material is author's, if borrowed, you must indicate the source of borrowing.

Example of resources where you can use tips for creating a poster report:

- Piktochart - http://piktochart.com/
- Venngage - https://venngage.com/
- Visual.ly - http://visual.ly/
- Easel.ly - http://www.easel.ly/
- Spritesapp is a simple and intuitive ad builder. Projects in Sprites are easily scalable and look good on mobile devices.

An infographic is a collection of images, diagrams, and minimal text that makes an overview of a topic easy to understand. Infographics combine various examples of information design (maps, diagrams, flowcharts, mind-map, etc.).

There is a distinction between static and dynamic infographics, which differ only in the complexity of the project, the number of frames or interactive elements. Static infographics combine images with text without animation elements; dynamic infographics include animated elements.

Example of resources where you can create an infographic:

- Canva - https://www.canva.com/
- Genially – https://genial.ly/
- Piktochart - http://piktochart.com/
- Visual.ly - http://visual.ly/

CRITERIA FOR EVALUATING INDEPENDENT WORK

Criteria for evaluating independent work	Number of points
Written work	
Completeness of disclosure of question	1
Integrity, systematicity, logical sequence of presentation	1
Teaching style problems	1
Maximum number of points	3
Presentation	
Clear and logical presentation of the material	1
Completeness of disclosure of the submitted topic	1
Effective presentation of information on a slide, animation effects, presentation style and design	1
Maximum number of points	3
Poster presentation	
Poster presentation Integrity and consistency of the presented material	1
Content, reasonableness, and reasonableness of the report	1
Style and design décor of stand	1
Maximum number of points	3
Infographics	
Expediency, content, and logic of information presentation	1
Style and design in the form of work	1
Maximum number of points	2
Dictionary of terms	
Completeness of the presented scientific categories and terms.	0.5
correct interpretation of scientific terminology.	0.5
maximum number of points	1

GLOSSARY

Copyright-the author's rights related to the creation and use of works of science, literature, and art. Source: Law of Ukraine "On Copyright and Related Rights". Access mode: https://zakon.rada.gov.ua/laws/show/3792-12#Text

Relevance of the topic – modernity, relevance, importance of something at the moment and in this situation to solve this problem.

Approbation - approval; discussion of scientific provisions and conclusions at scientific conferences, symposia, meetings, etc. Source: http://politics.ellib.org.ua/encyclopedia-term-6183.html

Databases are an organized structure designed to store, modify, and process interconnected information, mostly large volumes. Source: http://apeps.kpi.ua/shco-take-basa-danykh#:~:text=%D0%91%D0%B0%D0%B7%D0%B0%20%D0%B4%D0%B0%D0%BD%D0%B8%D1%85%20(%D0%91%D0%94)%20%E2%80%94%20%D1%86%D0%B5,%2C%20%D0%BF%D0%BE%D1%80%D1%82%D0%B0%D0%BB%2C%20%D0%BA%D0%BE%D1%80%D0%BF%D0%BE%D1%80%D0%B0%D1%82%D0%B8%D0%B2%D0%BD%D0%B8%D0%B9%20%D1%81%D0%B0%D0%B9%D1%82).

Bibliographic data, bibliographic information-specific information about a document (its author, title, place and year of publication, number of pages, content, etc.) used in compiling a bibliographic description of the document and in other forms of bibliographic characteristics. Source: http://politics.ellib.org.ua/encyclopedia-term-6194.html

Bibliographic reference – a set of bibliographic information about a document cited or mentioned in the text of a scientific or educational work. Source: https://kubg.edu.ua/images/stories/podii/2017/06_21_posylannia/dstu_8302.pdf

Conclusions – provisions submitted by the researcher for discussion by the scientific community, synthesis of accumulated scientific information in the main part, consistent, logical, clear presentation of the main results. Source: http://lyceum241.edukit.kiev.ua/ntl_noosfera/noosfera_slovnik/

Introduction - the structural part of the main text, which is the initial chapter. It aims to orient the reader in the further presentation, to prepare for assimilation of the main text. Source: https://studfile.net/preview/5189215/page:12/

Research hypothesis - is a scientific prediction of its results. Source: https://uk.wikipedia.org/wiki/%D0%93%D1%96%D0%BF%D0%BE%D1%82%D0%B5%D0%B7%D0%B0

Digitalization is the translation of information into digital form. Source: https://edin.ua/slovo-2019-roku-didzhitalizaciya/

Distance learning – training in which subjects of learning interact in conditions of spatial remoteness using Internet tools. Source: Lozova V.I., Trotsko G. V. (2002.) Teoretichny osnovy vyhovannya i navchannya: Navchalniy posibnuk [Theoretical foundations of education and training]. Khark. Derzh. ped. un-t im. G. S. Skovoroda. Kh.: OVS, 400 s.

Research is the process of studying a certain object (object or phenomenon) using scientific methods, which aims to establish the laws of its occurrence, development and transformation in the interests of rational use in the practical activities of people. Source: https://uk.wikipedia.org/wiki/%D0%9D%D0%B0%D1%83%D0%BA%D0%BE%D0%B2%D0%B5_%D0%B4%D0%BE%D1%81%D0%BB%D1%96%D0%B4%D0%B6%D0%B5%D0%BD%D0%BD%D1%8F

Electronic document – a document where information is recorded in the form of electronic data, including mandatory document details. An electronic document can be created, transmitted, stored, and converted electronically into a visual form. The visual form of presentation of an electronic document is the display of the data it contains by electronic means or on paper in a form suitable for receiving its content. Source: https://zakon.rada.gov.ua/laws/show/851-15#Text://zakon.rada.gov.ua/laws/show/851-15#Text

Electronic resources – educational, scientific, informational, reference materials and tools developed in electronic form and presented on any type of media or placed in computer networks, which are reproduced using electronic digital

technical means. Source: https://uk.wikipedia.org/wiki/%D0%95%D0%BB%D0%B5%D0%BA%D1%82%D1%80%D0%BE%D0%BD%D0%BD%D0%B8%D0%B9_%D0%BE%D1%81%D0%B2%D1%96%D1%82%D0%BD%D1%96%D0%B9_%D1%80%D0%B5%D1%81%D1%83%D1%80%D1%81

Research objectives – specification of the overall target, goals, taking into account the subject of research. Source: S. O. Sysoeva, T. E. Kristopchuk. (2013). Metodologiya naukovo-pedagogichnyh doslidzhen`: Pidruchnyk [Methodology of scientific and pedagogical research: textbook] Rivne: Volinsky oberegy, 360 s. Access mode: https://core.ac.uk/download/pdf/162001669.pdf

Mixed learning is a purposeful process of transferring and assimilating knowledge, skills, abilities and methods of human cognitive activity, based on a combination of traditional, electronic, distance and mobile learning technologies, with applicants' self-control over time, place, routes and learning rate. A source: Sobchenko T. M. Didakticheskaya (2021). Sistema zmishanogo navchanya studentiv filologichnyh spetsialnostey v zakladah vyshoi osvity [Didactic system of mixed education of students of philological specialties in institutions of higher education]: dis. ... d-ra ped. nauk [13.00.09, 13 .Kharkiv ; Poltava: [B. V.], 575 s.

Interactivity– the ability to interact or be in a conversation mode, dialogue with someone (computer, interlocutor). Source: Sikorskaya L. V. (2013) Interaktyvne navchyalne seredovuche yak chinnyk optymizacii navchyannia inozemnoi movy.[interactive learning environment as a factor of optimization of foreign language teaching.] Sychasni informaciny technologiy ta innovaciyny metoduky navchyannya y pidgotovci fahivciv: metodologiya, teoriya, dosvid, problem. Vyp 35. s. 445-450. Access mode: http://nbuv.gov.ua/j-pdf/Sitimn_2013_35_95.pdf

Informatization of education – creation and use of information technologies to improve the efficiency of activities carried out inthe education system. A source: Zavalnaya I. (2017) Informatyzaciya osvity yak chinnyk rozvutky informaciynogo syspilstva. [Informatization of education as a factor of information society

development.] Visnyk Nacionalnogo Universutety “Lvivska Politechnika”. Seriya: Uruduchny Nauky: zbirnyk naukovuh pratz. Lviv: Vudavnutstvo Lvivskoy Politehniky, no. 865, S. 211-214.

Information and digital technologies – a system of methods, processes and methods of using computer technology and communication systems for creating, collecting, transmitting, searching, processing and distributing information. Source: https://uk.wikipedia.org/wiki/%D0%86%D0%BD%D1%84%D0%BE%D1%80%D0%BC%D0%B0%D1%86%D1%96%D0%B9%D0%BD%D1%96_%D1%82%D0%B5%D1%85%D0%BD%D0%BE%D0%BB%D0%BE%D0%B3%D1%96%D1%97

Cybersecurity is the protection of vital interests of a person and citizen, society and the state during the use of cyberspace, which ensures the sustainable development of the information society and the digital communication environment, timely identification, prevention and neutralization of real and potential threats to the national security of Ukraine in cyberspace. Source: Law of Ukraine "On the basic principles of ensuring cybersecurity in Ukraine". Access mode: https://zakon.rada.gov.ua/laws/show/2163-19#Text

The aim of the research is a comprehensive and reliable study of an object, process or phenomenon, their structure, relationships and relationships based on scientific principles and methods of cognition, as well as obtaining and implementing useful results. Source: Zolotukhina S. T., Kin O. M., Tkacheva N. O. (2019) Metodychni rekomendatsii do samostiinoi roboty z navchalnoi dystsypliny «Teoretychni osnovy dydaktychnykh doslidzhen» dlia zdobuvachiv osvitnoho stupenia «Doktor filosofii». [Methodological recommendations for independent work on the academic discipline "theoretical foundations of didactic research" for applicants for the educational degree "Doctor of Philosophy".] Kh.: KHNPU imeny G. S. Skovorody, 26 s.

Method – a method of achieving a goal, a set of techniques and operations for theoretical and practical development of reality, a method of organized human activity in a certain way. A source: Lozova V.I., Trotsko G. V. (2002) Teoretychni

osnovy vykhovannia i navchannia: Navchalnyi posibnyk. [Theoretical foundations of education and training]. Khark. derzh. ped. un-t im. H.S. Skovorody. Kh: OVS, 400 s.

Mobile learning is the use of mobile technology both separately and together with other information and communication technologies to organize the educational process. Source: https://uk.wikipedia.org/wiki/%D0%9C%D0%BE%D0%B1%D1%96%D0%BB%D1%8C%D0%BD%D0%B5_%D0%BD%D0%B0%D0%B2%D1%87%D0%B0%D0%BD%D0%BD%D1%8F

A scientific problem is a specific question that arises when the available knowledge is not sufficient to solve a specific problem, and the method by which known knowledge can be obtained is unknown. Source: S. O. Sysoeva, T. E. Kristopchuk. (2013). Metodologiya naukovo-pedagogichnyh doslidzhen`: Pidruchnyk [Methodology of scientific and pedagogical research: textbook] Rivne: Volinsky oberegy, 360 s.

Scientific work – research aimed at obtaining a scientific result. Source: S. O. Sysoeva, T. E. Kristopchuk. (2013). Metodologiya naukovo-pedagogichnyh doslidzhen`: Pidruchnyk [Methodology of scientific and pedagogical research: textbook] Rivne: Volinsky oberegy, 360 s.

Scientometric databases – a bibliographic and abstract database with tools for tracking the citation rate of articles published in scientific publications. Source: https://il.kubg.edu.ua/informatsiya/diialnist/korysni-resursy-dlia-naukovykh-doslidzhen/749-naukometriia.html

Account (s) - a set of information provided about the user, the user's funds and rights in relation to the multi-user system. The account usually contains information necessary to identify the user when connecting to the system, as well as information for authorization and accounting. This is the user name and password. The account can also contain the user's photo and additional personal data (first name, last name, patronymic, pseudonym, gender, age, date of birth, address, e-mail, home address, phone number, etc.). The categories of personal data are determined

by the system administrators. Source: https://uk.wikipedia.org/wiki/%D0%9E%D0%B1%D0%BB%D1%96%D0%BA%D0%BE%D0%B2%D0%B8%D0%B9_%D0%B7%D0%B0%D0%BF%D0%B8%D1%81

A research problem is a complex theoretical or practical issue that requires study and resolution. Source: S. O. Sysoeva, T. E. Kristopchuk. (2013). Metodologiya naukovo-pedagogichnyh doslidzhen`: Pidruchnyk [Methodology of scientific and pedagogical research: textbook] Rivne: Volinsky oberegy, 360 s.

A social network is an interactive multi-user website that provides an automated social environment that allows users who share common interests to actively communicate. Source: Arkhipova T. L., Osipova N. V., Lvov M. S. (2015) Informatsiini tekhnolohii v osviti: Zb. nauk. pr. [Information technologies in education: Collection of Sciences]. Issue 22. Kherson: KhSU Publ., 2015, S. 7-18.

Digital competence – confident, critical and creative use of information and communication technologies for work, employment, training, leisure, and participation in social activities. Source: Decree of the Cabinet of Ministers of Ukraine "On approval of the Concept for the Development of digital Competencies in Ukrainian Society and approval of the action plan for its implementation". Access mode: https://thedigital.gov.ua/storage/uploads/files/normative_document/2020/11/%D0%9F%D1%80%D0%BE%D1%94%D0%BA%D1%82_%D0%A0%D0%BE%D0%B7%D0%BF%D0%BE%D1%80%D1%8F%D0%B4%D0%B6%D0%B5%D0%BD%D1%8F_%D0%9A%D0%9C%D0%A3_%D0%9A%D0%9E%D0%9D%D0%A6%D0%95%D0%9F%D0%A6%D0%86%D0%AF.pdf

Digitalization – is the introduction of digital technologies in all spheres of life. Source: https://strategy.uifuture.org/kraina-z-rozvinutoyu-cifrovoyu-ekonomikoyu.html

Digital content - content and information content of a particular site, in particular texts, images, music, and videos posted on an information resource. Source: Milash V. (2017) Poniattia ta pryroda tsyfrovoho kontentu v mezhakh

hospodarskoho oborotu [The concept and nature of digital content within domestic turnover.] Pidpryiemnytstvo, hospodarstvo i pravo. № 12. s. 102-106.

Digital education-combining various components and the most modern technologies through the use of digital platforms, the introduction of progressive forms of organization of the educational process and active teaching methods. Source: Decree of the Cabinet of Ministers of Ukraine "On approval of the Concept for the Development of digital Competencies in Ukrainian Society and approval of the action plan for its implementation". Access mode: https://thedigital.gov.ua/storage/uploads/files/normative_document/2020/11/%D0%9F%D1%80%D0%BE%D1%94%D0%BA%D1%82_%D0%A0%D0%BE%D0%B7%D0%BF%D0%BE%D1%80%D1%8F%D0%B4%D0%B6%D0%B5%D0%BD%D1%8F_%D0%9A%D0%9C%D0%A3_%D0%9A%D0%9E%D0%9D%D0%A6%D0%95%D0%9F%D0%A6%D0%86%D0%AF.pdf

Digital education – is education that mainly functions through digital technologies, i.e. electronic transactions that are implemented through the use of the Internet. Source: Kraus K. M. (February 27, 2018) Imperatyvy formuvannia tsyfrovoi osvity v Ukraini. [Imperatives of digital education formation in Ukraine.] Upravlinnia sotsialno-ekonomichnymy transformatsiiamy u suchasnomu misti: materialy Vseukr. nauk.-prakt. konfer. (27 liutoho 2018). – Kyiv: KUBH, 2018. – S. 49-51.

Digital educational resources are educational, scientific, informational, and reference data that are presented on the Internet (storage facilities, digital services, and so on). Digital educational resources combine a wide range of pedagogical software tools, electronic textbooks, electronic texts, computer models, simulators, didactic games and simulators that differ in their intended purpose, level of complexity, form of technical execution and types of interface. Source: https://sites.google.com/site/cifroviosvitniresursi/

The digital educational environment of an educational institution is a pedagogical subsystem for supporting and implementing educational activities in an educational institution, which is based on modern pedagogical and digital

technologies that integrate relevant digital educational services and are designed to adapt the modern educational process to the conditions of a digital society. Source: Kartashova L. A., Yurzhenko V. V., Guralyuk A. G., Lipskaya L. V., Gumennaya L. S., Zueva A. B., Shupik I. M., Rostoka M. L., Shevchenko V. L. Za nauk. red. Luzana P. G. (2017) Informatsiino-osvitnie seredovyshche profesiino-tekhnichnykh navchalnykh zakladiv: posibnyk [Information and educational environment of professional and technical educational institutions: textbook.] Kyiv: IPTO NAPN, 124 s. Rezhym dostupu:
http:/lib.iitta.gov.ua/709621/1/Posibnyk_IOS_PTNZ_novyi.pdf

Навчальне видання

Собченко Т.М.

Власенко Я. В.

Методичні рекомендації до самостійної роботи для здобувачів (іноземних громадян) третього (освітньо-наукового) рівня вищої освіти до організації самостійної навчальної і науково-дослідної роботи

Відповідальна за випуск: Собченко Т.М.

Відповідальність за дотримання вимог академічної доброчесності несуть автори