

UDC 001.82:378.046-021.68

DOI <https://doi.org/10.31470/2415-3729-2023-17-28-51>

Development and Optimization of Skills in Searching, Processing and Analysing Information from Various Sources in the future Doctors of Philosophy (PhD) training: from Educational Requirements to Scientific Improvement

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Розвиток та оптимізація навичок пошуку, обробки та аналізу інформації з різних джерел у підготовці майбутніх докторів філософії (PhD): від освітніх вимог до наукового вдосконалення

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Abstract

The study is devoted to the issue of development and optimization of the skills of searching, processing and analysing information from various sources in the training of future doctors of philosophy (PhD). **The purpose of the article** is to justify the importance and relevance of the development and optimization of the skills of information searching, processing and analysing for doctors of philosophy (PhD) on specialty 015 Professional education (by specialization) at different stages of their academic and scientific career. **Methods.** To achieve the goal, the authors used the following methods: analysis, synthesis of regulative and scientific and pedagogical sources, generalization, observation, own scientific and pedagogical experience. **The results.** The relevance of the problem of developing and optimizing the skills of information searching from various sources, its processing and analysing in the training of future doctors of philosophy (PhD)

has been proven. Modern research in the field of psychology and pedagogy was analysed (John Sweller – the study of cognitive load and thinking processes, on the ability of students to process and analyse information; Richard Mayer – the study of cognitive aspects of education, including methods of presenting information and its perception by students; Carol Kuhlthau – information processes in education and development of information literacy). Attention is focused on the possibilities of researching the analysed topic through the lens of the Carol Kuhlthau 's Information Search Process (ISP) Model. The essence of the notion of «informational and analytical competence of a post-graduate student (future doctor of philosophy (PhD))» has been determined. **Conclusions.** It is noted that the importance of informational and analytical competence is that it allows effective performance of research tasks: scientific intelligence (finding and selecting relevant information helps a post-graduate student to determine the scientific validity of its research and find out whether similar work has been carried out before); evaluation of information (the ability to critically evaluate information helps a post-graduate student to determine its reliability and relevance, which are key factors in making scientific decisions); analysis and interpretation (the ability to analyse and interpret information helps a post-graduate student to identify patterns and connections between various aspects of the research); scientific writing (scientific writing skills allow a post-graduate student to create scientific papers and a dissertation that meet the standards of the scientific community); effective communication of results (the ability to present the research and results clearly and convincingly helps a post-graduate student communicate with colleagues, receive funding and disseminate findings); ethical aspect (adherence to ethical standards in the use of information and in conducting research, academic culture and academic integrity is extremely

important for scientific activity). The development of criteria, their content and the levels of formation of the informational and analytical competence of post-graduate students (future PhDs) are defined as the prospects for further research.

Keywords: Doctor of Philosophy (PhD), ability, informational and analytical competence, competence, Educational and Scientific Program (ESP) «Professional Education».

References

1. ONP «Profesiina osvita» za spetsialnistiu 015 Profesiina osvita (za spetsializatsiiamy) (2020) [ESP «Vocational education» by specialty 015 Vocational education (by specializations)]. *Universytet imeni Alfreda Nobelia*. Retrieved from https://duan.edu.ua/images/head/Science/UA/PhD_and_Postdoc_studies/015/prof_osv_2020-prog.pdf [in Ukrainian].
2. ONP «Profesiina osvita» za spetsialnistiu 015 Profesiina osvita (za spetsializatsiiamy) (2023). [ESP «Vocational education» by specialty 015 Vocational education (by specializations)]. *Universytet imeni Alfreda Nobelia*. Retrieved from https://duan.edu.ua/images/head/Quality_Edu/OPP_drafts/2023-2024/Final/prof_osv_2023-prog.pdf [in Ukrainian].
3. ONP «Profesiina osvita» za spetsialnistiu 015 Profesiina osvita (za spetsializatsiiamy) (2020). [ESP «Vocational education» by specialty 015 Vocational education (by specializations)]. *Kharkivskiy natsionalnyi pedahohichniy universytet imeni H. S. Skovorody*. Retrieved from http://smc.hnpu.edu.ua/files/Osv%D1%96tn%D1%96_programi/Osvitno_naykovi_programu/2020/Profesiina_osvita.pdf [in Ukrainian].
4. ONP «Profesiina osvita» za spetsialnistiu 015 Profesiina osvita (za spetsializatsiiamy) (2023). [ESP «Vocational education» by specialty 015 Vocational education (by

specializations)]. *Kharkivskyi natsionalnyi pedahohichnyi universytet imeni H. S. Skovorody*. Retrieved from http://smc.hnpu.edu.ua/files/Osv%D1%96tn%D1%96_programi/Osvitno_naykovi_programu/2023/Profesiina_osvita.pdf [in Ukrainian].

5. ONP «Profesiina osvita (za spetsializatsiiamy)» za spetsialnistiu 015 Profesiina osvita (za spetsializatsiiamy) (2021). [ESP «Vocational education (by specializations)» by specialty 015 Vocational education (by specializations)]. *Mukachivskyi derzhavnyi universytet*. Retrieved from https://msu.edu.ua/wp-content/uploads/2021/03/%D0%9E%D0%9D%D0%9F_%D0%9F%D1%80%D0%BE%D1%84%D0%B5%D1%81%D1%96%D0%B9%D0%BD%D0%B0-%D0%BE%D1%81%D0%B2%D1%96%D1%82%D0%B0-%D0%BF%D1%80%D0%BE%D1%94%D0%BA%D1%82-21-%D0%B4%D0%BE%D0%BA%D1%82%D0%BE%D1%80-%D1%84%D1%96%D0%BB%D0%BE%D1%81%D0%BE%D1%84%D1%96%D1%97.pdf [in Ukrainian].

6. ONP «Profesiina osvita» iz spetsialnosti 015 «Profesiina osvita» (2022). [ESP «Vocational education» by specialty 015 Vocational education]. *Natsionalnyi universytet bioresursiv i pryrodokorystuvannia Ukrainy*. Retrieved from https://nubip.edu.ua/sites/default/files/u356/onp_2022.pdf [in Ukrainian].

7. Paul A. Kirschner, John Sweller & Richard E. Clark (2006). Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching. *Educational Psychologist*, 41:2, 75-86, DOI: https://doi.org/10.1207/s15326985ep4102_1 [in Ukrainian].

8. John Sweller (1988). Cognitive Load During Problem Solving: Effects on Learning. *Cognitive Science*, 12(2), 257-285, DOI: https://doi.org/10.1207/s15516709cog1202_4.

9. Richard E. Mayer (2009). *Multimedia Learning*. University of California, Santa Barbara. DOI: <https://doi.org/10.1017/CBO9780511811678>

10. Ruth C. Clark, Richard E. Mayer & Will Thalheimer (2003). E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning. *Performance Improvement*, 42(5), 41-43. DOI: <https://doi.org/10.1002/pfi.4930420510>.

11. Carol C. Kuhlthau (2008). From Information to Meaning: Confronting Challenges of the Twenty-first Century. *Libri*, 58(2), 66-73. DOI: <https://doi.org/10.1515/libr.2008.008>.

12. Carol C. Kuhlthau (1991). Inside the search process: Information seeking from the user's perspective. *Journal of the American Society for Information Science*, 42(5), 361-371. DOI: [https://doi.org/10.1002/\(SICI\)1097-4571\(199106\)42:5<361::AID-ASI6>3.0.CO;2-%23](https://doi.org/10.1002/(SICI)1097-4571(199106)42:5<361::AID-ASI6>3.0.CO;2-%23).

13. Paul A. Kirschner, John Sweller & Richard E. Clark (2006). Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching. *Educational Psychologist*, 41:2, 75-86, DOI: https://doi.org/10.1207/s15326985ep4102_1.

14. John Sweller (1988). Cognitive Load During Problem Solving: Effects on Learning. *Cognitive Science*, 12(2), 257-285, DOI: https://doi.org/10.1207/s15516709cog1202_4.

15. Richard E. Mayer (2009). *Multimedia Learning*. University of California, Santa Barbara. DOI: <https://doi.org/10.1017/CBO9780511811678>

16. Ruth C. Clark, Richard E. Mayer & Will Thalheimer (2003). E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning. *Performance Improvement*, 42(5), 41-43. DOI: <https://doi.org/10.1002/pfi.4930420510>.

17. Carol C. Kuhlthau (2008). From Information to Meaning: Confronting Challenges of the Twenty-first Century. *Libri*, 58(2), 66-73. DOI: <https://doi.org/10.1515/libr.2008.008>.

18. Carol C. Kuhlthau (1991). Inside the search process: Information seeking from the user's perspective. *Journal of the American Society for Information Science*, 42(5), 361-371. DOI: [https://doi.org/10.1002/\(SICI\)1097-4571\(199106\)42:5<361::AID-ASI6>3.0.CO;2-%23](https://doi.org/10.1002/(SICI)1097-4571(199106)42:5<361::AID-ASI6>3.0.CO;2-%23).

Introduction

Problem statement. In today's information society, the amount of available information from various sources, including scientific publications, databases, social networks, and others, is growing. The skills of searching, processing and analysing information become important, modern scientists must work effectively with the selection, filtering and analysis of information to achieve scientific goals. Educational and Scientific Programs (ESP) in the specialty 015 «Professional education (by specialization)» are multidisciplinary, and the research of modern scientific problems in this direction requires an interdisciplinary approach. Scientists need to be competent in searching, processing and analysing information from various sources for effective using knowledge from different fields. Therefore, one of the leading competencies necessary for a future scientist/researcher is the ability to search, process and analyse information from various sources.

The analysis of accredited educational and scientific programs of the third (educational and scientific) level of higher education, doctor of philosophy (PhD), in the specialty 015 Professional education shows that different interpretations of this competence are available in all the programs we studied.

1. *Alfred Nobel University*, ESP «Professional Education» specialty 015 Professional Education (by specializations), 2020 (GC* is General Competence):

- GC*-1. Ability to think abstractly, search and critically analyse information, generate new ideas;
- GC-6. Ability to search, process, analyse and contextualize a significant amount of scientific information from different sources, interpret the results of scientific research.

In the ESP, updated in 2023, the investigated competency acquired the interpretation of GC-5 «Ability to search, process and analyse information from various sources», and GC-1 is presented in the following version: «Ability to abstract thinking, analysis and synthesis».

2. *Kharkiv National Pedagogical University named after H.S. Skovoroda*, ESP «Professional Education» in specialty 015 Professional Education (by specializations), 2020:

- GC 3. Ability to abstract thinking, analysis and synthesis, rational search, processing, analysis and critical evaluation of information from various sources.

The competence numbering and content has remained relevant for the ESP of 2023.

3. *Mukachevo State University*, ESP «Professional education (by specializations)» on specialty 015 Professional education (by specializations), 2021:

- SC* 02. Readiness for scientific searching, processing and analysis of information from various sources, mastery of methods of conducting pedagogical research, formation of personally significant qualities of the researcher.

This competence has not undergone any changes in the 2023 version of the ESP. The difference between this scientific program and other analyzed programs is that the investigated competence is not classified as general, but as special (specialist) competences (SC* is Special Competence).

4. *The National University of Life and Environmental Sciences of Ukraine*, ESP «Professional Education» in specialty 015 «Professional Education», 2022:

– GC01. Ability to search, process and analyse information from educational and scientific sources in national and foreign languages.

Therefore, in the modern scientific environment, access to information is a very large resource; the skills of searching, processing and analysing information are decisive for a successful scientific career and the achievement of scientific goals. They help scientists to be efficient, innovative and competitive in the modern scientific environment.

The purpose of the article is to justify the importance and relevance of the development and optimization of the skills of information searching, processing and analysing for doctors of philosophy (PhD) in specialty 015 Professional education (by specialization) at different stages of their academic and scientific career.

Research methods

In the process of a scientific search the results of which are analysed in this article, the normative documents, scientific publications on the research problem were considered, the current educational and scientific programs of the third level of higher education, the Doctor of Philosophy (PhD) degree, in the specialty 015 Vocational education were analysed. The existing practical developments and own pedagogical experience regarding the development and optimization of the skills of information searching from various sources, processing and analysing it were summarized.

Results and their discussion

The scientific study of the influence of the ability to search, process and analyse information on the successful writing of a doctoral dissertation is part of the field of information science, education, and psychology. This topic has been studied to one degree or another by many modern scientists and researchers in

the specified fields. In particular, the following foreign scientists made a significant contribution to the study of this problem:

John Sweller studied the issues of cognitive load and thought processes that can affect students' ability to process and analyse information;

Richard Mayer studied the cognitive aspects of learning, including ways of information presentation and perception by applicants for education;

John Hattie conducted a meta-analysis of research on education and the determining factors impacting on studying, including information skills;

Carol Kuhlthau studies information processes in education and the development of information literacy;

Allison Head studies the impact of students' information behavior patterns on their academic performance;

Barbara Fister specializes in the role of libraries and information literacy in academic learning.

The work of some scientists should be considered in more detail within the framework of the investigated problem.

Dr. John Sweller is a well-known contemporary Australian psychologist who has made significant contributions to the understanding of cognitive processes in learning. One of his important contributions is the development of the theory of «cognitive load», which has a direct impact on the ability to search, process and analyse information.

John Sweller's theory of cognitive load asserts that the limited capacity of «working memory» (the part of memory where information is temporarily stored and processed) limits the possibility of generating new material and solving tasks. In other words, when working memory is overcrowded, learning becomes less efficient (Sweller, 1988). His research suggests that learning can be more effective if the material is presented to learners in a

way that minimizes the load on working memory. For example, he recommends using «problem-based learning», when learners are given the opportunity to think and analyse information actively, instead of passively receiving facts (Kirschner, Sweller & Clark, 2006).

Although John Sweller himself did not focus directly on the ability to search and analyse information, however, his research points to the importance of forms of information presentation and learning methods in order to ensure optimal loading into working memory. In other words, if students are given too much information at once, it may be more difficult for them to absorb and analyse it.

John Sweller's research has opened up new horizons in the field of learning psychology and learning methods, designed to improve learning effectiveness and improve students' ability to absorb and analyse information. They can be used in the development of strategies for training future PhDs and improving the skills of searching and analysing scientific information.

Based on the analysis of John Sweller's research, we have developed recommendations that can increase the level of information and analytical competence of students of educational and scientific programs of the third (educational and scientific) level of higher education – Doctor of Philosophy (PhD) in the specialty 015 Professional education:

- *appropriate use of information resources*: the ability to find and analyse information from various sources quickly and effectively can improve the quality of the literature review and working material for the dissertation;

- *optimization of educational methods*: John Sweller's research encourages the development of educational methods that minimize the load on students' working memory. This can be useful while preparing for the defence of a doctoral dissertation,

when it is important to optimize the process of learning and studying a large amount of information;

- *strategies for information creating and analysing*: the postgraduate's ability to choose strategies for defencing and analysing information can help to optimize time and resources when writing a dissertation. For example, using previous research and expert opinion for analysis may be more effective than reporting analysis of each source;

- *self-regulation and planning*: the ability to self-regulate, plan and organize the work process can greatly facilitate the writing of a doctoral dissertation, after which it allows postgraduates to manage their efforts and resources effectively.

Overall, John Sweller's research provide a scientific ground for understanding how information processing abilities affect learning and can be applied in the context of doctoral dissertation writing. Understanding these concepts can help postgraduates to optimize their learning process and achieve greater success in research and dissertation writing.

Dr. Richard Mayer is a well-known American researcher in the field of educational psychology, who focuses on the study of cognitive processes and learning technologies, in particular, on the impact of multimedia tools on the assimilation of information. Richard Mayer's primary research concerns multimedia learning theory and cognitive learning theory (Mayer, 2009; Clark, Mayer & Thalheimer, 2003). In particular:

- *Multimedia Learning Theory*. One of R. Mayer's major contributions is his theory of multimedia learning. He studies how the use of various multimedia elements, such as text, graphics, animation and audio, can affect the perception, assimilation and retention of information by students. The scientist developed several basic principles to follow when creating multimedia learning materials such as the principle of contiguity and the principle of separability.

– *Cognitive Theory of Multimedia Learning.* R. Mayer also investigates the cognitive processes that occur in the brain during learning through multimedia. His research is aimed at understanding what cognitive processes occur during learning, and which factors contribute or not to absorbing new material.

– *Principles of Multimedia Learning.* R. Mayer identified several key principles that can promote multimedia learning; the contrast principle, the active listener principle, and the contiguity principle were among them. In our opinion, you can use these principles to develop educational resources that will help postgraduates to learn the technology of information searching, processing and analysing. It is important to create materials that are easy to digest, logically structured and motivating for learning.

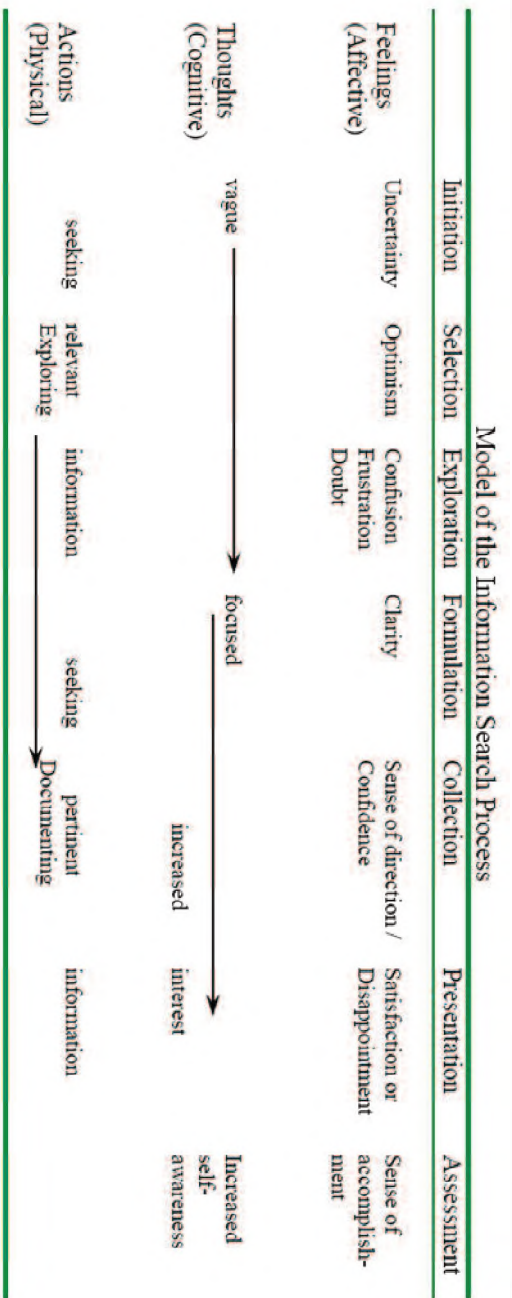
– *Impact of Technology on Learning.* R. Mayer also investigates how modern technologies, such as computers and interactive devices, can affect the learning process. He studies the effectiveness of various technologies and programs to improve the educational process.

R. Mayer's research has a significant role for understanding how people learn through multimedia and how this can be used to improve teaching methods and teaching materials. His work is aimed at optimizing the learning process and can be important for students, postgraduates, teachers and educational programs/curriculum developers. In addition, R. Mayer focuses his attention on the possibilities of global access to learning, using technology, the possibility of distance learning and global access to educational resources. This will allow postgraduate students to study anywhere and interact with other learners and sources of information from around the world.

Dr. Carol Kuhlthau is an American pedagogue, researcher and international speaker, a recognized expert in the field of information literacy and information-search processes in education. Her research focuses on the development of information literacy and how education can improve an

individual's ability to find, process, and analyse information. Her research on information literacy can be summarized in three main theses:

– *The Model of the Information Search Process (ISP)*. C. Kuhlthau developed the model that describes the process of information searching by students and other educational groups. The ISP describes the general experience of seeking information for a complex task that has a distinct beginning and end and that requires significant development and training. The model reveals the search process in which a person seeks meaning from information. From the user's perspective, the main purpose of information retrieval is to accomplish the task that initiated the search, not simply to collect information as an end in itself. It shows how individuals interact with information and helps educators and librarians to understand this process and support learners better.



Picture 1. *The Model of the Information Search Process* (Kuhlthau, 1991).

The ISP model is formulated in a holistic view of information search from the user's point of view in six stages:

1. «Initiation», when a person first becomes aware of a lack of knowledge or understanding, feelings of uncertainty, ambiguity and apprehension are common. At this stage, the seekers of education (students) understand that they have a specific need for information. This need may arise for a variety of reasons, including academic assignments, study projects, or research specifics. The seekers of education must formulate their information needs (specific requests or questions to which they want to find answers), formulate the purpose of the search (the target result the student hopes to achieve by knowing the information). A goal can be a specific task the student plans to accomplish or knowledge he/she wants to acquire. At this stage, search parameters (information sources, keywords, terms, researchers) are clarified. By initiating a search, the student starts the process of gathering information aimed at satisfying his/her needs and achieving the set goal.

2. «Selection», when a general area, topic, or problem is identified and initial uncertainty is often replaced by a short-term sense of optimism and a willingness to begin the search. At this stage, the seeker of education initiates the search for information. The student searches sources of information, including libraries, the Internet, databases, etc., and formulates search queries and strategies to find original sources of information.

3. «Exploration», when people faced with inconsistent, incompatible information, uncertainty, confusion, and doubt often increase, and they find themselves «in the gutter» of certainty. At this stage, the seeker of education analyses the results and decides whether it is necessary to expand or limit the scope of the search, looks for which source of information is most useful and which aspects he/she should study in more detail.

4. «Formulation», when a focused perspective is formed, uncertainty diminishes and confidence increases. At this stage,

the seekers of education set themselves the task of a more accurate and deep search for information. Forming the right search queries and developing effective search strategies help them to find more relevant and useful information, which leads to successful search completion. It is important to remember that at this stage the student can update his/her original goal, taking into account new knowledge and information found. The purpose of the search may become more specific or change according to the results.

5. «Collection», when information relevant to a focused prospect is gathered and uncertainty subsides with interest and involvement deepening. The seekers of education search for information using the search queries and strategies developed at the previous stage. They may use other sources, such as libraries, online resources, databases, websites, academic journals, etc., and analyse and evaluate each collected resource to determine whether the information meets their criteria for reliability, actuality, and relevance. During the collection of information, the student may find that some of the collected resources do not meet his/her needs. In this case, he/she can modify the search strategies and search queries in order to improve results.

6. «Presentation», when the search ends with a new understanding that allows a person to explain gained knowledge to others or in some other way to use the knowledge obtained. The seeker of education examines the information collected in the previous stages. This includes sources checking, content analysing and assessing its relevance to initial information needs; the student considers methods of organizing the collected information, classifies data, creates a structure for convenient access and use, highlights individual or the most relevant pieces of information for further use, prepares information for use in projects, research or assignments (this may include citations, summaries, abstracts, creating tables, diagrams or other means of

organizing information). This stage is important for the seekers of education to make the information understandable and useful for themselves and others, as well as for further use in scientific, professional or educational contexts.

– *Development of information literacy through learning in the library.*

C. Kuhlthau emphasizes the importance of developing information literacy through learning in the library. She has developed methods and programs for librarians and teachers to increase the level of information literacy among students.

– *The leading role of teachers in the development of information literacy.* C. Kuhlthau 's research points to the importance of the teacher's role in teaching students the skills of information searching, processing, and analysing it. She emphasizes that teachers must be as effective role models and support other in the development of these skills (Kuhlthau, 2008).

Taking into account C. Kuhlthau's research, it is worth improving educational and research activities as follows:

– to develop educational program on information literacy using the ISP model and other methods of the researcher;

– to provide comprehensive and systematic support to teachers and librarians, having provided them with tools and resources for the implementation of educational programs.

– to involve students in the learning process, having provided them with the opportunity to be active participants in the educational process, and to help them to understand the process of searching and analysing information, to create situations where they can use these skills in practice.

C. Kuhlthau's research provides important guidance on how to improve the information literacy of students, which in turn improves their ability to search, process, and analyse information.

The analysis of scientific research and publications showed that the ability to information searching from various sources,

processing and analyzing it is only a part of the leading competence that is necessary for a researcher/scientist, namely an informational and analytical competence. We have made an attempt to formulate the concept of «informational and analytical competence» within the scope of the conducted research. We believe that the informational and analytical competence of a graduate student (future doctor of philosophy (PhD)) is the ability and skills that allow you to effectively and systematically find, collect, process, analyze and interpret information from various sources for the purpose of conducting research, solving problems, writing scientific works and a doctoral dissertation. This competence may include the following aspects (structural elements):

- search of information: the ability to search for information in libraries, databases, scientific journals and other sources effectively, taking into account the specifics of the research topic;
- selection and assessment of information: the ability to select relevant information and assess its reliability, objectivity and scientific value;
- data processing: the information processing skills, including its organization, classification, systematization and structuring for further analysis.
- information analysis: the ability to understand, analyse and interpret information in order to highlight important aspects, patterns, trends and scientific conclusions;
- the ability to think critically: the ability to ask critical questions about information, to consider different points of view, and to distinguish well-founded from unfounded arguments;
- skills in writing scientific texts: the ability to create scientific works, including a dissertation, that have a logical structure, scientific argumentation and a high level of language proficiency;

- the effective communication and presentation of results: the ability to transfer information and scientific results in other ways, such as oral reports, presentations and publications;
- the ethics and copyright compliance: understanding ethical standards in the use of information and following copyright rules while using resources.

Informational and analytical competence is important in research work, as it allows postgraduates to work with information effectively, to develop scientific research and make significant contributions to the scientific field.

Conclusions

Therefore, the ability to search, process and analyse information from various sources is extremely important for postgraduates, especially while writing a doctoral dissertation and conducting scientific research in general, and is expressed in the need to adapt to modern requirements and develop relevant skills for achieving scientific and educational goals in the modern information environment. The importance of informational and analytical competence lies in the fact that it allows you to perform the following tasks effectively: scientific intelligence (finding and selecting relevant information helps postgraduates to determine the scientific validity of their research and find out whether similar works have been carried out before); information evaluation (the ability to evaluate information critically helps a postgraduate to determine its reliability and relevance, which are key factors in making scientific decisions); analysis and interpretation (the ability to analyse and interpret information helps a postgraduate to identify patterns and connections between various aspects of his/her research); scientific writing (scientific writing skills allow a postgraduate to create research papers and a dissertation that meet the standards of the scientific community); effective communication of results (the ability to present the research and its results clearly and convincingly helps

a postgraduate to communicate with colleagues, to obtain funding and disseminate their findings); ethical aspect (compliance with ethical standards in the use of information and in the conduct of research, an academic culture and integrity are extremely important for scientific activity).

The prospects for further research are seen in the definition of criteria, their content and levels of informational and analytical competence of post-graduates as future PhDs. After all, the development of this competence contributes to the improvement of the quality of scientific research and doctoral dissertations, allowing postgraduates to make a greater contribution to their scientific field and global science in general.

Resources

1. ОНП «Професійна освіта» за спеціальністю 015 Професійна освіта (за спеціалізаціями) (2020). *Університет імені Альфреда Нобеля*. URL: https://duan.edu.ua/images/head/Science/UA/PhD_and_Postdoc_studies/015/prof_osv_2020-prog.pdf.

2. ОНП «Професійна освіта» за спеціальністю 015 Професійна освіта (за спеціалізаціями) (2023). *Університет імені Альфреда Нобеля*. URL: https://duan.edu.ua/images/head/Quality_Edu/OPP_drafts/2023-2024/Final/prof_osv_2023-prog.pdf.

3. ОНП «Професійна освіта» за спеціальністю 015 Професійна освіта (за спеціалізаціями) (2020). *Харківський національний педагогічний університет імені Г. С. Сковороди*. URL: http://smc.hnpu.edu.ua/files/Osv%D1%96tn%D1%96_programi/Osvitno_naykov_i_programu/2020/Profesiina_osvita.pdf.

4. ОНП «Професійна освіта» за спеціальністю 015 Професійна освіта (за спеціалізаціями) (2023). *Харківський національний педагогічний університет імені*

Г. С. Сковороди. URL: http://smc.hnpu.edu.ua/files/Osv%D1%96tn%D1%96_programi/Osvitno_naykovi_programu/2023/Profesiina_osvita.pdf.

5. ОНП «Професійна освіта (за спеціалізаціями)» за спеціальністю 015 Професійна освіта (за спеціалізаціями) (2021). *Мукачівський державний університет* URL: https://msu.edu.ua/wp-content/uploads/2021/03/%D0%9E%D0%9D%D0%9F_%D0%9F%D1%80%D0%BE%D1%84%D0%B5%D1%81%D1%96%D0%B9%D0%BD%D0%B0-%D0%BE%D1%81%D0%B2%D1%96%D1%82%D0%B0-%D0%BF%D1%80%D0%BE%D1%94%D0%BA%D1%82-21-%D0%B4%D0%BE%D0%BA%D1%82%D0%BE%D1%80-%D1%84%D1%96%D0%BB%D0%BE%D1%81%D0%BE%D1%84%D1%96%D1%97.pdf.

6. ОНП «Професійна освіта» із спеціальності 015 «Професійна освіта» (2022). *Національний університет біоресурсів і природокористування України* URL: https://nubip.edu.ua/sites/default/files/u356/onp_2022.pdf.

7. Paul A. Kirschner, John Sweller & Richard E. Clark (2006). Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching. *Educational Psychologist*, 41:2, 75-86, DOI: https://doi.org/10.1207/s15326985ep4102_1.

8. John Sweller (1988). Cognitive Load During Problem Solving: Effects on Learning. *Cognitive Science*, 12(2), 257-285, DOI: https://doi.org/10.1207/s15516709cog1202_4.

9. Richard E. Mayer (2009). *Multimedia Learning*. University of California, Santa Barbara. DOI: <https://doi.org/10.1017/CBO9780511811678>

10. Ruth C. Clark, Richard E. Mayer & Will Thalheimer (2003). E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning.

Performance Improvement, 42(5), 41-43. DOI: <https://doi.org/10.1002/pfi.4930420510>.

11. Carol C. Kuhlthau (2008). From Information to Meaning: Confronting Challenges of the Twenty-first Century. *Libri*, 58(2), 66-73. DOI: <https://doi.org/10.1515/libr.2008.008>.

12. Carol C. Kuhlthau (1991). Inside the search process: Information seeking from the user's perspective. *Journal of the American Society for Information Science*, 42(5), 361-371. DOI: [https://doi.org/10.1002/\(SICI\)1097-4571\(199106\)42:5<361::AID-ASI6>3.0.CO;2-%23](https://doi.org/10.1002/(SICI)1097-4571(199106)42:5<361::AID-ASI6>3.0.CO;2-%23).

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Розвиток та оптимізація навичок пошуку, обробки та аналізу інформації з різних джерел у підготовці майбутніх докторів філософії (PhD): від освітніх вимог до наукового вдосконалення

Анотація

Дослідження присвячено питанню розвитку та оптимізації навичок пошуку, обробки та аналізу інформації з різних джерел у підготовці майбутніх докторів філософії (PhD). **Мета статті** полягає в обґрунтуванні важливості та актуальності розвитку та оптимізації навичок пошуку, обробки та аналізу інформації для докторів філософії (PhD) спеціальності 015 Професійна освіта (за спеціалізаціями) на різних етапах їхньої академічної та наукової кар'єри. **Методи.** Для досягнення мети автори використали такі методи: аналіз, синтез нормативних та науково-педагогічних джерел, узагальнення, спостереження, власний науково-педагогічний досвід. **Результати.** Доведено актуальність проблеми розвитку та оптимізації навичок пошуку, обробки та аналізу інформації з різних джерел у підготовці майбутніх докторів філософії (PhD). Проаналізовано сучасні дослідження в галузі психології та педагогіки (Джон Суеллер – вивчення когнітивного навантаження та процесів мислення, на здатність студентів обробляти та аналізувати інформацію; Річард Майєр – дослідження

когнітивних аспектів навчання, включаючи способи представлення інформації та її сприйняття здобувачами освіти; Керол Кульгау – інформаційні процеси в освіті та розвиток інформаційної грамотності). Акцентовано увагу на можливостях дослідження аналізованої теми через призму моделі процесу пошуку інформації (Information Search Process, ISP) Керол Кульгау. Визначено, сутність поняття *«інформаційно-аналітична компетентність аспіранта (майбутнього доктора філософії (PhD))»* **Висновки.** Зазначається, що важливість інформаційно-аналітичної компетентності полягає в тому, що вона дозволяє ефективно виконувати науково-дослідні завдання: наукова розвідка (знаходити та відбирати релевантну інформацію допомагає аспірантові визначити наукову обґрунтованість свого дослідження та розвідати, чи були схожі роботи раніше проведені); оцінка інформації (вміння критично оцінювати інформацію допомагає аспірантові визначити її достовірність та актуальність, що є ключовими факторами при прийнятті наукових рішень); аналіз та інтерпретація (здатність до аналізу та інтерпретації інформації допомагає аспіранту виявити закономірності та зв'язки між різними аспектами його дослідження); наукове письмо (навички наукового письма дозволяють аспірантові створювати наукові роботи та дисертацію, які відповідають стандартам наукової спільноти); ефективна комунікація результатів (здатність чітко та переконливо представляти свої дослідження і результати допомагає аспіранту спілкуватися з колегами, отримувати фінансування та розповсюджувати свої відкриття); етичний аспект (дотримання етичних стандартів у використанні інформації та в проведенні досліджень, академічна культура та доброчесність є надзвичайно важливим для наукової діяльності). Перспективами подальших досліджень визначено розробку критеріїв, їх змісту та рівнів сформованості інформаційно-аналітичної компетентності аспірантів – майбутніх докторів філософії.

Ключові слова: доктор філософії (PhD), здатність, інформаційно-аналітична компетентність, компетентність, ОНП «Професійна освіта».