Digital services for the formation of a research culture

Sitnikova Anastasia Andreevna

Lecturer

Mechnikov North-West State Medical University

Abstract. The component composition of the research culture is revealed. Digital services providing a culture of research activity are considered. Research micro-skills potentially replaced by digital services have been identified. A review of technical means to simplify the implementation of a number of practical tasks in the implementation of research activities is carried out.

Keywords: culture of research, digitalization of education, digital services.

The purpose of our study is to examine the potential of relevant digital services that provide a culture of research. In modern psychological and pedagogical research (I.V. Nosaeva, E.D. Andreeva, N.V. Petrova, I.F. Isaev, etc.), various definitions of the concept of "culture of research activity", or research culture, are proposed. In our work, we will rely on the definition of the researcher N.V. Petrova, who reveals this concept as "an integrative, dynamic personality quality, characterized by a value attitude towards research activity, an unsaturated need for search activity, a combination of methodological, ideological, general subject, reflective knowledge and research skills, and a high potential of research abilities" [7]. The specified definition contributes to the awareness of the component composition of this concept, which determines the accent tasks in the formation of the culture of students' research activities. These tasks include: the formation of the knowledge component (methodological, ideological, general subject, reflective, as well as a holistic picture of the world); skills and abilities of the process of scientific knowledge; research consciousness (value attitude). Moreover, some of the components are formed empirically in the process of studying and analyzing natural and social phenomena. On the basis of conscious experience, further interaction with the subjects of the surrounding world takes place in the framework of research activities.

The very process of acquiring research experience has universal requirements, which include standard procedures, stages, and scientific methods used. In this way, subjectivity, fragmentation, unreasonableness are reduced, and specific characteristics of research activities are acquired. These include: objectivity, theoretical and practicality, rationality, verification, reproducibility, consistency and criticality [9]. These features standardize the understanding of the values, ethical norms and principles of partnership in the research community, which are the guiding lines of the research culture. Analyzing the points of view of the authors Petrova N.V., Komarova I.V., Shikhova O.N., we come to the conclusion that the fundamental value in the study is the awareness of the need to implement the process of movement towards truth or knowledge itself [7, 6, 9]. Guided by norms, cognition ensures the accumulation of the researcher's cognitive experience, forms his research consciousness and position in the socio-cultural space.

The research culture meets the needs of the individual in assigning values to reality. It manifests itself in the individual system of ideas about the diversity of sign-symbolic, social and other worlds, which is supplemented throughout life. The sum of these worlds forms a unique socio-cultural landmark of a person in life and profession in particular. According to O.N. Shikhova, in the pedagogical process, research culture serves as a means (tool) for the formation of competencies in teaching students future professional activities, including research activities [4].

Research culture, according to researchers, helps to form a willingness to accept reality, the need for constant adaptation to changing conditions, to form the ability to build an individual route and follow it and optimize the process of gaining knowledge, etc. [9]. Thus, the research culture is aimed, first of all, at the acquisition of skills and abilities of scientific knowledge, value attitude to research activities.

Research activities are characteristic of the level of higher education in areas corresponding to the profile of training specialists. The first research papers appear at the initial stage of the specialist (reports, term papers, thematic reports, solving a creative, research problem with a previously unknown result).

In order to avoid the establishment of a false model of behavior, the most appropriate is the formation of a research culture from the first research steps. The passage of the stages of becoming a researcher includes the sequential performance of tasks in an individual rhythm to achieve maximum progress for each student and strengthen their values through experience. This implies the need to introduce a long-term spiral method of building a program, where the elements are arranged not only sequentially, with gradual complication, but implies a cyclical preparation: from taking notes of scientific papers, writing abstracts to completing the thesis.

The formal curriculum allocates sufficient time for the "average" student, however, the time required for mastering in each specific case (individual format) often does not coincide with the average, which can be overcome through individualization of training [12]. Individualization of training meets the differing needs of students, the depth of the material being mastered, the speed of perception of information, i.e. we are talking about an "individual educational trajectory" (term by I.S. Yakimanskaya) [11], including the mechanisms of self-organization and self-realization of the individual, adaptability to individual personality characteristics, which contributes to the personal progress of each, and not just the "average" student.

Thus, having defined the concept of "culture of research activity", having considered its component composition, its potential in educational activities and the path of formation within the framework of higher education, the final goal of this activity and the requirements for acquiring research experience, we will transfer it to the current conditions of digitalization to consider the potential of digital resources in terms of optimizing research activities.

Many issues of the formation of a research culture are related to the issues of digitalization. In accordance with the concept of implementing national goals in the field of science and higher education until 2030, digitalization, representing the introduction of digital means in education, is determined by ensuring the availability and individualization of higher education. According to the concept, the ultimate goal of the

modernization of education is to ensure the presence of the Russian Federation among the leaders in the ranking of countries with outstanding success in scientific activities and a high level of authority of researchers, which also determines the formation of readiness for international interaction and research culture as the key tasks of higher education [1]. The foregoing implies that the intended concept is the actual means of developing students' research culture are digital means.

The introduction of digital technologies in education has a number of advantages: it increases the speed of knowledge production, monitors the implementation of standards for the products of scientific activity, and also individualizes learning by using artificial intelligence and neural network technologies, as a result of which knowledge turns into information or data that digital algorithms use directly [14, 13]. With their help, it is realistic to build information systems that predict on the basis of an analysis of possible ways to achieve the goal, as well as to optimize a number of research tasks. Before looking at the potential benefits of digital media in shaping a research culture, consider the microskills involved.

Earlier, considering the tasks, we indicated the knowledge and value components, as well as the skills and abilities of scientific knowledge. Most of the above requires purposeful development or understanding through analysis and adjustments empirically, in turn, a number of micro-skills can be simplified by replacing them with the skills of using digital means. Researchers Krasnobaeva T.R. and Bryzgalova S.I., considering the problem of the component composition of research skills, identified micro-skills that, in our opinion, can be replaced by artificial intelligence operations. These include: selection of relevant authoritative sources (the basis of bibliographic search); control of compliance with the ethics of scientific citation (part of the ability to cite, refer ...); obtaining and summing up pre-experimental data, analyzing the results of the experiment (checking the results); visualization of content (use of graphics); registration of work according to digital science standards for quick search (report preparation); control of the timing of the work (planning and carrying out) [5,2]. We will sequentially consider each micro-skill and services that automate the implementation of actions.

The selection of relevant authoritative sources includes the search for information in accordance with its thematic content, citation, thematic direction, type, release time, limiting the flow. Criteria search in such systems helps to limit the area of actual sources of information to speed up their processing. In solving this problem, the search tools can be Official Google Scholar and Academia.edu - platforms with built-in parsing by parameters, as well as grouping texts by researcher with similar scientific interests. An additional opportunity is to search for co-authors and proposals for cooperation with various institutions. Such associations ensure the exchange of information at the ideological and practical levels, which contributes to the discovery of areas of greatest interest, and the interactivity of the loaded texts (the presence of hyperlinks) organizes the sources of information used.

Speaking about the ethics of citation, it is worth noting the importance of the formation of a value component, respect for the work of another. Observance of scientific ethics is considered to indicate all the sources used at the ideological level and when copying fragments of the text. Plagiarism, as the borrowing of

parts of the work of third-party authorship without reference to the original, is considered a violation and is strictly controlled and regulated by the established norm of originality [4]. Ideological copying can't always be fixed in the mind of the reader, for this reason it is necessary to check the text on programs that analyze the text, identify the literary base, the changes made (syntactic or even translation from another language). The most thorough check of the Russian-language text takes place on the basis of Antiplagiat, and the foreign one on Turnitin. Based on the results of the check, it is necessary to supplement the list of sources and compare the percentage of originality declared in the requirements with the real one.

To check the results of the study, input and output surveys, questionnaires and tests are carried out, the content of which can be placed in digital format and disseminated through the broadcast of the link, the summary table of answers provides a convenient format for further analysis and formulation of conclusions. The channel for obtaining data can be programs for automated processing of answers to asked questions Google forms or Testograf.

The obtained statistical data is considered to be the most reliable indicator of the reliability of the evidence base and form a positive image of the researcher. Graphpad is a means of using appropriate statistical techniques to support claims in quantitative or qualitative research. An additional feature of the service is visualization in the form of graphs and charts exported in various formats.

Data visualization makes it easier to understand the material provided and to track the logic of argumentation. Visualization, replacing emotionality, is becoming not only a way to simplify understanding of content and organization of content, but also to attract and retain attention. Orange - provides a suite of automated data visualization, processing and analysis tools that create an interactive workflow for analyzing and visualizing data through the creation of charts, histograms, trees, dendrograms, networks, and heat maps.

Designing a paper according to digital science standards for quick search when compiling a report requires a strict narrative structure, parts of which are delimited by markers, as well as a description of the content with keywords that will become answers to the specified search parameters of another researcher. Thus, the text of the work becomes not only a presentation of the research, but also a theoretical ideological or practical component of other researchers. In finding the right cliché to structure information and minimize the assumption of spoken language in a foreign language, Imitative writing technique using REF-N-WRITE will help as a substitution and cliché search program.

Controlling the timing of individual activities is an indicator of effective consistent work. Visual Planner with Reminders - Trello does not replace the micromanagement of all activities, but serves as a motivational component and automates daily planning with a monitoring function that relaxes the requirements for the level of self-control. An addition to the organization of research is, for example, version control in Git and Bitbucket, which contains a record of all changes made to the document, with the ability to undo the changes at any time or return to an earlier version of the document, if the intermediate and expected results do not match.

Within the framework of the article, all the previously set goals were achieved. The analysis of the concept of "research culture" is carried out, its content is studied and the potential of digital tools for optimizing research activities is determined. The need for the formation of a knowledge component (methodological, ideological, general subject, reflective, as well as a holistic picture of the world), skills and abilities of scientific cognition, as well as research consciousness, mostly empirically, has been determined. Microskills have been identified that can be replaced by the skills of using tools that perform actions automatically instead of a person. These include: selection of sources, analysis of copies, processing of test results, questionnaires, visualization of content, design of work, monitoring of compliance with deadlines. Thus, a reserve for the intensification of research activities and ways of its optimization through the identified digital services were found.

References:

1. Amirov, R.A. Strategy for the development of higher education in Russia // Bulletin of NGIEI. - 2019. - №8 (99). URL: https://cyberleninka.ru/article/n/strategiya-razvitiya-vysshego-obrazovaniya-v-rossii (appeal date: 15.03.2021).

2. Bryzgalova S.I. Formation of the teacher's readiness for pedagogical research at the university: theory and practice. Kaliningrad, 2004.

3. Karpova, O. L. Research activity of students in the context of personal development professional education / O.L. Karpov, V.A. Anisimova // Alma mater. – 2009. – № 1. – P. 38-41.

4. Krieger, E.E. Characteristics of a digital society and the principles of education in it // Bulletin of the Russian State University for the Humanities. Series "Psychology. Pedagogy. Education". - 2018. - №4 (14). URL: https://cyberleninka.ru/article/n/harakteristiki-tsifrovogo-obschestva-i-printsipy-obrazovaniya-v-nem (appeal date: 09.03.2021)

5. Krasnobaeva, T.R. The structure of students' research skills and indicators of formation / T.R. Krasnobaeva // Higher school teacher: traditions, problems, prospects: Materials of the X All-Russian Scientific and Practical Internet Conference (with international participation), Tambov, November 11, 2019. – Tambov: "Derzhavinsky" Publishing House, 2019. – P. 46-52.

6. Komarova, I.V. Technology of design and research activities of schoolchildren in the conditions of the FSES [Text] / I.V. Komarova. — SPb.: KARO, 2015. — 128 P.

7. Petrova, N.V. Psychological and pedagogical essence of the research culture of personality / Bulletin of the Adyghe State University. Series 3: Pedagogy and Psychology – [Electronic resource] https://cyberleninka.ru/article/n/psihologo-pedagogicheskaya-suschnost-issledovatelskoy-kultur y-lichnosti.

8. Popova S.M. — On the concept of digital transformation of science // Trends and Management. – 2019. – №. 4. – P. 1 - 16.

9. Shikhova, O.N. Development of the research culture of modern students in the university: monograph / O.N. Shikhova. — Moscow: INFRA-M, 2018. — 126 P.

10. Czerniewicz L MOOC—making and open educational practices / L Czerniewicz, A Deacon, M Glover, S Walji Journal of Computing in Higher Education – 2017. - №. 29 (1). - P. 81-97.

11. He Q. et al. Strategic alliance research in the era of digital transformation: Perspectives on future research // British Journal of Management. – 2020. – V. 31. – №. 3. – P. 589-617.

12. İnce E. Y., Kabul A., Diler İ. Distance education in higher education in the COVID-19 pandemic process: A case of Isparta Applied Sciences University // Distance Education. – 2020. – V. 4. – №. 4. - P. 343-351

13. Mackenzie A. The Performativity of Code: Software and Cultures of Circulation // Theory, Culture & Society. - 2005. - V. 22. - №. 1. - P. 71-92.

14. Vaidhyanathan S. The Googlization of Everything (And Why We Should Worry). - Oakland, CA: University of California Press, 2011. – 280 P.