

Development of digital literacy in vocational education as a condition for regional sustainable development

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Abstract. The article is devoted to the problem of developing digital literacy in vocational education as a condition for sustainable development of a region. The key main components of the concept of digital literacy are digital consumption (the use of Internet services for work and life), digital competences (skills to effectively use technology), digital security (basics of security on the Internet). In the field of regional professional education, conditions for developing digital competence, digital consumption, digital security are to be established. The informational and educational environment of a leading regional higher education institution (Altai State University), represented by the “Moodle” learning management system, satisfies such conditions. Effectiveness of developing digital literacy skills by means of electronic courses is confirmed by the quality of independent work on searching, selecting and evaluating, structuring, visualizing information, as well as organizing independent work and joint activities using cloud technologies and online applications.

Keywords: digital literacy, sustainable development, education, digital economy

1. Introduction

In the first quarter of the 21st century, the specificity of Russia’s industrial development is determined by the need to introduce new priorities for both federal and regional economic policies. In July 2017, at the meeting of the Presidential Council on Strategic Development, the digital economy was recognized as one of the key priority projects. Digital economy is an economic activity, a leading factor of production, contributing to the information space taking into account the needs of citizens and society in obtaining high-quality and reliable information, developing an information structure of the Russian Federation, as well as establishing a new technological basis for the social and economic environment [1].

Economic digitization as a trend of contemporary economic evolution correlates with a holistic concept of sustainable development put forward by both domestic and foreign researchers as an alternative idea of socio-economic development, an adequate response to global economic problems. Fundamentals of the concept of sustainable development, as defined in the report of the UN Commission on Environment and Development (1987), imply a focus on socio-economic development that supports human, material, cultural capital, taking into account the interests of future generations. The concept of sustainable development was the subject of scientific research in the works of P. Birney, A. Boyle, F. Sands, in the works of Russian scientists N. A. Sokolov, R. M. Valeev, K. A. Bekyashev, M. N. Kopylov. As M. V. Rossinskaya, and M. V. Bugaeva note.

Transition to a new economic strategy for sustainable development means gradually developing social self-organization in the economic, social, and environmental spheres at the regional level [2]. Development of digital economy technologies contributes to the saving of material and human resources. Development of human capital, socially responsible consumption and production allows to overcome the problems of social inequality and the activation of regional communities contribute to such self-organization in the economic sphere. Local governments, commercial and non-profit organizations, regional residents are the subjects of those projects implementation of which is aimed at achieving and ensuring sustainable development. Activation of local communities and partnerships in the context of sustainable development goals and trends towards economic digitalization is a possible subject for developing digital literacy. Information and digital literacy is the basis for building a participatory culture and responsible citizenship [3].

Digital literacy, its importance in contemporary culture, economics, education are defined by a number of international documents, UNESCO publications, and the international broadband commission for sustainable development [4]. In the works of a number of foreign and domestic researchers, digital literacy is characterized by a set of knowledge and skills necessary for the safe and effective use of digital technologies and Internet resources, the ability of a person to use digital tools to increase the efficiency of his work, to develop an active personal position, critical thinking and creativity, to understand principles of human interaction and digital technology, as well as features of the development of network communities [3, 5].

In the context of sustainable development goals, the contemporary basic education should build lifelong learning skills based on digital technologies, including in the form of massive open online courses [6]. The main components of the digital literacy concept are digital consumption (the use of Internet services for work and life), digital competences (skills to effectively use information retrieval technologies, production of multimedia content, etc.), digital security (security basics in the Internet). In 2018, according to the research data of the Regional Public Organization “ROCIT Internet Technologies Center,” the key trends in the development of digital literacy among Russians include the following: developing the infrastructure and involving the Russians in information processes, as well as the growth and expansion of the range of digital competence. According to the 2018 statistical study “Index of Digital Literacy of Citizens in the Russian Federation”, in comparison with the data obtained in 2015-2017, an average value of the index decreased due to the increasing imbalances between the following three components: digital competencies, digital consumption, and digital security [7].

Consequently, results of these studies actualize the problem of developing digital literacy, which is one of the key conditions for ensuring sustainable development of a region. Education, personnel retraining, formation of a system of values based on sustainable development goals play a decisive role in regional development. Conditions for developing skills of digital competence, digital consumption, digital security need to be shaped in the region’s professional education.

2. Electronic Resources

In the Russian system of secondary vocational and higher education, the competency model of graduates represented in federal state educational standards, as well as the labor functions described in professional standards, are the main guideline in the design of educational programs. The tasks of forming competences can be achieved only if there is a developed information and educational environment that ensures an active position of a student in the learning process, as well as contributing to the diversification of educational technologies, methods and forms. In Altai State University, e-courses are developed on the basis of the Moodle learning management system. At the Faculty of Arts and Design, with the goals of developing digital literacy skills for students, the following e-courses have been developed and optimized for students in the humanities and creative areas of training: “Basics of Information Culture”, “Audiovisual Means of Presenting Information”, “Information and Communication Technologies in Science and Education”, “Creation of Multimedia Presentations”, “Contemporary Means of Visual Communication”, “Information Technologies and Design Software.”

Electronic courses serve the tasks of delivering educational content in a structured form, publishing information about the organization of educational processes, the evaluation system and the criteria for evaluating specific tasks, the current learning situation, student learning outcomes, and the placement of student work, as well as the organization of pedagogical communication. These electronic courses are used in the implementation of academic disciplines on a mixed learning model. Each e-course contains links to e-publications that are recommended for study, for example, links to materials from foreign, Russian, and regional professional communities, videos, links to mass open online courses and public educational resources. There are various ways to include recommended electronic resources in the content of an e-course: publishing relevant links on the main page of e-courses, use individual publications as a starting point for discussion in a practical exercise or mention them as an example in lectures, tasks for independent work, suggesting reflection, formulating your own position on the topics of publication.

Individual courses involve performing independent work of students on the management of digital content, thematically related to academic discipline. These tasks are aimed at developing learning motivation, general digital literacy skills and independent work with information.

Another type of tasks for independent work is aimed at mastering the possibilities of online applications, with the help of which students can save, structure, visualize information, organize their activities, develop creative projects and presentation materials. The list of applications offered for familiarization and independent work is dynamic, as new successful solutions appear, some sites cease to function. In the 2018/2019 academic year, the possibilities of online applications were shown as the example of office programs (Google Docs, etc.), services for developing slides and other visual projects (Google Presentations, Canva, Piktochart, etc.), as well as searching for visual information (Pinterest, TinEye), developing intelligence maps (Coggle, etc.), organizing independent or collective work (Trello), and website designers (Tilda, Readymag). ending on its type, students are provided with strict criteria for evaluating work results. These include independence of execution, developing a structure, harmonization of compositional and coloristic solutions (for visual projects), quality of text elements, linguistic and copyright norms. Dynamism of the information environment, technological innovations and trends determine the need for constantly updating the content of electronic courses and updating the forms of practical training activities of students.

A final component of the courses is exercises on reflexive understanding of the experience gained or a discussion organized in class about how to use information and communication technologies in personal and professional development, methods of self-organization and work with information that students plan to use in the future, about the forms of online learning that students are going to actively use, including after completing the formal training.

3. Applicability of Electronic Resources: Key Research Highlights

Effectiveness of developing digital literacy skills by means of electronic courses is confirmed by the quality of independent work on searching, selecting and evaluating, structuring, visualizing information, as well as organizing independent work and joint activities using cloud technologies and online applications. The students did not know the majority of popular services offered for performing these tasks before mastering the course. The formation of motivation for independent effective use of information and communication technologies is confirmed by the results of an oral survey of students and an analysis of reflexive educational work. In the process of implementing academic disciplines on a blended learning model, the following results were obtained:

1. Basic skills in working with cloud technologies are formed, knowledge about online tools is expanded, specific ways of working with information are proposed;
2. Motivation for independent development of online educational resources is developed, including after completing the formal training, and the methods of independent learning using online platforms are mastered;

3. Methods and tools for selecting and structuring a thematic digital content, including professionally oriented one, are offered to students to update their professional skills and develop competence.

4. Discussion

Acquaintance of students with various sources of digital content and possibilities of online applications for working with information and organization of activities determine the breadth of professional horizons and professional thinking in general, contributes to mastering professional vocabulary, including in foreign languages, develops individual information competences, critical thinking skills, abilities to make informed assessments and interpret data. Supervision of thematic content allows students to focus on topics that are currently being discussed by the professional community, shape the need for updating professional knowledge, demonstrate ways of obtain relevant professional information throughout their lives [8]. Analyzing the results of educational activities shows that students have difficulty in performing tasks related to selecting, structuring, and evaluating thematic information. The nature of these difficulties is associated with a lack of awareness of students about the sources of high-quality, useful professional information. Another area of concern is the difficulty of students mastering the norms of digital ethics and related aspects of academic ethics. In full, overcoming these problems is impossible within the framework of mastering a separate discipline; this task should be solved by the entire educational program and efforts of most teachers implementing it. In this connection, not only the formation of digital literacy among future professionals, but also its development in the current faculty of the university are of particular importance.

Digital literacy skills make available a significant segment of the labor market for a university graduate, including options for the remote form of work using computer technology, contributes to its competitiveness, professional mobility, as well as to overcome regional inequalities.

5. Conclusion

The key task of a regional university is the development of human capital as a condition for the economic and social growth of the region. Digital and information competence contributes to the actualization of professional and personal potential in a situation of social uncertainty, mobility of professional boundaries, digitalization of all sectors of the economy. Developing an educational programs, which is aimed at shaping the personality of a professional and adapted to the real conditions of production and technological trends, is an important means of achieving sustainable development goals.

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