Digital competence as the basis of a lecturer's readiness for innovative pedagogical activity

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Abstract. The paper considers the problem of developing a lecturer's readiness for innovative pedagogical activity. The authors determined its main components – axiological, neological, and praxeological ones and outline some specific features of their content in the context of digitalization of education. Motivational-and-axiological, cognitive and activity-based components have been distinguished in the structure of digital competence. The paper shows the role of readiness for innovative activities in the transprofessionalization of a modern lecturer. Digital competence is seen as one of the fundamental features of a transprofessional. The authors present study results of the level of digital competence development in lecturers of Russian State Agrarian University – Moscow Timiryazev Agricultural Academy. The study has shown that all the components of the digital competence of a lecturer were not sufficiently formed. To compensate for these shortcomings, advanced training was organized for university lecturers under the program "Electronic Information-and-Educational Environment of the University". Taking into account the results obtained, the authors have offered the main ways of improving the digital competence of lecturers: digital transformation of the educational environment in the university, improving the content of further professional education programs by including the development of the digital competence of lecturers as an invariant component, organizing further professional training programs in an electronic information-and-educational environment, and providing methodological and coaching support for the innovative activities of lecturers.

1. Introduction
The current social processes caused by the spread of the new coronavirus infection have seriously affected the education system, virtually dividing it into "before" and "after" stages. Not long ago the digitalization of education was still a progressive and fairly well-ordered innovation process [1, 2], but in 2020, it has become spontaneous and avalanche-like due to a sharp massive transition of the education system to a distance format [3]. However, any crisis situation implies not only coping with the emerging difficulties and risks, but also using new opportunities to improve the education system under the changed circumstances.

In the conditions of an uncertain, complex, ambiguous, and unpredictable information society, a key characteristic of any specialist, including a university lecturer, is readiness for innovative activities [4, 5]. Since the digitalization of education tends to modify the content of a lecturer's professional competency, digital competence is becoming its most important component. In this regard, it seems especially relevant to examine all opportunities of improving the digital competence of a lecturer as an active participant of innovative processes in professional education.
2. Research methods
The research purpose is to determine the role and place of digital competence in the structure of a lecturer's readiness for innovative pedagogical activity.

Research methods include analyzing scientific and pedagogical literature on education digitalization, analyzing pedagogical experience, participant observation, questionnaire surveying, testing, and expert assessment.

The research was carried out in Russian State Agrarian University – Moscow Timiryazev Agricultural Academy by the academic staff of the Department of Pedagogy and Psychology of Professional Education. It involved 716 lecturers.

3. Results
The development of an innovative economy puts forward new requirements for specialists engaged in any area as related to their readiness and ability to develop and maintain innovative equipment and technologies. However, to train such specialists, appropriate teaching staff is required. This study covers the system of further professional education for lecturers (the study was performed in the process of advanced training of university lecturers) and does not apply to the higher level of vocational teacher training. General approaches to solving the problem of improving the digital competence of a lecturer are similar for both spheres, the main differences are in the specific features of learners (further professional education requires taking into account the principles of andragogy, reliance on personal and professional experience, specific features of a lecturer's professional activity, possible prompt application of the acquired knowledge, skills, and competences, etc.). Further professional education can be considered as a cross-cutting component of lifelong education [6], providing an operational correction of the professional competences of specialists, and their adaptation to the labor market requirements.

A lecturer's readiness for innovative pedagogical activity is an integrative personality feature that forms the basis and serves as a prerequisite for the transprofessionalization of a specialist. Transprofessionalism is an integral quality of a specialist, characterizing the ability to master and perform activities from various types and groups of professions [7]. Indeed, in modern society, the diffusion of various professions is increasing, which is manifested by the interpenetration of specialized actions. At the same time, digital competence acts as one of the fundamental characteristics of a transprofessional.

The structure of a lecturer's readiness for innovative pedagogical activity comprises such components as axiological, neological, and praxeological. They correspond to three sections of pedagogical innovation (axiology, neology, and praxeology). The digitalization of education leaves its mark on their content, focusing on lecturers' awareness of the importance of digital technologies and assessing their role in the study process, their development and practical application in education, the organization of e-learning, the development of e-learning resources, etc. It is important to master not only the technical issues of the online communication, but also the organization of active interaction, cooperation of all the participants in the study process, productive research-and-study activities [8,9,10]. The new educational paradigm emphasizes a lecturer's role of a mentor, tutor, and navigator for students [11,12]. At the same time, a lecturer delegates a part of his/her teaching and control functions to a computer training system, implemented in the form of e-learning courses. In this regard, a separate important task for improving the qualifications of lecturers is the development of effective technologies for organizing students' independent work, especially with e-learning courses provided by the study portal, as well as the development of these courses.

Thus, the structure of a lecturer's digital competence consists of motivational-axiological, cognitive and activity-based components that cover all aspects of the study process.

Due to the switch to distance learning in March 2020, not all the lecturers were able to quickly adapt to the changed conditions. Therefore, the advanced training program "Electronic Information-and-Educational Environment of the University" (72 hours) organized for university lecturers turned out to be extremely topical and sought-after. Initially, the course was supposed to be organized using a blended
learning technology that combines online and offline distance learning and classroom activities. In blended learning, special attention is paid to the organization of independent work of students, and it is of an advanced nature: students master basic knowledge and skills (at the levels of recognition and understanding) on the topics studied on the study portal of the university, and then deepen and improve them (at the levels of application and creativity) in the process of contact work with their lecturers. However, in the high-alert mode due to the pandemic, it was necessary to adapt this technology only for online and offline formats, while an important role was assigned to individual counseling of students, taking into account their age and psychological characteristics, as well as the initial level of their digital competence.

In order to study the dynamics of the digital competence development in university lecturers, the level of its formation was measured before the start of training and after its completion. The formation levels of the three components of digital competence (motivational-axiological, cognitive and activity-based) in lecturers were assessed using knowledge tests and analyzing the results of lecturers’ activities and their self-assessments (by questionnaires). For aggregate assessment of the development of digital competence components, a 100-point scale was used (table 1).

**Table 1.** Results of the digital competence development in lecturers.

| Training stage | motivational-axiological | cognitive | activity-based |
|----------------|--------------------------|-----------|----------------|
| Beginning      | 49                       | 29        | 42             |
| End            | 83                       | 71        | 89             |

4. Discussion

Based on the analysis of the data obtained, we have analyzed the attitude of the lecturers to modern digital technologies, as well as the experience of using these technologies in the study process.

Regarding the use of modern digital technologies in their professional activities, 89% of the lecturers noted that they actively apply them in their professional activity – they mainly use the Internet to search and select the necessary information, communicate with and teach students. 61% of the lecturers have little experience of using e-learning resources for study purposes, 31% constantly train students in an e-learning environment, and only 8% have not practiced this type of activity. The overwhelming majority of the lecturers (72%) noted the presence of difficulties in using digital technologies in their professional activities, in particular, an insufficient level of their own proficiency. The lecturers noted their lack of knowledge in the field of digital technologies (46%), difficulties with the development of distance learning methodologies for academic subjects – 39%, psychological difficulties among teachers of mature age – 60%), which indicates the insufficient development of all the digital competence components.

In the course of mastering the advanced training program, the lecturers demonstrated a positive trend in the growth of knowledge and skills applicable in the use of digital technologies in the study process. They noted that they began to more clearly understand the advantages of using e-learning resources, the teaching methodology, and showed increased positive motivation for this activity.

Thus, the development of digital literacy of lecturers, the required methodological and consulting support for pedagogical activities in the e-learning environment, the encouragement of university lecturers to intensify the use of innovative technologies in the study process contribute to the development of their digital competence and make them highly qualified specialists, ready for modern challenges and open to innovative changes.

Taking into account the experience gained, special attention should be paid to the psychological support of lecturers, concentrating on emphasizing their professional needs instead of identifying deficiencies. Focusing on a goal instead of a problem will allow each lecturer (independently or with the help of coaching practices) to maintain their resource state, determine their "points of growth", reflect and re-consider their actions and capabilities.
Other important conditions for optimizing the process of developing lecturers’ digital competence include its regular monitoring, which provides clear information on the dynamics of the competence development; personalization of further professional education; more intensive designing of practice-oriented training courses; scientific and methodological support for continuing professional education and self-education of university lecturers.

5. Conclusion
To sum it all up, sharp expansive introduction of digital technologies into the education system leads to the forced transition to a distance learning format. This emphasizes the problem of insufficient digital competence of university lecturers. It is obvious that its significance will only increase under any possible scenario of further development. It is digital competence that becomes the most important component of professional and pedagogical competence in general and the basis of a lecturer's readiness for innovative pedagogical activity.

Taking into account the present research results, we have developed some basic solutions for improving the digital competence of lecturers:

- establishing and further adjusting the electronic information-and-educational environment of the university, centered around the study portal;
- improving the syllabus content of further professional education as an invariant component of the digital competence of lecturers;
- organizing further professional education using the electronic information-and-educational environment;
- organizing scientific, methodological and coaching support for the innovative activities of lecturers.

A high level of digital competence helps lecturers to effectively carry out innovative pedagogical activities: to be aware of the motives of professional and personal self-development, be open to new knowledge, be able to learn quickly and effectively, to do research and create new things. Therefore, the theory and methodology of professional education so acutely raises the issues of finding effective technologies for preparing lecturers for innovative pedagogical activities in the context of the digitalization of education.

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