

PERAET 2021**International Scientific Conference «PERISHABLE AND ETERNAL: Mythologies and Social Technologies of Digital Civilization-2021»****DIGITAL COMPETENCE OF UNIVERSITY TEACHERS: SELF-PERCEPTION OF SKILLS IN ONLINE-ENVIRONMENT**

Antonina V. Noskova (a)*, Daria V. Goloukhova (b), Elena I. Kuzmina (c)

*Corresponding author

(a) Moscow State Institute of International Relations (MGIMO), Moscow, Russian Federation,
a.noskova@inno.mgimo.ru,(b) Moscow State Institute of International Relations (MGIMO), Moscow, Russian Federation,
d.v.goloukhova@inno.mgimo.ru,(c) Moscow State Institute of International Relations (MGIMO), Moscow, Russian Federation,
e.kuzmina@inno.mgimo.ru**Abstract**

The accelerated introduction of digital technologies into the higher education system against the backdrop of the COVID-19 epidemic is raising the issue of digital competence of higher education teachers. The skills of using digital tools for communicating with students, transferring, and monitoring knowledge are gaining special weight in the list of professional competencies of a teacher. The article presents some results of a study focused on studying the consequences of digitalization for the socio-professional status of a teacher. The method of focus group discussion was used with teachers of social, humanitarian, and natural disciplines from Russian universities with at least three years of professional experience. In total, 5 focus groups were held with 7 teachers in each. The purpose of the study is to show how, through self-perception and self-assessment of their own digital competence, higher education teachers develop an attitude towards the digital transformation of education. The adaptation of university teachers to digital technologies in the educational environment, teachers' assessment of their own digital competence and the effectiveness of online communication with students; the study of socio-cultural problems generated by the digitalization of education, including the emergence of new forms of alienation and educational inequalities are among the tasks. The conclusion is made about the differentiation of teachers into three categories depending on the mastery of digital competencies - innovators, active and passive. Each category is characterized in terms of the emotional, cognitive, and behavioral aspects of attitudes towards digitalization of higher education.

2357-1330 © 2021 Published by European Publisher.

Keywords: Digital competencies ,digitalization of the educational environment, focus groups, higher education, professional chances



This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 Unported License, permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

1. Introduction

The focus on digital education in the international social research agenda took shape in the pre-coronavirus era. Already before the pandemic lockdowns, many universities around the world were implementing digital infrastructure, which gave scientists a reason to substantiate the need to promote digital education through the discourse on the development of a digital society (José Sá & Serpa, 2020), as well as analyze the new educational realities of the digital-global world (Antyukhova, 2020, p. 158). Based on the generalization of the observed digital practices, specialists managed to explicate the content of digital learning into theoretical concepts. The digital transformation of higher education was presented as a longitudinal process with sequential passage of several stages (Minina, 2020). According to Giddens, such a process means a transformation of the structure of an educational institution with a change in both the rules of functioning and the resources available to agents (Giddens, 2005, p. 29). The digital innovations introduced by the structure require social and professional changes from the subjects of the educational process. Therefore, in some way, the completion of the first stage was the verification of the readiness of countries for the transition to digital learning technologies (Centre for European Policy Studies, 2019).

The dramatic acceleration in the digital modernization of higher education in the wake of the pandemic has generated a digital “expansion” effect in education (Zeer et al., 2020). The digital innovations being introduced at a high speed demanded *to instantly master new digital competencies* - the skills and abilities of working in a digital educational environment from the subjects of the educational process. Not all teachers and university students managed to cope with this task. There were threats of alienation from the educational process, a decrease in the quality of education, a loss of trust in university education, a limitation of social and professional prospects, etc. Another aspect of this problem is associated with the formation of a new kind of inequality - the digital divide. This issue has been comprehended by scientists since the early 2000s (Dobrinskaya & Martynenko, 2020), but recently the focus has shifted from unequal access to technical devices towards *unequal access to digital competencies, skills in using digital technologies, differences in the level of digital literacy* (Dobrinskaya & Martynenko, 2019; Glukhov & Stakhovskaya, 2021; Lebedeva, 2019; McGarr & McDonagh, 2019).

Thus, the rapid digitalization of higher education has led to a new need for the accelerated formation of *digital competencies and digital expertise* - the possession of a set of competencies required for professional activity (Medvedev et al., 2013). The study of this issue is the focus of this article.

2. Problem Statement

As the analysis of publications shows, digital competencies in education are becoming an independent research area. A theoretical and methodological framework for studying this issue is being formed. The definition of digital competencies is taken as a basic concept, spelled out in “The Digital Competence Framework for Citizens with eight proficiency levels and examples of use” (Carretero Gomez et al., 2017). The conceptual approach of J. van Dijk on the types of access to digital technologies is widely used (Dobrinskaya & Martynenko, 2020).

At the empirical level, various aspects are investigated: the promotion of digital literacy in the culture of education and the formation of digital competencies through education (José Sá & Serpa, 2020, p. 4521; Rafi et al, 2019); measuring the level of formation of digital competencies among students (Volkova & Petrova, 2019, p. 22); the degree of readiness of teachers to teach digital skills, analysis of the factors that impede the use of distance learning technologies (Zeer et al., 2020); differences in the profiles of digital competencies of students and teachers of universities, as well as in the trajectory of the development of social-network communication literacy (Glukhov & Stakhovskaya, 2021; Noskova et al., 2021).

Despite the interest in the topic, enough empirical data has not yet been accumulated to form a scientific approach to understanding digital competence, especially in that part of it, which deals with the social and cognitive mechanisms of differentiation of the subjects of the educational process by this parameter. The study, the results of which are presented in the article, is intended to fill this gap.

3. Research Questions

We assumed that, depending on the degree of adaptation to the digital conditions of professional life, which is determined by a set of digital competencies, teachers are differentiated into the following categories: creators of new digital educational practices; agents quickly adapting to new structural requirements; poorly adaptable teachers who resist the requirements of the structure.

We are interested in the following research questions: 1) the possession of which digital competencies determines falling into one or another category to a greater extent; 2) what groups of factors - personal (attitudes, socio-demographic characteristics) or structural (belonging to a university) - determine the category of teachers to a greater extent.

These research issues were addressed within the framework of the project “Attitudes towards digitalization of higher education and its consequences for teachers at Russian universities”.

4. Purpose of the Study

The aim of the study is to show how, through self-perception and self-assessment of their own digital competence, higher schoolteachers form an attitude towards the digital transformation of education and how its consequences are seen.

Reflection of personal experience of “digital learning”, attitudes towards building new pedagogical and communication strategies (insights, a new look at the learning process, one's own pedagogical activity and the activities of colleagues), perception of the transformation of the content of the teacher's professional activity under the influence of digitalization, self-perception of one's professional chances, zones of professional and personal development in the new digital environment are among the tasks.

5. Research Methods

An exploratory study was carried out using the method of focus group discussion on the way to solving this goal. The participants in the discussion (informants) are university professors of social, humanitarian, and natural sciences from different regions of Russia with at least 3 years of professional

experience. Five focus groups were held, each group containing seven respondents from different cities and regions, different scientific disciplines; groups are mixed by gender and age.

The first group includes teachers of the humanities from top universities (Federal universities, national research universities, global universities from the Project 5-100). In the second group there are teachers of natural and technical specialties from top universities, in the third group there is a mixed composition (teachers of both natural and humanitarian disciplines from leading universities). In the fourth group - teachers of humanitarian specialties of ordinary universities (university, academy, institute), in the fifth - teachers of natural and technical specialties of ordinary universities.

The analysis of the content of the focus group discussion transcripts was carried out using the typology of teachers proposed by the authors: creators-active-passive. The informant was correlated with one of the categories based on self-assessments of digital skills and attitudes towards distance education in general, in the structure of which emotional, cognitive, and behavioral components were distinguished. A meaningful assessment of digital competencies is based on the list of basic competencies of a higher schoolteacher (Kim, 2018): scientific and subject; psychological and pedagogical; communicative; managerial; creative competence.

6. Findings

The research results showed that informants differentiate into three categories.

Creators are agents creatively reacting to the requirements of the structure, producers of new educational practices. They are a kind of innovators who are the first to react to the transformations of social structures. A minority of the teachers surveyed correspond to creators. On an emotional level, they respond positively to digital transformations in education and tend to find opportunities for professional and personal development in them, which can be seen in many of their statements regarding both teaching and transformations taking place in higher education.

At the cognitive level, they are characterized by a high level of digital competence: they are confident PC users, as a rule, additionally possessing the skills of working in specialized programs. Teachers of technical specialties are more often the creators. Working on computers with various software is an integral part of the learning process for them:

“... we are techies, it is very convenient for us to show a large number of materials, new technical means ...” (teacher of road safety organization, Kazan, 16 years of experience).

Humanitarians are also creators. They do not generate new technologies, but they quickly and willingly master them, introduce them into the educational process, actively responding to structural educational transformations:

“I even have an electronic course ... I don't see any problems here” (Teacher of cultural studies, St. Petersburg, 15 years of experience.)

“I think most of us can be classified as confident users, and if there is a need to learn a new program for our work, we will definitely study and master it in a week or less” (history teacher, Tomsk, 40 years of experience).

At the behavioral level, creators are characterized by the active use of digital teaching methods, a variety of educational practices and initiative in their implementation. They usually work in universities

with a strong material and technical base, where the integration of digital technologies into education has long been initiated (Moodle platform, online courses, etc.). At the same time, the administration of universities encourages teachers to use technology through an effective contract system or constantly updating the requirements for the qualifications of teachers. Teachers also note that often the initiative related to the inclusion of innovation and digital technologies in the educational process comes from students:

“We have a robotics department, here the initiative is from the students themselves, from the teachers, there are such enthusiastic people here” (teacher of refrigeration of technological processes, Kazan, work experience 12 years).

Creators recognize the need for innovation in education in response to the transforming labor market. In some professional areas, intensive digitalization is taking place, the requirements of employers are changing:

“From 2022 ... design organizations will not accept drawings on paper, everything is only BIM-design” (teacher of the theory of mechanisms and machines, Tomsk, 14 years of experience).

The second group consists of actively responsive teachers. They quickly and easily adapt to new structural requirements, have developed cognitive capabilities and are open to learning new things. *Most of the informants fall into this category.* At the emotional level, their reactions to the digitalization of the educational process can be characterized as mixed. They note the positive aspects and possibilities of the new form of education, recognize that digital technologies have become an integral part of the educational process, but at the same time they also indicate the risks of digital learning.

Here are some examples of positive emotional reactions:

“I believe that in the 21st century digital support is needed for any discipline, it is simply dictated by the norms” (teacher of Russian as a foreign language, Moscow, 7 years of experience).

Informants most often noted digital communication, digital methods of pedagogical influence (visualization), liberation from routine practices as new opportunities.

“We got some kind of solidarity, chats appeared in messengers, and we began to communicate even more” (teacher of methodology of international regional studies, St. Petersburg, 10 years of experience).

“... communication has become more intense thanks to online conferences ... both with the same and with new people” (teacher of German, St. Petersburg, work experience 25 years).

Digital visualization of the taught material, as the teachers of a few disciplines note, is not only becoming a more visual way of teaching but is reaching a fundamentally new level.

“In my religious studies course, digital visualization is a very important element. It's just some kind of new quality of work” (teacher of Philosophy, Tomsk, 30 years of experience).

All teachers note the convenience of digital technologies:

“... Through digital technologies... it is more convenient to check everything than to collect all these pieces of paper, read, then go somewhere with them, exhibit something” (teacher of methodology of international regional studies, St. Petersburg, 10 years of experience).

Now about the risks of digital learning. Most often, there was insufficient contact with the audience, dependence on technical devices, difficulties in organizing certification, the risk of reducing the teaching staff of universities, a lack of socialization:

“... we will be gradually transferred to a distance learning program, because this provides enormous opportunities for reducing the teaching staff” (teacher of conflict management, Kazan, 29 years of experience).

At the cognitive level, active responders are characterized by an average *level of digital competence*. They are capable of independently and quickly mastering new programs and tools. Many of them believe that the ability to quickly adapt and learn is a characteristic inextricably linked with the teaching profession.

At the behavioral level, active responders willingly use the most widespread digital learning tools, but rarely initiate the introduction of more complex and rare technologies into the educational process. Rather, they follow the initiative of the university management or colleagues.

“Active” informants often talked about using digital learning tools. Many teachers see significant advantages in this aspect of digitalization:

“We have a subscription for all students, teachers, we have a corporate mail ... That is, you go in, log in to the library's website - and almost all possible databases are available, in this regard it is very convenient” (teacher of methodology of international regional studies, St. Petersburg, 10 years of experience).

The group of “passive” teachers is not numerous; to a greater extent, such teachers work in non-top universities with a poorly developed digital infrastructure. Passive users are poorly adaptable teachers who resist the requirements of the structure. On an emotional level, they are characterized by a negative attitude towards digital innovations in the educational process in general and distance learning.

At the cognitive level, they have *medium to low degree of digital competence*. They have basic computer skills but are reluctant to use them in their professional activities.

The transition to distance learning was painful for them, they completely abandoned digital learning tools with the end of it:

“... If the teacher feels that this material can be submitted remotely - please, there is access, no one bothers. The most important thing is for the students to perceive it. If you think that it doesn't work out in any way, then, it seems to me, [it is not necessary to enter it] as an obligatory element” (teacher of economics, Moscow, experience 20 years).

The general rejection of digitalization-related innovations for these teachers is due to the weak technical equipment of the university and the lack of initiatives on the part of the administration to introduce digital teaching methods:

“For the university, it was also a serious test, because they were not ready for this. There were no platforms, nothing. Our computer scientists have created a Moodle user manual. It is only for IT people who understand these words. And it was awful for people who were just like ordinary computer users” (teacher of economics, Moscow, 20 years of experience).

A cursory acquaintance with new technologies and digital educational tools also denies the merits of online learning.

7. Conclusion

The research results show that the possession of a full-fledged set of digital competencies is largely determined by the structural factor, which is expressed in the presence of an appropriate technological, educational, and socio-cultural environment of universities. Therefore, the attitude of the teachers of the “top universities” to digital processes is more loyal and more oriented towards the adoption of innovations, while teachers from ordinary universities were more often classified as passive and resistant to innovations. Socio-demographic and personal factors are less important in this situation. Even older teachers can not only be open to change, but also act as “engines of progress” in their universities, and their younger colleagues can resist digital innovation.

Acknowledgments

The study was supported by a grant from the President of the Russian Federation for state support of leading scientific schools of the Russian Federation (competition in 2020), NSh -2615.2020.6.

References

- Antyukhova, E. A. (2020). Aktornyye modeli global'noy obrazovatel'noy politiki [Actor models of global education policy]. *Polis. Political studies*, 3, 158-168. <https://doi.org/10.17976/jpps/2020.03.11>
- Carretero Gomez, S., Vuorikari, R., & Punie, Y. (2017). The Digital Competence Framework for Citizens with eight proficiency levels and examples of use. *Publications Office of the European Union*, <https://doi.org/10.2760/38842>
- Centre for European Policy Studies (2019). *Methodological Note on the Index of Readiness for Digital Lifelong Learning*. Retrieved from: https://www.ceps.eu/wp-content/uploads/2019/11/Readiness-for-Digital-Lifelong-Learning_Methodological-note.pdf
- Dobrinskaya, D. E., & Martynenko, T. S. (2019). Perspektivy rossiyskogo informatsionnogo obshchestva: urovni tsifrovogo razryva [Prospects for the Russian Information Society: Levels of the Digital Divide]. *RUDN Journal of Sociology*, 19(1), 108-120.
- Dobrinskaya, D. E., & Martynenko, T. S. (2020). *Vozmozhno li tsifrovoye ravenstvo? (o knige YA. van Deyka «Tsifrovoy razryv»)* [Is digital equality possible? (about the book by J. van Dyck “Digital Divide”)] *Sotsiologicheskiye issledovaniya* [Sociological Studies], 10, 158-164. <https://doi.org/10.31857/S013216250009459-7>
- Giddens, E. (2005). *Ustroyeniye obshchestva: Ocherk teorii strukturatsii* [Organization of society: Essay on the theory of structuration]. Akademicheskii proyekt.
- Glukhov, A. P., & Stakhovskaya, Yu. M. (2021). Tsifrovoy razryv v fokuse mezhpokolencheskoy kommunikatsii [The digital divide at the focus of intergenerational communication]. *Tomsk State University Journal of Philosophy Sociology and Political Science*, 59, 148-155. <https://doi.org/10.17223/1998863X/59/14>
- José Sá, M., & Serpa, S. (2020). COVID-19 and the Promotion of Digital Competences in Education. *Universal Journal of Educational Research*, 8(10), 4520-4528. <https://doi.org/10.13189/ujer.2020.081020>
- Kim, I. N. (2018). Formirovaniye bazovykh sostavlyayushchikh professional'noy kompetentnosti prepodavatelya vuza [Formation of the basic components of the professional competence of a university teacher]. *Power of the book: library, publishing house, university*, 18. Retrieved from <https://www.dvfu.ru/library/almanac-power-books-/articles-almanac-18-2018/Ким.pdf>
- Lebedeva, L. (2019). Tsifrovaya transformatsiya v sotsial'no-trudovoy sfere: novyye vyzovy i vozmozhnosti [Digital transformation in the social and labor sphere: new challenges and

- opportunities]. *World Economy and International Relations*, 63(12), 42-49. <https://doi.org/10.20542/0131-2227-2019-63-12-42-49>
- McGarr, O., & McDonagh, A. (2019). *Digital Competence in Teacher Education, Output 1 of the Erasmus+ funded Developing Student Teachers' Digital Competence (DICTE) project*. https://www.researchgate.net/publication/331487411_Digital_Competence_in_Teacher_Education
- Medvedev, M. N., Konovalova, N. Yu., Kuntsevich, Z. S., & Medvedeva, L. Z. (2013). Soderzhaniye professional'noy kompetentnosti prepodavatelya vuza [The content of the professional competence of a university teacher]. *Vestnik of Vitebsk State Medical University*, 12(4), 133-139
- Minin, V. N. (2020). Tsifrovizatsiya vysshego obrazovaniya i yeye sotsial'nyye rezul'taty [Digitalization of higher education and its social results]. *Vestnik of Saint-Petersburg University. Sociology*, 13(1), 84-101. <https://doi.org/0.21638/spbu12.2020.106>
- Noskova, A. V., Goloukhova, D. V., Proskurina, A. S., & Nguyen, T. H. (2021). Tsifrovizatsiya obrazovatel'noy sredy: otsenki studentami Rossii i V'yetnama riskov distantsionnogo obucheniya [Digitalization of the educational environment: assessment of the risks of distance learning by Russian and Vietnamese students]. *Vyssheye obrazovaniye v Rossii [Higher Education in Russia]*, 30(1), 156-167. <https://doi.org/10.31992/0869-3617-2021-30-1-156-167>
- Rafi, M., JianMing, Z., & Ahmad, K. (2019). Technology integration for students' information and digital literacy education in academic libraries. *Information Discovery and Delivery*, 47(4), 203-217. <https://doi.org/10.1108/IDD-07-2019-0049>
- Volkova, I. A., & Petrova, V. S. (2019). Formirovaniye tsifrovyykh kompetentsiy v professional'nom obrazovanii [Formation of digital competencies in vocational education]. *Bulletin of Nizhneartovsk State University*, 1, 17-24.
- Zeer, E. F., Lomovtseva, N. V., & Tretyakov, V. S. (2020). Gotovnost' prepodavateley vuza k onlain-obrazovaniyu: tsifrovaya kompetentnost', opyt issledovaniya [University Teachers' Readiness for Online Education: Digital Competence, Research Experience]. *Pedagogicheskoye obrazovaniye v Rossii [Pedagogical Education in Russia]*, 3, 26-39. <https://doi.org/10.26170/po20-03-03>