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Research on the Teachers' Commitment to Use Digital Technologies in Educational Activity

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ABSTRACT
The article explores modern approaches to the digital technologies application in education. Results of research on teachers' commitment to implement them in professional activity are presented. Methodological frameworks of research are the approaches of domestic and foreign scientists in the field of education digitalization and digital technologies application, a systematic, activity, competency-based approach to education. The experimental research involved primary school teachers in Omsk and Omsk region with various professional experience. Analysis of obtained data shows the insufficient commitment of teachers to implement digital technologies in their professional activity due to the insufficient provision of educational institutions with computer and multimedia equipment, access to the Internet, as well as the insufficient implementation of the relevant advanced training courses.
Keywords: *digital technologies, educational activity, teacher, educational process*

1. INTRODUCTION

The relevance of research of teachers' commitment to use digital technologies in educational activity is due to the social demand for training teachers with new professional qualities at the university.
Currently, the program-targeted documents of the Russian Federation in the education focus on the problem of maintaining the best domestic traditions of training Russian teachers, in developing new professional qualities according to the standard of professional activity [1].
One of the main directions of digital economy development has become the Federal project "Personnel for the digital economy", within which, on the basis of educational organizations, training should be performed for students who will be the base of staffing for the digital economy of the Russian Federation [2].

1.1. Related Work

Methodological frameworks of research were domestic and foreign works in the field of education digitalization and digital technologies, a systematic, activity, competency-based approach to education.

1.1.1. Manual interactive assumption generation

The target of research is teachers' commitment to use digital technology in educational activity. The subject of research is the interconnection between the levels of teachers' commitment to use digital technologies in educational activity and the professional experience, the provision of educational organizations with computer and multimedia equipment, and the level of teachers' competence in this field.
The goal of research is to identify the levels of teachers' commitment to use digital technologies in educational activity and its dependence on the provision of educational organizations with computer and multimedia equipment, on the teachers' competence in this field.
Research hypothesis: there is no unique dependence between the level of teachers' commitment to use digital technologies in educational activities and professional experience; there are interconnections between the teachers' commitment to use digital technologies and the provision of educational organizations with computer and multimedia equipment, as well as their level of competence in the field of education digitalization.

1.1.2. Automated assumption generation

Most researchers reflect the understanding of integrative nature of digital technology in educational activity.
M. Henderson , G. Finger , N. Selwyn emphasize the importance of the educational potential of digital technologies, the flexibility of their application, and note the advantages in maintaining the logistics of modern training [3].
https://experts.colorado.edu/individual/pubid_239799
According to S. Smythe, in the digital age, there is a need to establish new forms of training that will contribute to the development of digital literacy of the population from an early age. New forms of teaching activity should completely change the interaction of students and teachers,

contribute to a better orientation of all members of educational process in the digital space [4].

E.V. Panisheva, studying the organization of vocational education in the context of introduction of modern information and communication technologies, comes to the conclusion about the need for individualization of educational activity based on their application [5].

S. Mahony notes the special role of using digital resources in developing collaborative skills and reflective practice to solve teaching problems. The use of digital resources should be part of the planned development at the curriculum level [6].

M. Esteban-Guitart, C. Coll, W. Penuel emphasize the interconnection between school and out-of-school education based on developed nationwide infrastructures in a digitalized society [7].

I.O. Kotlyarova, G.U. Soldatova, V.N. Shlyapnikova showed that the degree of university teachers' commitment to use modern educational technologies is mainly at the average level and requires strengthening of the methodological support of the educational process [8].

According to A. Bodnar, Y. Zhurat, training of a future teacher should be performed in conditions as close as possible to future teaching activity, which requires the teacher to actively include digital technologies in his professional activity [10].

E.V. Molchanova [10], P.I. Frolova [11,12] O.V. Yakubenko [13] actualizes the risks of information technologies spread in the educational process: the availability of a huge amount of information resources for the student that have a negative impact on health, an increase in neurotic disorders and actualizes the use of various technologies for health protection. Researchers consider the introduction of digital education as a factor in the effectiveness of educational organization.

S.W. Elliott shows that the last decade reforms in the education digitalization are insufficient to meet the challenges posed to society and education by the fourth industrial revolution [14].

Theoretical analysis of works in the field of digitalization by A.Yu. Uvarova, S. Van, C. Kan, shows that one of the current tasks of education is to bridge the digital divide in society as one of the new types of social inequalities. In this regard, the strategy of digital transformation of education should include priority actions for:

- reducing inequality in access to digital technologies through the development of a digital educational environment;
- overcoming the inequality in the use of digital technologies through the development and introduction of effective digital teaching materials and the transition to a personalized organization of the educational process [15].

Currently, the education system of the Russian Federation has faced new challenges related to the need to organize activities during a difficult epidemiological situation. The application of digital technologies in the current epidemiological situation is an inevitable process in the context of increasing the level of epidemiological safety, as well as in the interests of preserving the health of students and teachers [16].

Therefore, today, Russian society and the state are interested in training teachers with relevant competencies for the digital society of the future. In the time of accelerating technological changes, the education system should respond to the challenges of the digital society in training future personnel for the digital economy through the introduction of new digital educational technologies.

The key role in this process is given to teachers who must possess the necessary knowledge in modern digital educational technologies and be prepared for application of these technologies in educational practice.

1.2. Our Contribution

The research of teachers' commitment to use digital technologies in educational activities was performed in 2020. The experimental research involved primary school teachers in Omsk and Omsk region.

When defining criteria for teachers' commitment to use digital technologies in teaching activities, we based on works of G.U. Soldatova, V.N. Shlyapnikova. We have identified the following criteria: cognitive, the indicators of which are the level of teachers' knowledge about specific types of digital technologies, its features, and the possibilities of application in professional activity; motivational, including the teachers' interest in the use of digital technologies in professional activity now and in the future, the express of interest among students in the digital technologies implementation by teachers in lessons and in extracurricular activities; activity, evaluating the systematic use of digital technologies by teachers in educational practice, the range of digital technologies used by teachers and the main obstacles to their implementation.

We conducted a questionnaire survey of practicing primary school teachers. The level of teachers' commitment was studied by ranking the answers of respondents from 1 (minimum expressed sign) to 10 (maximum expressed sign) in points.

Analysis of the questionnaire survey data for teachers working in the Omsk region shows that they have an average level of cognitive criterion formation of commitment to use digital technologies in educational activities, since the average score was from 5.0 to 5.75 points.

Teachers with professional experience from 5 to 10 years have demonstrated the lower boundary of the average level of cognitive criterion formation, mixing the concepts of "digital technology" and "digital resources" with the types of digital platforms. They could not characterize specific digital technologies, indicate the specifics of their use in professional activity. A higher level of the cognitive criterion formation was found in teachers with experience up to 5 years. They are more informed about the types of

digital technologies, their features; find it difficult to indicate the possibility of application in professional activity.

Among teachers with experience of 10–15 years, a level of cognitive criterion was revealed at averaged 5.6 points. However, a qualitative analysis shows that they mix the concepts of "digital technology" and "educational subjects" on which they are implemented. Teachers with experience of more than 15 years have demonstrated the upper limit of the average level of cognitive criterion formation. They named augmented and virtual reality technologies, wireless technologies.

Analysis of results of the questionnaire survey of teachers working in schools in Omsk shows that for teachers with less than 15 years of experience, the level of cognitive criterion formation is higher and averages 7 points. Teachers with experience up to 15 years have knowledge of the types of digital technologies and specific educational platforms: Learning Apps, Multimeter, Google Classroom, Linoit.com and others. They reveal the specifics of these technologies application in the educational process.

Teachers in the city with experience of more than 15 years have demonstrated a low level of cognitive criterion formation, as their average score was only 3.5 points. They do not have clear and specific knowledge about the types of digital technologies, their features, and the possibilities of application in professional activity. These teachers mix digital technology with educational technology: Theory of Inventive Problem Solving - teaching, project activity, portfolio.

Further, the data systematization was performed according to the motivational criterion. The lowest average score (5 points) was obtained from teachers in the Omsk region with experience of 10-15 years, and the highest average score (9.33) was obtained from teachers with experience up to 5 years. The average level of motivational criterion formation was identified among teachers with experience from 10 to 15 years. These teachers demonstrated a lack of interest in the digital technologies application, which they justified by the lack of computer and multimedia equipment in educational organizations, as well as their lack of competence in this area. At the same time, they assess a rather high degree of students' interest in digital technologies implementation, especially using mobile phones.

Teachers with experience from 5 to 10 years have demonstrated an average level of motivational criterion formation, as their average score was 6.5 points. They are more interested in using digital technology, as these teachers are more competent in this field. They started their professional activity more recently, therefore they had the opportunity to master digital technologies in the system of higher teacher education. Namely over the past 10 years digital educational technologies have been actively introduced in pedagogical universities. This group of respondents notes the high interest of students in the use of digital technologies, especially in the form of multimedia presentations, video lessons.

Almost the same distribution of average points (more than 9 points) was obtained from teachers with experience of up to 5 years and more than 15 years. These groups of respondents showed a high interest in the use of digital technologies in professional activity. This is due to the fact that young teachers in the early stages of their professional development are immersed in the digital environment. They indicate the maximum possible degree of students' interest in digital technologies implementation and they consider video lessons, work with training simulators as the most effective form.

Teachers of the region with more than 15 years of experience also showed a high interest in the use of digital technologies in professional activity (with average score 9.12). They are included in the system of supplementary vocational education on the basis of the State Funded Educational Institution of Supplementary Vocational Education "Institute for the Development of Education of Omsk Region" and regularly increase their level of professional competence in this field. This group of teachers assesses the level of students' interest in the digital technologies implementation as high (over 9 points) and especially in working with an interactive whiteboard, digital lessons, and simulators.

Analysis of the motivational criterion formation among teachers in the city revealed that the lowest average score was also obtained from teachers with 10-15 years of experience, as well as among teachers in the region. However, in comparison with teachers in the region, this indicator is much higher (5 and 7 points, respectively). This is due to a higher level of provision with computer and multimedia equipment, access to the Internet of educational institutions in the city compared to the region.

This group of teachers in the city estimates the level of students' interest in the digital technologies implementation as quite high (7.67 points). They believe that digital technologies are effective at all stages of the educational process.

Teachers in the city with experience of up to 10 years show a high level of motivational criterion formation – more than 8 points.

They also have a strong interest in digital technology, as they are well adapted to the digital environment. Their personal and professional development took place during the age of widespread adoption of the Internet and the processes of modern society globalization. They assess the level of students' interest in implementing digital technologies as very high (9.4 points). These teachers believe that Learning Apps, Menterimeter, Google Classroom, Linoit.com, uchi.ru and Diary.ru are the most attractive for students.

The highest level of the motivational criterion formation was identified among teachers in the city with experience of more than 15 years. The level of their interest in digital technologies implementation is approaching the maximum possible (10 points). In the same way, they assess the level of students' interest in implementing digital technologies, especially in working with multimedia presentations, an interactive whiteboard.

Assessment of the activity criterion formation among teachers in the Omsk region shows rather large differences (twice) in the quantitative data distribution: from 3 to 6.67 points. The distribution obtained indicates that for teachers with 5-10 years of experience, the activity criterion is formed at a low level. There is a lack of systematic implementation of digital technologies in their professional activity. Applying digital technologies in the educational process, they are limited to multimedia and video lessons and do not see the prospects for the digital technologies introduction in their professional activities in the future.

For teachers with professional experience of more than 15 years, the activity criterion is formed at an average level and amounts to 4.88 points. They regularly use digital technologies in the educational process, use the following technologies: distance and online training (courses, tests, simulators). They assess the possibilities of using digital technologies in their professional activity in the future little higher.

For teachers with experience up to 5 years and teachers with experience from 10 to 15 years, the activity criterion is formed at a level above the average (from 5.6 to 6.6 points). They regularly use digital technologies in their professional activities: distance learning, online training, video simulators, interactive whiteboard training, and multimedia presentations. These teachers assess the prospects for the digital technologies introduction in education in the future as very high.

A similar distribution of data on the activity criterion formation was revealed by us among the teachers of Omsk. Teachers with experience from 5 to 15 years revealed a low level of this criterion formation (4 points). They indicated the same digital technologies as the teachers of the region, but rated the prospects for their implementation in their professional activity as higher.

For teachers with professional experience of more than 15 years, the activity criterion is formed at a level above the average (5.5 points). Qualitative analysis also did not reveal significant differences with the teachers of the region. They assess the prospects for introducing digital technologies in their professional activities at 6 points.

The highest level of activity criterion formation (7 points) was demonstrated by teachers with professional experience up to 5 years. They actively use Learning Apps, Menter, Google Classroom, Linoit.com and others in their professional activity. They assess the prospects for the use of these technologies in professional activities rather high - at 7.6 points.

2. CONCLUSION

Theoretical analysis of modern scientific approaches and our empirical research allow us to draw the following conclusions:

1. At the current stage of Russian education development, there is an objective need for the use of digital technologies in the teachers' professional activity, which is due to the globalization trends of the digital society and the digital economy.
2. The teachers' commitment to implement digital technologies in education is insufficient. This is due to the lack of competence of teachers, the insufficient provision of educational institutions with computer and multimedia equipment, access to the Internet, as well as the insufficient implementation of relevant advanced training courses.
3. There is no unique dependence between the level of teachers' commitment to use digital technologies in educational activities and the professional experience.
4. Most teachers assess the prospects for the digital technologies introduction in education in the future as quite high and show a sufficiently high motivation for their development due to the high interest of students in their use.

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