

Using the Digcompedu Framework as A Self-Assessment Tool for Enhancing Teachers' Self-Education in Preschool Education

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Abstract: The study examines the use of the DigCompEdu framework as a self-assessment tool for enhancing teachers' self-educational activity in preschool education. In the context of digitalization, teachers' self-education often remains fragmented due to the lack of structured assessment tools. The purpose of the study is to substantiate and empirically verify the effectiveness of DigCompEdu in supporting teachers' professional development. The research was conducted as a formative pedagogical experiment involving 62 preschool teachers. An adapted questionnaire based on DigCompEdu was used, and statistical analysis was performed using the McNemar test. The results demonstrated significant positive changes in key indicators of self-educational activity, including readiness for self-development and the use of digital resources. The findings confirm that DigCompEdu serves as an effective and evidence-based tool for structuring and enhancing teachers' self-education.

Keywords: Digital competence, DigCompEdu, teachers' self-education, preschool education, self-assessment, professional development, digitalization.

Introduction: In the context of the ongoing digitalization of education, the role of teachers' professional self-education is significantly increasing, particularly in preschool education, where the rapid transformation of educational approaches and digital tools occurs under conditions of high practical workload [5; 11]. Modern preschool teachers are required not only to possess basic digital skills, but also to use digital resources consciously and effectively for their professional development [9].

At the same time, despite the wide availability of digital educational platforms, online courses, and professional communities, teachers' self-educational activities often remain fragmented and unsystematic [8; 10]. One of the key reasons for this is the lack of effective tools that enable teachers to objectively assess their digital competence, identify professional gaps, and plan their further development. In this regard, the European Framework for the Digital Competence of Educators

(DigCompEdu) can be considered not only as a model for describing digital competence, but also as a practical tool for self-assessment and structuring the process of teachers' self-education [6].

The scientific novelty of this study is as follows:

The scientific novelty of this study lies in the conceptual and empirical substantiation of the DigCompEdu framework as a multifunctional tool for supporting teachers' self-education in preschool education. In contrast to traditional approaches that consider DigCompEdu primarily as a model for assessing digital competence, this study reveals its potential as a practical self-assessment instrument that enables teachers to structure and regulate their own professional development [6].

The study identifies and empirically validates a set of indicators characterizing teachers' self-educational activity, including readiness for professional self-

development, the use of digital educational resources, the need for further ICT development, and improvements in lesson preparation. These indicators are considered not in isolation, but as an interconnected system reflecting the transformation of teachers' self-education in a digital environment.

A significant contribution of the study is the demonstration of the relationship between the use of a structured self-assessment tool and the development of teachers' reflective position, awareness, and autonomy in professional growth [8]. The findings show that the integration of DigCompEdu into self-educational practices contributes to the transition from fragmented and situational activities to a more systematic and purposeful model of professional development.

Furthermore, the study substantiates the possibility of integrating the DigCompEdu framework into the practice of preschool educational organizations as a mechanism for supporting continuous professional development and enhancing the quality of teachers' self-education in the context of digital transformation [5].

The effectiveness of the proposed approach is confirmed through the results of a formative pedagogical experiment. Statistical analysis using the McNemar test revealed significant changes across key indicators of teachers' self-educational activity ($p < 0.05$), which indicates the reliability of the observed positive dynamics and supports the validity of the study's conclusions.

Purpose of the study

The purpose of the study is to substantiate and empirically verify the use of the DigCompEdu framework as a self-assessment tool for enhancing teachers' self-educational activity in preschool educational organizations in the context of digitalization.

Research object

The object of the research is the process of teachers' self-education in preschool educational organizations.

Research subject

The subject of the research is the use of the DigCompEdu framework as a tool for self-assessment in the development of teachers' self-educational activity.

Analysis of relevant literature

In the context of the digitalization of education, the use of universal and scientifically grounded tools for assessing and developing teachers' digital competence is of particular importance. One of the internationally recognized frameworks is the European Framework for the Digital Competence of Educators (DigCompEdu) [6], developed by the European Commission and aimed at supporting teachers' professional development.

DigCompEdu represents a structured system of reference points [6] that allows for assessing the level of teachers' digital competence, identifying areas for professional growth, and determining directions for further development. Unlike approaches focused primarily on technical skills, the framework emphasizes the pedagogically meaningful use of digital technologies and their integration into professional practice and teaching [7].

The diagnostic function of DigCompEdu lies in enabling comprehensive self-assessment of teachers' digital readiness [6], while its developmental function is reflected in guiding gradual professional advancement and conscious mastery of digital tools. The universality of the framework ensures its applicability across different levels of education, including preschool education, where digital competence is closely related to the organization of the educational process, professional interaction, and self-education.

In the context of professional self-education [8], DigCompEdu can be considered an effective tool that promotes teachers' awareness of their own level of digital competence. The self-assessment process enables teachers to align their existing skills with the demands of the modern educational environment and to move from intuitive use of digital resources to more conscious professional development [9].

The use of DigCompEdu facilitates the identification of individual professional gaps related to the application of digital technologies and supports the development of targeted self-education strategies [10]. Teachers are thus able to determine priority areas for development, select appropriate digital resources, and plan their individual learning trajectories in accordance with professional needs.

Thus, DigCompEdu acts not only as a diagnostic tool, but also as a means of supporting conscious self-education based on internal motivation, reflection, and

independent planning of professional growth. Its application in preschool educational organizations contributes to the transition from fragmented self-educational practices to a more systematic and purposeful model of professional development in the context of digitalization [11].

METHODS

The empirical part of the study was carried out within the framework of the author’s dissertation research and conducted on the basis of preschool educational organizations in Tashkent, as well as professional development courses for teachers. The study involved 62 preschool teachers.

The research was designed as a formative pedagogical experiment and included initial (diagnostic) and control stages, which made it possible to analyze the dynamics of indicators characterizing teachers’ self-educational activity.

An adapted questionnaire based on the European Framework for the Digital Competence of Educators (DigCompEdu) [12] was used as the main diagnostic tool. The instrument was aimed at identifying the characteristics of teachers’ use of digital resources in professional practice, their readiness for self-development, their need for further ICT competence

development, and changes in lesson preparation.

Within the study, the DigCompEdu framework was considered as a tool for organizing self-assessment and supporting teachers’ reflection on their professional development. The comparison of the results obtained at the initial and control stages made it possible to identify changes in the indicators of teachers’ self-educational activity.

To assess the statistical significance of the observed changes, the McNemar test was applied, which is appropriate for analyzing paired nominal data in repeated measurements. The use of this method allowed for confirming the reliability of the identified differences in the indicators before and after the formative stage of the experiment.

RESULTS

The analysis of the results of the formative experiment revealed a positive dynamics in the indicators characterizing the self-educational activity of preschool teachers.

Figure 1 presents the dynamics of key indicators of teachers’ self-educational activity at the initial and control stages of the experiment.

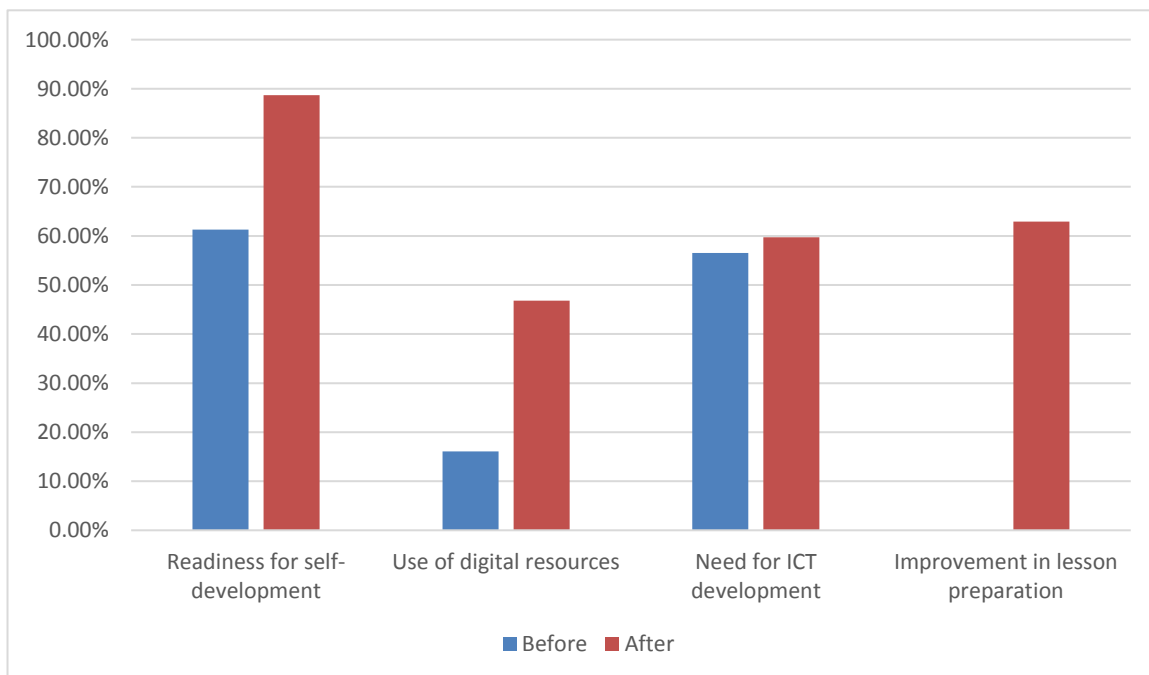


Figure 1. Dynamics of teachers’ self-educational activity indicators at the initial and control stages of the experiment

In particular, the proportion of teachers demonstrating readiness for professional self-development increased

from 61.3% at the initial stage to 88.7% at the control stage. Significant changes were also observed in the use

of digital educational resources in the process of self-education, with the indicator rising from 16.1% to 46.8%.

An increase was also recorded in teachers' conscious need for further development of information and communication technologies (from 56.5% to 59.7%), which indicates the formation of a more reflective attitude toward their professional development. In addition, 62.9% of teachers reported positive changes in lesson preparation after participation in the formative stage of the experiment, while this indicator was absent at the initial stage.

The obtained results indicate the positive impact of using the DigCompEdu framework as a self-assessment tool on the development of a more systematic and conscious approach to teachers' self-educational activity.

DISCUSSION

The obtained results allow us to consider the use of the DigCompEdu framework as a significant factor in enhancing the self-educational activity of preschool teachers. The observed dynamics of the indicators indicate the development of a more conscious attitude toward professional growth [8] and the expansion of the use of digital resources for self-education purposes.

The increase in teachers' readiness for professional self-development, along with the growth in the use of digital educational resources, indicates a shift from episodic use of digital tools to their more systematic integration into professional practice. At the same time, the identified increase in the need for further development of information and communication technologies reflects the formation of a more reflective position of teachers toward their own digital competence.

In this context, the DigCompEdu framework demonstrates its potential not only as a diagnostic tool but also as a means of structuring the process of self-education. Self-assessment based on this framework facilitates the identification of individual professional difficulties and supports the development of targeted strategies for professional growth. This makes it possible to consider DigCompEdu as a mechanism that promotes the systematic and sustainable development of teachers' self-educational activity in the context of digitalization.

Thus, the application of the DigCompEdu framework in preschool educational organizations can be recommended as an effective tool for fostering conscious and purposeful professional self-development of teachers.

CONCLUSIONS

The study substantiates the potential of the European Framework for the Digital Competence of Educators (DigCompEdu) as an effective self-assessment tool in the process of teachers' self-education in preschool educational organizations. The results of the formative experiment demonstrated positive dynamics in key indicators, including readiness for professional self-development, increased use of digital educational resources, and the development of a reflective attitude toward professional activity.

These findings confirm that the use of DigCompEdu contributes to the transition from fragmented and situational self-educational practices to a more systematic and conscious model of professional development. The integration of self-assessment mechanisms based on DigCompEdu supports the formation of teachers' autonomy, awareness, and responsibility for their own professional growth in the context of digitalization.

The practical significance of the study lies in the possibility of applying the DigCompEdu framework within preschool educational organizations as a tool for organizing and supporting continuous professional development of teachers. Its implementation can enhance the effectiveness of self-education by providing a structured approach to identifying professional needs and planning individual development trajectories.

Based on the results of the study, the following recommendations can be proposed:

to integrate the DigCompEdu framework into professional development and retraining programs for preschool teachers as a tool for self-assessment and reflection;

to incorporate self-assessment practices based on digital competence frameworks into the system of continuous professional development;

to support teachers in identifying individual professional deficits and planning personalized self-

education trajectories using digital tools;
to promote the development of digital educational environments that encourage systematic and reflective self-educational activity among teachers;
to provide methodological support for the implementation of digital self-assessment tools in preschool educational organizations.

The results obtained confirm that the DigCompEdu framework serves as an effective and evidence-based approach to enhancing the quality and effectiveness of teachers' self-education in the context of digital transformation.

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