

**SCTMG 2023****International Scientific Conference «Social and Cultural Transformations in the Context of  
Modern Globalism»****PREDICTIVE MODEL FOR SUPPORTING TEACHERS IN THE  
CONTEXT OF DIGITALISATION OF EDUCATION<sup>1</sup>**

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**Abstract**

The article substantiates the author's predictive model of support for teachers in conditions of digitalisation of education, which is a natural process of the information age. Supporting teachers is a process aimed at solving methodological and personal problems in their professional activity, information search for possible solutions, reassessment and rethinking of the use of information and communication technologies and resources. The basis for the development of the predictive model is the social and pedagogical approach, which in the study acts as a methodological regulator for a deeper study of the links between the sphere of education and the processes of using digital technologies, network and other innovative means of communication and work with information. This approach is revealed by us on the basis of the basic concepts of the activity, information and acmeological scientific approaches. The principles of the predictive model are defined and described: openness of education to the external demands of the digital world; subject orientation to the continuity of education; cooperation and digital dialogue; facilitation; socio-professional activity; personal self-realisation of the teacher as a digital professional.

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## 1. Introduction

In the conditions of digitalisation of education, there is a demand for quality training of teaching staff with deep fundamental knowledge, capable of adapting to constantly changing requirements, proficient in new methods and technologies, clearly aware of professional tasks in order to successful self-realisation of individual abilities regardless of their age. Systemic renewal concerns not only the components of the pedagogical system, but also its subjects, the use of virtual environment and information and communication technologies (Pak et al., 2022).

The predictive model of support for teachers in the conditions of digitalisation of education is based on the idea of a gradual increase in the subjectivity of teaching staff when interacting with the digital educational environment. It occurs from the level of digital organisation, which involves mastering all elements of a digital educational resource with the guidance of a teacher-mentor, through the level of digital navigation, which develops teachers' experience of independent work with electronic educational resources with the support of a teacher-mentor. And all this ends in the level of digital navigation, which develops teachers' experience of independent work with electronic educational resources with the support of a teacher-mentor; including the level of digital navigation, which develops teachers' experience of independent work with electronic educational resources with the support of a teacher-mentor.

Forecasting as a property of thinking, which allows us, based on the analysis of past experience and features of the current situation, to anticipate the future, is one of the most important components of purposeful human activity. It allows a person to better navigate in the natural and social world and to ensure the construction of plans and programmes of activity based on reasonable assumptions about its possible dynamics, alternative ways of implementation and probable results. A.V. Brushlinsky (2021), considering the role of forecasting in the thinking process, showed that it is the anticipation of what is sought that determines the economy, validity and correctness of a decision. And the success of activity most often depends on a person's ability to anticipate his or her own future or the future behaviour of other people, the development of certain phenomena and situations in the future.

## 2. Problem Statement

In the context of the current study, the use of the concept "predictive model" requires additional clarification of its content. We used the terms "forecast", "foresight", "prediction" as the same order, describing the complex problems of determining social prospects, general outlines of the upcoming changes in the education system, the direction of its movement in the future, possible only on the basis of a renewed paradigm arising from the dynamic relationship between social cognition and practice. The developed model had theoretical and applied value for predicting the potential of scientifically based transformations in the system under study on the basis of the ability of consciousness to anticipatory reflection of reality. This made it possible to characterise the course, target benchmarks, the nature of links and relations, performance indicators, and features of the formation of digital literacy of a teacher. The implementation of the predictive model was carried out in a set of leading ideas, regularities, principles and rules, the sequence of research stages and included probabilistic-target, structural-content,

coordination-technological and result-analytical blocks, the unity and interrelation of which reflect the purpose and result of the research.

There are a number of studies devoted to the process of supporting teachers in the conditions of digitalisation of education. Some researchers write about the pedagogical component of activity support, while others prefer to consider the technological side of supporting the teacher community. The authors' point of view on this issue is substantiated in the monograph (Ivanishcheva et al., 2023).

The essence of support is to provide support and assistance in cases of difficulties, to preserve personal potential and promote its formation, to bring it to certain results, to realise the right to full development of the individual and his/her self-realisation in society. We share O.V. Davlyatshina's (2017) views on the essence of the support process and consider it as a way of including an individual in the process of interaction in order to create conditions for self-development, self-movement in the activities of all subjects of interaction.

We are close to the opinion of E.F. Zeer (2008), who believes that the process of support as a form should be maintained not only during the period of professional formation of an individual, but also throughout his professional life. These involve support, stimulation and assistance throughout the professional life of a person, conducting psychotechnologies of professional growth, professional correction and rehabilitation.

Supporting teachers in the modern conditions of digitalisation of education is a process aimed at solving methodological and personal problems in professional activity, information search of possible solutions, reassessment and rethinking of the use of information and communication technologies and resources to improve the quality of teaching and building a career trajectory. In this case, support includes the teacher in the process of interaction in order to create conditions for self-realisation and self-movement in professional activity.

The created predictive model as a scientifically based construct provides a deeper and more complete study of the process of teacher support in the conditions of digitalisation of education. The theoretical and predictive purpose of the model is emphasised by V.V. Kraevsky and V.M. Polonsky. Kraevsky and Polonsky (2001): "A model is the next result of abstract generalisation of practical experience rather than a direct result of experiment" (p. 51).

### **3. Research Questions**

The subject of the article is the problematics of designing a predictive model of teacher support in the conditions of digitalisation of education. The interaction of subjects of continuous pedagogical education in the system "university - school" is expanded by means of new ways of establishing communications in visualised models of learning in the digital era.

### **4. Purpose of the Study**

The aim of the article is to present the results of the research on designing a predictive model of support for teachers in the conditions of active transition to digital education.

## 5. Research Methods

The study used theoretical (analysis, synthesis, comparison, abstraction, generalisation, modelling) and empirical (pedagogical observation, study of pedagogical experience and school practice) methods.

## 6. Findings

The social andragogical approach (S.I. Zmeev, N.A. Ivanishcheva, A.I. Kukuev, A.E. Maron, et al.) was used as a basis for the development of a predictive model of support for teachers in the conditions of digitalisation of education. In the study, it acts as a methodological regulator for a deeper study of the links between the sphere of education and the processes of using digital technologies, network and other innovative means of communication and working with information.

The social andragogical approach is revealed by us on the basis of analysis of modern theoretical research on a wide range of problems of adult education and pedagogy itself (Knowles et al., 2005). We proceeded from the understanding that perceptions of the object are set and determined not so much by its objective characteristics as by the means and methods of our thinking and activity, the leading ideas of activity, information, acmeological methodological approaches.

The social andragogical approach not only fixes the orientation of our scientific research with its goal orientation, sets a predictive model of the author's vision, understanding and interpretation of phenomena, facts and events in the education system. But it also acts as a kind of axiomatic basis for the holistic analysis of the logic of support for teachers in the conditions of digitalisation of education. It is aimed at realising the continuity of education and improving its effectiveness by taking into account the personal and age characteristics, life and professional experience, culture, values and ideals of students.

The social andragogical approach aims to design the process of accompanying teachers based on andragogical principles and technologies of adult learning, to utilise the existing experience of individuals and to ensure that new knowledge is quickly put into practice using digital tools and digital technologies.

A system of principles forms the conceptual basis for supporting teachers' activities in the conditions of digitalisation of education:

the principle of openness of education to the external demands of the digital world provides, on the basis of variability and openness of the educational process, the filling of professional activity with personal meaning; the teacher perceives the digital educational environment as a source of enrichment of his/her own inner world, thanks to which he/she forms digital literacy and strengthens the potential of the environment itself, oriented towards meeting the requirements of employers;

- i. the principle of subject orientation to the continuity of education determines the most effective ways to achieve pedagogical goals of teacher support through the implementation of educational material based on the synthesis of knowledge of modern sciences, associated with the professional activities of the teacher, his/her lifelong continuous education and self-education;
- ii. the principle of cooperation and digital dialogicity points to the intersubjective nature of interaction between different-aged participants of professional activity, joint search for truth in the process of pedagogical creativity and digital creativity, exchange of

meaningful positions. This contributes to the development of value orientations, enrichment of life and professional experience, allowing him to join the achievements of culture and create innovations himself;

- iii. facilitation principle makes it possible to move from the formation of a specialist-functional to the training of an active teacher capable of independent analysis of pedagogical situations in the information world and making non-standard decisions, ready to divide management functions between teaching staff in order to increase the productivity of activities in the digital educational environment;
- iv. the principle of socio-professional activity is expressed in the formation of teachers' internal need to realise their life, professional and creative achievements in the digital environment, the formation of an orientation towards success. This implies independent life creation in the application of the digital environment in the vector direction away from themselves (modifying the surrounding society) and in the direction inside themselves (improving themselves), the development of motivation for professional growth and their personal capabilities;
- v. the principle of personal self-realisation of the teacher as a digital professional determines the priority of the teacher's initiative in choosing ways of self-realisation in the process of mastering the digital literacy programme. This gives the opportunity to master new knowledge through the analysis of their own experience, disclosure of their individual abilities and needs, and aims at successful creative self-realisation in pedagogical activity.

In the process of designing a predictive model of support for teachers in the conditions of digitalisation of education, the activity approach (Jarvis, 2004) ensured the recognition of learning as a jointly-divided activity (pedagogical and educational). This implies that the leading role is played by variant activities in the digital educational environment ensuring the recognition of learning as a jointly shared activity (pedagogical and educational). Here, the leading role is played by variant activity in the digital educational environment - active independent activity of teachers to develop their own competence.

Reliance on the activity approach (Rubinstein, 2012) allows us to emphasise the role of subjectivity in interaction with the digital educational environment. The active role of the teacher himself, his involvement, reflexivity, purposefulness and orderliness of actions, creative and productive nature of activity in the conditions of digitalisation are important. From the point of view of the activity approach, the "embodiment" of the values, goals and content of digital education also implies the possession of the necessary arsenal of methods and tools, and the organisation of support for the teacher's activities in the educational and professional context. Various types of activities made it possible to organise the assimilation of knowledge in the field of digitalisation of education and a productive pace of learning without overloading teachers, to carry out a reflective analysis of their own activities, and, consequently, to ensure their readiness for continuous self-development in the profession.

The social andragogical approach in the interpretation of the ideas of the activity approach provides:

- i. developing personal and professional qualities of a teacher that meet the requirements of the information society, digital economy, and the objectives of the system of continuous professional education;
- ii. transiting to a strategy of social design and construction in the education system based on the development of content and digital technologies that define ways and means of achieving the socially desirable level (result) of personal and professional development of a teacher;
- iii. orienting to the results of the professional activity of a teacher using digital content;
- iv. recognising the crucial role of teacher-mentor support and professional partnership in achieving the goals of personal, social and professional development of teachers and digital literacy;
- v. taking into account individual age, psychological and physiological characteristics of teachers, the role and importance of activities and forms of online/offline communication to determine the goals of continuing professional education, ways to successfully achieve them;
- vi. building an individual trajectory of professional development for the teacher, ensuring the growth of creative potential, cognitive motives, enrichment of forms of partnership cooperation with the teacher-mentor in the conditions of digitalisation of education;

ensuring a combination of forms of continuing professional education (self-education, advanced training, internships, retraining and obtaining a new speciality, special-purpose courses).

In the structure of the information approach, as a basic category for the social andragogical approach, we consider the functioning of systems or objects in terms of transformation, storage, exchange, issuance and use of information necessary to achieve the purpose of functioning. We assume that this will allow us, firstly, to implement the way of abstract-generalised description and study of the information aspect of functioning and structure formation of complex systems, information links and relations in the language of information theory (Kagan, 2023). Secondly, it actualises the cybernetic point of view on the pedagogical process, which allows us to consider it as a controlled informational pedagogical interaction between a teacher and children. Thirdly, to strengthen the translating functions of a teacher's professional activity, thanks to which the consolidation of different-age subjects becomes possible. The content and volume of information are limited by a kind of filter, which passes through itself only that part of it, which the society through the "teacher" considers appropriate and possible to transmit to the "student". This filter is the programme of teaching, or, to be more precise, the programme of learning, i.e. the programme of what should be taught to the "pupil". In addition to the filter of the "teacher" (the teaching programme), there is a second filter in educational communication - the filter of the "student". The "pupil" filters out some of the information that is given to him by the "teacher", guided by considerations of subjective value. In the process of learning, the "pupil" works as if in accordance with his or her own programme, the learning programme, which is explicitly or, in the vast majority of cases, implicitly expressed. This learning programme acts as a second information filter.

The "teacher", transmitting a message to the "student", puts the information in the appropriate verbal or sign form (oral speech, text on paper, schemes, drawings, graphs, pictograms, etc.). The subject,

influencing the object with the purpose of its cognition, interacts informationally with the object, not only receiving information from it (about it), but also transmitting to the object (even contrary to its "will") information about itself in the same amount.

In the context of acmeological approach ideas the social andragogical approach determines the nature of professional and personal development of a teacher in the individual trajectory of professional growth on the principles of andragogy. The image of the teaching profession as a cognitive and emotional phenomenon changes the system of general guidelines in the public and individual consciousness of people in the conditions of digitalisation of education. The profession already acts as a means of achieving the desired lifestyle, rather than as an essential part of the lifestyle itself (Kashapov, 2023). A teacher is a subject that is considered as the value core of the education system. Integral characteristics of personality (orientation, competence, flexibility) allow the teacher to act in the digital educational environment as a self-organising subject capable of independently carrying out and managing professional activities with a variety of digital tools, responsibly determining his/her position among people of different age, social status and professional status. The subject orientation of teacher support is manifested in the development of the teacher's focus on the satisfaction of personal goals and its correspondence to the motives, values, and attitudes of the digital educator.

Supporting teachers in the conditions of digitalisation of education ensures the activation of "self" processes in professional activity to achieve "acme" at different levels of maturity (Sinyakova & Symanyuk, 2023). Productive creative activity of a teacher provides professional and personal development, achievement of professional mastery on the basis of realisation of creative potential of a personality. "There comes" the realisation of the need to change the digital attitudes of the teacher, to transform his/her inner world and to search for new opportunities of self-fulfilment in professional work. The identified principles, as the basis of professional and personal development, determine the teacher's ability to turn his/her own life activity into a subject of practical transformation and promotes creative self-realisation in the digital space.

Thanks to the dominant social andragogical approach, a qualitative peculiarity of the teacher's style of building an individual trajectory of professional development based on partnership cooperation with a teacher-mentor in the conditions of digitalisation of education was formed.

## **7. Conclusion**

The predictive model of support for teachers in the conditions of digitalisation of education is a praxeological projection of the concept and structured education. It includes a set of the following components: social demand and consideration of social demands, personal interests and professional deficits, goals, diagnostics and self-diagnostics, output to determine the level of formation of digital literacy. In this case, the content, forms, methods, technologies, evaluation tools, the process of building a teacher individual are integrated. Each element of the model is connected with another. The whole process is cyclical and allows the teacher to move in his/her development in a spiral, each time reaching a higher level of digital literacy development.

The following organisational and pedagogical conditions for the implementation of the predictive model have been identified:

- i. software and methodological support of content design (epistemic-oriented, motivation-oriented, practice-oriented directions) of the modular programme for the formation of digital literacy of teachers;
- ii. technological support of a subject-subject interaction between teacher-mentor and teachers from the position of professional partnership and cooperation, taking into account the main trends of digitalisation of education;
- iii. facilitating support for teachers in continuous professional self-learning, self-improvement and self-realisation, development of skills required by the digital transformation of education.

The predictive model of support for teachers in the conditions of digitalisation of education developed by us includes the following blocks: probabilistic-target, structural-content, coordination-technological, result-analytical.

The probabilistic-target block of the model reflects a subsystem of goals and tasks specifying them, characterised by the mutual influence of the situation of uncertainty of the outcome and consequences of digital transformation of education (which are probabilistic in nature), on the one hand. And the situation of polyvariant goal-setting of participants of professional partnership interaction (teacher-mentor-teacher), strategic guidelines of support in accordance with the requests of teachers, the requirements of society and employers are on the other hand.

The structural and content block includes the composition of support directions (scientific and informational, programmatic and methodological, organisational and technological) of teachers' activity in the conditions of digitalisation of education and "digital" content implemented in the programme of formation of digital literacy. It takes into account the form of training, method of presentation of educational material, period of training, individual trajectory of professional development considering the professional needs of teachers, levels of preparedness to work in digital information and education.

The coordination and technological block of the model allows revealing the specifics of changes in the structure of professional activity, in which the specific weight and importance of information interaction between the subjects of the educational process with digital educational resources and ICT (cloud technologies, virtual reality technologies, non-contact information interaction technologies, etc.) are significantly changing.

The result-analytical block contains reliable information about the progress and results of teacher support, providing warnings about the possible manifestation of risks. They promote or hinder effective work in the digital educational environment of the school and the achievement of the final result of the study - the formation of digital literacy of teachers on the basis of operational analysis, diagnosis, interpretation and correction.

Based on the results of the research, the teacher builds his/her own individual trajectory in the context of trends in the digital world, "assembling" it within the structural-content, coordination-technological and result-analytical blocks. The predictive nature of the model enables each teacher to make probabilistic forecasts of digital literacy development, taking into account his/her own current level of development, individual and professional characteristics. Obtaining an individual result after mastering the programme of digital literacy development returns the teacher to the probabilistic-target block. Thus,

a spiral movement in professional development is achieved, with each time reaching a higher level of digital literacy development.

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