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# Opportunities for Improving the Professional Success of Teachers in the Modern Educational Environment

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**Abstract**

The relevance of studying the problem of improving the professional success of teachers is determined by the system-structural nature of the educational space, which includes a huge variety of factors that are subject to dynamic changes.

The purpose of the work is to show the components of the educational environment that influence the success of the teacher's professional activity and to reveal the possibilities of managing the professional trajectory of the teacher. The study considers the world experience of analyzing various components of the educational environment that determine the features of individual trajectories of the professional development of teachers. It is shown that one of the leading factors of professional success of teachers is their professional qualifications.

It is concluded that managing the process of improving the competence of a teacher through the content of professional qualifications is one of the most effective mechanisms for improving the effectiveness of the educational process.

A variant of constructing a digital predictive - prescriptive model using artificial intelligence technologies is proposed. This model will allow designing an effective individual trajectory of the professional development of a teacher and the content of professional development programs. The theoretical and practical significance of the research is determined by the need to improve the effectiveness of the teacher's activities through the management of the development of his professional competencies.

*Keywords*: big data, educational process, educational environment, digital environment, professional success of a teacher, student success, professional development of a teacher.

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## Introduction

Despite the variety of works devoted to the issue of professional success of teachers, this problem remains one of the most relevant in modern pedagogical research. This is primarily due to the fact that the educational space is understood as a dynamic system, which is determined by changes occurring in the external macro-environment. External conditions, in turn, affect changes in the quality standards of education, in the understanding of educational results, and in the requirements for educational programs (Malanov, 2012).

The article highlights the central problems of the modern educational process, which are addressed by the professional community. First, it is the problem of providing quality education in a rapidly expanding digital space. Secondly, it is the individualization of education, personality orientation, search for ways to overcome the utilitarianism of the received knowledge, assistance in building individual educational trajectories. To solve these problems, drastic changes to the system of teacher training are required (Pogozhina, & Podolskaya, 2018). Therefore, there is a special need for highly qualified teachers who can make decisions independently, predict the possible consequences of changes and form students' competencies most effectively (Dementieva, 2011).

Modern educational space includes various components that determine the effectiveness of the professional activity of a teacher. In the scientific literature, there can be found a number of studies devoted to determining the factors that affect the success of students, as well as the level of their significance. For example, the socio-economic status and level of education of a student's family are significant indicators (Goshin & Mertsalova, 2018). Some scientists place considerable emphasis on the infrastructure and resource support of the educational process (Morosova, Volkov & Mysin, 2014). It should not be forgotten that children's education is a process of interaction between the teacher, the student and other participants in the educational process (Balikoeva, 2015). In some sources, crucial importance is attached to the level of motivation and focus of the student in the educational process, their involvement in educational activities (Chetvertak, 2012).

A study by Ogunkola and Archer-Bradshaw (2013) showed the impact of assessment activities on student learning outcomes. This study provided insight into teachers' perception of the assessment process in the classroom. Factors that may affect assessment activities were identified, such as gender differences and teacher experience (academic qualifications and professional qualifications). Alternative forms of assessment were studied: portfolios, projects, questionnaires, interviews, rating scales, etc. At the same time, the teacher's expertise is shown in terms of organizing adequate assessment activities of students.

Thus, the effectiveness of the teacher's professional activity depends on the interaction of components of the educational environment and their impact on the learning process, as well as on the results of students' learning. At the same time, there is no factor model confirmed by longitudinal research and analysis of big data that captures the list and significance of factors that determine the effectiveness of the teacher's activity, as well as those that have a certain predictive power. Currently, one of the educational trends is the integration of the educational space into the digital environment. This allows us to accumulate huge amounts of educational analytics and opens up prospects for finding fundamental patterns and factors of the effectiveness of professional activities of the educational process actors based on big data and artificial intelligence technologies. The applied value of these patterns is the ability to predict effective individual trajectories of the professional development of each teacher based on the analysis of the entire variety of components of the educational environment.

This study reflects the consistent trends in the field of educational processes related to the digitalization and is part of the solution to one of the objectives of the research project. i.e. to develop a digital predictive-prescriptive model, based on artificial intelligence technology, which will allow designing an efficient individual trajectory of professional development of teachers and the content of training programs.

**Purpose and objectives of the study**

The purpose of the work is to show the components of the educational environment that influence the success of the teacher's professional activity and to reveal the possibilities of managing the professional trajectory of a teacher in a digital environment.

**Literature review**

Modern society requires teachers who are able to design their own professional development following the trends of society's development. High-quality education can only be provided by a competent teacher who understands the tasks charged by modern society, is motivated to achieve educational results meeting the challenges of the time, and is able to ensure the achievement of these results. Therefore, in modern peda-

gogy, the problem of success and professional development of teachers is of considerable importance.

One of the key indicators of a teacher's effectiveness in their professional development is their professional success – a central category in psychological and pedagogical research, which is understood primarily as a positive result of interaction between a teacher and a student (Kopylova, 2007). At the same time, according to the majority of Russian researchers, the basis of the teacher's professional success constitute internal factors, i.e. pedagogical competencies (Shchelocheva, 2019). For example, Aminov, Morozova and Smyatskih (1994), describing the type of a contemporary successful teacher, give the following characteristics: a relaxed manner of teaching, individual attention, sincerity and a friendly tone. A successful teacher is a creative one who is comprehensively involved in various spheres of life and has a wide range of interests and hobbies (Polyakov, 2003).

Most researchers (Shiriaev, 2016) agree that one of the most important factors affecting the success of a student's educational activity is the teacher's qualification, i.e. the level of development of their professional teacher training and psychology competencies associated with the effective and timely application of relevant educational techniques and technologies that allow students to engage in the educational process and stimulate their cognitive activity and communication.

The competencies of a successful teacher include a subject-methodological competence, psychology and teacher training competence, competence in the field of health protection technologies, competence in the use of media technologies, communicative competence, competence in the management of the "student-teacher" system, competence in the translation of their own experience, research and acmeological competence (Dranishnikova, & Sergeeva, 2014).

A number of researchers highlight the influence of the teacher's professional and pedagogical foci on their success in professional activities (Povarenkov, & Slepko, 2014). In this regard, a three-component model for evaluating the professional success of teachers is proposed. The structure of this model includes three main components that reflect the attitude of the teacher to pedagogical work, to the personality of the student and the personality of the teacher. The content of these components is revealed through the following orientations of the teacher:

1.  The focus of the teacher's activities on the interests and needs of the child, as the main content - respect for the child, unconditional acceptance of the child, respect for the development of their personality, interaction and cooperation with the child;

2. The significance of the teacher's attitude to the profession and professional activity, including the professional value system which expresses the importance of work for a person, characteristics of their needs and motivation to participate in work. These are areas of creativity and self-fulfilment in the profession; the social significance of professional activity; professional cooperation;

3. The professional value of the teacher, which determines the attitude to their personality as a teacher and attitude towards themselves as a teacher.

The question arises – what is the level of qualifications of modern Russian teachers (Shadrikov & Kuznetsova, 2013)? The introduction of new educational standards and the new Education Act in the Russian education system has led to a shift in priorities towards the re-evaluation of professional competencies on the list of teacher qualities. The most important direction is to improve the educational process and involve teachers in the process of professional development. The law "On education in the Russian Federation" regulates the duties and responsibilities of teachers, including both moral and professional issues. According to the law, the teacher must comply with moral and ethical standards and show respect for students and parents. Unlike the previous period, the teacher is prohibited from promoting any political or religious ideas. The teacher's standard involves an attempt to lay down requirements for the teacher in general terms. These are professional expertise, continuous professional development, the ability to work with various children, the development of learning strategies and creative abilities (Balura, 2017).

Based on the European experience of evaluating the success of teachers, we can identify the following general evaluation criteria that we can use to analyze the professional activity of teachers. The first and one of the most important factors is the positive influence of the teacher on the learning outcomes of their students. At the same time, success should be defined not in terms of acquiring new knowledge, but in terms of applying it into practice and gaining valuable experience. This is why teachers in Europe work using various training programs since there is no guarantee that only one method will yield the desired results.

Second, teachers should be able to critically evaluate students' knowledge and results and understand whether they need to fill in learning gaps themselves, i.e. to learn something themselves, and then teach the students. When evaluating students' knowledge, teachers rely on standardised tests, as well as interviews with students about their learning.

Third, teacher training is cyclical, not linear. At regular times they need to return to the theoretical concepts of what has already been studied in practice. Most research refers to the use of forms such as modeling and coaching. These interventions are designed and coordinated to achieve a specific learning goal – students' understanding of the meaning of reading, solving mathematical problems, and the ability to scientifically

justify the content. It is important for teachers that their current practices constantly change over time. This is why so much attention is paid to development and improvement.

Is it possible to create conditions that ensure the personal and professional success of a modern teacher, a set of conditions that lead to the success of the teacher's personality without destructive changes in the formation of positive relationships with oneself? The development of the necessary professional competencies of a teacher is a long-term process that begins at the stage of their career guidance towards a teacher training profession and primary training and continues throughout their school career.

The formation and improvement of competencies rests on the problem of teacher training. Thus, one of the main factors of the educational environment, which is most interrelated with the success of the teacher, is the professional development training. Herein, we understand professional development in accordance with the regulatory documents adopted in the Russian education system. The article of the Law "On education in the Russian Federation" states that professional development is the updating of theoretical and practical knowledge, improving the skills of employees (in this case, teachers) due to constantly increasing requirements for their qualifications. The results of socio-economic and spiritual development of society directly depend on the level of teachers' expertise and their ability to continue education (Federal Law №273 «On education in the Russian Federation», 2012).

In Russia today, the certification scheme is undergoing changes. The assessment process is simplified: the documentation package has dwindled, and an electronic portfolio is used. In some regions of Russia, teachers are tested which also affects the results of teacher assessment. There are two qualification grades: the first category and the highest category. Experts in the professional activity of teachers evaluate three areas: the results of students' mastering of educational programs (evaluated based on outcome monitoring); the teacher's development of the students' abilities for scientific (intellectual), creative, etc. activities (evaluated based on the results of the students' participation in competitions and Olympiads); advancements in teaching methods, the productive use of new educational technologies (evaluated based on the results of teachers' participation in seminars, conferences and their scientific publications (Markina, 2018).

However, these areas of assessment do not contribute to a self-regulated increase in the professional success of teachers. A teacher will hardly take the risk of using new teaching methods doing it openly and meaningfully just like a researcher if a less desirable result puts their job, salary, or reputation at risk.

The analysis of psychological and pedagogical research shows that the most successful professional development of a teacher is carried out when a number of conditions are implemented. They are, teachers have the same supply of materials and technical support, good social and living conditions, opportunities to im-

plement their own ideas; the prospects for career growth; the organization of the educational process so that the results of the teacher's work depend primarily on the teacher, their abilities and characteristics; the state should have a clear assessment scheme based on two main principles: favourable conditions for passing the assessment and the absence of contradictions between the motives, incentives for lifelong education and the conditions for its implementation; the economic and social aspects should correspond to the amount and quality of energy and time spent by teachers in work (Gamaniuk, 2013).

At the same time, the lack of evidence-based recommendations and technologies for building teachers' individual professional development trajectories which would take into account the teacher's personal characteristics, conditions and performance poses a significant problem. The correct and justified building of individual trajectories of the teacher professional development based on the analysis of a set of factors that affect their professional effectiveness represents itself a mechanism that largely determines the potential success of their students.

**Methodology**

The leading method of this study is the theoretical analysis of literary sources. The analysis is based on theoretical assumptions of the following pieces of work:

1. Works that reveal the influence of the educational environment components on teachers' professional development.

2. Works that reveal the features of the teacher's professional development.

3. Works that reveal the main assumptions of evidence-based pedagogy.

**Results**

We see the source of overcoming difficulties in the digital capabilities of the modern educational environment. The accumulation of significant amounts of data on various components of the educational environment within modern digital platforms opens up significant opportunities for building accurate predictive models of the development of the teacher's professional activity. Big data analysis in education is one of the leading trends in modern research. This allows us to provide high-quality analytics. Data Analytics is the process of using special algorithms to analyze data sets and extract useful and unknown patterns, relationships and information. Data Analytics is used to find significant relationships between different variables when working with Big Data.

At the moment the authors together with experts in the field of information technology are conducting a study that includes the exploration of an array of big data on the activities of teachers, school management and student success. The data has been collected and continuously updated in the system "E-education for the Republic of Tatarstan" since 2009. The final result of this research is viewed as a relationship model between the success of primary school teachers and subject teachers in organizations of general education with the following generalized factors:

- level, type of vocational education, the sequence of its obtaining;

- subject taught;

- qualifications characteristics;

- experience and age and gender characteristics;

- used pedagogical technologies and teaching materials;

- types of activity practices in the framework of professional development programs where the teacher participates, their performance in vocational communities;

- administrative and extracurricular activities of the teacher;

- teaching load and schedule of the teacher;

- location and infrastructural facilities of the school, including digital and other technical means of teaching;

- the number of students and employees of the educational organization, wage fund;

- student achievement;

- performance in vocational communities;

- duration and content of professional development services.

As a result, analytics and data accumulated over the last 10 years in the Republic of Tatarstan will retrieve information on the relation of a socio-economic and infrastructural environment of the school, characteristics of the educational process, socio-demographic and qualifications characteristics of teachers, types of

the educational practices and teaching methods with the professional performance of a teacher and the success of the pupils. The application of the results will be a digital version of a predictive-prescriptive intellectual-analytical model that will allow establishing the trajectory of teachers' professional development and will function in the form of intelligent tooltips for the teacher and head of the educational organization regarding the recommended trajectory of professional development of teachers, as well as for providers of educational services regarding the parameters of teachers' professional development programs, considering which will ensure teachers' greater performance.

**Discussions**

Currently, most researchers agree that one of the most significant determinants of achieving quality results in the educational process in school is the professional activity of teachers. However, it is obvious that not all school teachers are equally efficient in their activities. Therefore, the issue of the teacher professional development and the specifics of its impact on the success of students becomes one of the most important and widely studied in scientific research concerning fundamental issues of the modern educational environment.

The modern education system is characterized by significant changes in the content and mechanisms of the educational process. This has a significant impact on the effectiveness of the professional activities of teachers. Professional performance of a teacher is determined by the results of their activities. One of the indicators of the effectiveness of such activities is the success of the students included in the educational process.

The basis of this activity is formed by the professional competence of the teacher – educational background, qualifications, the use of effective psychological and pedagogical methods and technologies.

One of the most holistic and systematic approaches is the one proposed by John Hettie, who analyzed the results of more than 50,000 global studies covering a sample of more than 86 million schoolchildren. As a result, they selected the most significant factors that affect the achievement of students. Among these factors, Hattie (2009), in particular, identified the teacher's qualifications, which are determined by the effectiveness of their teaching; the teacher's educational background and experience; the procedure for teacher assessment; the teacher's undertaking of professional training courses.

At the same time, the educational space includes a diverse set of components that influence the trajectory of the professional activity of the teacher, as well as the results of this activity. The analysis of these components, both individually and collectively, presents significant difficulties. First, it is difficult to cover all

educational institutions in order to form a complete picture of the impact of a particular component and build a model that would allow both predicting possible professional development thrusts of a teacher and managing the individual trajectories of those. Secondly, it is necessary to take into account the interdependence of a variety of components of the educational environment based on a systematic understanding of the educational space. Consequently, the problem of the influence of educational environment factors on the success of a teacher's professional activity, despite its relevance, is presented quite discretely in the available research.

**Conclusion**

1. World experience includes studies of various factors and components of the educational environment that determine the features of individual trajectories of teachers' development. The theoretical and practical implication of such research is determined by the need to improve the effectiveness of the teacher's performance through managing the development of their professional competencies.

2. Among the leading factors that influence the success of professional activities of teachers is their professional qualifications. Thus, improving teacher competence through the content of professional qualifications is one of the most effective mechanisms for improving the effectiveness of educational processes.

3. The research aimed at improving the professional success of a teacher considers discrete factors which are presented separately. At the same time, the results offered are based on the evidence collected from individual studies that do not comprise significant amounts of samples and data.

4. The proposed study will cover data covering a long period from 2009 to 2020, characterized by a significant number of respondents (more than a million students, more than a hundred thousand teachers), a significant number of information units (more than two billion digital traces). It will be constantly  updated. These data will reveal fundamental patterns of interaction between various components of the educational environment (socio-economic and infrastructural characteristics, characteristics of the educational organization performance, indicators of the educational process, socio-demographic and qualification characteristics of teachers), and will identify the practical potential of the selected patterns for the construction of individual trajectories of the professional development of teachers.

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formation of an individual trajectory of teacher's professional development based on big data and neural networks (on the example of the Republic of Tatarstan)" № 19-29-14082.

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