

Instrumental and methodological needs and support for teaching staff in the conditions of digital transformation

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ABSTRACT: The forced transition of distance learning during the Covid-19 pandemic demonstrated the possibilities of digital education, at the same time showing that the identification of teachers' difficulties, and prompt and timely support of their activities is the most important condition for ensuring the quality of implementation of digital educational tools. The purpose of the study was to identify the main difficulties of teachers in the organisation of training and substantiate the types of support for pedagogical activity in the digitalisation of general education. To identify the main difficulties of teachers in the implementation of distance/mixed (hybrid) education and popular types of support for pedagogical activities, a *hybrid learning: problems and opportunities* survey was conducted of 134 teachers from 94 educational organisations in Astana, Kazakhstan. The results indicate that teachers, regardless of age, work experience, qualification category and place of residence, experienced difficulties in organising distance learning of a methodological, psychological, technical and logistical nature, and needed timely types of support. To address this problem, a personalised approach is recommended.

INTRODUCTION

Being in self-isolation during the coronavirus pandemic, as well as being exposed to deteriorating weather conditions, showed the need for broad involvement of society in the functioning of education systems [1]. According to the World Bank report, this process turned out to be very difficult for most countries, opening up problems that have accumulated in education (Kazakhstan is no exception in this regard) for many years: the underdevelopment of the school infrastructure of information transmission channels, the unavailability of many teachers to work with digital tools, the lack of high-quality and powerful on-line resources, and many others. During the transition of education to the distance mode, almost all regions faced such problems as the unwillingness of educational institutions to change the learning conditions, digital incompetence of teachers, inequality of students in gaining access to digital educational tools and providing computer equipment, low quality of digital educational content, instability of Internet connection, and others [2].

Countries such as Finland and Singapore functioned almost painlessly during the lockdown, as they intensively and timely reformed their education systems, including their digitalisation. Most countries (the United States of America, Canada, several European countries, African countries, Kazakhstan, and others) have taken the path of identifying the consequences of epidemic and post-epidemic situations in education [3]. Based on the analysis of the obtained data, the ways of stabilising the activities of educational institutions at various levels of education have been determined; the ratio of traditional and digital education optimised; and the preparation of teachers, students and parents for effective interaction with the use of digital educational resources has progressed. In this context, it seems relevant to study the essence of the problems faced by teachers in the conditions of transferring the educational process to a remote mode, as well as the justification for using relevant support tools in solving the problems of digitalisation of education. This article continues a series of publications on the scientific and methodological support for teachers, and methodological developments about the essential difficulties of teachers in the conditions of transferring the educational process to a remote mode [4].

The identification of the main difficulties of teachers in the organisation of hybrid learning and the justification for the types of support for pedagogical activities in the context of the digitalisation of education was the key problem, which required the development of diagnostic tools for this identification, as well as the analysis and interpretation of the empirical data obtained.

In the conditions of digitalisation of education, an important objective is the identification of various types of support for a pedagogical activity, as well as the differentiation of teachers' difficulties considering such parameters as age, work experience, level of general education, subject area taught; and determining the attitude of teachers to the processes of digitalisation of education is also essential [5].

The issues of digitalisation of education are currently the focus of psychological and pedagogical science, where the general trends of modernisation processes in education are discussed, as well as the actual practical needs of teachers experiencing a wide range of difficulties in implementing various innovations [6].

Several scientists have made a huge contribution to the study and development of digital modernisation and transformation of education. Of interest are the studies of Oreshkina devoted to forecasting the digital transformation of education in the context of continuity, with emphasis on its levels - from preschool to post-professional - in which the theoretical foundations of such forecasts are the ideas of digitalisation of scientific, technological and economic spheres [7]. In the work of Panshin digital transformation in view of the digital culture as an efficiency and risk-reducing factor was discussed [8]. Uvarov et al focused on the role of digital technologies that transform the technosphere, and lead to the digital transformation of education [9]. These authors believe that digital changes in the educational process are dominant in the development of education systems in the world [9]. Currently, known as the *point of return* of secondary schools to full functioning and practical realisation of personalised learning opportunities is considered to be a mixed learning format - a combination of traditional learning format with on-line learning [10].

The most scientifically grounded and recognised concept of blended learning is the concept of Horn [11], and Staker [12], who considered blended learning as any educational programme aimed at improving the level of education. As part of such an educational programme, each student studying full-time, at least partially resorts to on-line learning. This concept is based on the principles of personality-oriented education and structurally includes a description of approaches to the organisation of blended learning and *breakthrough* technologies that allow, on the one hand, the student to manage not only his/her own *upward movement*, but also the learning process itself, and on the other, the teacher to become creative, become a mentor able to improve his/her professional competencies as well.

MacLeod analysed the risks of on-line/blended learning, both for students and teachers, creating the necessary conditions to overcome these obstacles [13]. In the study of Ally, great importance is paid to the description of the competencies necessary for a digital teacher to work effectively [14]. The analysis of theoretical and practical problems concerning the professionalism and motivation of teachers in the conditions of digitalisation of education is presented in the work of Watson [15]. Nevertheless, it has to be stated that the problem of comprehensive support of teachers' activities in the context of digital transformation of education remains insufficiently examined at the moment. This circumstance served as the basis for this study.

RESEARCH METHODOLOGY AND RESULTS

The initial materials for identifying the main difficulties of secondary school teachers in the organisation of hybrid education were the answers of 134 respondents who are teachers of 94 secondary education organisations in Astana, including Almaty district - 32 teachers, Saryarkinsky district - 30, Yesilsky district - 17 and Baikonur district - 15.

The survey was conducted through Google Forms, and consisted of eight questions on the topic *hybrid and blended learning: problems and opportunities*.

The following research methods were used: theoretical (analysis, synthesis, clarification, generalisation); diagnostic (questionnaire survey), empirical (experience of teachers organising the educational process in a remote/mixed format, a study of normative and methodological documentation); ascertaining experiment; methods of mathematical data processing.

The study of the problem was carried out in several stages:

- In the first stage, the task was set to diagnose and differentiate the difficulties of teachers in the implementation of hybrid learning by the parameters of age, work experience and level of general education. For this purpose, based on the results of theoretical research, an on-line questionnaire was developed, the questions of which made it possible to identify and differentiate by these parameters the difficulties of teachers in preparing and conducting educational and extracurricular activities in an on-line format;
- In the second stage, an empirical study was carried out to assess the needs of teachers in various types of support in the process of organising hybrid learning;
- In the third stage, based on the analysis and interpretation of the empirical data obtained, conclusions were formulated about the types of support for pedagogical activities that are relevant to the conditions of the digitalisation of education.

As a result of the analysis of the data obtained, the following groups of difficulties of teachers were identified: cognitive, psychological and pedagogical, methodological, organisational, regulatory.

First of all, cognitive difficulties of teachers were identified, since the effectiveness of their activities depends precisely on the ability to rationally cognise the world and purposefully interact with it; perceive, process and analyse information; design and implement action programmes. In the context of this study, these difficulties are manifested in a lack of understanding of the essence, principles and methods of distance learning.

The largest group of participants is represented by teachers aged from 36 to 55 years (57%), which, according to modern psychological research, belongs to the second period of human maturity and is characterised by such qualities as a high level of professional motivation, adequate self-esteem, self-sufficiency, resilience, social maturity, tolerance, ability to adapt. The smallest group of participants in the survey were teachers under 25 years of age (2%) The distribution of participants by age is shown in Figure 1.

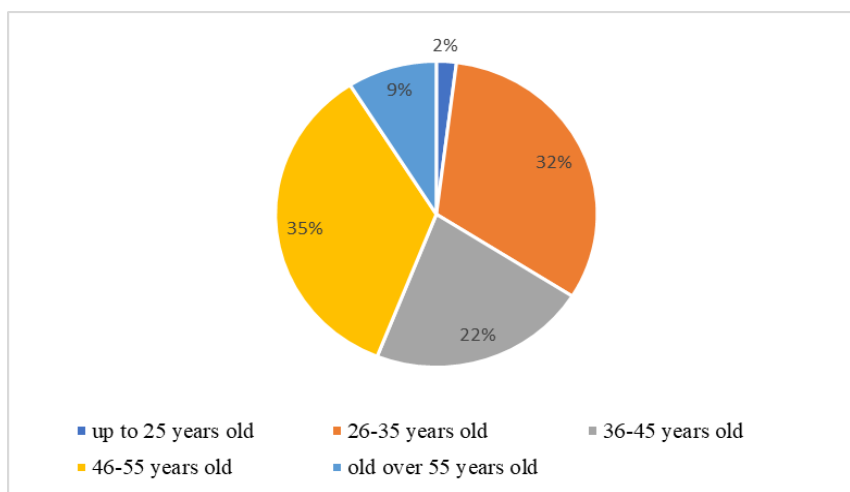


Figure 1: Distribution of participants by age.

The respondents' answers showed that during the period of forced transition to distance learning, many teachers did not fully master the necessary competencies for organising the educational process in a new format. Thus, 48% of the surveyed teachers believed that they generally had an idea about distance learning at the time of the survey, and 5% did not understand it well. Nevertheless, 46% of the survey participants considered themselves competent specialists in the field of distance learning. Moreover, 87% of them continued to use remote technologies in their work and when they returned to full-time education, they fulfilled the need for their use in the modern world. The data obtained during the on-line survey allowed the authors of this article to determine the proportion of teachers by territorial parameter who did not understand the principles and methodology of distance learning (see Figure 2).

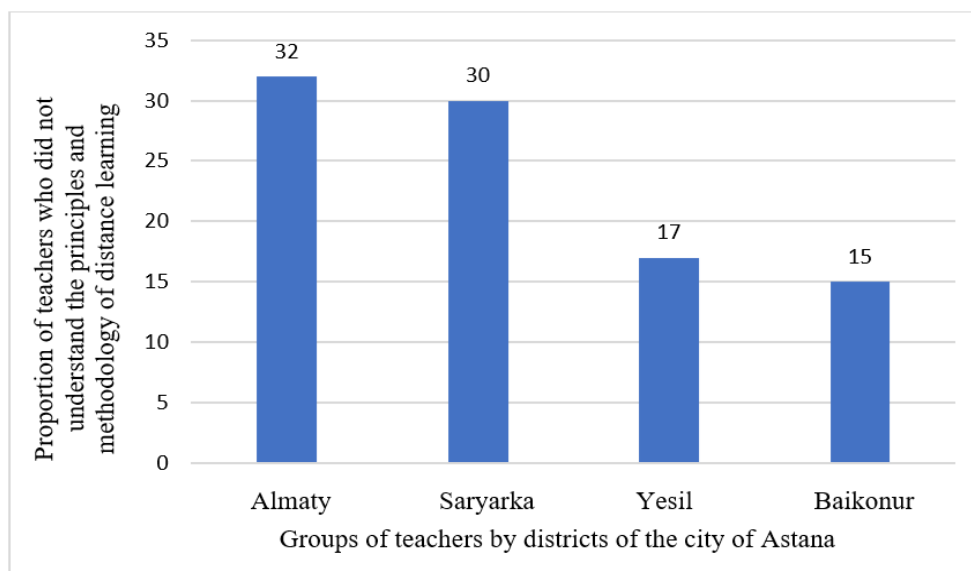


Figure 2: The proportion of teachers who did not understand the principles and methodology of distance learning.

Contrary to the well-established stereotypical opinion that it is more difficult for a person to master new tools of activity with age, the study showed that only 9% of the teachers over the age of 55 noted a lack of understanding of the principles and methods of distance/blended learning. Such problems were also experienced by a minimal number of young professionals under the age of 25 with little work experience, of which only 2% reported them.

Cognitive problems were most often experienced by teachers of two age groups: 46-55 years (35%) and 26-35 years (32%). In the 45-55-year-old group, this can be explained by psychological problems - a period of critical rethinking of professional and life prospects by people and of their achievements, a sceptical assessment of further professional and life prospects, frequent depressive states that prevent them from mastering innovations. Unexpected was the fact that there was no confirmation of the idea of high pedagogical mobility and readiness to be involved in everything *new* for

teachers aged 26-35, who should not have had problems in mastering and implementing distance learning since they are confident users of various digital tools. With a certain degree of probability, it can be assumed that this situation occurred because 65% of the teachers experiencing cognitive problems in the implementation of distance learning live in the Almaty district and the Baikonur district of Astana. Only 13% of the teachers turned out to be in the Esil district, which seems logical since their budgets allowed even before the pandemic to widely introduce digital educational resources and carry out appropriate teacher training.

The leading position, according to the respondents, is occupied by the need for instrumental and methodological support. More than half of the teachers (58%) are in urgent need of advanced training in the implementation of educational programmes in a mixed and distance format; 29% need methodological support in the preparation of interactive educational materials and on-line lessons.

Equally important for teachers are information and methodological (17%) and regulatory (16%) types of work support (local acts, reviews of best practices on the use of digital educational resources, etc).

Respondents did not consider certain types of support and assistance relevant to them. These are, in particular, the organisation of innovative platforms (9%), conducting methodological seminars (7%), recommendations for the design of individual educational routes (6%) and conducting educational webinars with students (6%).

Among the various types of instrumental support that teachers received, methodological assistance dominates (65% of the teachers). Moreover, 46% of the respondents indicated that it came from the school administration, 15% - from school methodological associations, and 14% - from other structural divisions of the school. It is indicative of the fact that 11% of the teachers pointed out that they did not need methodological assistance since they used materials and teaching tools posted on the YouTube channel.

An example of an open information and educational environment is the channel *Digital Pedagogy*, developed by PhD student K.G. Balginbaeva for teachers to provide methodological assistance, and to implement training seminars and advanced training courses for teachers of geography and computer science subjects. On this channel, the author presents and describes a tool for the professional development of teachers. Special attention is paid to the subject-methodical section, the regulatory section and the variable section. The creation of a professional development programme implemented through the digital pedagogy training tool in an on-line format with the use of distance learning technologies meets the needs of students to study in a place convenient for them and at a convenient time.

The Covid-19 pandemic and the forced conditions for organising the educational process on-line were unexpected for most teachers. Many schools and teachers in general were not ready for such working conditions. Therefore, the fulfilment of the requirements of the State Educational Organisation in Kazakhstan, the quality of the implementation of basic and additional educational programmes and the educational results achieved by students depended on how quickly and competently the support of teachers' activities was organised. Therefore, it was important in this study to establish how teachers evaluated the quality of the provided assistance. As shown in Figure 3, in general, all types of support received by the participants were very limited.

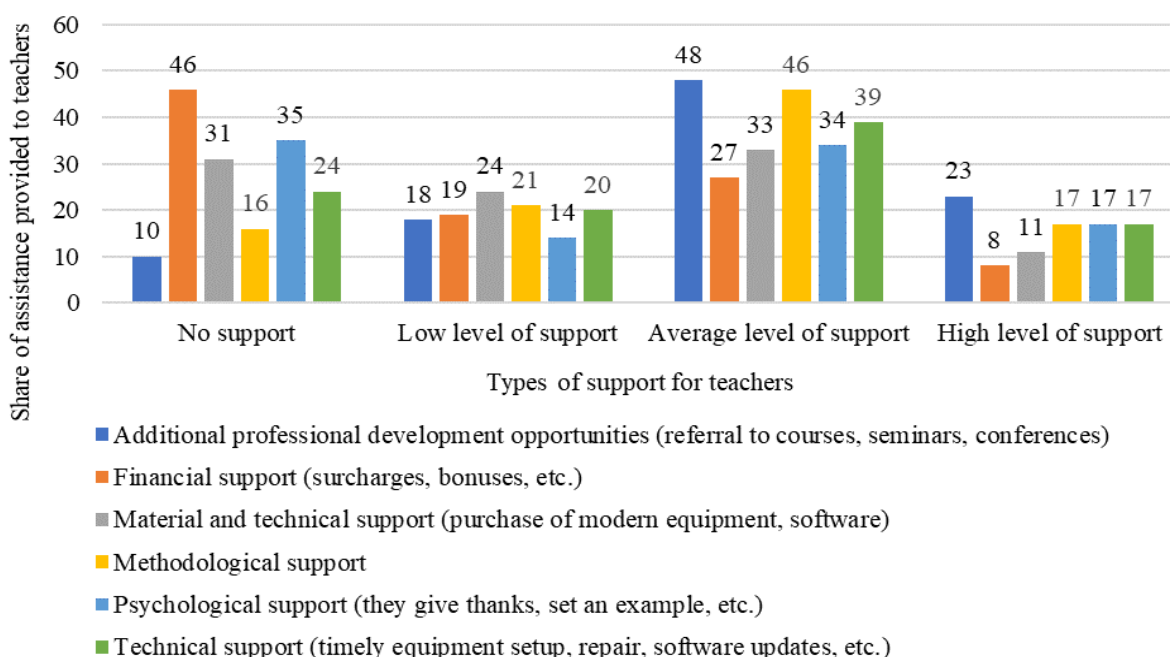


Figure 3: Types of teacher support in the process of implementing distance/blended learning.

Thus, the opportunity to receive additional professional development (training courses, participation in seminars and conferences dedicated to on-line learning) was highly appreciated by 23% of the teachers. Technical, methodological, and psychological support was considered as organised perfectly by 17% of the teachers. Very few organisations were able to provide high-level issues material and logistical support for teachers (8% and 11%, respectively). This means that, in general, teachers did not receive additional funding, and the problems of providing them with modern equipment, software and digital resources remained unresolved until the end.

The obtained data indicate that in the process of transformation of general education, teachers need to possess certain digital competencies when mastering and implementing innovations. At the same time, various difficulties that arise for teachers (organisational, methodological, technical, didactic, etc) become a serious obstacle to achieving the planned results by students at each level of education. Sixty-two percent of the participants agreed that they were required to use digital educational resources by the forced transition of educational activities to distance learning.

Indeed, before the pandemic forced the whole world to live by the new rules, few specialists and managers of the general education system planned an active transition to the systematic use of digital educational resources. The trend of the last few years towards an increase in the number and importance of information bases and resources indicated that gradually and irrevocably they are conquering the educational space of all levels of education.

CONCLUSIONS

The digital transformation of education is a complex, not a simple problem caused by the forced transition to distance learning. Systematic updating of the goals and content of education, organisational forms and methods of teaching in a developing digital environment is impossible without ensuring the appropriate competence of the teaching staff. According to the conducted survey, 54% of the teachers did not consider themselves competent in the field of hybrid learning and experienced various problems (methodological, psychological, organisational, logistical) in its implementation. More than half of the respondents (58%) confirmed the need to improve their competence in the field of new training formats, and at the same time demonstrated dissatisfaction with the content of advanced training courses and methodological seminars.

The results of the study indicate that teachers, regardless of age, work experience, qualification category and place of residence, need various types of assistance to a greater or lesser extent. According to the obtained data, 65% of the teachers received methodological assistance, which came mainly from the school administration (46%), as well as from school methodological associations (15%) and other structural units of the school (14%).

The system of teacher support in the context of the digital transformation of general education should integrate such types of assistance as educational and methodological, psychological, technical, material, logistical, regulatory, informational and methodological.

The analysis of the research data proved the need to transform the support of the teaching staff, which should become predominantly personalised. A personalised approach, taking into account the identified competence deficits and the requirements of the teacher's professional standard, should become fundamental for the systems of methodological work and additional professional education of teachers based on the implementation of personal educational programmes and the use of digital technologies.

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