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TEACHERS' ADAPTATION TO CHANGES IN AN INCREASINGLY COMPLEX WORLD THROUGH THE USE OF AI

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Abstract. In a rapidly changing world, the adaptation of educators to new challenges becomes critical.

Our research within the framework of the research and technical program (grant No. BR21882260, funded by the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan) found that 9,890 (16.1%) of 61,426 teachers consider innovation, creativity, and critical thinking skills to be unimportant or not very important for mentoring. This rejection of an innovation requires a deep understanding of its causes and consequences.

These objections may be due to fear of an uncertain future, misunderstanding of the benefits of artificial intelligence (AI), or fear of job loss. The current paper presents the conditions and mechanisms for teachers to adapt to changes in an increasingly complex world using AI.

Keywords: teachers' adaptation; AI in teaching; emotional AI; digital facilitator; professional network

1. Introduction

In a rapidly changing world, teachers' adaptation to new challenges becomes critical. The dynamics of development of modern technologies and innovations are the driving force behind changes in educational paradigms. Despite all the changes in the external environment and teaching tools, interaction with a qualified teacher remains a key element of an effective educational process.

Since the new generation and the modern teacher today are in the same starting position facing uncertainty, the need to adapt both sides increases in the conditions of exponential transformation of the educational eco-environment under the external influence of scientific and technological progress.

Our research has established that teachers' perceptions of the AI phenomenon in society have different consequences. On the one hand, complete admiration for

the capabilities of AI, tracking AI trends and its gradual implementation in various types of activities, and on the other hand, the emergence of various difficulties in the implementation of AI, such as preventing changes or denying opportunities as a result of its evolutionary development.

Note that 9,890 (16.1%) of 61,426 teachers believe that innovation, creativity and critical thinking skills are not important, or are not particularly important for mentoring. This rejection of an innovation requires a deep understanding of its causes and consequences.

These objections challenge educational science and test a number of assumptions: opposition to innovation may be driven by fear of an uncertain future, misunderstanding of the benefits of AI, or fear of job loss. To overcome these challenges, research is also required on the conditions and mechanisms for teachers to adapt to changes in an increasingly complex world through the use of AI.

The rest of the paper is organized as follows. The next section reviews some existing technologies for applying AI in education. Section 3 presents our research survey and results and the last section concludes the paper.

2. Review of AI educational technologies

A review and analysis of AI technologies in education and modern pedagogical methodologies within the framework of the Bett Show 2020–2023, FETC-2024, and the global intelligent data platform HolonIQ showed that today AI assists the teacher not only as a smart tool to support the teachers' professional activities, but also as a multimodal agent of all their activities throughout the educational process. There are ideas of considering the usage of AI in education as an integral part of determining the degree of digitalization of a higher education institution (Beloev et al. 2023).

Research and scientific publications note that emotional AI is able to "identify, understand and respond to human emotions" (Muskan & Deepika 2023). In addition the Quantum Learning educational methodology (Li et al 2020) triggers the brain's natural ways of learning to maximize learner engagement, understanding, competence, reflection and self-esteem. At the same time, quantum learning is considered as a process that includes uncertainty and openness to new opportunities and paths of development (Syukria 2019).

Taking into account the above, we can conclude that a change in the paradigm of education in an increasingly complex world requires the implementation of pedagogical centering in the professional development of a teacher. In this regard, it is necessary to consider the conditions and mechanisms of adaptation to new realities through personal changes in the teacher, social support and interaction between teachers. One of the effective approaches to adapting teachers to changes will be the creation of a supportive community – a professional network of facilitators through the use of AI.

The importance of teaching communities and their facilitators for teacher professional development has been noted by various researchers like Perry & Boylan 2017, Vangrieken, Meredith, Packer & Kyndt 2017, Aangenendt, Sjoer & Wallner 2023. Summarizing a series of studies (Perry & Boylan 2017; Perry & Bevins 2019; Perry & Boodt 2019) in her work Emily Perry defines three roles of those who contribute to the professional development of teachers: coordinators, designers and facilitators (Perry 2020).

3. Research study and results

As part of the implementation of the research and technical program: "Creating a system of continuous professional development of teachers in the aspect of education for a complex world: paradigm, methodology, digital tools" (BR 21882260) (2023 – 2025) with the participation of the National Center for Advanced Training "Orleu" in February 2024, a survey of teachers of the Republic of Kazakhstan was conducted to study the needs of general secondary school teachers in a professional network of facilitators. The survey involved 61,426 teachers of general secondary schools, including 85% women and 15% men.

The number of teachers with teaching and scientific-pedagogical experience of less than 5 years was 17%, from 5 to 9 years 16%, from 10 to 14 years 16%, from 15 to 19 years 14%, from 20 to 24 years 12%, from 25 up to 29 years old 10% and over 30 years old 15%. Thus, more than half of the respondents (67%) have more than 10 years of work experience.

The survey among teachers of secondary schools in Kazakhstan showed that teachers in their continuous professional development could rely on the help of facilitators. Thus, 73.26% of respondents agreed with the statement "A teacher can develop professionally in interaction with the professional community," which

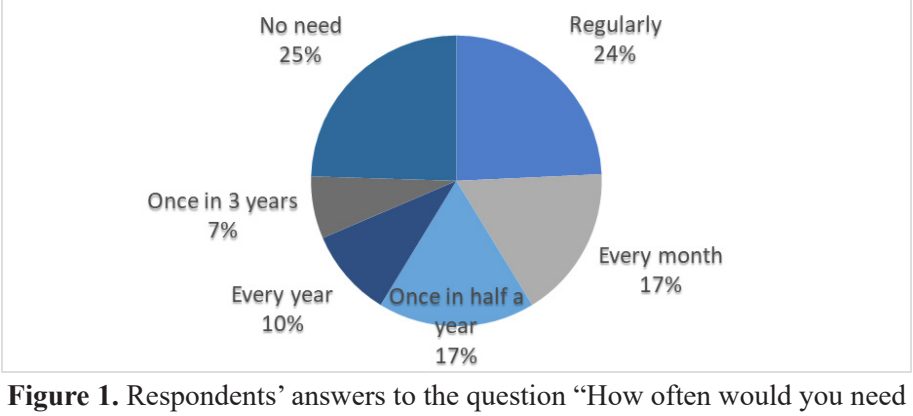

Figure 1. Respondents' answers to the question "How often would you need the help of a facilitator (mentor) in your professional development"

confirms the relevance of professional communities of teachers. 31% of teachers noted that they quite often receive professional support from a mentor.

Systematic support is provided to young specialists; 80.2% of teachers with up to 5 years of experience interact on an ongoing basis with a colleague whom they consider their pedagogical mentor. However, the majority of those with more than 5 years of work experience do not have their own officially assigned mentor (77.5%).

75% of teachers noted that they need support from a facilitator (mentor) with a certain frequency, among them 68% of teachers need support annually or more often than once a year (Figure 1).

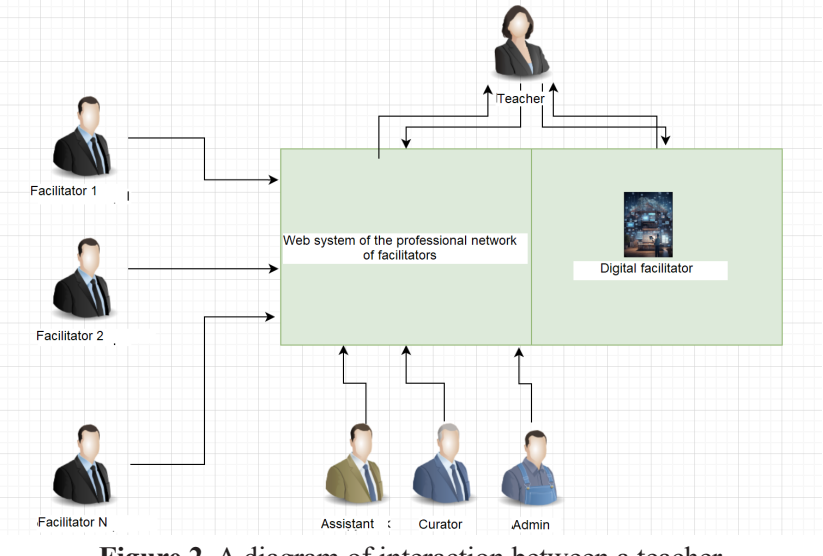

Figure 2. A diagram of interaction between a teacher and real and digital facilitators

Teachers noted thematic seminars and sessions, individual and group meetings as the most preferred formats of interaction with facilitators.

56.6% of respondents would like to gain experience as a mentor themselves. Teachers noted the most important competencies of the facilitator: knowledge of the subject area, deep knowledge of pedagogical content, creativity, critical thinking, constant improvement of their own professional qualifications.

Thus, creating a professional network of facilitators for continuous professional development of teachers can provide professional, methodological and emotional support to teachers, helping and inspiring them. In this way it will also help to improve the quality of teaching and relationships with students, the development of creativity and motivation for professional development.

The architecture of the professional network of facilitators should provide for interaction with both a "live facilitator" and a "digital facilitator", providing augmented reality to the teacher. The digital facilitator implements basic facilitation techniques, for example, Me We Us, which allows the opinion of each participant (teacher and live facilitator) to be taken into account. At the same time, the logical structure of the interaction of a real facilitator in the network is reinforced by the multimodal agency of the "digital facilitator". Such a model of interaction in a professional network of facilitators will make it possible to comprehensively provide for unstable conditions and cover all possible adaptation mechanisms for a teacher (see Figure 2 and Figure 3). The key characteristic of such a network is the pedagogical focus of the organization of continuous professional development of the teacher.

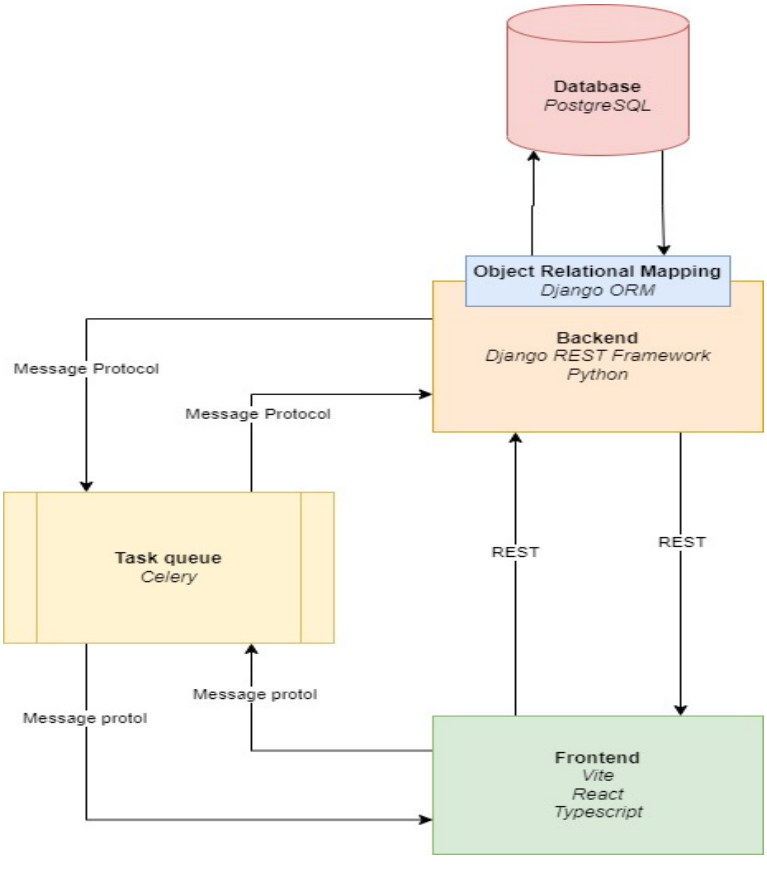

Figure 3. Architecture of a professional network of facilitators

The key adaptation mechanisms for teachers to be implemented in this professional network are:

1. Regular professional development through courses on new teaching methods, technologies and changes in curriculum.
2. Integration of digital tools and educational platforms for the learning process.
3. Cooperation with colleagues, exchange of experience to develop new learning strategies, mutual support and motivation.
4. Using emotional artificial intelligence, work on your emotional and psychological state to maintain energy levels and motivation.
5. Experiment with everything new and adapt them to changes in the educational eco-environment.

The above mechanisms allow teachers to cope with the challenges of uncertainty, as well as constantly develop in the professional field.

4. Conclusion

In the era of digitalization of all spheres of modern society, digital support is needed to create a permanent professional network of facilitators for teachers. Therefore, the capabilities of AI, such as emotional AI and the methodology of quantum pedagogy, at the core of the digital ecosystem will ensure the interaction of facilitators (real and digital) and teachers in the network, expand opportunities and create conditions for the continuous professional development of teachers.

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