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Development of professional qualifications of teachers based on the application of an online course

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Abstract

The education sector is currently developing dynamically. As of 2015, there are a huge number of online platforms in online education for remote communication and training in all fields. On these platforms, students can receive training and feedback through online broadcasts based on educational content, and they can supplement their knowledge through the completion of various tasks. In Kazakhstan, such platforms in the Kazakh language are few. These projects are being developed and implemented in developed countries of the world, such as Europe, the USA, Canada, Russia, etc. Now, the educational platforms in these countries are being used reliably and at a high level. Unfortunately, in the field of education, such platforms and digital technologies are not used in their own tenge, so a number of works (seminars, courses, trainings, etc.) should be carried out in order to improve the digital literacy of teachers. In this regard, the article defines the content of the educational process in a new way, corresponding to the development of teacher competence in the field of education, and the need for it to be based on educational technology. Educational technologies aim to improve the capabilities of digital technology in the educational process and enhance the digital knowledge of teachers through the creation and use of massive open online courses. The article defines the direction of changes in the field of education. The emergence and development of methods of its management correspond to the development of the teacher's skills in the field of education. The essence of the educational system is revealed as the basis for the formation of professional skills of teachers in the learning process. It reveals the nature, structure, functions, and prerequisites for organizing the process of improving the competencies of future teachers. These processes are based on the content of technical support, including educational technology. The relevance of the problem we are studying is obvious, given the fact that the President of the country, Kassym-Jomart Tokayev, has stated that for digital transformation to be successful, every employee must have the necessary amount of digital skills. The research methodology was based on the literature on philosophy, education, psychology, and methodology, as well as research and analysis of legal texts.

Keywords: Competence, Digital technology, Education, MOOC, Online learning.

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1. Introduction

Rapid changes in the field of education and the development of technology place new demands on teachers. The future educator must have the skills for the quality and effective use of new teaching technologies and digital technologies in the educational process. These include knowledge, professional skills, and performance, the use of interactive pedagogy, modern pedagogical models, and traditional pedagogy.

In order to improve the professional competence of future teachers, there are many experimental studies and research. These include aspects such as studying teaching effectiveness, evaluating new teaching methods, examining guidelines and practical activities, analyzing the impact of technology in education, and assessing knowledge and skills. This research helps to determine the best teaching methods and practices and to prepare future teachers professionally.

2. Research Methodology

This refers to the knowledge, skills and motivation required to provide information services and to apply new information technology. Improvement of professional competence is considered as a general component of the process of professional development of a future teacher [1]. Professional competence of a teacher consists of several basic elements: professional knowledge, ability to adapt to changing circumstances, ability to work with personalities, willingness to cooperate with others, ability to combine different resources, willingness for continuous learning and self-improvement, ability to overcome difficulties and achieve success, ability to perform, desire for personal and professional development [2]. The development of professional competence involves the development of personal qualities necessary for effective learning, the creation of an environment conducive to growth, including the promotion of positive attitudes, the provision of support, the encouragement of cooperation and the promotion of self-regulation. The term professional competence encompasses cognition, efficacy and communication components that contribute to the teacher's effective and successful professional role [3].

There is a change in indicators of the action-personal component of teacher competence with increasing length of service. Increasing professional experience increases the effectiveness of the teacher's work and the quality of education. Teaching success depends on the teacher understanding the individual characteristics of each pupil, such as knowledge, strengths and weaknesses [4].

Shulman has identified three components of effective teaching that help teachers to be successful in their work [5]. First, in order to provide students with accurate and valuable information, teachers must have in-depth knowledge of the subject matter. Second, teachers need to have a deep understanding of how to teach and be able to use different teaching strategies to meet the varying needs of students. Thirdly, teachers need to have strong moral principles and to maintain high ethical standards in the practice of their teaching.

To improve teaching effectiveness, teachers can simplify complex concepts, engage students through interactive activities, feedback and assessment, create a supportive learning environment, and emphasise the importance of lifelong learning. Furthermore, teachers should strive to build good relationships with students and encourage their active participation during class discussions. It is very important for him/her to have continuous professional development. They should attend seminars, conferences and other training programmes so that they can stay abreast of the latest trends and teaching strategies [6].

Teachers can have a positive impact on students' lives by continuously improving their professional competence in order to make effective use of issues such as prioritising the special needs of each student, creating a conducive learning environment, and increasing their interest in the subject through the use of digital technology in the educational process.

Introducing digital technologies into the educational process not only changes the content of education but also its methods and techniques, elevating them to a higher level and creating more favorable conditions for the personal and overall development of students. Competitive teachers with developed digital literacy and professional competence are essential for such changes.

Digital literacy is defined as 'a set of knowledge and skills necessary for the safe and effective use of digital technologies and internet resources' [7]. The cognitive processes involved in digital literacy fall into three categories: 1) finding and consuming digital content, 2) creating digital content, and 3) disseminating digital content [8].

According to the American Library Association, "digital competence is the ability to use information and communication technologies for locating, evaluating, creating, and disseminating information that requires cognition and technical skills." On the basis of the above definitions, we can conclude that the professional competence of teachers can be improved through the enhancement of digital literacy, as it allows for the use of various digital technologies in the creation of online courses, becoming familiar with the concepts and types of algorithms for their development.

It is well known that the rapid development of digital technologies has created some 'difficulties' for teachers. However, due to the pandemic, all educational institutions in the country have been 'forced' to use these technologies and move towards online learning. For most teachers to adopt and use digital technologies for online learning, digital literacy needs to be

improved. There is a need to enhance teachers' professional competence in creating and using publicly available online courses. The creation and use of MOOCs pave the way for a new stage in improving teachers' professional competence.

3. Results and Discussion

MOOC (Massive Open Online Course in English) is an educational format that allows an unlimited number of participants from all over the world to learn online via the Internet [9]. As well as traditional learning materials such as video and audio lectures, MOOCs are considered to be interactive as they allow course participants to join forums, hold discussions and provide feedback via social media, and have become a popular form of distance learning [10].

Through the work of George Sears and Stephen Down, the concept of MOOC first emerged in 2008. They developed a course on a dedicated platform that allowed most students to watch lectures and complete assignments for free, and the course became very popular [11].

The real revolutionary success of MOOC, however, came after leading universities such as the Massachusetts Institute of Technology (MIT), Harvard University and Stanford University had launched the course. In 2012, these universities joined together to form a project called Coursera. High quality courses developed by the most experienced professors from these universities were offered through this project. Also, in 2012, the edX platform was launched with the participation of MIT and Harvard [12].

ECDs represent a new format of education and are used to achieve multiple learning objectives. These courses serve to solve problems that have arisen, to create new experiences, to supplement knowledge, and to develop the skills of each individual. A MOOC can offer solutions to problems encountered while carrying out tasks, conduct online seminars, solve a problem by watching video tutorials and communicate through online forums [13].

MOOChas some important features in the modern space of education and training. Online courses in many fields, seminars and social platforms teaching via media may become MOOC [14]. In this way, students can study in their own time, and assessment services and test taking assistance can be provided during the course completion period. Through MOOC, people can have access to education anytime and anywhere.

To understand the phenomenon of education, the characteristics of the educational system in the educational process are helpful. MOOCs offer the opportunity to select content relevant to the students' problems and needs in the local education community.

One of the main advantages of MOOCs is the flexibility of learning. Students can choose to study when it is convenient for them. This is particularly important for those who are in full-time employment and have limited time for further study. In addition, MOOCs allow for interactive and engaging learning through a variety of formats such as video lectures, assignments, discussion forums, and knowledge checks. However, despite the benefits, there are also limitations to the use of MOOCs for teacher professional development. It is important to bear in mind that MOOCs provide only one part of the educational process and are not a substitute for full and comprehensive teacher training. Additionally, as MOOCs do not always include teacher evaluation and support, they require independence and discipline from teachers. MOOCs can offer a variety of topics related to teaching methods, the use of modern technologies in the educational process, the psychology of teaching, and many other aspects of the teaching profession. Teachers can choose their own courses and study the topics that are most interesting and useful for their work.

Future teachers can develop professional pedagogical skills, such as pedagogical opportunities, flexible learning programmes, practice, sharing and certification, and strengthen their digital knowledge in the process of creating and using MOOCs. It is important to keep in mind that MOOCs are not a substitute for a complete education and that they require the independence of the teacher. However, if MOOCs are used in the right way, they can be a powerful tool for the development and enhancement of the professional competence of future teachers.

The pedagogical conditions for the development of professional competence through professional development include the organization of learning, the personalization of learning, the use of feedback, motivation, the application of knowledge in practice, and network support. Such learning conditions in MOOCs help to develop the professional competence of future teachers, taking into account the specifics of online learning and the real conditions of pedagogical work. Teachers have an opportunity to update and expand their professional knowledge and skills in the process of creating and using MOOCs. In the process of using MOOCs, teachers have access to high-quality educational resources that have not been available to them before. As a result, there will be an increase in teachers' professional competence in the creation of MOOCs, and there will be an increase in the use of MOOCs [15].

In the course of their professional career, every teacher should be familiar with digital resources and platforms for the creation of online courses. It is necessary to be able to choose the right platform for creating courses, taking into account the features, characteristics, and advantages of platforms for creating an educational system. This means considering whether the chosen platform meets the educational objectives of the course, content management, feedback transmission, meeting the requirements of the target audience, and other needs.

In order to create an online course, a variety of platforms are used for the creation, development and management of online courses. Coursera, Canvas, edX Studio, Udemy, Moodle, Stepik.org, etc. are some of the most popular MOOC creation software and platforms.

These platforms have different characteristics, but they usually offer tools for creating high-quality online courses, including various functionalities, user-friendly interfaces, assessment tools, and content management tools.

This paper discusses the educational platform Stepik.org as one of them. Stepik.org is an educational platform that allows you to create and deliver online courses, but it is not specifically designed for the creation of MOOCs. The Stepik.org platform allows for the creation of online courses and training, so it can be used to develop MOOCs, but it is important to recognize

that additional tools and platforms may be required to create advanced MOOCs that offer broader and more professional opportunities and extend the reach to a wider audience. However, Stepik allows teachers to create courses and publish educational content such as video lessons, quizzes, assignments, and other materials that can be used for online learning. The platform has a number of tools for organizing and managing learning, which makes it popular with teachers and students.

In the study, we proposed to teach a course entitled 'Creating and Using Online Courses' to familiarise teachers with the above platforms and digital resources. The purpose of this course was identified, the content was developed and it was proposed to teach the course online. The online course 'Creation and use of online courses' was created in the Stepik.org environment and presented to the participants.

The experimental study was conducted in the 2021-2022 academic year with the participation of 86 respondents from South Kazakhstan State Pedagogical University and Shymkent IT Lyceum №7. The first stage was theoretical and practical, aimed at understanding the problem, its purpose and hypothesis, and creating tasks and work plans. Preparation of the experimental basis related to the research topic was included in this stage. The second stage involved the development of the methodology for the pedagogical experiment, execution of experiments on identification and standardization, creation of control and experimental groups, analysis of the results, and identification of opportunities and conditions for increasing the level of mastery of e-courses and learning platforms. The synthesis of new knowledge based on the information gathered using information technology tools was also part of this stage. The third stage was generalization, which included clarifying the main conclusions of the study, approving the methodology of the pedagogical experiment, and developing recommendations for its practical implementation.

A survey was carried out among the respondents before the course was offered. From the answers of the respondents it is clear that they are interested in organising e-courses using web-based platforms. Respondents shared their thoughts, opinions and suggestions during the survey. The results of the survey show that most of the respondents are highly interested in e-learning. In response to the question 'Would you like to create an online course and further enhance your teaching experience by creating an informative educational environment', 81.4% of the respondents answered 'Sure, how important would it be to your experience', 76.7% answered 'I think it would help' (Figure 1).

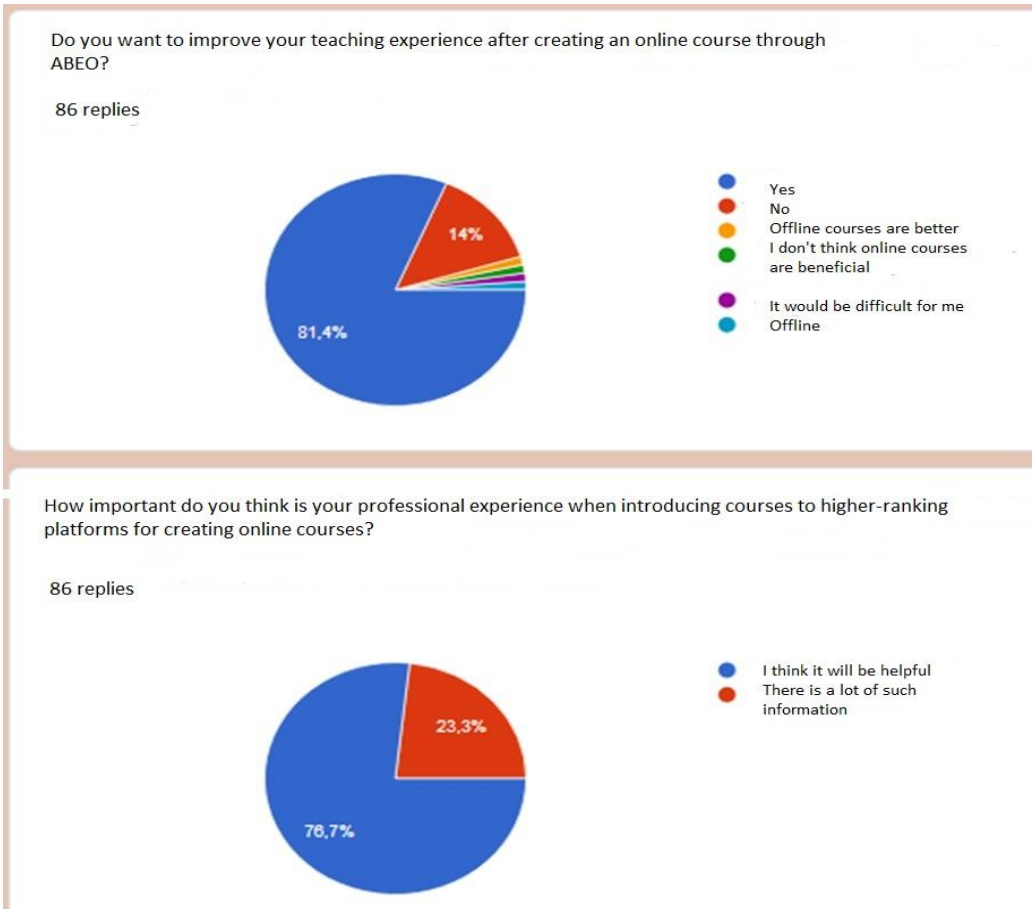

Figure 1.
Indicator of respondents according to the survey data.

The answer of the overwhelming majority shows that it will be useful for the organisation of e-learning in the field of information education and for the organisation of pedagogical work with it. It is also obvious that in order to train future young specialists, it is necessary first of all to pay attention to education and a large number of qualified specialists.

During the research, educational institutions had to work with real online learning programmes and not only develop them in special settings, but also achieve good results in using these programmes in practice. The most important example of

the digitalisation of education is online learning. For this reason, we believe that we should focus on a complementary education that is based on the maximum use of online learning.

The knowledge and skills of creating an information and learning environment and extensive use of online learning resources were formed according to the data collected from the questionnaire after taking our proposed online course. To compare teachers' performance before and after the course, the data collected during and after the pre-survey were analysed using descriptive statistics such as mean and standard deviation. The results, as indicated by the increase in post-test scores compared to pre-test scores, showed a significant improvement in teachers' knowledge and skills after the study (Figure 2).

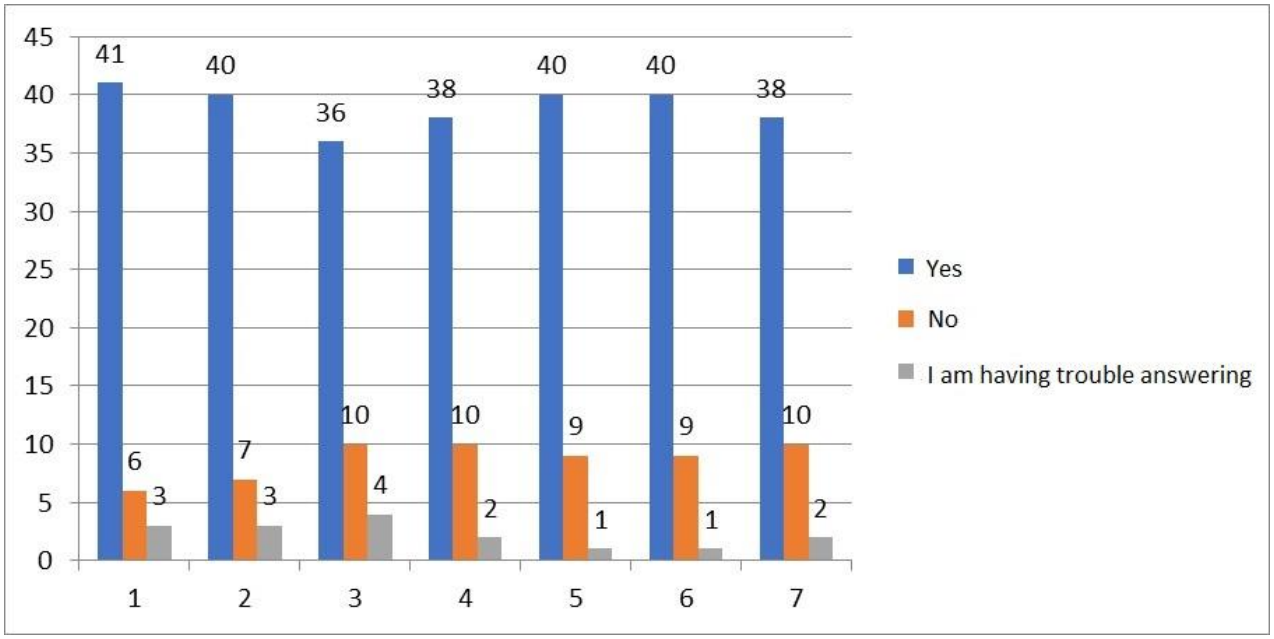

Figure 2.
Examination results after the end of the course.

In general, when we compare the results of the two surveys, we see a higher rate. We also found that teachers were able to develop a number of skills during the course, including

- Creating and managing digital learning materials: Teachers learned how to create and share digital learning materials such as assignments, tests, and multimedia resources using Google Classroom. They also learned how to organize and manage these materials to improve student access and engagement.

- Provide personalised feedback: Teachers learned how to use Google Classroom to provide personalised feedback to students, including written comments and comments on student work.

- Improve communication: Quizzis can be used to facilitate communication between teachers, students, and families. Teachers can learn how to use this platform to enhance communication and collaboration in the classroom.

- Streamline assessments: Teachers can learn how to use Google Classroom to streamline the assessment process, including the use of rubrics, automated scoring, and other features.

- Student engagement: during the course, teachers could learn how to use online platforms to create an engaging and interactive learning experience for students, including the use of multimedia resources, online discussions and collaborative projects.

Feedback from participants indicated a high level of satisfaction with the design, content, and accessibility of the course. Teachers found it easy to learn, provided practical skills to use in teaching, and included educational games to consolidate their knowledge.

The study has implications for the intergenerational benefits of digital pedagogy and highlights the potential value of such courses for improving learning outcomes in higher education institutions.

4. Conclusion

Through the creation and use of a high-quality MOOC, teachers can develop their professional skills while learning opportunities are provided that help them to fully understand all aspects of education and teaching methods, share experiences, and obtain certificates. This can have an impact on the professional skills of teachers. They will be able to choose the most effective and flexible teaching methods, adapted to the different educational levels of the students. We believe that improving teachers' professional skills, including digital skills, is an effective way to do this [16].

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