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A MODEL FOR USING DIGITAL EDUCATION TECHNOLOGIES TO DEVELOP THE PROFESSIONAL COMPETENCE OF FUTURE PRIMARY SCHOOL TEACHERS

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Annotation: This article covers the model of using digital educational technologies in the development of professional competence of future primary school teachers.

Keywords: digital educational technologies, professional competence, Flipped classroom, distance learning, mobile applications, learning environments.

One of the main aspects of improving the educational process in higher education institutions in our country is the modernization of the digitalization of the educational process [1].
With the introduction of digital technologies, the characteristics of education are changing. This leads to organizing the educational process based on modern educational technologies, increasing students' interest in science, promoting independent learning, and developing professional competence. Furthermore, it allows for an increase in the volume of educational information presented to students. In connection with the possibility of using various teaching methods and forms, it ensures the visualization of any educational material learned by students. By teaching modern methods of independent study, it facilitates knowledge acquisition through differentiation and individualization, ensuring successful learning for students of all categories.
Therefore, the introduction of digital educational technologies into the educational process for future specialists in higher education institutions, including future primary school teachers, and the development of new approaches to this process, remains one of the urgent challenges today.

In the proposed research, to address these issues within the framework of the study, a model for utilizing digital educational technologies to develop the professional competence of future primary school teachers has been improved (see Figure 1)

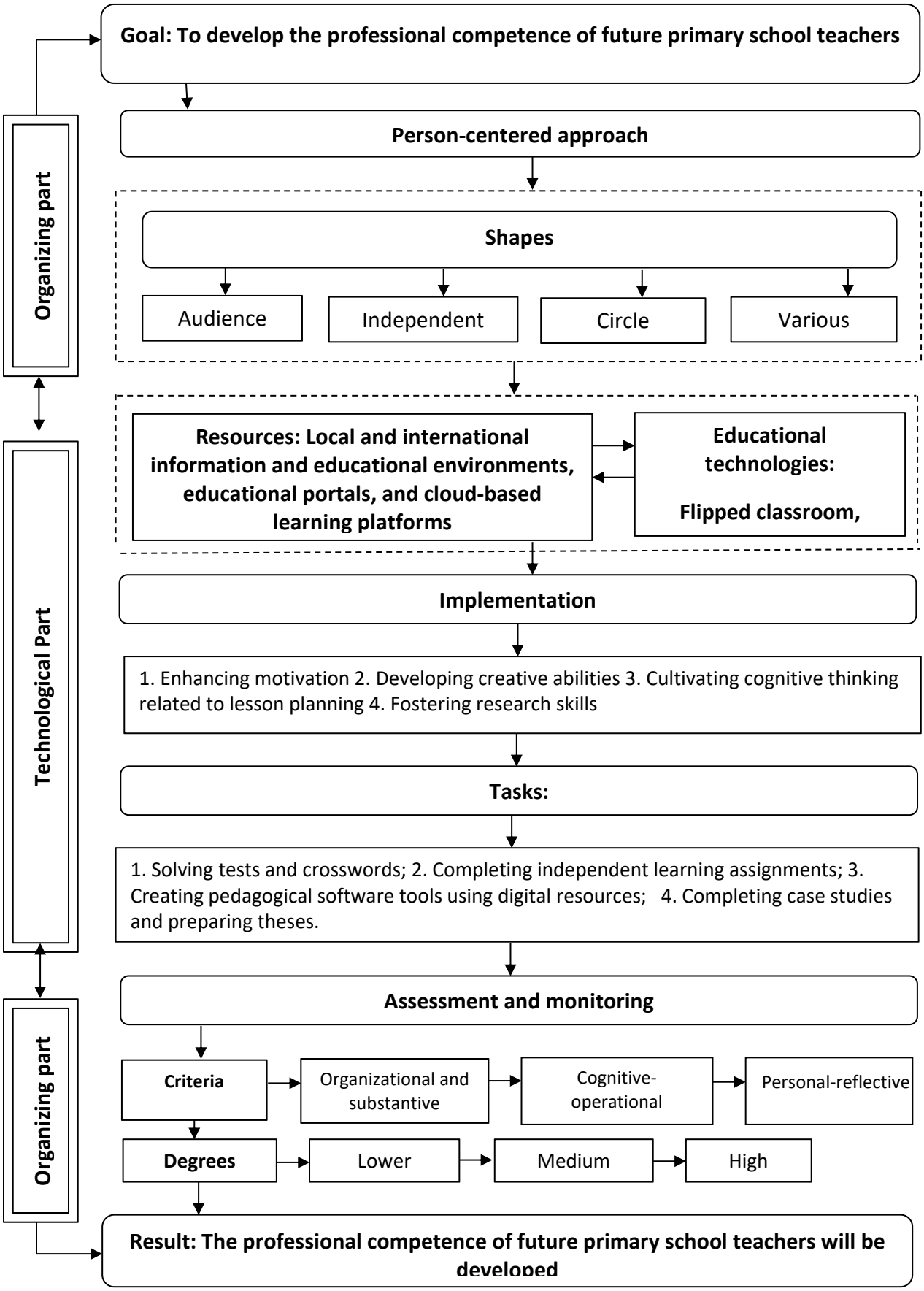

Figure 1. Model for developing professional competence of future primary school teachers

The proposed model consists of organizational, technological, and control components. In the organizational part, the goal is defined as utilizing digital educational technologies for the

effective organization of the educational process and the development of professional competence in future primary school teachers.

The technological part of the model envisions classroom activities, independent learning, organization of clubs, and conducting various events for future primary school teachers based on a person-centered approach.

"A person-centered approach is education based on the learner's personality, their individuality, values, and the creation of humane relationships within the group. Through this approach, each student recognizes themselves as a person with equal rights"[2].

Also, the personality-oriented approach consists in the formation and development of the student's cognitive abilities, contributing to the formation, development, and upbringing of the individual by ensuring the requirements for a deep volume of knowledge, skills, and abilities. "The goals of the personality-oriented approach are to direct the activities of students towards the search and processing of information and the generalization of methods of action. This is not about presenting ready-made material, but about awakening the student's interest, discovering the potential of each of them, activating their collective activity. The relevance of personality-oriented learning lies in the fact that it offers students various interesting materials: the practical application of work on personality-oriented learning during lessons, such as role-playing and didactic games, puzzling questions, problem tasks, entertainment and game situations, which contributes to the creation of learning conditions that transform students into subjects eager for self-knowledge and self-development"[2]. Taking into account the presented possibilities of the personality-oriented approach, it is advisable to use it in the development of professional competence of future primary school teachers.

The goal is to use the integration of local and foreign information and educational environments, educational portals, cloud-based educational environments, as well as Flipped Classroom and blended learning technologies.

Therefore, in the development of professional competence of future primary school teachers, it is recommended to use the following information and educational environments, educational portals, and cloud-based educational environments (see Table 1).

Table 1.

Educational environments, mobile applications and their capabilities

No.	**Educational books and mobile apps**	**Recommendations for use**
	Educational environments	
1.	learningapps.org	Word formation from letters
2.	powtoon.com	Create a subject video presentation
3.	kahoot.com	Hold online quizzes
4.	ahaslides.com	Preparation of various presentations
5.	wordwall.net	Preparation of didactic teaching aids for the logical development of students in the subject

6.	bookwidgets.com	Online crossword puzzles
7.	thewordsearch.com	Development of didactic tools with various word-games
8.	gamma.app, slidesgo.com	Artificial intelligence presentation preparation
9.	gamilab.com	Preparation of didactic learning tools with online games
Mobile apps		
	YouCut-Video Editor	Prepare image video presentations
	Test Maker	Preparation of online didactic assessment and control tools
	AI Questions Generator	Preparation of pedagogical software tools for assessment and control with artificial intelligence

For effective utilization of the recommended learning environments and mobile applications, it is advised to employ Flipped Classroom and blended learning technologies.

Flipped Classroom is a modern approach to organizing the educational process, a teaching technology designed to structure classroom activities and students' independent learning. It is also a technology that aligns well with problem-based learning, ensuring broader student engagement in the learning process [3]. This approach enables the creation of a dynamic and creative environment in which future primary school teachers learn to think critically and collaboratively solve given tasks.

The term "flipped classroom" is a direct translation of the English phrases "flipped classroom" or "inverted classroom." A distinctive feature of the Flipped Classroom learning technology is the complete or partial shift of knowledge acquisition to independent study. French educators have simplified the definition of the Flipped classroom learning technology. According to M. Lebrun, one of the authors of the book "Flipped Pedagogy": "Flipped teaching is not fundamentally a new method, but rather a new way of thinking, aimed at optimizing classroom work with students through extracurricular activities focused on in-depth subject study" [4]. The teacher's role is to encourage students to independently seek knowledge outside the classroom, teaching them not only to search for information but also to verify its reliability, analyze it, and understand it critically. Subsequently, the goal is to foster an active intellectual engagement with the educational material in the classroom, which is a necessary condition for acquiring new knowledge.

The use of the "Flipped Classroom Method" in the higher education system is subject to certain conditions. The philosophy behind this approach is rooted in Socrates and his method of stimulating thought and establishing truth, as well as the art of eliciting correct answers from students. The Socratic method is based on a dialogue between two students, where truth and knowledge are not presented in a ready-made form, but rather emerge through problem-posing and investigation. Therefore, it requires preparation prior to the class session. Socrates viewed his role as engaging in conversation and posing increasingly probing questions, encouraging students to discover the truth for themselves [5].

Although foreign scientists have conducted research to determine the effectiveness of the Flipped Classroom technology, particularly, E. Mazur, a physics professor at Harvard University in the USA, recommended providing lecture materials in advance so that students could at least familiarize themselves with new concepts and terms when preparing for the lesson. At the beginning of the class, Mazur conducted a brief survey, the results of which signaled to the professor how well the educational material was understood and which questions required special attention. Subsequently, in-depth study of the material and problem-solving were carried

out in mini-groups. Unlike traditional physics lectures, he did not demonstrate solutions to similar problems, but instead encouraged students to think about and apply general principles and theories in various situations [5]. The conducted intermediate and final tests showed a higher level of mastery of the educational material compared to traditional teaching methods [6].

Regarding these issues, the term "Flipped Classroom" was first used in 2007 when two high school chemistry teachers in the USA, D. Bergman and A. Sams, began distributing unpublished materials, including video lessons that could be used to study new educational content at home. The school where Bergman and Sams worked was in a rural area, where students often missed classes. To save time and avoid giving additional lessons to absent students, the teachers proposed the idea of recording their lessons on video. This way, students who missed lessons could watch the video recording of that lesson at their convenience at home. Students responded enthusiastically to this approach of independently studying classroom material. Moreover, those who attended the lessons also began to review the video lessons, especially during exam preparation periods. According to Bergman and Sams, as a result of this experiment, the number of underperforming students significantly decreased [7]. The success of these video lessons served as an impetus for further development and experimental testing of this idea in terms of finding ways to optimize educational content.

This method represented a minor revolution in the approach to traditional education and provided an opportunity for professional development and self-improvement for progressive teachers. Without neglecting the process of knowledge transfer, they directed their efforts towards student-centered learning and development.

Currently, several forms of education based on the Flipped Classroom technology are distinguished [4]. The model of the educational process based on the Flipped Classroom technology involves familiarizing students with theoretical material prior to the upcoming lesson. Preparatory materials can be presented in the form of lecture summaries, textbook paragraphs, presentations, or video and audio documents. During the lesson, the professor-teacher facilitates a discussion of the covered material, explains difficult points, answers questions, and employs interactive teaching methods. It should be noted that despite the partial implementation of distance learning, this model remains similar to the traditional education system and retains a translational character: first, theories, concepts, and models are studied, followed by their practical application [5].

The application of the Flipped Classroom technology, traditionally considered "advanced," also involves two stages in the next model of education - classroom learning and independent study. It entails a gradual increase in task complexity and an expansion of activity types. During the initial preparation process, students independently search for information on the given topic, study scientific and methodological sources, watch video lessons, and prepare theses, discussion points, or questions for round tables, which they will present to listeners in mini-groups or individually. They upload their work results to a shared digital platform, allowing the professor-instructor and other students to familiarize themselves with the materials in advance and better prepare for the lesson. This way, each student's independent work is monitored. In the classroom, prepared sources are presented, the studied material is discussed, each group's work is substantiated, and based on the expressed opinions, either a general conceptual framework is developed or a mini-colloquium is held, where one group gives a presentation while the other organizes debates [5].

Based on the ideas presented, it can be said that the Flipped Classroom technology model is a combination of two models. The essence of this model is not changing the location where a certain type of activity is carried out, but rather reorganizing the main components of the educational process. The traditional sequence of applied competencies (memorization, understanding, application, analysis, synthesis, evaluation) is changing.

Firstly, the practical application of the theory or model is studied, and only then is it theoretically substantiated. In the context of increasing the practical orientation of the educational process, this model of Flipped Classroom technology is the most realistic pedagogical approach. This is

because in everyday and professional life, we often have to make decisions under conditions of uncertainty or risk, especially in the economic sphere. During the distance learning stage, students in mini-groups work on a task or problem situation, try to evaluate it, search for and analyze the information necessary for an objective assessment of events, and propose possible solutions. The found data and sources are presented to the students, the task is analyzed under the guidance of the professor-teacher, and the advantages and disadvantages of each proposed solution are compared. After this, another stage of distance learning begins, during which students study the theoretical foundations of this problem and the experience of working on the given issue. In the final stage, the results are summarized for the participants and all the material studied on the topic is consolidated. The applicability of the given model or theory to other situations is analyzed.

While traditional pedagogy presents knowledge in a ready-made, structured, and logically organized form, the Flipped Classroom technology requires students to actively participate in searching for, understanding, and processing information for further use. This approach stimulates interest in the subject being studied, encourages students to think independently, and broadens their knowledge boundaries within the discipline. In this context, the role of the professor-teacher also evolves. The professor-teacher transforms into a consultant, organizer of various student activities, a guide in the process of developing specific competencies, a work supervisor and mentor, manager, and moderator [8].

At the same time, the Flipped Classroom technology significantly alters the traditional assessment process, focusing on the repetition of knowledge and its application in clearly defined academic situations. Various flipped classroom models offer a wide range of knowledge assessment forms depending on the tasks students face. In cases where information is not provided by the professor-teacher, but students need to find it themselves, the approaches used for the search are evaluated.

According to N.V. Tikhonova, to ensure quality education that is required in real life, the teacher must have a clear understanding of what is happening in the program's courses. Additionally, they should work with colleagues from other fields of knowledge to develop interdisciplinary situations that provide integrity to the acquired knowledge and help form the ability to view problems comprehensively. She emphasizes that learning based on Flipped Classroom technology is not an entirely new method; it intersects with various approaches such as learner-centered education, problem-based learning, competency-based approach, and the system-activity approach [5].

The main purpose of the Flipped Classroom technology is to have future primary school teachers study lesson topics in advance using scientific and methodological sources and educational environments [9]. During the class, the professor and future primary school teachers collaboratively discuss and find solutions to problematic issues related to the topic. This plays a crucial role in helping future primary school teachers master the professional subjects taught in their training. In this approach, the topics of professional courses are shifted to independent study. Specifically, future primary school teachers independently study a particular lesson topic beforehand using information and educational environments, learning platforms, and cloud-based resources. During class time, they clarify unclear concepts, apply their acquired knowledge in practice, and exchange ideas with one another. Throughout the lesson, the professor takes on the role of instructor and advisor. As a result, classroom activities for future primary school teachers are oriented towards organizing debates and discussions, thereby enhancing their creative abilities.

Thus, it is recommended to utilize the model proposed within the framework of this study for developing the professional competence of future primary school teachers. In this context, the goal is set to incorporate digital educational technologies in the training of future primary school teachers.

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