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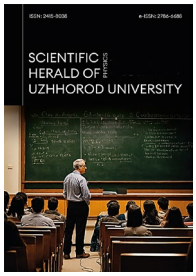

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Development of ICT competence of the future primary school teacher

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Abstract

Relevance. The relevance of the study is conditioned by the problem of expanding the educational space by introducing high capabilities of information and communication technologies that allow improving educational activities in primary school.

Purpose. The purpose of the study is to develop a model for the development of professional competencies of future primary school teachers, allowing them to successfully apply information and communication technologies in the educational process.

Methodology. The leading approach to this problem was a questionnaire survey based on the developments of V.V. Sinyavsky and V.A. Fedoroshin "Communicative and organisational inclinations". It allows determining the level of qualities that will improve communication links, create visibility of the educational process at a high and effective level, and reveal the level of interest in the use of ICT for primary school students.

Results. The paper presents a model of the use of ICT at the primary school as part of the educational process in the classroom when studying various subjects, which includes the course "Window to the world" that creates visibility and informativeness of the studied area by applying modern capabilities of ICT. Its scope includes the presentation of information in a video sequence about the explained aspects, which will increase the level of understanding and assimilation of the topic and create more interesting visual content, which will enhance motivation for the educational process and broaden the horizons of students, creating an environment for the cultural and cognitive development of primary school students.

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Conclusions. The study concludes that the timely adoption of ICT innovations significantly enhances the educational process in primary education, improving the quality and effectiveness of teaching through the development of a model for ICT competence that enriches the learning experience with engaging, informative content, thereby fostering cultural and cognitive development in primary school students.

Keywords: visibility of the educational process; information and communication technologies; professional competencies; methodology; education.

Introduction

Modernisation of the educational environment introduces the technological expansion of pedagogical tools, which, due to innovative developments, will significantly improve the educational process in schools [1]. Among the new and available tools that expand the boundaries of the usual educational process are information and communication technologies (hereinafter – ICT), which have a wide range of possibilities, and can improve many aspects of the educational environment [2].

School education is considered mandatory, taking into account the study of various subjects within classes, where there are a large number of different children, considering aspects of a possible transition to another level of the educational system based on the class, age criteria for admission, and the features of the development of the age framework, which the stage of development of the younger generation has a big difference in various aspects of the perception of the information [3]. Considering the difference in upbringing, interests, the level of preschool development, but in the presence of a large number of children in an educational institution, as a class, where all conditions must be met to maintain an environment that will ensure a high level of preservation of children's health. And under various parameters of external influence, which are understood as any manifestations of visual, auditory, tactile, sensory, emotional, and personal factors that affect the development of the student's personality, both in detail and in general consideration of them. It also consistently affects physical and psycho-emotional health, which includes an individual's self-perception in society, the development of a sense of dignity, the culture of its manifestation, and various indicators of physical health, which should not be violated within the framework of education, and considering the preservation of visual acuity, and posture, and other indicators of neuropsychiatric development, which fall under a great influence from all external parameters [4].

Considering the above, the educational process should be built in such a way that, against the background of obtaining an information competency, they affect students, and especially younger classes, where the level of psycho-emotional flexibility and mobility is very high. Thus, it is necessary to create an atmosphere of goodwill, clarity, and high interest with health-saving factors, which will improve the system of perception and understanding of the knowledge being studied [5]. Thus, within the framework of innovative developments in the field of ICT application, this would allow implementing various tasks facing the educational environment of school, considering its initial stage, and within the framework of strengthening the cognitive part in its realistic representation, improving communications from the aspect of creative manifestations by submitting the necessary information part, which would also contribute to the development of practical skills. At the same time, the widespread introduction and use of ICT require the development of special qualities of their competent organisation and broadening the horizons of the teacher, who will have to possess these features at the level of professional competence, which makes the topic relevant [6].

Materials and Methods

The study was based on a questionnaire survey "Communicative and organisational inclinations" developed by V.V. Sinyavsky and V.A. Fedoroshin. The survey allows identifying accents of an individual's internal predisposition to their understanding of the use of personal skills for timely organisation within the framework of important criteria for maintaining student's health. This, in general, will include organisational and communication qualities, which should be present in any contingent of teachers, and especially in primary school teachers, who should implement this based on factors considering different regulations of these components in their impact on the health of primary school students [7]. In addition, within the framework of the study, the pedagogical survey was used to determine the level of identified interest and motivation to attend the lesson and participate in the educational process with and without the use of ICT tools as part of a survey of schoolchildren using 5 developed questions.

The test has 40 questions that represent judgments in interrogative form, having a different character for personal perception of various situations with an assessment at the level of individual attitude, which the subjects will evaluate using the "yes" or "no" answer. After diagnostic testing, the results obtained were calculated using ready-made keys that allowed determining the level of personal qualities within the framework of organisational and communication abilities at the levels of low, below average, medium, high, very high. Thus, the sphere of personal participation will be highlighted against the background of the formed internal opportunity, where the personal qualities of future teachers will be considered based on their internal motivation to solve organisational issues in a friendly framework of creative conditions that contribute to the improvement of all components at the emotional, social, and physical level of primary school children in school lessons. When estimating the results of the study, the standard method of mathematical calculation and graphical representation of the results was used.

The pedagogical experiment was conducted on the premises of Sarsen Amanzholov East Kazakhstan University, Republic of Kazakhstan. 105 students from the 2nd to the 4th year of study with an age parameter from 20 to 26 years were subjected to diagnostic testing. In addition, the survey was conducted in the general

secondary school No. 3 named after Amir Temir, the Republic of Kazakhstan, where 50 primary school students aged 7 to 10 years were interviewed.

This problem was investigated in three stages. At the first stage, a theoretical analysis of scientific, research, methodological literature on the problem under study was carried out as part of the development of a model of professional competence to use ICT tools at the primary school, and the actual problem, goal, research method, and work plan were identified. At the second stage, students and schoolchildren were tested and this experimental work was carried out with the analysis of the results and the formulation of conclusions. At the third stage, the conclusions were clarified and the results obtained were systematised.

Results and Discussion

In this pedagogical survey, with a system approach, the data obtained during testing were analysed, which allowed identifying the personal characteristics of future primary school teachers and their individual professional ICT competence. This will significantly affect their use of new ICT and its application in the educational process during lessons when explaining the topic, or as part of the answer to the question. This will create conditions for a deeper understanding of the studied area by expanding pedagogical tools that significantly diversify the form of teaching activity in the parameter of adding new elements and details related to the use of various ICT toold. In addition, it includes the preservation of all necessary and existing norms related to the stay of students in an educational institution, which will ensure a high level of preservation of physical and psycho-emotional health of students, within the framework of positive examples that will have a beneficial effect on the development of the younger generation on a par with the development of their cultural image of self-expression on the personal and social levels [8].

With a focus on the described criteria of health preservation factors, the obtained data were analysed, which showed personality properties at the level of organisational abilities that will encourage, if necessary, to apply technological means within the framework of ICT along with conducting educational work in the classroom. This will develop the creative aspects of manifestation in the factor of viewing a visual series of examples at the level of the successful self-manifestation of strangers, taking into account the factor of the mechanism of implementation of the associative transfer of this criterion of behavioural and emotional order at the level of perception of the personality of a primary school student. In addition, this is consolidated within the framework of its foundations with repetition, and from the position of influencing the ideological part of knowledge about the world by applying various knowledge and spheres with various manifestations of practical life in general and detailed consideration, which in fact will be reflected with the help of ICT [9].

Thus, ICT will also carry an educational function to broaden the horizons and form the direction of mental activity based on the semantic background. The video series and audio accompaniment will reflect in a holistic sense what is shown to the younger generation based on its various characteristics, such as playback speed, colour scheme, musical series, gestures at the level of situational level reactions, and many other aspects that will be reflected in each detailed and imaginative version on the educational process of students. This shows them an example of behaviour at different levels and in various forms of its manifestation, based on the mechanisms of influence of the constituent elements of what they saw, based on its various technical characteristics of perception and influence on the development of the personality of students and their health, in the aspect of development and psychosomatic symptoms, and also considering the possible effective result is at the level of a destructive effect on the psycho-emotional and nervous system in view of the possibilities of causing an alarming factor. This includes stressful parameters that will provoke the development of various pathological conditions, both physical, based on an increase in heart rate, respiratory rate, spasms, and changes in comfortable body posture within the framework of a healthy manifestation of free physiological movements, healthy posture, and also at the level of a psychoemotional parameter during influence on the preservation of a positive, friendly and cheerful emotional background, with the absence of neurotic reactions and other pathological aspects of psychological manifestation. Such as, for example, the formation of tics, stuttering, and many overwhelming reactions, and also of a social level against the background of preserving the cultural and aesthetic aspects of the manifestation of vital activity in view of preserving creative behaviour and taking into account conflict-free calm, deliberate and creative solutions to various life situations with the output on a positive basis of the results obtained in all aspects of their implementation and with influence on the life of students [10]. And what is described must necessarily be sustained within the framework of the study of various topics and the use of technological means of information and communication order at a level that excludes all factors that have a negative impact on the physical, psycho-emotional, and social level, both in the internal personal state of the student and in the factor of their self-manifestation at the level of maintaining the positions of a prosperous life in general.

The behavioural and emotional criteria considered on the level of social behaviour and the establishment of communication links should be within the framework of correct legitimate and competent self-presentation, as well as the creation of a high level of self-presentation. Thus, consideration of each individual case will allow for a high level of care in its public manifestation within the framework of preserving the well-being of society, and from the position of respect for nature and surrounding people, which will also provide options for improving the life of the population from the position of influence on the culture of younger generation [11]. The described criteria are also supplemented from the standpoint of consideration of the future professional activity of each student, who will see many components of different areas of support, creative implementation, administrative level of ICT application from the perspective of reviewing the necessary factors within the framework of considering an isolated topic of study. At the same time, this will also strengthen the positive impact of the use of technological

development tools within the framework of ICT. Such an approach will form competent ideas about the application in a generalised understanding of the various components of the knowledge being studied and along with the development of personal positive criteria from the position of the use of professional environments active at the level of criteria formation for further professional orientation. The performance of future professional duties, which students will see on a positive example with a competent of quality, technology, modern criteria for environmental friendliness, informativeness and many others would allow students to form personalities with the improvement of all components of life and understanding of public importance and benefit in the performance of their future professional duties [12].

Thus, the future primary school teacher has a great responsibility in choosing the necessary parameters based on the conditions of health and environmental conservation of visual examples that will open the boundaries of perception of visual video and audio series. Using the technological capabilities of ICT from the position of a positive and competent example, the necessary will be fulfilled based on an important criterion of motivational and target area within the framework of educational and pedagogical support of primary school students. And so, it is given at the level of expanding the prosperous component of their cognitive, creative, contemplative, thinking, communication, and other elements of various functional environments of the cognitive and intellectual sphere. It will create conditions for successful educational and creative processes against the background of school education and educational activities, and in general the stay of primary school students in educational institutions [13]. The use of ICT will also allow future teachers to carry out competent correctional activities, discussing in-depth facts in this use with the acquisition of cognitive criteria. The lessons and educational activities of the teacher will create conditions for the development of new areas of discussion against the background of realistic aspects of the highlighted phenomena, situations, and actions that should be noted [14].

Thus, the competent use of the resource capabilities of ICT will allow, against the background of their natural application, to use a multidimensional system of cognitive and aesthetic components that will have a positive impact on the upbringing and education of primary school students, development of their social activity. The multidimensionality of the options for using the ICT, which will be applied in practice only within the framework of proceeding from the beneficial impact on development, will encourage students to creative and cultural social communication, self-realisation, increase their self-esteem and self-confidence, develop their cognitive and creative functions [15].

Further, the analysis of the results of diagnostic testing, pedagogical supervision, and necessary clarifications in primary school students allowed the study to create methodological elements for the development of the necessary model. Such a model allows developing professional competencies when using ICT to expand and improve the conduct of lessons and educational activities. The model considers the influence of factors of the use of ICT on the personality of students, which was carried out with the help of methodological analysis of the above at the level of consideration of all the details and parameters. Thus, considering the above-described components of the experimental pedagogical research, the model will ensure the effectiveness of conducting scheduled activities at the primary school. The results are understood as the formed level of professional competencies of future teachers within the framework of their use of ICT in their future pedagogical work at the level of practical school education.

The results of the study on the development of ICT competencies were introduced into the educational process in several stages, which included determining the level of personal abilities for organisational and communicative manifestations in future teachers, and in the framework of a survey that allows identifying the level of interest in educational work at the school level in primary school students, with accompanying pedagogical supervision and clarifications of the necessary from the respondents, and with a complete statistical processing of the results obtained. Subsequently, at the next stage, a model for the development of ICT competencies among teachers was developed and implemented for its further use in the field of practical education.

The study covered 105 pedagogical students with an in-depth investigation of pedagogy at the level of teaching primary school students, and analysis of the results of diagnostic testing allowed to conclude that organisational and communication abilities of most of them are developed at an average and below average level, as shown in Figure 1.

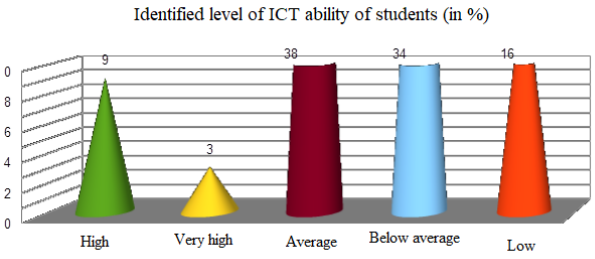

Figure 1. Distribution of students according to the level of organisational and communication skills required within the framework of the use of ICT at the initial stage of the study

The revealed data indicate that the majority of future teachers are limited in their personal manifestation of general communication and have a limited circle of people to manifest themselves within the framework of social interaction, and this potential, based on the factors necessary within the framework of self-manifestation at the level of organisational abilities and the creation of communication links, has an unstable position within the framework of personal disposition to this. The results obtained suggest that the identified criteria of personal abilities need to be developed. From the standpoint of the created model, it is possible to identify criteria of an indicative order in creating the necessary conditions that will allow personal aspirations to be realised at the level of organisational manifestations. This will also be reflected in the factor of creating prerequisites for fruitful discussions, interesting and corrective conversations, answers to

questions that can also expand the boundaries of the use of ICT in a creative framework that increases the level of understanding of the topic and allows improving the necessary components of lessons, improving the educational process, which will also develop motivation and the perseverance of students by increasing interest in the dynamic creative and prosperous background of the scheduled activities [16-20].

In turn, a detailed analysis of the results determined the components of personal characteristics at the level of behavioural prerequisites within the framework of identifying the necessary factor affecting organisational and communication abilities, which is defined in the criteria parameters by answering questions:

– it is difficult to navigate in the current critical situation – 67%;

– it is easy to establish contacts with strangers – 34%;

– it is hard to get used to a new team – 58%;

– people around annoy you – 72%;

– you like to participate in collective games – 47%;

– you are willing to start organising various events – 38%.

The analysis of these issues determined the need to compile a system for the use of ICT factors that will compensate for personal predisposition factors, and to develop the necessary criteria for creative communications and the development of successful organisational skills by obtaining pedagogical education, and in the field of their future professional pedagogical activity [17; 21-23].

In addition, a survey of 50 primary school students on the level of their interest in visiting an educational institution revealed a low level of personal manifestation in the factor of motivation and interest development, positive attitude towards the teacher and stay in an educational institution, and against the background of their participation in the educational process in the classroom, which is reflected in Figure 2.

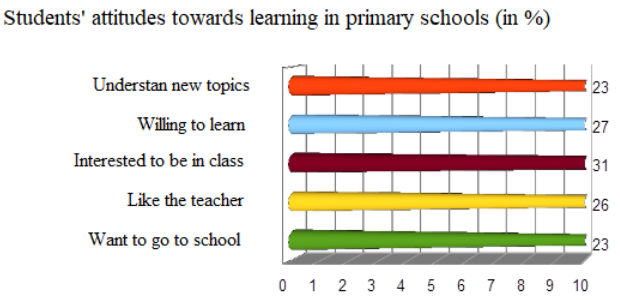

Figure 2. Distribution of schoolchildren in relation to the components of the educational process at the initial stage of the study

Thus, the processing of all the information received indicated the need to introduce into the system of practical school education factors that would satisfy the above parameters. It would significantly improve the educational process based on the expansion of pedagogical means through the use of ICT allowing to develop creative communication skills in the conditions of children's stay in school institutions based on the development of parameters in the characteristics of value attitudes to life and its various spheres, with the manifestation of personal interest against a positive background of the development of psycho-emotional, informational, creative, and social parameters [18; 24; 25].

Based on the above, the trend and parameters for the implementation of the research conditions in the process of developing a model for the development of ICT competencies that will allow the effective use of ICT during the regular activities at the level of teaching primary school students, which will also contribute to the development of high motivation and interest in studying subjects at school, which is of great importance for the field of practical school education [19; 26]. The identified factors were comparable with assessments of the resource capabilities of ICT at the present stage of development, which could create conditions against the background of their application with comparable criteria described above, which will be important for reflecting the facts under consideration in the educational process by creating conditions for preserving the psychological, physical, and social health of primary school students. Thus, with the development of their high need for cognitive and cultural activities within the framework of socially prosperous self-manifestation, which will contribute to the development of the cultural personality of the student from the primary school educational environment, and at the level of future consideration has prerequisites for increasing these positive criteria for the development of the personality of students [20; 27-30].

Thus, considering the above in the aggregate, the parameters were determined and a model was developed for the development of professional ICT competence among future primary school teachers, which will allow them to successfully apply the technological capabilities of ICT in the framework of studying the necessary aspects of the topic, or its deepening, according to the developed pedagogical programme "Window to the World", which allows them to create successful visibility and the informativeness of the studied subject area in its local application or in the position of integration at the level of visualisation of the necessary information in a video sequence on a high-resolution screen regarding many aspects studied at the theoretical or practical level, depending on the discipline and its capabilities. And what is being considered will create conditions for real reproduction of its practical application at the level of its actual realistic image, which will increase the level of interest in being present at the lesson and active self-expression in educational, scheduled activities on a successful factor that enhances motivation, as well as in understanding and assimilation of the semantic characteristics of the topic being studied, at the level of accompanying interesting full-fledged visual content, creating an environment for development within the framework of the cultural and educational process for primary school students [31-36].

Further, the developed model of the use of ICT "Window to the World", which allows the development of professional ICT competencies among teachers, was introduced into the educational process at the level of their cognitive part within the framework of the need and importance of using ICT in their future professional activities in the framework of work in school institutions

with primary school children. The results of repeated diagnostic testing revealed a significant increase in indicators characterising the organisational and communication abilities of future teachers, which is reflected in Figure 3.

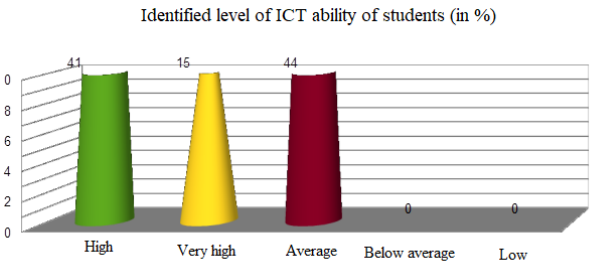

Figure 3. Distribution of students according to the level of organisational and communication skills required within the framework of the use of ICT at the control stage

Consideration of detailed indicators also determined successful factors in acquiring the necessary ICT competencies by giving answers during repeated testing from respondents:

– it is difficult to navigate in the current critical situation – 24%;

– it is easy to establish contacts with strangers – 87%;

– it is hard to get used to a new team – 32%;

– people around annoy you – 32%;

– you like to participate in collective games – 81%;

– you are willing to start organising various events – 79%.

A repeated survey of the primary school students also revealed successful criteria within the framework of increasing interest and motivation in the educational process, as shown in Figure 4.

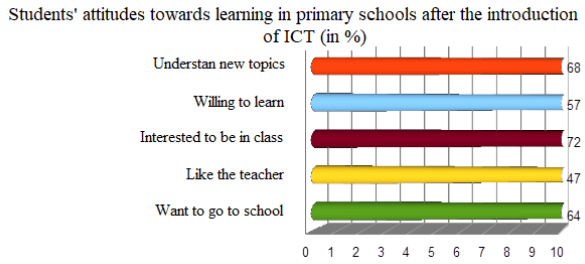

Figure 4. Distribution of schoolchildren in relation to the components of the educational process at the control stage of the study

Pedagogical clarifications on the level of interest in the use of ICT reflected the criteria of total interaction with these modifications of the educational process, which also reflects the success of the created model.

Figure 5 shows the attitude towards the introduction of ICT on the part of primary school students.

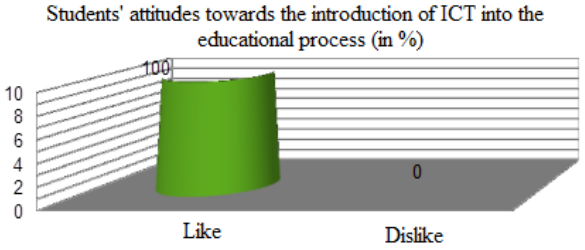

Figure 5. Distribution of schoolchildren depending on their attitude to the introduction of ICT into the educational process

Figure 6 shows the attitude to the modernisation of the educational environment against the background of the inclusion of ICT by future primary school teachers, which also reflects the success of the developed model of creating ICT competencies in the framework of their application in the educational process.

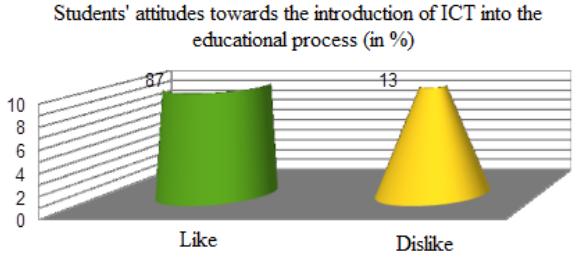

Figure 6. Distribution of students depending on their attitude to the introduction of ICT into the educational process

A general and detailed analysis of the data obtained suggests that the created model for the development of ICT competencies in future primary school teachers has shown itself from a successful position. Both as part of the training of future specialists in the conditions of its introduction into the field of pedagogical education, and at the school level based on its increasing components on the level of increasing cognitive and motivational spheres in school education [37-41]. The correctness of the findings was ensured by the fact that the characteristics, these parameters of the diagnostic test and the survey, with the developed criteria of the model were comparable in the study.

The introduction of ICT to expand the pedagogical learning environment, both as a quality-enhancing criterion in the framework of training highly qualified personnel, and as part of school education, reinforced many components of the educational process, which makes ICT an effective pedagogical tool for improving cognitive, semantic parameters in the study topics, both in its isolated fact and in the concept of integrated application [21-23; 42; 43].

Thus, the model of the development of ICT competence among future teachers within the framework of the primary school educational process has proved to be effective and can be used in practice to improve its quality.

Conclusions

Timely introduction of new developments in the field of innovation at the level of ICT at the present stage of improvement of the pedagogical and school educational environment can significantly improve the quality of the educational process, making the relevant field of pedagogy more qualitative from the standpoint of increasing the level of visibility and considering the acquisition of new and important factors that enhance the information and practical application of knowledge at the level of application of developments in the field of ICT. The model of ICT competence development allows acquiring the necessary skills in the successful and effective use of these ICT tools, which at the level of a pedagogical tool allow improving understanding and assimilation of the information component of the academic process at school. This also helps to increase horizons, develop mental activity, increase interest in studying subjects, due to the developed ICT application programme within the framework of the created model, which includes a pedagogical methodological model "Window to the world". It creates visibility and informativeness of the topic under study within the framework of presenting information in a video sequence on a high-resolution screen. It includes the explanation on the theoretical value of the information component of knowledge, which will create the visibility of their practical application and the realism of the image against the background of the content of the necessary sphere of knowledge, creating an environment for the cultural and cognitive development of junior schoolchildren.

The materials of this study will be useful for workers in the field of education and upbringing, as well as methodologists, and can be applied in practice, which will contribute to solving important tasks in the field of pedagogy.

Acknowledgements

None.

Conflict of Interest

None.

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Формування ІКТ-компетентності майбутнього вчителя початкової школи

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Анотація

Актуальність. Актуальність дослідження зумовлена проблемою розширення освітнього простору шляхом впровадження високих можливостей інформаційно-комунікаційних технологій, які дозволяють удосконалити освітню діяльність у початковій школі.

Мета. Мета дослідження – розробити модель розвитку професійних компетентностей майбутніх учителів початкових класів, які дозволять їм успішно застосовувати інформаційно-комунікаційні технології в освітньому процесі.

Методологія. Провідним підходом до розв'язання цієї проблеми стало анкетування на основі розробки В.В. Синявського та В.А. Федорошина "Комунікативні та організаторські схильності". Воно дозволяє визначити рівень якостей, які дозволять покращити комунікативні зв'язки, створити наочність навчального процесу на високому та ефективному рівні, а також виявити рівень зацікавленості у використанні ІКТ для учнів початкової школи.

Результати. У статті представлено модель використання ІКТ у початковій школі як складової освітнього процесу на уроках під час вивчення різних предметів, яка включає курс "Вікно у світ", що створює наочність та інформативність досліджуваної галузі шляхом застосування сучасних можливостей ІКТ. Його зміст передбачає подання інформації у вигляді відеоряду про пояснювані аспекти, що дозволить підвищити рівень розуміння та засвоєння теми та створити цікавіший візуальний контент, що сприятиме підвищенню мотивації до навчального процесу та розширенню кругозору учнів, створюючи середовище для культурного та пізнавального розвитку учнів початкової школи.

Висновки. У дослідженні зроблено висновок, що своєчасне впровадження ІКТ-інновацій значно посилює освітній процес у початковій школі, підвищуючи якість та ефективність викладання завдяки розробці моделі ІКТ-компетентності, яка збагачує навчальний процес цікавим, інформативним змістом, тим самим сприяючи культурному та пізнавальному розвитку учнів початкової школи.

Ключові слова: наочність навчального процесу; інформаційно-комунікаційні технології; професійні компетенції; методологія; освіта.