

DEVELOPMENT OF ICT COMPETENCE OF TEACHERS OF EDUCATIONAL ESTABLISHMENTS

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Abstract. The processes of informatization, the widespread use of information and communication technologies (ICT) are a condition for the fulfillment of the state order for the development of education. The state educational standard, the strategy for the formation of the information society create a demand not only for updating the information and educational environment of educational organizations, but also for the effective use of its resources. And this is impossible without constant professional development of teachers. In this case, the information and educational environment acts as a field and tool for the development of their professional competence. At the same time, the constant change in its potential requires the rapid development of teachers' competence in the use of ICT. Different ways of understanding the importance of ICT competence of school teachers are analyzed. Based on the analysis, in order to develop an effective methodology for improving the competence in the use of ICT by school teachers, a survey of teachers in Kazakhstan was conducted in order to study the assessment of ICT components and study their use. The results of the study can be used to develop tools for a comprehensive assessment of teachers' competencies in the use of ICT. The requirements of society for the activities of a teacher indicate the need to develop the skills of teachers in the use of ICT. The problem of developing teachers' competencies in the use of ICT is also manifested and exacerbated in an era of high biosocial risks and uncertainty.

Competence in the use of ICT is a set of knowledge, skills and attitudes that allow the critical and creative use of ICT to achieve goals related to work, study and / or leisure.

In his work, the teacher must perform many functions related to the digitalization of the educational process, the successful implementation of which often determines the success of education.

These functions include: information function (search, selection of reliable information, analysis and storage of the necessary information); creation of didactic materials (preparation of textbooks in ICT format, assessment materials, materials for independent work of students); ensuring information security (knowledge of the rules for protecting ICT personal data and educational data of an educational institution, confidentiality); communication (development of communication channels and receiving feedback from students); technical function (skills in working with various ICT and applications, skills in solving technical problems).

Keywords: school teacher, school, digital, competence, modern, functions, education, formation

Basic provisions

Dynamic changes in the modern world, corresponding to the stage of transition to the information society, dictate the need to search for new approaches to the theory and practice of building digital competence in the use of information and communication technologies (ICT) in all areas of human activity.

Digitalisation of education is now declared as one of the priority areas of state policy in the field of education. ICTs are called upon to play a unique role in improving the quality of education, since the current level of their development: significantly expands the possibilities of access to educational and professional information for teachers and students, improves the management of an educational institution, increases the efficiency of it and the educational system as a whole; simplifies the integration of the national education system into the world one, and to a large extent facilitates access to international sources of information in the field of education, science and culture.

Introduction

Most modern countries of the world have recognized the need to modernize general secondary education as one of the priority goals of reforming national education, since the effectiveness of a general education school is an important indicator of the degree of development of any country, its socio-economic potential and international authority. The documents of international organizations (UNESCO, UNICEF) note that school education must meet the needs of modern society, which is faced with an increasing number of unresolved problems that encourage us to look for ways to solve them through the disclosure of the reserves of the creative potential of people, primarily those studying at school.

In this context, the need to study educational processes in foreign countries is of the greatest relevance, and the “dialogue of cultures” makes it possible to avoid national isolation and reach the level of comparative analysis of pedagogical experience accumulated in different countries, and, therefore, constantly improve the theory and practice of teaching and education.

The formation of digital competencies of a school teacher is an important and difficult task. Digital competencies, on the one hand, are part of professional competencies, on the other hand, they are part of the general digital literacy. However, it is the professional functions of the school teacher that determine the composition and content of these competencies.

ICT at school is a modern educational process based on modern digital approaches.

Today, society needs a school teacher who is capable of perceiving new ideas, making non-standard decisions, actively participating in innovative processes, ready to consistently and competently solve existing and newly emerging professional tasks and one of the skills necessary to undertake a research for solution of these issues is digital competence. Consideration of this request is of crucial importance in meeting the social requirements to a modern teacher. Designing the system we have conceived for the formation of readiness of school teachers for their professional and research activity within the digitalization process is a complex and demanding task. We do not have reference developments in the past, because the

previous educational activity for the training of school teachers did not face such complex official requirements that have arisen at present in the context of modernization of the education system in general and higher pedagogical school in particular. The purpose of the study is to develop, scientifically substantiate and experimentally test a model for the formation of digital competence of teachers in the school [1].

In the field of secondary education, electronic admission to school is currently available, electronic learning management systems (LMS) and digital educational resources are used.

Materials and methods

In this case, during the conducted research we applied the following mentioned methods. They are theoretical methods: theoretical analysis of pedagogical, methodological, organizational and managerial literature, analysis, synthesis, generalization, comparison, systematization, and modeling;

empirical methods: pedagogical observation, conversations, questioning, testing, peer review and self-assessment;

experimental methods (stating, forming and control stages of the pedagogical experiment);

method of quantitative and qualitative evaluation of the results obtained (statistical and computer data processing).

Research base. The research base was the secondary school No. 123 in Almaty.

The goal and tasks set determined the course of the theoretical and experimental research, which was carried out during 2021-2022. In three interrelated steps.

At the first stage (2021), the analysis of the problem of formation of digital competence of the teacher and information educational space of the school was carried out. The methodological foundations, prerequisites, as well as the goals and objectives of the study were determined, a hypothesis was formed, and a methodology for scientific research was developed. Based on theoretical analysis, the concepts of "digital competence» were studied and filled with new content.

The analysis of pedagogical, methodical, organizational and managerial literature on the research problem was carried out, advanced pedagogical experience was generalized. The relevance of the formation of digital competence in the information educational space of the school was substantiated.

At the second stage (2022), the theoretical methodological foundations for building a model of formation teacher's digital competence in the context of information educational space of the school, were identified and justified

The research program was refined and corrected, a pedagogical experiment was carried out, and the results obtained were summarized.

At the third stage (2022), the pedagogical experiment continued to determine the effectiveness of the developed model, during which the main components of the model were corrected and refined formation of digital competence, the conditions

for increasing the efficiency of the developed theoretical and practical provisions were identified.

Results

In the course of a theoretical analysis of the scientific and pedagogical literature, it was revealed that the ICT competence of a teacher in the context of the development of a unified information education environment (IEE) acts as a key component of his professional competence. The essence of ICT competence is represented by cognitive, motivational and value, operational and activity, reflective and design components [2].

It is clarified that the development of the professional competence of teachers in the information and educational environment (IEE) occurs in stages and is transformed into the levels of development of ICT competence: 1) the achievement of elementary and functional literacy; 2) achieving a basic level, with the most common ways of doing things; 3) achievement-professional competence, which allows the use of new tools of activity; 4) mastering a new culture, in our case informational; 5) formation of individual informational mentality of a person [3].

Based on the thesis that the development of ICT competence of teachers of educational institutions leads to the transformation of IEE, it was concluded that each level of development of ICT competence should take into account the activity component. The level of activity is compared with the level of development of professional competence: 1) the inclusion of teachers in the activities for the development of IEE; 2) inclusion of IEE in the system of continuous education of teachers; 3) activation of innovative activities of teachers in the field of ICT; 4) systemic use of IEE resources in the educational process; 5) participation of teachers in the formation of local IEE. IEE acts as an orientation field for the development of ICT competence of teachers of educational institutions [4].

It has been clarified that the scientific and methodological support (SMS) for the development of ICT competence of teachers of educational institutions can be considered as a systemic activity aimed at the controlled creation of conditions for the development of the professional competence of a teacher in the IEE.

The conceptual model of the SMS for the development of ICT competence of teachers of educational institutions, which includes: the subjects of the process, the functional-activity structure, a multi-level system of connections and relations, has been substantiated and characterized.

The SMS process is implemented in the subjective quadrilateral represented by:

- accompanied by a teacher (group);
- accompanying person - the entity implementing the SMS;
- teachers involved in the formation of a new pedagogical system and forming the sphere of professional development;
- subjects of the educational process (students, heads of educational institutions, parents, the public) who create a request for the use of IEE resources as a means of professional development [5].

Correction of the conditions for the development of ICT competence of teachers of educational institutions can occur when IEE is used as a sphere of development and as a means of development. The development of technological and cognitive components of ICT competence occurs as a result of the development of IEE as a means of development. The use of the potential of the IEE as a sphere of development is aimed at developing the motivational-value and reflective-projecting components of teachers' ICT competence.

The functional and activity structure of the SMS for the development of ICT competence of teachers of educational institutions includes four activity elements (general theoretical, technological, didactic and design) and three functional elements (accompanying the development of IEE of educational institutions, programs of innovation, continuous education of teachers). Their interaction is determined by properties that reflect the characteristics of the NMS. Relationships in the SMS system for the development of ICT competence at the regional, municipal, local and personal levels are represented by different resource availability (educational, methodological, personnel, technological, organizational, etc.) [6].

To solve the problems of SMS for the development of ICT competence of teachers of educational institutions, it is necessary to comply with organizational, pedagogical and technological conditions, considered as the circumstances of the process of SMS and affecting ITS through connections with the surrounding information space.

The criteria for the effectiveness of SMS as a systemic activity should reflect the creation of conditions for the development of ICT competence of teachers in the IEE. The effective criterion includes qualitative changes in the components of the ICT competence of teachers: the level of development of the IEE of the educational institution; the level of technological readiness of the teacher to use ICT; the level of rigidity; the level of readiness for self-education and professional-pedagogical activity. The criteria for the effectiveness of the implemented SMS model reflect its optimality and fruitfulness and are described by: the level of demand; the level of development of resource provision and systemic relations; the level of change in the innovative potential of support subjects. [7].

Discussion

Thus, according to the results of the survey, the lack of time for mastering new knowledge and skills in the field of digitalization of education plays a leading role in the development of digital competencies of school teachers [8, p.416].

Experts emphasize that computer tools in education help to make lessons more interesting. Digital elements in teaching allow students to be interested in the topic of the lesson. If earlier even the multiplication table seemed boring, uninteresting and everything was done routinely, now children are involved in the learning process. Digital elements in teaching have enlivened the educational process. They brought their own zest. Routine school assignments sparkled with new colors.

Modern teachers can use the following digital tools in their work:

- Video technologies - scientific films, educational cartoons for primary school children and films for middle and high school children (during the pandemic

and self-isolation, virtual excursions, online broadcasts of performances and musical productions were relevant).

- Electronic library systems;
- Educational digital (computer) programs;
- Interactive technologies;
- Constructors for creating online quizzes (the teacher can create their own quizzes or use ready-made materials);
- Multimedia is also a necessary element that allows you to create presentations or short videos on the topic of the lesson;
- Video conferences.

To further digitalize the processes in schools, it is planned to introduce a digital portfolio of a teacher, where information will be collected on passing certification, advanced training, participation in competitions, as well as automation of the process of hiring teachers. Each student will have their own digital profile with the content of academic achievements, social GPA and competence cards.

For the convenience of citizens, the availability of online enrollment and transfer services between schools will be provided through the applications of eGov Mobile and second-tier banks.

In order to maximize the digitalization of the entire learning process, together with the Ministry of Digital Development, Innovation and Aerospace Industry of the Republic of Kazakhstan, special projects will be implemented to provide primary school students with mobile devices with a subscription to digital textbooks in order to unload the backpack and to provide schools with high-speed Internet with high-quality Internet inside schools.

Digitalization of the selection and monitoring of textbooks in schools is planned for transparency and analysis.

Secondary education certificates will be issued with a QR code for authentication, and they will also be available digitally in the eGov Mobile personal account and applications of second-tier banks.

Thus, systematic work is being carried out in Kazakhstan on the introduction of digital technologies in various fields of education. These measures have already had concrete results and will undoubtedly raise the quality of educational services

Conclusion

The dynamism of the processes of transition to the information society and the innovative strategy determine the main factors in the development of modern society. The educational process in the modern school is oriented towards the transmission of values and technologies characteristic of a post-industrial society. The information and educational environment (IEE), saturated with ICT tools, is becoming a sphere of accumulation of knowledge, technologies and means of communication for the formation of personal qualities. The professional competence of the teacher should be adequate to the requirements of the IEE. The society expects from the teacher the innovative use of IEE resources in active work as a researcher, educator, consultant, leader. All this presupposes the readiness of the teacher for

continuous learning, self-education and self-development of his ICT competence. These two conditions are inseparable: the development of a teacher's professional competence is impossible without the continuous renewal of his activities, without the growth of his innovative potential.

A fundamentally important problem for the theory of the practice of continuous education of teachers in the IEE is the substantiation and development of conditions, technologies and methods for the implementation of scientific and methodological support (SMS) for the development of ICT competence of teachers of educational institutions at all levels of the regional education system.

The need to solve this problem determined the purpose, methodological apparatus, concept and logic of the study. In the course of the study of ICT competence as an integral component of the professional competence of a teacher, systemic approaches to scientific and methodological support for the development of ICT competence of teachers of educational institutions and the criteria for the effectiveness of the professional development of teachers in the conditions of IEE were described.

The opinion of the school school teachers about the real state of the digital competence realization and importance of solving the problem of increasing the digital competence of school teachers in the context of development of national education is analyzed. The results showed that it is mainly realized in such functions as: individual professional development and performance of organizational functions; creation, effective responsible use and scaling of digital resources for training; development of digital competencies of school children; and also it demonstrated that they believe that the content of a school teacher's digital competencies consists of a person's digital literacy and professionally significant competencies. It is suggested that professional development courses to increase the digital competence of school teachers should be as close as possible to the technical capabilities of the educational institution, and focused on practice.

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БІЛІМ БЕРУ ОРЫНДАРЫ МҰҒАЛІМДЕРІНІҢ АКТ ҚҰЗЫРЕТТІЛІГІН ДАМЫТУ

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Аңдатпа. Ақпараттандыру процестері, ақпараттық-коммуникациялық технологияларды (АКТ) кеңінен қолдану білім беруді дамытудың мемлекеттік тапсырысын орындаудың шарты болып табылады. Мемлекеттік білім беру стандарты, ақпараттық қоғамды қалыптастыру стратегиясы білім беру ұйымдарының ақпараттық-білім беру ортасын жаңартуға ғана емес, оның ресурстарын тиімді пайдалануға сұранысты тудырады. Ал бұл мұғалімдердің кәсіби біліктілігін үнемі арттырмайынша мүмкін емес. Бұл жағдайда ақпараттық-білім беру ортасы олардың кәсіби құзыреттілігін дамытудың өрісі мен құралы ретінде әрекет етеді. Сонымен қатар оның әлеуетінің үнемі өзгеріп отыруы мұғалімдердің АКТ-ны қолданудағы құзыреттілігін жедел дамытуды талап етеді. Мектеп мұғалімдерінің АКТ құзыреттілігінің маңыздылығын түсінудің түрлі жолдары талданады. Талдау негізінде мектеп мұғалімдерінің АКТ қолдану құзыреттілігін арттырудың тиімді әдістемесін әзірлеу мақсатында АКТ компоненттерін бағалауды зерттеу және оларды пайдалануды зерттеу мақсатында Қазақстан мұғалімдеріне сауалнама жүргізілді. Зерттеу нәтижелерін мұғалімдердің АКТ қолданудағы құзыреттілігін кешенді бағалау құралдарын әзірлеу үшін пайдалануға болады. Қоғамның педагог қызметіне қойылатын талаптары мұғалімдердің АКТ-ны қолдану дағдыларын дамыту қажеттігін көрсетеді. Мұғалімдердің АКТ қолдану құзыреттілігін дамыту мәселесі жоғары биоәлеуметтік тәуекелдер мен белгісіздік дәуірінде де көрініс тауып, шиеленісуде.

АКТ қолдану құзыреттілігі – еңбекке, оқуға және/немесе демалысқа байланысты мақсаттарға жету үшін АКТ-ны сыни және шығармашылық пайдалануға мүмкіндік беретін білім, білік және дағдылардың жиынтығы.

Мұғалім өз жұмысында оқу-тәрбие процесін цифрландыруға байланысты көптеген функцияларды орындауы керек, оның табысты жүзеге асуы көбінесе білім берудің табыстылығын анықтайды.

Бұл функцияларға мыналар жатады: ақпараттық функция (іздеу, сенімді ақпаратты таңдау, қажетті ақпаратты талдау және сақтау); дидактикалық материалдарды құру (АКТ форматында оқулықтарды, бағалау материалдарын, студенттердің өзіндік жұмысына арналған материалдарды дайындау); ақпараттық қауіпсіздікті қамтамасыз ету (АКТ дербес деректерін және білім беру ұйымының білім беру деректерін қорғау ережелерін білу, құпиялылық); коммуникация (байланыс арналарын дамыту және студенттерден кері байланыс алу); техникалық функция (әртүрлі АКТ және қосымшалармен жұмыс істеу дағдылары, техникалық есептерді шешу дағдылары).

Тірек сөздер: мұғалім, мектеп, сандық, құзыреттілік, заманауи, функциялар, білім, қалыптасу

РАЗВИТИЕ ИКТ-КОМПЕТЕНЦИИ ПЕДАГОГОВ ОБРАЗОВАТЕЛЬНЫХ УЧРЕЖДЕНИЙ

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Аннотация. Процессы информатизации, широкое использование информационно-коммуникационных технологий (ИКТ) являются условием выполнения государственного заказа на развитие образования. Государственный образовательный стандарт, стратегия

формирования информационного общества создают спрос не только на обновление информационно-образовательной среды образовательных организаций, но и на эффективное использование ее ресурсов. А это невозможно без постоянного повышения квалификации педагогов. В данном случае информационно-образовательная среда выступает как поле и инструмент развития их профессиональной компетентности. В то же время постоянное изменение ее потенциала требует опережающего развития компетентности учителей использования ИКТ. Проанализированы разные способы понимания значения ИКТ-компетентности школьных учителей. На основе проведенного анализа с целью разработки эффективной методики повышения компетентности по использованию ИКТ учителями школ был проведен опрос учителей Казахстана с целью изучения оценки компонентов ИКТ и изучения использования их. Результаты исследования могут быть использованы для разработки инструментов комплексной оценки компетенций учителей по использованию ИКТ. Требования общества к деятельности педагога свидетельствуют о необходимости развития навыков педагогов по использованию ИКТ. Проблема развития компетентностей педагогов по использованию ИКТ также проявляется и обостряется в эпоху высоких биосоциальных рисков и неопределенности.

Компетентность по использованию ИКТ представляет собой набор знаний, навыков и отношений, позволяющих критически и творчески использовать ИКТ для достижения целей, связанных с работой, учебой и/или отдыхом.

В своей работе педагог должен выполнять множество функций, связанных с цифровизацией образовательного процесса, успешная реализация которых зачастую определяет успешность образования.

К таким функциям относятся: информационная функция (поиск, отбор достоверной информации, анализ и хранение необходимой информации); создание дидактических материалов (подготовка учебников в формате ИКТ, оценочных материалов, материалов для самостоятельной работы студентов); обеспечение информационной безопасности (знание правил защиты ИКТ персональных данных и образовательных данных образовательного учреждения, конфиденциальности); общение (развитие каналов коммуникации и получение обратной связи от студентов); техническая функция (навыки работы с различными ИКТ и приложениями, навыки решения технических задач).

Ключевые слова: учитель, школа, цифровая среда, компетентность, современность, функции, образование, становление

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