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THE IMPORTANCE OF USING INFORMATION TECHNOLOGIES IN DEVELOPING THE PEDAGOGICAL SKILLS OF PRIMARY SCHOOL TEACHERS

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Abstract

The thesis analyses the role of information technologies in developing the pedagogical skills of primary school teachers. The components of pedagogical skill are considered in relation to the digital competence of educators described in international frameworks. The ways in which information technologies support lesson design, differentiated instruction, assessment, communication with parents and the teacher's continuous professional development are examined, and the conditions for the effective use of these technologies in primary schools of Uzbekistan are identified.

Keywords: Primary school teacher, pedagogical skill, information technologies, digital competence, professional development, differentiated instruction, formative assessment.

Introduction

Primary education lays the foundation for all subsequent learning: it is at this stage that children acquire reading, writing and numeracy skills, form learning habits and develop their attitude towards school. The quality of this stage depends to a great extent on the pedagogical skill of the teacher, that is, on the teacher's ability to plan lessons, organise the activity of young learners, take into account their individual differences, assess progress and maintain a positive learning



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atmosphere. In recent years these traditional requirements have been supplemented by a new one: the ability to use information technologies purposefully in teaching. Children of primary school age grow up surrounded by digital devices, and the school cannot ignore this environment, but it also has to protect children from its risks.

The Law of the Republic of Uzbekistan “On Education” identifies the continuous professional development of teachers and the introduction of modern pedagogical and information technologies into the educational process as important principles of state policy [1]. International studies show that teachers themselves recognise the need for further training in this area: according to the OECD TALIS 2018 survey, the use of ICT for teaching was among the professional development needs most frequently reported by lower secondary teachers [2]. The aim of this thesis is to determine the importance of information technologies in developing the pedagogical skills of primary school teachers and to identify the conditions under which their use is pedagogically effective.

Materials and methods

The study is based on the analysis of international frameworks of teachers’ digital competence (UNESCO, the European Union), research on effective teacher professional development, OECD reports, and national legislation on education. The methods of theoretical analysis, comparison, generalisation and pedagogical modelling were applied. First, the structure of the pedagogical skill of a primary school teacher was determined; then the components of this skill were compared with the areas of digital competence described in international frameworks; finally, the directions in which information technologies can support the development of each component were identified.



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Results and discussion

In pedagogical literature, pedagogical skill is usually understood as a combination of professional knowledge, methodological abilities, communicative culture and the personal qualities of the teacher, which together allow the teacher to solve educational tasks creatively and effectively. For a primary school teacher this skill has specific features. The teacher works with children whose attention span is short, whose thinking is largely visual and concrete, and whose motivation depends strongly on play, emotion and the teacher's personal example. The same teacher usually teaches several subjects and maintains close contact with parents. Information technologies should therefore be evaluated not by their technical possibilities, but by how well they correspond to these features.

Pedagogical skill is not formed once and for all. It develops throughout a teacher's career through practice, reflection and learning from colleagues. Young teachers usually master the technical side of the lesson first: planning, time management, discipline. Experienced teachers increasingly pay attention to the individual development of each child, the atmosphere in the class and their own pedagogical style. Information technologies can support this development at every stage, but in different ways: for a beginning teacher they are primarily a source of ready methodological materials and models, while for an experienced teacher they become a means of sharing experience, analysing practice and creating original resources [3].

The European Framework for the Digital Competence of Educators (DigCompEdu) describes digital competence in six areas: professional engagement, digital resources, teaching and learning, assessment, empowering learners and facilitating learners' digital competence [4]. The UNESCO ICT Competency Framework for Teachers similarly treats ICT not as a separate subject but as a dimension of all aspects of a teacher's work, from understanding



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ICT in education policy to curriculum, pedagogy and professional learning, and distinguishes the levels of knowledge acquisition, knowledge deepening and knowledge creation [5]. A comparison of these frameworks with the components of pedagogical skill shows that digital competence is not an addition to pedagogical skill, but a means of realising its traditional components in a new environment.

An important feature of both frameworks is that they consider the teacher's digital competence not only as the ability to use technology personally, but also as the ability to develop the digital competence of learners. For primary school this means that the teacher gradually introduces children to the basic rules of working with digital devices: how to find information, how to behave safely online, why personal data should not be shared and how to distinguish reliable sources from unreliable ones. These elements of digital literacy are formed most effectively when they are integrated into ordinary lessons rather than taught as separate abstract rules [4].

The first component is lesson design. Information technologies allow a primary school teacher to prepare visual and interactive materials, such as illustrated presentations, short educational videos, interactive exercises and simple games, that correspond to the visual thinking of young learners. However, the pedagogical value of such materials depends on their purpose. A presentation that only duplicates the text of the textbook does not improve the lesson; a short animation that shows a process children cannot observe directly, such as the growth of a plant or the movement of the planets, does. A skilled teacher uses technology where it adds something that cannot be achieved otherwise and limits screen time in accordance with the age of the pupils.

Interactive whiteboards and projectors, which are now present in many primary classrooms in Uzbekistan, illustrate this point well. When used skilfully, they



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allow the teacher to involve pupils in the lesson: children come to the board, move objects, solve examples and see the result immediately. When used poorly, they turn the lesson into a passive show in which the teacher clicks through slides and pupils watch. The difference lies not in the equipment but in the teacher's methodological decisions, that is, in the pedagogical skill itself. Training should therefore show teachers concrete models of interactive work rather than only explain the technical functions of the device [6].

The second component is differentiated instruction. In one primary class there are children who already read fluently and children who are still learning to decode words. Digital tools make it easier to prepare tasks of different levels of difficulty, to give additional practice to those who need it and to offer extension tasks to those who have mastered the material. Adaptive programmes for reading and mathematics can suggest the next exercise based on the pupil's answers. At the same time the teacher remains responsible for observing the child, interpreting the results and deciding when the child needs direct help rather than another exercise on the screen [7].

Differentiation is particularly important for inclusive education, which has been developing actively in Uzbekistan in recent years. Children with special educational needs may require larger fonts, audio support, additional visual materials or more time to complete tasks. Information technologies make it possible to adapt materials to these needs without isolating the child from the class: for example, the same text may be offered in printed form, in enlarged form on a tablet and as an audio recording. The teacher's skill lies in choosing the form of adaptation that supports the child's participation in the common activity of the class [7].

The third component is assessment. Formative assessment, which is especially important in primary school, requires regular feedback on what the pupil has



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learned and what difficulties remain. Short online quizzes, electronic portfolios with photographs of pupils' work and recordings of reading aloud allow the teacher to track progress over time and to discuss it with the child and the parents. Such tools also help the teacher reflect on the effectiveness of his or her own methods. The DigCompEdu framework treats the use of digital data to analyse learning and to adjust teaching as a separate area of the educator's competence [4].

At the same time, primary school teachers should avoid the excessive use of digital testing. Young children learn through activity, play and communication, and many important results of primary education, such as the ability to listen, explain, cooperate and express emotions, cannot be measured by multiple-choice tests. Digital tools should therefore support, but not replace, observation, conversation with the child and the analysis of creative work. A teacher who relies only on automated results risks narrowing the content of education to what can be easily measured, which contradicts the aims of primary schooling [6].

The fourth component is communication with parents. In primary school, cooperation between teacher and family directly affects the child's success. Electronic diaries, messengers and school platforms make it possible to inform parents regularly about homework, progress and school events, and to involve them in supporting learning at home. This, however, places new demands on the teacher's communicative culture: messages should be clear, respectful and limited to what is necessary, and personal data of children must be handled in accordance with the law. Pedagogical skill in this sense includes the ability to set reasonable boundaries in digital communication.

The digital environment has also created new forms of parental involvement. Parents can see examples of their children's work, follow short video explanations prepared by the teacher and receive advice on how to help with



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reading or mathematics at home. This is especially useful for families in which parents work long hours or live far from the school. However, not all families have equal access to devices and the internet, and not all parents are confident users of digital services. A skilled teacher therefore combines digital channels with traditional forms of communication, such as parents' meetings and individual conversations, so that no family is excluded [2].

The fifth and, in our view, decisive component is the teacher's continuous professional development. Information technologies have changed the forms of such development: online courses, webinars, open educational resources, professional communities in social networks and video recordings of lessons are now available to teachers in any region. Darling-Hammond, Hyler and Gardner show that professional development is effective when it focuses on specific content, involves active learning, supports collaboration, uses models of effective practice, provides coaching and feedback, and lasts long enough to change practice [3]. Digital formats can meet these criteria, for example when teachers record their lessons, analyse them together with colleagues online and receive feedback from a mentor.

The analysis of one's own lessons deserves special mention. Video recording, with the consent of parents and the school administration, allows a teacher to see the lesson from the outside: how much time the teacher talks, how pupils react, which children remain passive, how instructions are understood. Watching such a recording together with a mentor or colleague and discussing specific episodes is one of the most effective ways of developing pedagogical skill. In this case technology does not teach the teacher directly; it creates material for reflection, which is the main mechanism of professional growth [3].

At the same time, the use of information technologies does not automatically improve teaching. Selwyn warns that educational technology is often introduced



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with exaggerated expectations, while its actual effect depends on the social, economic and pedagogical context in which it is used [6]. The OECD Digital Education Outlook 2023 also stresses that digital tools produce results only within a coherent system that includes infrastructure, teacher training, quality digital content and clear rules [7]. For primary schools in Uzbekistan, where conditions in urban and rural schools still differ, this means that training programmes should take into account the real equipment available to teachers and offer solutions that work with limited resources.

The health of young learners is another factor that limits the use of technology in primary school. Prolonged screen time affects children's eyesight, posture and attention, and sanitary rules establish limits on the continuous use of computers and other devices by pupils of different ages. The teacher should plan lessons so that work with screens alternates with physical activity, work with real objects and communication with classmates. This requirement is part of pedagogical skill: a teacher who knows how to use technology must also know when not to use it [7].

On the basis of this analysis, the following conditions for the effective use of information technologies in developing the pedagogical skills of primary school teachers can be formulated. First, technology should be subordinated to the learning goal of the lesson and to the age characteristics of the pupils. Second, teacher training should combine technical skills with methodological ones: teachers need to learn not only how a programme works, but when and why it should be used. Third, professional development should be continuous and practice-oriented, with opportunities for teachers to try new tools in their own classes, reflect on the results and discuss them with colleagues. Fourth, issues of children's digital safety, health and personal data protection should be an integral part of the teacher's digital competence.



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The role of school leadership should not be underestimated either. Teachers are more willing to experiment with new technologies when the school administration supports them, provides time for training, ensures the maintenance of equipment and creates an atmosphere in which mistakes are treated as part of learning rather than a reason for criticism. TALIS data show that teachers who participate in collaborative professional activities and receive feedback on their work report higher self-efficacy and job satisfaction [2]. Thus the development of the pedagogical skill of primary school teachers through information technologies is not only an individual task, but also a matter of school culture and management.

Particular attention should be paid to the gradual development of digital competence. International frameworks describe it as a sequence of levels, from initial use of digital tools to their creative and innovative application [4; 5]. A teacher at the initial level may use ready-made presentations and online tests; at a higher level he or she adapts digital resources to the needs of the class; at the highest level the teacher designs new learning activities and shares experience with colleagues. Taking these levels into account allows methodological services and in-service training institutions to plan support for each teacher according to his or her actual needs.

Finally, the use of information technologies should be considered in connection with the content of primary education itself. National curricula for primary school set requirements for reading, writing, mathematics, the study of the natural and social world, and the moral education of children. Digital resources are useful only when they correspond to these requirements and to the textbooks used in the classroom. Materials found on the internet are often designed for other education systems, other languages and other age norms. Therefore one of the important professional skills of a primary school teacher is the ability to select, adapt and



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evaluate digital resources according to the national curriculum, the age of the pupils and the aims of a particular lesson. The development of a national collection of verified digital resources for primary school, prepared by experienced teachers and methodologists, would significantly support this work [1].

An important role in this process belongs to school methodological associations of primary school teachers. Regular meetings at which teachers demonstrate how they used a particular digital tool, discuss what worked and what did not, and agree on common approaches turn individual experience into the collective knowledge of the school.

Conclusion

Information technologies are an important means of developing the pedagogical skills of primary school teachers. They support all the main components of pedagogical skill: lesson design, differentiated instruction, assessment, communication with parents and continuous professional development. Their effectiveness, however, depends on whether they are used purposefully, in accordance with the age characteristics of young learners and within a coherent system of teacher support. The development of the digital competence of primary school teachers should therefore be seen not as a separate technical task, but as an integral part of improving their pedagogical skill. Further research should develop and test a model of in-service training that combines digital tools with mentoring and lesson analysis.



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