

**PEDAGOGICAL AND PSYCHOLOGICAL FOUNDATIONS OF
DEVELOPING STUDENTS' INFORMATION AND
COMMUNICATION SKILLS IN THE HIGHER EDUCATION
SYSTEM OF NEW UZBEKISTAN**

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Abstract: This article examines the pedagogical and psychological foundations of developing students' information and communication skills in the higher education system of New Uzbekistan. The study analyses the genesis of the concept of information and communication skills, reviews the scholarly perspectives of local and foreign researchers, and identifies the structural components of the skills system.

Keywords: information and communication skills, STEAM education, digital competence, pedagogical and psychological foundations, higher education, New Uzbekistan.

INTRODUCTION

The rapid development of information technologies and globalisation processes in contemporary society impose new demands on the higher education system. In the context of New Uzbekistan, forming students' information and communication skills has become critically important in the areas of transitioning to a digital economy, implementing an innovation-driven development strategy and expanding international cooperation. Today, graduates of higher education institutions are expected not only to possess professional knowledge, but also to use information technologies effectively, express their ideas clearly through various communication channels and participate in collaborative projects. For this reason, the scientific investigation of the pedagogical and

psychological foundations of developing students' information and communication skills is one of the most pressing academic tasks.

The aim of this study is to theoretically substantiate and analyse the pedagogical and psychological foundations of developing students' information and communication skills in the higher education system of New Uzbekistan. The research objectives include: conducting a scientific and theoretical analysis of the concept of information and communication skills; identifying the psychological mechanisms underpinning the development of these skills among students; substantiating the relevant pedagogical principles and approaches; and elucidating the specific features of this process in the context of New Uzbekistan's education reforms.

RESEARCH METHODS

The study employed theoretical research methods. The method of scientific literature analysis was used to examine the scholarly views of local and foreign researchers on information and communication skills. The comparative analysis method allowed different academic approaches and theories to be contrasted. The synthesis method was applied to generalise the data collected and to formulate new theoretical conclusions, while a systemic approach was used to determine the structural framework of information and communication skills. The study also analysed the regulatory and legal documents governing the higher education sector in the Republic of Uzbekistan, national educational standards and international best practices.

RESULTS AND DISCUSSION

1. Genesis and definition of information and communication skills

The concept of information and communication skills began to take shape in the last quarter of the twentieth century within the framework of the information society concept. Initially interpreted as a set of technical competencies, its meaning has since expanded considerably. Today, information and communication skills are understood as

a person's capacity to search for, collect, process, store and transmit information; to establish effective communication through various channels; and to function productively in a digital environment. These skills are recognised as an integral component of a modern specialist's professional competence.

2. International scholarly perspectives

Among foreign researchers, scholars such as J. Piaget, L. Vygotsky, J. Bruner and H. Gardner have conducted in-depth studies of information reception and processing within cognitive development theories. M. Castells, through his theory of the network society, emphasised the role of information flows in personal development. D. Jonassen substantiated a methodology for teaching in information environments based on a constructivist approach. The European Union's digital competence framework, DigComp, presents a standardised system of information and communication skills covering five core areas: information literacy, communication and collaboration, digital content creation, safety, and problem-solving.

3. Local scholarly perspectives

Among Uzbek researchers, scholars such as N. Muslimov, O. Ko'ysinov, Sh. Sharipov, M. Quronov and B. Xodiyev have studied the application of information technologies in pedagogical education and the development of students' information culture. U. Begimqulov has conducted research on the design of digital learning environments; N. Sayidahmedov on educational technologies; and R. Ishmuhamedov on interactive methods. Uzbek researchers place particular emphasis on harmonising national educational traditions with contemporary technologies and developing digital competence on the foundation of national values.

4. Structural components of information and communication skills

An analysis of the structural components of the information and communication skills system identified three principal components. The cognitive component

encompasses the abilities to receive, analyse, synthesise and evaluate information, as well as critical thinking and information literacy. The operational component covers technical skills, software proficiency, the ability to create and edit digital content, and problem-solving capabilities. The motivational component refers to interest in information technologies, the drive for self-development, openness to innovation and a professional growth orientation.

Table 1. Structural Components of Information and Communication Skills and Their Characteristics

Component	Content and Characteristics	Key Skills
Cognitive Component	Abilities to receive, analyze, synthesize and evaluate information; critical thinking and information literacy	Information search and evaluation, logical analysis, critical assessment of sources, knowledge structuring
Operational Component	Technical skills, software proficiency, digital content creation and editing, problem-solving skills	Working with computer applications, creating multimedia content, using online platforms and collaborative tools
Motivational Component	Interest in information technologies, self-development drive, openness	Lifelong learning readiness, professional self-improvement,

	to innovation and	curiosity about
	professional growth	emerging digital tools

5. Psychological mechanisms of skill development

The psychological processes of receiving and processing information have a complex structure. At the sensory memory stage, information is first received through the sense organs — a process lasting milliseconds. The information then passes to short-term memory, where it is stored for 15–30 seconds and processed. If the information is deemed important, it is transferred to long-term memory. Because the volume of information in a digital environment is extremely large, students' selective attention and information-filtering skills are of particular importance. According to cognitive load theory, an excessive flow of information may reduce learning effectiveness; therefore, skills in structuring and systematising information are essential.

6. New Uzbekistan education policy and digital transformation

The strategic directions of New Uzbekistan's education policy are defined by the sweeping reforms that have been implemented since 2017. The Decree of the President of the Republic of Uzbekistan No. PF-5847, dated 8 October 2019, together with other regulatory documents, envisages the modernisation of higher education, its alignment with international standards and the broad introduction of digital technologies. Under the Digital Uzbekistan-2030 strategy, digitalising the education sector has been designated a priority direction. This strategy sets objectives including the development of e-learning platforms, the creation of digital educational resources, and the enhancement of the digital competence of both teachers and students.

Information and communication competencies occupy a prominent place in the national educational standards. The updated state educational standards specify clear requirements regarding graduates' digital literacy and their information technology and communication skills. Information technology subjects have been included as a

compulsory component in the curricula of higher education institutions. Furthermore, elements aimed at developing information and communication competencies have been integrated into all discipline-specific subjects. The standards also reflect students' skills in using digital tools in research activities and working with electronic libraries and databases.

Digital transformation in Uzbekistan's higher education system is advancing rapidly. In recent years, e-learning platforms have been introduced in all higher education institutions and distance learning opportunities have been expanded. Learning management systems such as Hemis and Moodle are widely used. The network of digital libraries has grown and access to international scientific databases has been created. Virtual laboratories and simulation software are enabling practical skills to be developed remotely.

7. Pedagogical approaches

Research findings indicate that developing students' information and communication skills in the higher education system of New Uzbekistan is a multifaceted process requiring the interaction of pedagogical, psychological and technological factors. Compared to the scholarly positions of foreign researchers, Uzbek scholars place particular emphasis on developing a methodology for forming information and communication skills that takes national specifics into account. However, considerable work remains to be done in studying international experience and adapting it to the national context.

An analysis of psychological mechanisms shows that students of university age possess optimal conditions for acquiring information and communication skills. Nevertheless, even for the generation raised in a digital environment, targeted pedagogical intervention is necessary, since daily use of technology does not automatically guarantee the development of professional-level skills. Taking

motivational aspects into account, supporting students' intrinsic interest and creating conditions for success are essential prerequisites for effective learning.

The analysis of pedagogical principles and approaches demonstrates that the integration of competency-based, person-centred and STEAM approaches yields the most effective results. When traditional teaching methods are combined with modern interactive and collaborative methods, students' information and communication skills develop in a comprehensive manner. The conditions necessary for implementing these approaches are being created within the framework of New Uzbekistan's education reforms.

Table 2. Pedagogical Approaches to Developing Information and Communication Skills

Pedagogical Approach	Core Principle	Application in ICT Skill Development
Competency-based approach	Focus on practical skills and real-world task performance rather than theoretical knowledge alone	Students complete real digital projects, create e-portfolios, and demonstrate skills through applied tasks
Person-centred approach	Tailoring the educational process to each student's individual characteristics, learning pace and interests	Differentiated digital tasks, personalised learning paths, adaptive educational platforms

Interactive approach	Active learner engagement through dialogue, discussion, simulation and collaborative activities	Webinars, virtual labs, online discussions, collaborative document editing, peer-review exercises
Collaborative approach	Joint problem-solving and knowledge creation through group work and project collaboration	Team-based digital projects, co-creation of content, cross-disciplinary online collaboration
STEAM methodology	Integration of Science, Technology, Engineering, Arts and Mathematics in a unified learning process	Interdisciplinary digital projects combining technical, creative and analytical skills in one task

CONCLUSION

According to the research findings, the development of students' information and communication skills in the higher education system of New Uzbekistan is a complex, multidimensional process requiring the interaction of pedagogical, psychological and social factors. Information and communication skills should be developed as an integrated system consisting of cognitive, operational and motivational components. Taking psychological mechanisms into account — in particular, the cognitive developmental characteristics of students at university age, information reception processes and motivational factors — constitutes the foundation of effective pedagogical influence. The integration of competency-based, person-centred, interactive and collaborative approaches, together with the application of STEAM methodology,

ensures the most effective outcomes. Within the framework of New Uzbekistan's education reforms, the necessary regulatory framework and infrastructure for developing information and communication skills are being established, yet this process must continue to be refined. The development of national digital competence standards, the expansion of teacher professional development programmes and the creation of high-quality digital educational resources remain urgent priorities for the future.

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