

**O‘ZBEKISTON RESPUBLIKASI OLIY TA’LIM, FAN VA
INNOVATSIYALAR VAZIRLIGI**

**MIRZO ULUG‘BEK NOMIDAGI O‘ZBEKISTON MILLIY
UNIVERSITETINING JIZZAX FILIALI**



KOMPYUTER ILMLARI VA MUHANDISLIK TEXNOLOGIYALARI
mavzusidagi Xalqaro ilmiy-texnik anjuman materiallari to‘plami
2026-yil 25-26-sentabr

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Kompyuter ilmlari va muhandislik texnologiyalari. Xalqaro ilmiy-texnik anjuman materiallari to'plami – Jizzax: O'zMU Jizzax filiali, 2026-yil 25-26-sentabr. 507-bet.

Xalqaro miqyosidagi ilmiy-texnik anjuman materiallarida zamonaviy kompyuter ilmlari va muhandislik texnologiyalari sohasidagi innovatsion tadqiqotlar aks etgan.

Globalashuv sharoitida davlatimizni yanada barqaror va jadal sur'atlar bilan rivojlantirish bo'yicha amalga oshirilayotgan islohotlar samarasini yaxshilash sohasidagi ilmiy-tadqiqot ishlariga alohida e'tibor qaratilgan. Zero iqtisodiyotning, ijtimoiy sohalarni qamrab olgan modernizatsiya jarayonlari, hayotning barcha sohalarini liberallashtirishni talab qilmoqda.

Ushbu ilmiy ma'ruza tezislari to'plamida mamlakatimiz va xorijlik turli yo'nalishlarda faoliyat olib borayotgan mutaxassislar, olimlar, professor-o'qituvchilar, ilmiy tadqiqot institutlari va markazlarining ilmiy xodimlari, tadqiqotchilari, magistr va talabalarining ilmiy-tadqiqot ishlari natijalari mujassamlashgan.

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Mazkur to'plamga kiritilgan ma'ruza tezislarining mazmuni, undagi statistik ma'lumotlar va me'yoriy hujjatlarning to'g'riligi hamda tanqidiy fikr-mulohazalar, keltirilgan takliflarga mualliflarning o'zlari mas'uldirlar.

8. Qahharov A.A. Developing the graphic competence of students in engineering education programs on the basis of visual-intellectual transformation // CyberLeninka Scientific Electronic Library. – 2026.

9. Xusnidinova N.A. Forms, methods, and tools for teaching engineering graphics disciplines // CyberLeninka Scientific Electronic Library. – 2025.

METHODOLOGICAL APPROACHES TO FOSTERING STUDENTS' INDEPENDENT THINKING VIA INTELLIGENT COMPUTING SYSTEMS

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Abstract: *This article examines the role and methodological capabilities of intelligent computing systems in developing independent thinking skills among future specialists within a digital educational environment. The theoretical and practical mechanisms for enhancing students' cognitive activity, cultivating algorithmic thinking, and fostering independent decision-making through the integration of adaptive and intelligent technologies into the educational process are scientifically substantiated. Furthermore, the core methodological approaches applied in the learning process are analyzed.*

Keywords: Intelligent computing systems, independent thinking, methodological approaches, digital education, adaptive learning, algorithmic thinking, cognitive activity.

1. INTRODUCTION

The process of digital transformation in modern education and the widespread integration of intelligent technologies require students not only to master pre-existing knowledge but also to independently search for information, critically analyze it, and creatively solve complex problems. Traditional teaching methods are often based on passive listening and rote memorization of standard formulas, which proves insufficient for fully uncovering students' critical and independent thinking capabilities.

Today, information technology and intelligent computing systems are becoming an integral part of the educational landscape. Their primary advantage lies in their ability to adapt to the individual characteristics of the learner and to cultivate independent problem-solving skills. Therefore, substantiating the scientific and methodological foundations for implementing intelligent computing systems in education is one of the most pressing scientific and pedagogical tasks.

2. THEORETICAL AND METHODOLOGICAL FOUNDATIONS OF INTELLIGENT COMPUTING SYSTEMS

In pedagogical theory, independent thinking is characterized as an individual's logical approach to resolving problems encountered in activities, and the ability to apply existing knowledge in novel situations. Intelligent computing systems, on the

other hand, are software-hardware complexes that perform functions traditionally associated with human intellect, such as logical deduction, learning, and evaluation.

The utilization of such systems in the educational process not only relieves the instructor of routine burdens but also transforms the student into an active subject of cognitive activity. Through interactive systems, students independently identify, examine, and analyze their errors, seeking out optimal solutions autonomously.

3. CORE METHODOLOGICAL APPROACHES TO DEVELOPING INDEPENDENT THINKING

Fostering independent thinking among students within an intelligent computing environment relies on the following interrelated methodological approaches:

- Adaptive-person-centered approach: Intelligent systems analyze a student's knowledge level, learning pace, and error patterns to dynamically generate personalized learning pathways. This approach enhances the student's motivation for autonomous study, self-assessment, and personal accountability.

- Problem-based learning approach: The system does not provide ready-made rules or algorithms; instead, it generates problematic situations of an algorithmic and logical nature. Through interactive dialogue with the system, the student tests various hypotheses and arrives at conclusions independently.

- Modeling and visualization approach: By visually modeling complex calculations, processes, or system architectures within an intelligent computing environment, students can easily comprehend abstract concepts. This serves as a vital factor in developing spatial and logical reasoning.

4. PRACTICAL IMPLEMENTATION AND RESULTS ANALYSIS

Within the framework of this research, the integration of intelligent computing systems into the educational workflow was analyzed through experimental testing. It was established that adaptive assignments and intelligent analysis environments specifically designed for learners significantly enhanced their skills in independent programming, logical problem-solving, and error correction.

Specifically, compared to control groups taught via traditional methods, students who engaged independently with the support of intelligent systems exhibited higher analytical processing speeds and superior indicators in discovering non-standard solutions to complex problems.

5. CONCLUSION

In conclusion, the deployment of intelligent computing systems in the educational process serves as a powerful instrument for developing students' independent thinking and analytical competencies. The proposed methodological approaches not only elevate educational quality but also ensure the preparation of competitive specialists capable of making autonomous decisions and operating freely in modern digital environments.

REFERENCES

1. Saidov, M. R. (2024). Digital Educational Technologies and Intelligent Systems. Tashkent: Fan va texnologiya.

2. Karimov, B. T. (2023). Pedagogical foundations of developing independent thinking in students. *Journal of Pedagogical Education*, 4(2), 45-50.
3. Russell, S., & Norvig, P. (2020). *Artificial Intelligence: A Modern Approach* (4th ed.). Pearson.
4. Xusanov, A. A. (2025). Methodology of utilizing intelligent computing environments in the educational process. *Science and Education in Uzbekistan*, 1(3), 112-115.
5. Inoyatov, U. J. (2022). *Modern Pedagogical Technologies and Educational Efficiency*. Tashkent: O'qituvchi.

BOSHLANG'ICH TA'LIM TRANSFORMATSIYASIDA SUN'IY INTELLEKT TEXNOLOGIYALARI: STRATEGIK IMKONIYATLARI, ONA TILI DARSLARIDAGI DIDAKTIK MODELLARI VA KIBER-METODIK XAVFLARI

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ANNOTATSIYA

Ushbu maqolada boshlang'ich ta'lim platformasida, xususan, ona tili darslarida sun'iy intellekt (SI) modellarini integratsiya qilishning zamonaviy didaktik imkoniyatlari, pedagogik-metodik determinantlari hamda kiber-ijtimoiy xavflari chuqur tahlil etiladi. Axborot makonining globallasuvi boshlang'ich ta'lim tizimiga generativ algoritmlar va intellektual agentlarni joriy etishni taqozo etmoqda. Maqolada generativ sun'iy intellekt tizimlarining lingvistik topshiriqlarni tabaqalashtirish, matnli va ijodiy mashqlarni o'quvchilarning individual trayektoriyalariga moslashtirish hamda grammatik qoidalarni vizuallashtirishdagi funksional salohiyati amaliy misollar bilan yoritilgan.

Kalit so'zlar: Boshlang'ich ta'lim, sun'iy intellekt, generativ algoritmlar, raqamli didaktika, ona tili metodikasi, SI-savodxonlik, raqamli kompetensiya, personalizatsiyalashgan ta'lim.

XXI asr ta'lim paradigmasining tub burilish nuqtasi sun'iy intellekt (SI) tizimlarining dars jarayonlariga institutsional kirib kelishi bilan xarakterlanadi. Bugungi kunda sun'iy intellekt nafaqat texnik yordamchi mexanizm, balki boshlang'ich ta'lim arxitekturasini qayta loyihalashtiruvchi, o'quv motivatsiyasini tizimlashtiruvchi hamda pedagogik boshqaruv uslublarini transformatsiya qiluvchi fundamental elementga aylandi. Boshlang'ich ta'lim bosqichida ona tili darslari bolaning lingvistik tafakkuri, nutqiy madaniyati va savodxonlik bazasini shakllantirishda hal qiluvchi ahamiyatga ega.

UNESCO o'zining strategik qo'llanmalarida ta'lim muassasalarida generativ SI platformalarini qo'llashda inson omilini birinchi darajali mezon sifatida qoldirish