



**THE USE OF INTELLIGENT TUTORING SYSTEMS IN TEACHING LAW
AT SCHOOL: EXPERIENCE, OPPORTUNITIES AND LIMITATIONS**

Gulperiza Beknazarovna Bazarbayeva

Teacher, School No. 32, Republic of Karakalpakstan

Abstract

This article analyzes the possibilities of using intelligent tutoring systems in the teaching of law in general secondary schools, taking into account the regulatory and institutional specificities of Uzbekistan. The relevance of the topic is determined by the simultaneous development of two processes: the digitalization of school education and the growing demand for the early formation of legal culture, legal immunity, and skills of responsible civic behavior. In Uzbekistan, these tasks are directly linked to the Law “On Education,” the concept of raising legal awareness and legal culture in society, the course toward digital transformation, as well as new decisions on the development of artificial intelligence and the inclusion of legal-educational components in school subjects¹. From a methodological perspective, the study is based on a legal analysis of the normative acts of the Republic of Uzbekistan and a comparative analysis of international recommendations issued by UNESCO and the OECD, as well as on a review of modern studies on the effectiveness of intelligent tutoring systems in education². The article demonstrates that intelligent tutoring systems can enhance the personalization of learning, improve feedback, and facilitate the acquisition of legal concepts and scenarios for applying legal norms, especially in topics related to children’s rights, civic duties, digital safety, and basic legal reasoning. At the same time, their introduction into school-based law education is limited by a number of factors: the risks of errors and “hallucinations,” issues related to the protection of minors’ personal data, uneven digital infrastructure, a shortage of methodological models, and the need to preserve the leading role of the

¹ Law of the Republic of Uzbekistan “On Education” No. ZRU-637 dated September 23, 2020.

² UNESCO. *Guidance for Generative AI in Education and Research*. Available at: <https://www.unesco.org/en/articles/guidance-generative-ai-education-and-research>





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teacher. The article concludes that, for Uzbekistan, a technologically abstract model of implementation is less appropriate than a phased approach: first, in the form of a teacher's assistant and an adaptive training tool; then, as an element of blended learning; and only after regulatory and methodological testing, as part of a broader ecosystem of digital school education. The practical value of the article lies in formulating recommendations for ministries, schools, and developers of EdTech solutions.

Keywords

intelligent tutoring systems, law education, school education, artificial intelligence, legal culture, digitalization of education.

Introduction

Today, the discussion of teaching law in schools in Uzbekistan can no longer be conducted within the old logic, in which law is reduced to the memorization of norms and definitions. The demand has changed. Schools are now expected not only to transmit information about the state, the law, and human rights, but also to develop a stable legal orientation: the ability to identify a legal problem, correlate a real-life situation with a legal norm, understand the boundaries between what is permitted and what is impermissible, and act responsibly and safely in the digital environment. This formulation of the issue corresponds both to the general Law of the Republic of Uzbekistan "On Education," which establishes requirements for the quality and modern content of education, and to the Concept for Raising Legal Awareness and Legal Culture in Society, which directly emphasizes the importance of continuous legal education beginning within the education system³.

At the same time, the state is consistently strengthening its course toward digitalization. The "Digital Uzbekistan – 2030" Strategy identifies education as one of the priority areas of digital transformation, while later decisions on the development of artificial intelligence confirm the transition from declarations to institutional

³ Law of the Republic of Uzbekistan "On Education" No. ZRU-637 dated September 23, 2020.





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mechanisms for introducing AI technologies in various sectors⁴. Moreover, in 2024, the state plan for the development of legal aid separately fixed the task of developing legal immunity among schoolchildren through the renewal of the content of the subject “Upbringing.” This makes the issue of digital tools specifically for school-based legal education not abstract, but practically significant.

In the international literature, the discussion has already shifted from a simple recognition of the benefits of AI to a more cautious assessment of the conditions under which its use is permissible. A study by W. Ma and co-authors demonstrated an overall positive impact of intelligent tutoring systems on learning outcomes, but not under all conditions equally. More recent reviews of K–12 education and AI in education indicate that effectiveness depends on the design of the system, the role of the teacher, subject-specific features, and the quality of learning outcome assessment, rather than on the mere fact of using the technology. UNESCO, in turn, insists on a human-centered approach and warns of risks related to privacy, academic integrity, and pedagogical autonomy⁵. As for K–12 — pronounced “kay-twelve” — this refers to the school education system in the United States, Canada, and a number of other countries, covering education from kindergarten through grade 12 inclusive. It is a full cycle of primary and secondary education lasting 13 years, approximately from the ages of 5–6 to 18, and ending with the award of a diploma before entering higher education. In the Republic of Uzbekistan, a process has been initiated to transform school education toward a 12-year model. The key innovation is the integration of a preparatory year for six-year-old children directly into the structure of general education institutions. This step is aimed at synchronizing the national system with global standards, which is expected to simplify the recognition of qualifications and the admission of graduates to

⁴ Decree of the President of the Republic of Uzbekistan “On Approval of the Strategy ‘Digital Uzbekistan – 2030’ and Measures for Its Effective Implementation” No. UP-6079 dated October 5, 2020.

⁵ Ma, W. et al. Intelligent tutoring systems and learning outcomes: A meta-analysis. *Journal of Educational Psychology*. 2014. Vol. 106, No. 4. P. 901.





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leading foreign universities⁶. The purpose of this article is to determine the extent to which intelligent tutoring systems can be useful in teaching law in schools in Uzbekistan, and where their real pedagogical and legal limitations lie. To achieve this purpose, three tasks are addressed: first, the regulatory context of Uzbekistan is analyzed; second, international and research data on the effectiveness of ITS are examined; third, practical models for their cautious implementation in school-based legal education are formulated⁷. The working hypothesis is that intelligent tutoring systems can improve the quality of schoolchildren's acquisition of legal knowledge and practical skills, but only under conditions of strict pedagogical configuration, legal verification of content, and preservation of the teacher's leading role.

Main Part

1. Research Methodology

This article is theoretical and applied in nature. No empirical field research was conducted in schools; therefore, the conclusions are based on normative analysis, a comparative approach, and a critical review of scholarly literature. The source base consists of laws and subordinate regulatory acts of the Republic of Uzbekistan in the fields of education, digitalization, legal education, personal data, and the protection of children's rights; materials of state bodies; UNESCO and OECD international framework documents; as well as contemporary studies on the effectiveness of AI and intelligent tutoring systems in school education⁸.

This research design is determined by the very nature of the issue under consideration. In order to assess the suitability of ITS for teaching law at school, it is not sufficient merely to describe the technical functions of a platform. A threefold verification is required: whether implementation corresponds to national educational

⁶ Khaidarov, Shokhrukh. Uzbekistan will transition to a 12-year school education system. *Gazeta*. September 9, 2025.

⁷ Decree of the President of the Republic of Uzbekistan "On Fundamental Improvement of the System for Raising Legal Awareness and Legal Culture in Society" No. UP-5618 dated January 9, 2019.

⁸ Law of the Republic of Uzbekistan "On Education" No. ZRU-637 dated September 23, 2020.





objectives; whether it contradicts requirements concerning the protection of children and their data; and whether the technology has a confirmed pedagogical effect. For this reason, the article combines legal, pedagogical, and technological perspectives.

2. The Regulatory and Institutional Framework of Uzbekistan

Uzbekistan already has the basic legal prerequisites for discussing AI-based tools in schools. The Law “On Education” establishes the framework for the quality, modernity, and accessibility of education. The “Digital Uzbekistan – 2030” Strategy fixes digital transformation precisely in education as a priority area. The decisions adopted in 2024–2025 on the development of artificial intelligence show that the state views AI as an applied tool for specific sectoral tasks, rather than merely as an experimental technology⁹.

The legal-educational context is no less important. The 2019 Concept for Raising Legal Awareness and Legal Culture in Society directly emphasizes the need for the systematic and continuous formation of legal culture beginning from the education system. In 2020, the subject “Upbringing” was institutionally formalized as an important carrier of educational content, including legal awareness and legal culture. In 2024, a government plan included the task of incorporating into school education topics aimed at developing students’ legal immunity and law-abiding behavior. This means that school-based legal education in Uzbekistan is de facto understood more broadly than a separate academic module: it is embedded in the general educational and upbringing policy of the state. However, this is precisely where the first serious conclusion arises. For the implementation of ITS, a general digital strategy is not enough. A subject-oriented methodology is required. Law is not simply a set of “true/false” answers. In the school course, the interpretation of a situation, moral and legal choice, the distinction between rights and duties, and the analysis of consequences are especially important. If the system is designed merely as a testing robot, it may reduce the subject to a set of

⁹ Decree of the President of the Republic of Uzbekistan “On Approval of the Strategy ‘Digital Uzbekistan – 2030’ and Measures for Its Effective Implementation” No. UP-6079 dated October 5, 2020.





clichés. For legal education, this is particularly dangerous: the student becomes accustomed to searching for a “ready-made answer” rather than engaging in legal reasoning. This risk is also indirectly confirmed by international documents, which insist that AI should strengthen, not replace, human pedagogical judgment¹⁰.

3. The Potential of Intelligent Tutoring Systems for School-Based Legal Education

In the context of this article, intelligent tutoring systems are understood as digital platforms that model students’ knowledge, adapt the learning trajectory, provide adaptive assignments, explanations, and feedback. Classical research literature describes them as personalized learning technologies based on a domain model, a student model, and a pedagogical module. The meta-analysis by Ma et al. showed that, on average, ITS improve learning outcomes compared to non-ITS environments. More recent reviews of K–12 education also confirm a generally positive effect, although they note a high variability of results¹¹.

For school-based legal education, such systems have at least four strong advantages.

First, **personalization**. In one classroom, some students easily grasp legal concepts, while others confuse even basic categories: right, duty, liability, prohibition, guarantee, and procedure. An ITS can automatically offer additional explanations and practice cases precisely where a student makes systematic, rather than accidental, mistakes. This is especially useful for topics concerning children’s rights, cybersecurity, liability for bullying, personal data protection, and the digital footprint¹².

Second, **scenario-based learning**. Legal education works poorly in the format of a purely lecture-based approach, but it works well through the analysis of situations. An intelligent system can offer students real-life scenarios: a conflict at school, the publication of another person’s photograph without consent, cyberbullying, purchasing goods online, teenage employment, or applying to a state authority. The system then

¹⁰ UNESCO. *Guidance for Generative AI in Education and Research*. Paris: UNESCO, 2023.

¹¹ Ma, W. et al. Intelligent tutoring systems and learning outcomes: A meta-analysis. *Journal of Educational Psychology*. 2014. Vol. 106, No. 4. P. 901.

¹² Convention on the Rights of the Child.





guides the student step by step through questions: which rights are affected, who the participants in the legal relationship are, which actions are lawful, and where the assistance of adults or state bodies is needed. In this capacity, an ITS can serve not as a replacement for the teacher, but as a “simulator of legal thinking.” Such a format is consistent with the course toward the formation of legal immunity, and not merely reproductive knowledge.

Third, **immediate feedback**. In the real conditions of school teaching, a teacher cannot always analyze each student’s mistakes in detail. An adaptive system does this instantly. For law, this is valuable when the issue is not simply the correct answer, but the type of mistake: the student does not distinguish between a moral norm and a legal norm; confuses a subjective right with a duty; or transfers everyday assumptions onto a legal situation. Such mistakes are often persistent, and the earlier they are diagnosed, the higher the quality of further learning.

Fourth, **scalability**. According to the National Statistics Committee, at the beginning of the 2024/2025 academic year, there were 10,943 general education institutions operating in Uzbekistan, of which 455 were non-state institutions. On such a scale, unified digital legal literacy simulators can become a way to equalize access to high-quality learning materials, especially in places where the shortage of methodologically trained teachers is felt more strongly. An additional argument is Uzbekistan’s participation in TALIS 2024: the study was conducted in 210 schools, which demonstrates the education system’s growing interest in international instruments for assessing the school environment and pedagogical practices¹³.

4. Limitations and Risks

Perhaps the main risk is **content unreliability**. In the humanities, and especially in legal topics, an AI tool may produce an answer that appears convincing but is legally

¹³ TALIS 2024: Teachers in Uzbekistan Are Strong in Teamwork. *Kursiv Uzbekistan*. October 11, 2025. Available at: <https://uz.kursiv.media/2025-10-11/talis-2024-uchitelya-uzbekistana-silny-v-komandnoj-rabote/>
Accessed: March 17, 2026.





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inaccurate. For an adult user, this is already a problem; for a school student, it is twice as serious, because the student has not yet developed a reliable criterion for verification. Therefore, any systems designed for school-based legal education must use verified corpora of national legislation and undergo expert legal editing. Otherwise, the technology will reproduce legal misinformation in attractive packaging. The international discussion on legal education in the age of AI shows that this danger is already being taken quite seriously.

The second risk concerns **personal data and children's rights**. The Law of the Republic of Uzbekistan "On Personal Data" requires that the purposes of processing be clearly defined and comply with the law. The Law on Guarantees of the Rights of the Child prohibits arbitrary interference in a child's private life. For school-based ITS, this means that the collection of learning logs, error profiles, behavioral patterns, and especially biometric data cannot be treated as a mere "technical detail." Regimes of data minimization, transparency, access control, and role differentiation between the school, the platform, and the developer are required.

The third risk is **pedagogical simplification**. Legal education at school should develop the ability to reason about justice, legality, the limits of state intervention, individual rights, and civic duties. If a digital system replaces live discussion with automated hints, there is a temptation to "train" students to give correct answers without forming internal understanding. UNESCO and the OECD, in their latest documents, essentially convey the same idea: AI in schools should function as an enhancing tool, not as a substitute for professional pedagogical judgment.

The fourth risk is **infrastructural and staffing inequality**. Even where there is a nationwide digital strategy, the actual readiness of schools differs. Moreover, the implementation of ITS requires not only devices and connectivity, but also a teacher who is able to interpret digital analytics, adjust the learning trajectory, and recognize where the algorithm is useful and where it interferes. That is why UNESCO has





developed a separate framework on AI competencies for teachers. For Uzbekistan, this aspect is fundamental: without teacher training, even a high-quality platform in school-based legal education will function merely as an attractive but superficial service.

5. Discussion: What Is Realistically Applicable in Uzbekistan

For Uzbek schools at the nearest stage, a moderate model of implementation appears to be the most realistic. This does not mean “AI instead of the teacher,” but rather three limited scenarios.

The first is an adaptive legal literacy trainer. It can be used to practice concepts, basic cases, and diagnose typical mistakes. The second is a digital teacher assistant, which selects assignments according to the level of the class and provides explanations on difficult topics based on pre-verified content. The third is a simulator of legal situations, in which the student makes decisions and receives detailed feedback. These formats conflict least with the existing regulatory framework and fit best into the school logic of the subject “Tarbiya” and related legal-educational modules.

A less acceptable model would be an open generative assistant without strict legal configuration. For legal education, this creates an excessively high risk of errors, normative confusion, and pseudo-competence. If a school student begins to perceive any generated answer as legal truth, the educational effect will be the opposite of what is expected. Here, caution is more important than speed of implementation. In the conditions of Uzbekistan, it is more reasonable to begin with closed, subject-limited systems based on the school curriculum and verified sources.

Conclusion

The analysis conducted shows that intelligent tutoring systems can indeed become a useful tool in teaching law at school; however, their value is determined not by the fashionable nature of the technology, but by the quality of its pedagogical and legal configuration. For Uzbekistan, this topic is especially relevant for two reasons. First, state policy is simultaneously strengthening both the legal-educational and digital





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vectors of school development. Second, school-based legal education itself is gradually shifting from the transmission of abstract information toward the formation of legal culture, legal immunity, and skills of safe behavior in both offline and online environments. The opportunities offered by ITS in this field are quite concrete: personalization, scenario-based learning, rapid feedback, teacher support, and expanded access to high-quality materials. The most promising topics are those in which law is closely connected with the real-life situations of school students: children's rights, personal data protection, digital safety, responsibility for online behavior, and the basics of interaction with state institutions. It is precisely here that an intelligent system can transform an abstract legal norm into a comprehensible case. Yet the limitations are no less significant. Law is a subject of heightened normative sensitivity. AI errors in this field are more dangerous than in neutral disciplines. In addition, working with minors automatically brings issues of confidentiality, algorithmic transparency, and the legality of data processing to the forefront. Finally, no system can replace the teacher in shaping the value-based and discussion-oriented dimension of legal education. For this reason, a step-by-step model of implementation is optimal for Uzbekistan: piloting in selected schools, developing legally verified content, training teachers, independently assessing results, and only then proceeding to limited scaling.

In practical terms, this means the following. It would be advisable for the Ministry of Preschool and School Education, together with the Ministry of Justice and specialized AI structures, to develop methodological standards for school-based legal ITS, including requirements for legal sources, models of explanation, error logging, data protection, and the role of the teacher. Schools need pilot modules integrated into existing courses, primarily into "Tarbiya." Developers should be prohibited from using unverified generative answers as final legal judgments. Researchers, in turn, should move from general reasoning to field experiments in schools of Uzbekistan in order to assess not only academic performance, but also changes in legal thinking, digital responsibility,





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and students' critical attitude toward algorithmic prompts. The prospects for further research lie in three directions: developing a national model of school-based legal ITS in Uzbek and Russian; empirically testing its effectiveness across different age groups; and studying how students perceive the authority of AI in legal matters. This last issue may prove to be the most important: teaching a child not only to receive a digital prompt, but also to verify whether it complies with the law.

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