Prima Journal of Integrated Studies
ISSN (E): 3054-338X
Volume 01, Issue 05, May, 2026
Website: https://researchiapress.com


# INTEGRATION OF ARTIFICIAL INTELLIGENCE IN EDUCATION: FROM ADAPTIVE LEARNING TO HYBRID MODELS (BASED ON EMPIRICAL STUDIES IN RUSSIA, IRAN, INDONESIA, AND CHINA)

Arman Rsaliyev
Senior Teacher, Phd.
University of Tashkent for Applied Sciences

**Abstract**

This article examines the transformative role of artificial intelligence (AI) in contemporary education. Based on a critical synthesis of four empirical studies conducted in Russia, Iran, Indonesia, and China, the paper analyzes the adaptive potential of AI, the risks of algorithmic bias, and cultural irrelevance. A three-level hybrid model for the distribution of functions between the teacher and neural networks is proposed (technical-diagnostic, interpretative-adaptive, and motivational-reflective levels). It is argued that the effectiveness of the educational system in the digital age is determined not by the power of AI but by the quality of pedagogical design and the preservation of human-centered values.

**Keywords**: Artificial intelligence, adaptive learning, hybrid model, pedagogical design, cultural relevance, SPEAK-BOT, intelligent tutoring systems.

## Introduction

The current stage of digital transformation in education is characterized by the mass implementation of artificial intelligence (AI) technologies. As Juraev (2026) notes, AI acts not merely as a supporting tool but as an active agent redefining pedagogical approaches, assessment methods, and interaction formats within the "teacher – student – learning material" system.

However, the rapid spread of generative neural networks and intelligent tutoring systems (ITS) gives rise to a fundamental contradiction. On the one hand, empirical data demonstrate a significant increase in academic performance,

Prima Journal of Integrated Studies
ISSN (E): 3054-338X
Volume 01, Issue 05, May, 2026
Website: https://researchiapress.com


motivation, and the speed of language acquisition when using AI (the Chinese study cited in Sharipova & Rsaliyev, 2026). On the other hand, studies in Iran and Indonesia (Rsaliyev, 2026) reveal serious risks: algorithmic bias, disregard for cultural context, passive copying of answers by students, and, consequently, a decline in critical thinking.

The aim of this article is to propose a balanced hybrid model for the distribution of functions between the teacher and AI, based on a synthesis of empirical data obtained from four different educational contexts (Russia, Iran, Indonesia, and China). The paper addresses the following tasks: (1) to identify the positive and negative aspects of using AI in education; (2) to analyze cross-cultural differences in the effectiveness of AI tools; (3) to formulate practical recommendations for teachers, curriculum developers, and the institutional level.

## Research Data

An analysis of the literature shows that AI technologies possess significant didactic potential. Juraev (2026) identifies three key areas: personalized learning, automated assessment, and administrative support. In particular, Intelligent Tutoring Systems (ITS) are capable of modeling an individual student's trajectory, identifying weaknesses, and offering targeted exercises in real time. VanLehn (2011, cited in Juraev, 2026) argues that ITS approaches the effectiveness of human tutoring.

The most compelling quantitative data come from the Chinese study described in Sharipova & Rsaliyev (2026). The experiment involved 60 students with the same level of English proficiency, divided into a control group (traditional methods) and an experimental group (learning with AI). Over ten weeks, the experimental group demonstrated:

- statistically significant improvement in language skills compared to the control group;
- reduced time for information perception and assimilation;
- increased levels of motivation and self-regulated learning.

These results are consistent with the findings of Kravtsova (2024, cited in Sharipova & Rsaliyev, 2026), who emphasizes that neural networks (Grammarly, Twee, Gliglish) effectively automate the checking of formal speech parameters – grammatical correctness, syntactic complexity, and lexical diversity. Tazhenova

Prima Journal of Integrated Studies
ISSN (E): 3054-338X
Volume 01, Issue 05, May, 2026
Website: https://researchiapress.com


(2025) adds that platforms such as Duolingo, Babbel, and Rosetta Stone, through preliminary testing, ensure accurate content adaptation to the user's level.

However, Juraev (2026) warns against technological determinism: "AI enhances adaptive learning and supports teachers, but ethical concerns, data privacy, and the risk of over-reliance remain unresolved." Indeed, the digital advantages of AI – 24/7 accessibility, instant feedback, and the objectivity of statistical analysis – are not equivalent to pedagogical effectiveness without consideration of the human and cultural dimensions.

**Risks, Limitations, and Cultural Irrelevance**

If the Chinese study demonstrates the potential of AI, the research conducted in Iran and Indonesia (Rsaliyev, 2026) reveals systemic limitations. The key finding of the Iranian study is that teachers did not passively accept AI recommendations but actively interpreted them considering the cultural context. Educators adjusted algorithmic assessments by adding a category of "cultural relevance" because the neural network did not account for the features of Persian rhetorical tradition, where direct criticism is a sign of strong argumentation. Without this adjustment, the AI assessments were invalid.

This observation echoes the argument of Juraev (2026), who emphasizes that algorithmic bias can lead to unfair outcomes for certain groups of students. More broadly, as Selwyn (2019, cited in Juraev, 2026) points out, replacing human interaction with machine assessment risks dehumanizing education.

Even more revealing is the Indonesian study within the SPEAK-BOT framework (Rsaliyev, 2026). Four groups of students performed speaking tasks where AI prompts served not as ready-made answers but as triggers for discussion. Interaction quality was assessed using four parameters: turn-taking, elaboration, responsiveness, and coherence of discussion.

The results revealed dramatic variability. One group achieved maximum scores across all parameters, using AI prompts as a springboard for in-depth dialogue. Another group showed minimal results: students passively copied AI answers without engaging in meaningful interaction. This contrast, as Rsaliyev (2026) rightly notes, demonstrates that AI can both strengthen and weaken collaborative learning – depending on whether students perceive AI prompts as a source of ready-made answers or as a catalyst for joint discussion.

Prima Journal of Integrated Studies
ISSN (E): 3054-338X
Volume 01, Issue 05, May, 2026
Website: https://researchiapress.com


To this are added psychological risks. As noted in Sharipova & Rsaliyev (2026) with reference to Kravtsova (2024), when knowledge is obtained too easily (through a ready-made answer from a neural network), neural connections do not have time to form properly, and the value of such knowledge for the psyche is significantly lower. Chatbots also often provide generic or factually incorrect responses, and students are not always able to formulate a correct prompt, especially in a foreign language.

**Theoretical Model: Three-Level Distribution of Functions**. Based on a synthesis of empirical data from Russia, Iran, Indonesia, and China, as well as the theoretical conclusions of Juraev (2026) and Sharipova & Rsaliyev (2026), the following hybrid model for the distribution of functions is proposed.

**Level 1: Technical-Diagnostic (AI Dominance)**

At this level, AI performs tasks that require high data processing speed and do not involve deep contextual interpretation. These include:

- automated checking of formal speech parameters (grammar, syntax, lexical diversity);
- identification of statistical error patterns not obvious during manual checking (as in the Iranian study – AI detects systematic errors that a teacher might not notice for years);
- generation of varied exercises and adaptive learning materials taking into account the student's level and individual difficulties;
- 24/7 language practice with immediate feedback (development of automaticity).

Juraev (2026) confirms that such systems (including NLP for evaluating written responses) reduce the teacher's workload and allow time to be reallocated toward more meaningful interaction.

**Level 2: Interpretative-Adaptive (Collaboration, Co-piloting)**

This level assumes that AI provides analytical data while the teacher performs pedagogical interpretation. This includes:

- adaptation of AI analytics to cultural and individual characteristics of learners (Iranian study: adding a "cultural relevance" category);

Prima Journal of Integrated Studies
ISSN (E): 3054-338X
Volume 01, Issue 05, May, 2026
Website: https://researchiapress.com


- generation of AI prompts for group discussions and organization of their critical evaluation (SPEAK-BOT framework);
- joint design of assessment rubrics combining quantitative AI data with qualitative teacher judgments.

As Rsaliyev (2026) emphasizes, it is at this level that the problem of the "black box" of algorithms is solved: the teacher does not blindly accept AI recommendations but actively interprets them in the specific pedagogical context.

**Level 3: Motivational-Reflective (Teacher Dominance)**

At this level, functions that cannot be delegated to AI without the risk of dehumanization are retained:

- strategic goal-setting and long-term learning trajectory planning (considering student motivation, abilities, and life plans);
- emotional support, anxiety reduction, and motivation maintenance – AI is incapable of empathy;
- organization of live communicative interaction (discussions, debates, role-playing games) requiring attention to non-verbal signals;
- development of critical thinking through analysis of AI-generated content – teaching students to distinguish reliable from unreliable sources and identify algorithmic bias.

Juraev (2026) in this context references Holmes et al. (2019), arguing that AI should complement rather than replace human educators. Turayeva (2024, cited in Sharipova & Rsaliyev, 2026) adds: the teacher shapes personality, attitudes toward the world, and worldview – a fundamentally non-algorithmizable function.

**Recommendations**

Based on the research, there are some recommendations as follows:

**For Teachers**

The key transition is from knowledge transmitter to learning environment architect. This requires the development of competencies in prompt engineering – the ability to formulate queries that stimulate reflection rather than the production of ready-made answers. As the Iranian study (Rsaliyev, 2026) showed,

Prima Journal of Integrated Studies
ISSN (E): 3054-338X
Volume 01, Issue 05, May, 2026
Website: https://researchiapress.com


critical reflection on AI recommendations is becoming a key professional competence of the modern educator. Teachers are recommended to:

- include assignments in the learning process that require students to critically evaluate AI-generated content;
- use AI analytics to identify hidden problems in material comprehension;
- explain to students the difference between "knowledge as an answer" and "knowledge as a process."

**For Curriculum Developers**

The SPEAK-BOT framework demonstrates that AI tools should be embedded in structures where prompts act as discussion catalysts rather than sources of ready-made answers. Rsaliyev (2026) recommends including AI literacy modules in curricula, teaching students to interact critically with neural networks. This aligns with Juraev's (2026) conclusion about the need to train teachers for the effective use of AI.

**For the Institutional Level**

There is a need to create ethical and methodological frameworks for AI use that take into account the specifics of the subject area and cultural context. The Iranian study (Rsaliyev, 2026) irrefutably proves that standardized algorithmic assessments cannot be applied uniformly without consideration of cultural characteristics. Institutions must provide:

- technological infrastructure (access to verified AI tools, stable internet connection);
- policies for protecting student data from leaks and misuse (Juraev, 2026);
- professional development programs for teachers in AI.

**Discussion**

A comparative analysis of the four studies reveals a key paradox. In China (Sharipova & Rsaliyev, 2026), AI showed an unequivocally positive effect on academic performance and motivation. In Iran (Rsaliyev, 2026), the same AI without cultural correction produced invalid assessments. In Indonesia, the same SPEAK-BOT framework led to polar opposite results depending on the group's learning strategy.

Prima Journal of Integrated Studies
ISSN (E): 3054-338X
Volume 01, Issue 05, May, 2026
Website: https://researchiapress.com


This means that the effectiveness of AI is determined not so much by the technical characteristics of the neural network as by the **pedagogical design** in which it is embedded. As Juraev (2026) convincingly states: "The future of AI in education lies in its responsible and ethical integration." Responsible integration presupposes:

- transparency and explainability of AI systems (not a "black box");
- consideration of long-term consequences (not only cognitive but also socio-emotional);
- cross-cultural validation of algorithms.

Thus, the proposed three-level model allows us to resolve the false dichotomy of "teacher or neural network." Instead of replacement, a functional redefinition of roles occurs: AI takes over routine diagnostics and generation, while the teacher retains goal-setting, emotional support, and the development of critical thinking.

## Conclusion

The analysis of empirical studies conducted in China, Iran, Indonesia, and Russia, as well as the theoretical synthesis of the works of Juraev (2026), Rsaliyev (2026), and Sharipova & Rsaliyev (2026), allows us to formulate the following conclusions.

**1. AI possesses significant adaptive potential**: automation of diagnostics, personalization of learning trajectories, and 24/7 feedback objectively improve formal academic performance indicators (Chinese study).

**2. Without cultural and pedagogical interpretation, AI risks reinforcing inequality and algorithmic bias**: the Iranian study demonstrates the need for a "cultural relevance" category, while the Indonesian study shows the variability of effects depending on the learning strategy.

**3. The optimal approach is a three-level hybrid model**, where functions are distributed between AI (technical-diagnostic level), collaboration (interpretative-adaptive level), and the teacher (motivational-reflective level).

**4. The key factor in effectiveness is pedagogical design, not the power of the neural network**. As Sharipova & Rsaliyev (2026) rightly conclude, the ideal is a

Prima Journal of Integrated Studies
ISSN (E): 3054-338X
Volume 01, Issue 05, May, 2026
Website: https://researchiapress.com


combination of traditional teaching methods and computer-based learning, where AI acts as an effective assistant, analyzing the process but not replacing the living human teacher.

Future research should focus on the long-term analysis of the socio-emotional consequences of AI implementation, the development of cross-cultural standards for algorithmic fairness, and the creation of open educational resources on AI literacy for teachers and students.

## REFERENCES

1. Juraev, Sh. (2026). Artificial Intelligence in Education: Opportunities, Challenges, and Future Directions. Proceedings of the International Scientific and Practical Conference "Sustainable Development of Science and Education: New Strategies in the Era of Artificial Intelligence and Digital Technologies", Vol. 1, pp. 1-4. Shymkent: Central Asian Innovation University. DOI: 10.5281/zenodo.19856221.
2. Rsaliyev, A.T. (2026). Hybrid Model of Foreign Language Teaching: Optimal Distribution of Functions between Teacher and Artificial Intelligence. Proceedings of the International Scientific and Practical Conference "Sustainable Development of Science and Education: New Strategies in the Era of Artificial Intelligence and Digital Technologies", Vol. 1, pp. 3-8. Shymkent: Central Asian Innovation University.
3. Sharipova, F., & Rsaliyev, A. (2026). Teacher or Neural Network: Finding a Balance of Functions in Teaching English. Collection of Materials of the International Scientific and Practical Conference "Development of Philology: Innovation, Methodology and Applied Research", pp. 277-283. Tashkent: University of Science and Technology. DOI: 10.5281/zenodo.19877719.
4. Kravtsova, A.G. (2024). The Influence of Artificial Intelligence on Learning English. World of Science, Culture, Education, No. 4 (107), pp. 238-241.
5. Turayeva, N. (2024). Benefits of AI in English Language Classes. Foreign Linguistics and Linguodidactics, Vol. 2, Iss. 4, pp. 307-312.
6. Tazhenova, S. (2025). Application of Artificial Intelligence in Teaching English. Nukus: Nukus State Pedagogical Institute, Vol. 1, pp. 67-68.
7. Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial Intelligence in Education. Boston: Center for Curriculum Redesign.

**Prima Journal of Integrated Studies**
**ISSN (E):** 3054-338X
Volume 01, Issue 05, May, 2026
**Website:** https://researchiapress.com


8. VanLehn, K. (2011). The Relative Effectiveness of Human Tutoring, Intelligent Tutoring Systems, and Other Tutoring Systems. Educational Psychologist, Vol. 46(4), pp. 197-221.