



# **METHODOLOGY FOR IMPLEMENTING AI-BASED EDUCATIONAL PLATFORMS IN PRIMARY GRADES**

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## **Abstract**

This article highlights the methodological foundations for implementing artificial intelligence (AI)-based educational platforms in primary schools. It also analyzes issues such as organizing effective learning processes for students using modern digital technologies, developing their independent thinking, creativity, and critical thinking skills.

**Keywords:** Artificial intelligence (AI), digital technologies, educational platforms, primary education, innovative methods, interactive learning, individualized education, digital learning environment, learning process efficiency, creative thinking, critical thinking, pedagogical technologies, modern education.

## **Introduction**

AI-based educational platforms are digital systems that can automatically adapt the educational process according to the learners' knowledge level, interests, and learning pace. Such platforms use data analysis, machine learning, and natural language processing technologies to provide individualized approaches for students. AI platforms offer the following opportunities: creating individualized learning paths; automatically analyzing learners' mistakes; providing immediate feedback; and identifying students' knowledge gaps to develop personalized learning plans. Intelligent tutor systems act as virtual teachers assisting students. Example: AutoTutor communicates with students through natural language, answers questions, and provides explanations.

AI-based assessment systems automatically check and analyze students' work. Examples: Gradescope, Edulastic, Quillionz. These platforms save teachers' time and provide quick analysis of results.

AI-based reading assistants (e.g., Project LISTEN Reading Tutor) help students by identifying and correcting errors during reading.

Methodology for introducing AI platforms in primary classes

The process of integrating AI platforms into education is carried out in the following stages:

1st stage: Identifying educational needs

Analyze students' knowledge levels and determine which subjects require AI platforms (e.g., mathematics, native language, English).

2nd stage: Selecting the platform

The platform should meet the following criteria: compatibility with the curriculum, interactivity, suitability for students' age, and availability in Uzbek language.

3rd stage: Teacher preparation

For effective use of AI platforms, teachers should upskill in digital pedagogy, platform management, and result analysis.

4th stage: Integration into the learning process

AI platforms are used during lessons, for homework, and in independent learning. In diagnostic tests, AI platforms provide students with the chance to learn at their own pace, which is especially important in primary education.

5th stage: Monitoring results

Through these platforms, student progress, difficult topics, and knowledge levels are analyzed.

Main advantages of AI platforms in primary education

The key benefits of AI technologies are:

- Ensuring individualized learning,
- Raising students' motivation,
- Easing teachers' workload,
- Allowing for quick assessment,
- Providing continuous monitoring of student activity.

Studies show that solving accuracy has increased by 25% among students using AI platforms.

Challenges in implementing AI platforms:

Insufficient technical infrastructure; low internet speed; lack of teachers' digital competence; data security issues.

According to research, artificial intelligence technologies offer opportunities for individualizing the learning process, monitoring student activity, and improving teaching effectiveness. AI platforms analyze a student's knowledge level and suggest tasks accordingly. For example, adaptive learning systems automatically select educational materials based on learners' pace, mistakes, and interests via machine learning and data analysis. That's why AI technologies are an important means for implementing learner-centered education in the modern education system.

AI technologies used in primary education are categorized as follows:

- Adaptive learning platforms:

These platforms adjust lesson materials based on students' responses.

Examples: Knewton, Sparrow, Century Tech, Squirrel AI (identifying knowledge levels and developing individual learning paths).

Challenges identified in scientific articles:

- Insufficient technical infrastructure,
- Lack of teacher knowledge in AI,
- Data security issues,
- Few suitable platforms for primary school students.

Therefore, pedagogical methodology, technical facilities, and teacher preparedness are crucial in implementing AI technologies into education.

Research findings:

- AI technologies increase student motivation,
- Provide opportunities for individualized learning,
- Facilitate the understanding of complex topics,
- Ease teachers' workload.

For example, AI-based adaptive learning systems analyze students' knowledge levels in real-time and provide suitable tasks.

Developing students' AI literacy

Recent research emphasizes the need to develop AI literacy among primary school students. AI literacy includes algorithmic thinking, working with data, understanding digital technologies, and AI ethics. These competencies are important for living in a future digital society.

Innovative technologies are a set of new pedagogical methods, approaches, and information technologies aimed at organizing the learning process effectively and developing students' knowledge, skills, and abilities.

Applying innovative technologies in primary education helps promote students' independent thinking, creativity, communication, and problem-solving skills. In today's education system, in addition to traditional teaching methods, modern pedagogical technologies are crucial for improving education quality.

The importance of innovative technologies in primary education

Applying innovative technologies in primary classes provides the following opportunities:

- Makes the learning process engaging:

With innovative technologies, lessons are organized to be interactive, interesting, and student-centered.

For example: interactive games, multimedia materials, electronic presentations that increase students' interest in lessons.

- Fosters independent thinking:

Innovative methods encourage students not only to receive ready knowledge but also to conduct independent research.

For example: problem-based learning, project-based teaching, research methods which develop students' analytical and critical thinking.

- Improves learning efficiency:

During lessons, innovative technologies increase visibility, interactivity, and practical activity, resulting in quicker understanding, longer retention of knowledge, and higher lesson effectiveness.

Innovative technologies used in primary education:

- Interactive methods:

These methods engage students in active participation in lessons.

Examples: Brainstorming, Cluster, Insert, Boomerang, Venn diagram. These approaches teach students to exchange ideas and collaborate.

- Information and communication technologies (ICT):

ICT plays an important role in primary education.

Examples: Computer, tablet, interactive board, multimedia presentations. These tools help make lessons visual and accessible.

- Game technologies:

Game-based methods are highly effective for primary students, ensuring their active participation and easier knowledge acquisition.

Examples: Didactic games, Role-playing games, Intellectual games.

- Problem-based learning technology:



In this method, the teacher poses a problem or question, and students try to solve it independently, developing their thinking and creativity, and strengthening their knowledge.

#### Advantages of Innovative Technologies in Education

In primary education, innovative technologies:

- increase students' interest in lessons;
- develop independent thinking;
- foster creativity;
- enhance collaboration skills;
- improve the effectiveness of learning;
- adapt tasks and thus boost educational efficiency.

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