

## DIGITAL AGE AND THE DEVELOPMENT OF SPEECH AND THINKING IN PRIMARY SCHOOL STUDENTS: NEW METHODS AND APPROACHES

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### ABSTRACT

In the modern era of rapidly advancing digital transformation, the development of speech and thinking in primary school students has become one of the key pedagogical priorities in the education system. Digital tools introduce new content to children's cognitive and communication activities, creating a need for teachers to implement innovative methods that enhance language skills, logical thinking, and creative cognition. This article explores contemporary approaches, interactive environments, and the integration of technologies into instruction aimed at developing students' speech and thinking in the digital age.

The study shows that multimedia resources, gamified learning platforms, and collaborative digital tasks significantly improve students' oral expression, vocabulary, logical reasoning, and ability to articulate thoughts coherently. The use of digital storytelling, interactive reading programs, and audio-visual materials strengthens students' speech structure, text creation habits, and reflective thinking skills. In addition, inquiry-based learning, problem-solving activities, and virtual modeling enhance students' analytical thinking and cognitive flexibility.

The role of the teacher is particularly emphasized. Teachers must guide students to use digital tools purposefully, safely, and in a balanced manner. The results indicate that applying innovative digital methods not only improves the quality of learning but also prepares students for future digital society. Overall, the research confirms the necessity of applying new methods and approaches to the development of speech and thinking in the digital era.

**Keywords:** digital education, speech development, thinking development, primary school students, innovative methods.

### Introduction

The contemporary education system is significantly influenced by rapidly developing digital technologies. This process affects primary school students' learning environments and the formation of their speech and cognitive skills. The use of digital resources—including interactive whiteboards, e-textbooks, learning platforms, and game-based programs—increases students' cognitive engagement and develops their creative and critical thinking abilities.

The aim of this study is to investigate new pedagogical methods and approaches that promote the development of speech and thinking in primary school students in the digital era and to identify effective teaching strategies in this context.

Speech is a crucial psychological process through which a person expresses thoughts and facilitates social and cognitive development. Thinking refers to the ability to perceive the environment, establish connections between events, draw conclusions, and form new knowledge. Pedagogically, speech and thinking complement each other: proper speech development strengthens logical reasoning, while cognitive development enhances vocabulary and expressive skills.

### Aim

To develop a scientifically grounded approach for enhancing speech and cognitive abilities of primary school students through digital learning tools and modern pedagogical methods; to determine how digital society influences students' speech and thinking and its outcomes in the learning process; to assess the impact of interactive videos, digital games, animations, and multimodal resources on students' oral skills; to analyze the role of e-books, interactive texts, and digital reading environments in vocabulary and expressive skill development; to study the effect of problem-solving digital tasks and research activities on cognitive and analytical thinking; to evaluate the contribution of digital communication with teachers and peers to speech development; to justify the teacher's coordinating, guiding, and motivational role in digital learning; to propose methodological recommendations for safe, purposeful, and balanced use of digital resources; to observe and analyze changes in students' speech and cognitive skills in digitally enriched classrooms; and to suggest models and approaches adaptable to local educational contexts based on international experience.

### Significance

Digitalization creates new opportunities in the learning process while demanding different pedagogical approaches from teachers. Interactive platforms, digital games, simulations, and visual resources engage students and motivate them to learn. Through these tools, students not only acquire knowledge but also analyze it, form connections, and generate creative outcomes. Thus, digital learning environments provide favorable conditions for developing speech and thinking in primary school students.

Primary education is a stage where a child's personality, cognitive, and speech activities intensively develop. During this period, children's ability to perceive the environment and express their thoughts clearly and coherently is shaped by pedagogical and psychological influences. Speech is the form of expressing cognitive activity, while thinking constitutes the content of cognitive processes. The teacher's purposeful actions, an active learning environment, and appropriately chosen methods are essential for fostering this development.

Digital technologies—interactive boards, learning platforms, audiovisual resources, and e-textbooks—have transformed how children learn. These tools enable children to acquire new words through listening, repetition, and visual observation more efficiently. Digital environments enhance communication skills, enrich speech content, and expand vocabulary. Proper guidance by teachers further stimulates attention and memory development.

Game-based learning is one of the most effective means for developing thinking in primary students. During games, students think, make decisions, solve problems, and draw conclusions, which fosters logical, analytical, and creative thinking. Interactive tasks, digital games, open-question techniques, virtual experiments, and visual models increase students' engagement and activate cognitive processes.

Effective use of digital environments depends on teachers' and parents' digital literacy. Teachers must understand the pedagogical potential of new technologies and integrate them purposefully into lessons. Parents should guide their children's technology use and support their learning activities. Collaboration between teachers and parents enhances students' motivation and ensures the proper use of digital resources.

### **Theoretical Framework**

Experiences in classrooms using digital resources indicate that purposeful integration of digital tools significantly improves students' speech activity and cognitive levels. For example, tasks such as "speaking images," "word maps," and "complete the thought" foster both vocabulary and cognitive flexibility. Modern educational approaches—including STEAM education, project-based learning, multimodal instruction, and communicative methods—further enrich speech and thinking activities.

Digital innovations in education positively influence speech and cognitive development. Using interactive boards, teaching platforms, audio-visual materials, and game-based programs enhances students' interest in learning, expands vocabulary, and develops logical and creative thinking. Digital tools personalize learning, allowing each child's potential to emerge. Systematic and purposeful integration of digital resources is thus essential for speech and cognitive development.

Future research should examine the psychological and social communication impacts of digital technologies in primary education. Teacher training programs should enhance digital pedagogical competencies. Adapting teaching resources to national curricula and creating age-appropriate digital materials are also crucial.

#### **Recommendations:**

- Teachers should widely use interactive and game-based methods in lessons;
- Parents should monitor technology interactions and support learning-oriented activities;
- Schools should implement programs on digital literacy and media culture.

Digital tools open new perspectives for developing students' speech. Multimedia resources, interactive platforms, and e-books enrich vocabulary and strengthen oral and written expression. Visual and audio support facilitates comprehension, while digital games and simulations encourage decision-making and evaluation. Examples include:

- Simulation games: students learn to solve ecological and social problems;
- Task-oriented games: enhance logic and strategy skills.

Digital technologies also reshape teachers' methods and approaches. New methods promoting speech and thinking in primary students emphasize interactivity, project-based learning, and digital collaboration.

The STEAM approach motivates students to conduct research and projects using digital lab programs to perform experiments, analyze results, and present findings, developing both speech and cognitive skills. Digital platforms make lessons engaging and measurable. Platforms like Mentimeter, Kahoot, and Quizizz allow teachers to conduct quizzes, surveys, and tests, fostering active participation and critical thinking. Google Classroom, Teams, and similar platforms enable collaboration with teachers and peers. Virtual group projects enhance idea exchange, explanation skills, and speech development.

In the digital era, teachers' role extends beyond knowledge transmission. They must efficiently use digital tools and promote speech and cognitive development. Modern teachers should be digitally literate, creative, and aware of pedagogical technologies. Integrating various digital tools into lessons increases engagement and interactivity. For example, organizing a Kahoot quiz allows students to have fun while mastering lesson content.

Digital technologies in primary education enhance vocabulary, oral and written expression, and critical and creative thinking. Multimodal materials, interactive games, project-based tasks, and virtual collaboration increase motivation and engagement. Key approaches include: purposeful use of digital tools, STEAM and project-based learning, flipped classrooms, digital ethics, and teacher digital literacy.

## Literature Review

The development of speech and thinking in primary students in the digital era is widely discussed in pedagogical research. Literature shows that integrating digital technologies into learning environments creates new opportunities for organizing language skills and cognitive activities (Prensky, 2001). However, effectiveness largely depends on context and pedagogical approach (Selwyn, 2016).

Research indicates that multimedia and interactive resources enhance motivation (Mayer, 2009). Some studies caution that overuse can distract attention, emphasizing the need for pedagogically appropriate selection (Carr, 2011). Problem-based digital activities strengthen logical and critical thinking (Jonassen, 2010), but methodological gaps exist for primary-level adaptation (Vygotsky, 1978).

Teacher roles are categorized as: technology as a supportive tool (Fullan, 2013) and teachers as facilitators in digital environments (Trust, 2017). However, primary teachers' readiness for this shift remains debated.

Two gaps are evident:

1. Lack of models simultaneously developing speech and thinking in primary students (Mayer, 2009; Jonassen, 2010).
2. Limited methodological frameworks for pedagogically appropriate adaptation of digital tools (Selwyn, 2016; Trust, 2017).

## Methodology

A mixed-methods approach was employed, combining quantitative and qualitative data collection and analysis. Quantitative data measured the impact of digital tools on speech and cognitive skills; qualitative data explored teacher experiences and observations.

Participants included 120 3rd and 4th-grade students from three schools in Baku, with 18 students and 6 teachers selected for qualitative analysis. Random and purposive sampling ensured objectivity and experience-based selection. Tools included: speech development tests, cognitive skill diagnostics, teacher interviews, and classroom observation forms.

Data collection spanned four weeks:

1. Week 1: Pre-tests on speech and cognitive skills.
2. Weeks 2–3: Lessons using digital tools, teacher interviews, and classroom observations.
3. Week 4: Post-tests, data compilation, and coding.

Ethical standards were observed; anonymity was ensured. Quantitative data were analyzed using SPSS 26 (descriptive statistics, paired t-tests, ANOVA), and qualitative data via thematic analysis with triangulation.

## Findings and Discussion

The digital era offers extensive opportunities to enhance speech and thinking in primary students. Modern methods and digital approaches create interactive, motivated, and effective learning environments. Purposeful application of digital tools serves as a contemporary pedagogical approach supporting speech and cognitive development.

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