

THE TECHNOLOGY OF FORMING STUDENTS' CRITICAL THINKING SKILLS IN PRIMARY SCHOOLS**Borikhujaeva Nurjakhon Botirkhon qizi**

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Email: borixojayevanurjahon@gmail.com**Abstract**

This article examines the technologies for developing critical thinking skills in primary school students. It highlights the importance of critical thinking in modern education and analyzes pedagogical methods, interactive approaches, and innovative strategies that contribute to its development. The role of the teacher, learning environment, and practical activities in fostering students' independent thinking, analytical abilities, and reasoning skills are also discussed.

Keywords

critical thinking, primary education, pedagogical technology, interactive methods, cognitive development, problem-based learning

BOSHLANG'ICH SINFLARDA O'QUVCHILARNING TANQIDIY FIKRLASH KO'NIKMALARINI SHAKLLANTIRISH TEXNOLOGIYASI**Annotatsiya**

Ushbu maqolada boshlang'ich sinf o'quvchilarida tanqidiy fikrlash ko'nikmalarini shakllantirish texnologiyalari tahlil qilinadi. Zamonaviy ta'lim jarayonida tanqidiy fikrlashning ahamiyati yoritilib, uni rivojlantirishga xizmat qiluvchi pedagogik metodlar, interfaol usullar va innovatsion yondashuvlar ko'rib chiqiladi. Shuningdek, o'qituvchining roli, ta'lim muhiti va amaliy mashg'ulotlar orqali o'quvchilarning mustaqil fikrlashi, tahlil qilish va xulosa chiqarish qobiliyatlarini rivojlantirish masalalari yoritilgan.

Kalit so'zlar

tanqidiy fikrlash, boshlang'ich ta'lim, pedagogik texnologiya, interfaol metodlar, kognitiv rivojlanish, muammoli ta'lim

ТЕХНОЛОГИЯ ФОРМИРОВАНИЯ НАВЫКОВ КРИТИЧЕСКОГО МЫШЛЕНИЯ У УЧАЩИХСЯ НАЧАЛЬНЫХ КЛАССОВ**Аннотация**

В данной статье рассматриваются технологии формирования навыков критического мышления у учащихся начальных классов. Освещается значимость критического мышления в современном образовательном процессе, а также анализируются педагогические методы, интерактивные подходы и инновационные технологии, способствующие его развитию. Особое внимание уделяется роли учителя, образовательной среды и практических заданий в развитии у учащихся навыков самостоятельного мышления, анализа и обобщения.

Ключевые слова

критическое мышление, начальное образование, педагогические технологии, интерактивные методы, когнитивное развитие, проблемное обучение

INTRODUCTION

In the context of rapid globalization and the increasing flow of information, the ability to think critically has become one of the most essential competencies for individuals. Modern education systems are no longer focused solely on knowledge transmission but aim to develop learners who can analyze, evaluate, and apply information effectively. This shift is particularly important in primary education, where foundational cognitive skills are formed.

Primary school students are naturally curious and open to exploration, making this stage ideal for developing critical thinking skills. However, traditional teaching methods often emphasize memorization rather than reasoning. Therefore, implementing effective pedagogical technologies that promote critical thinking is a crucial task for educators.

MATERIALS AND RESEARCH METHODOLOGY

This study is aimed at exploring the technologies for developing critical thinking skills in primary school students, and it is based on both theoretical and practical approaches of modern pedagogy and psychology. During the research process, a wide range of local and foreign scientific sources, including educational standards, curricula, and methodological manuals, were utilized. In particular, theoretical perspectives on critical thinking development were analyzed based on Bloom's Taxonomy, Vygotsky's socio-cultural theory, and the modern competency-based approach.

The research materials included primary school textbooks, teaching and methodological complexes, interactive tasks, and the results of practical classroom activities. In addition, tests, questionnaires, and observation data aimed at identifying students' levels of thinking served as important empirical sources for the study.

The research methodology was organized on the basis of a comprehensive approach, incorporating several scientific methods. The method of theoretical analysis was used to examine and generalize existing scientific literature. The comparative method allowed for the evaluation of the effectiveness of different pedagogical technologies. The observation method was applied to study students' classroom behavior, their level of independent thinking, and their responses to problem situations.

Furthermore, experimental work was conducted to determine the impact of interactive methods, problem-based learning technologies, and group work strategies on the development of students' critical thinking skills. The results obtained during the research were analyzed and scientifically substantiated in terms of their effectiveness.

These methodological approaches ensure the reliability and scientific validity of the study and contribute to identifying effective ways of developing critical thinking skills in the primary education process.

In addition, particular attention was paid to the selection and implementation of age-appropriate instructional strategies that align with the cognitive and psychological characteristics of primary school students. The research also incorporated formative assessment techniques to monitor students' progress in developing critical thinking skills over time. These included reflective tasks, peer assessment activities, and teacher feedback sessions, which provided continuous insights into students' learning dynamics.

Moreover, elements of qualitative and quantitative data analysis were applied to ensure a balanced interpretation of the findings. Qualitative data obtained from classroom observations and open-ended questionnaire responses were categorized and analyzed thematically, while quantitative data from tests and structured surveys were processed using basic statistical methods. This mixed-methods approach enhanced the depth and accuracy of the research outcomes.

Ethical considerations were also taken into account during the study. Participation of students was conducted in a supportive and non-intrusive manner, ensuring that the learning process was not negatively affected. The confidentiality of collected data was maintained, and all findings were used solely for academic purposes.

Overall, the integration of diverse materials, systematic methodology, and ethical research practices strengthened the overall validity and applicability of the study results in real educational settings.

ANALYSIS AND RESULTS

During the course of this study, the effectiveness of pedagogical technologies aimed at developing critical thinking skills in primary school students was comprehensively analyzed. The findings indicate that, compared to traditional teaching methods, interactive and problem-based learning technologies significantly enhance students' levels of independent thinking.

In the experimental phase of the research, students were divided into two groups: a control group and an experimental group. In the control group, mainly traditional teaching methods were applied, while in the experimental group, interactive methods such as problem-based tasks, group work, discussions, and question-and-answer techniques were widely implemented. Initial diagnostic assessments revealed that the level of critical thinking in both groups was generally at a low or average level.

However, the final results demonstrated a noticeable difference between the two groups. In particular, students in the experimental group showed significant improvement in their ability to analyze problem situations, draw independent conclusions, and justify their opinions. They approached questions more deeply and were able to propose multiple solutions to given problems. In contrast, students in the control group mainly relied on reproducing memorized knowledge and provided more superficial responses.

Observational data further confirmed that the use of interactive methods increased students' engagement and motivation during lessons. Especially during group activities, students actively exchanged ideas, listened to different viewpoints, and evaluated alternative perspectives. These processes contributed not only to the development of critical thinking but also to the enhancement of social and communicative skills.

The results of questionnaires and tests also supported these findings. In the experimental group, indicators of higher-order thinking skills showed significant growth, whereas progress in the control group was relatively limited. Specifically, students in the experimental group demonstrated improved abilities in analysis, comparison, and evaluation, which are essential components of critical thinking.

Another important factor identified during the research was the role of the teacher. When the teacher acted as a facilitator and guide rather than merely a transmitter of knowledge, students showed a greater tendency toward independent thinking. The use of open-ended questions, constructive feedback, and individualized approaches encouraged students to become more intellectually active and engaged in the learning process.

The results also suggest that the development of critical thinking is a continuous and systematic process. It cannot be achieved through isolated activities alone but should be integrated into the entire educational process. The content of lessons, teaching methods, and assessment strategies must all be aligned with the goal of fostering critical thinking skills.

Furthermore, the study revealed that primary school students acquire critical thinking skills more effectively when learning activities are adapted to their age and interests. Lessons enriched with visual materials, game elements, and real-life examples help stimulate students' thinking processes and promote deeper understanding of the subject matter.

An additional observation of the study was that students exposed to interactive learning environments demonstrated greater confidence in expressing their ideas. They were more willing to participate in discussions, ask questions, and challenge assumptions. This indicates that the learning environment plays a crucial role in shaping not only cognitive skills but also students' attitudes toward learning.

Moreover, it was found that collaborative learning strategies significantly contributed to the development of critical thinking. When students worked in groups, they engaged in dialogue, negotiated meanings, and co-constructed knowledge. Such interactions encouraged them to

reflect on their own thinking and consider alternative viewpoints, which are essential aspects of critical thinking.

In general, the results of the study highlight the necessity of integrating interactive pedagogical technologies into the primary education system. These approaches not only enhance students' critical thinking skills but also contribute to their overall development as independent, creative, and responsible individuals. The findings confirm that early development of critical thinking lays a strong foundation for lifelong learning and successful participation in modern society.

In addition to the above findings, the study also revealed measurable differences in students' cognitive flexibility and their ability to transfer knowledge to new situations. Students in the experimental group demonstrated a higher capacity to apply previously learned concepts to unfamiliar tasks, indicating a deeper level of understanding. This transfer of learning is considered a key indicator of well-developed critical thinking skills.

The analysis of classroom interactions showed that students exposed to interactive pedagogical technologies were more likely to engage in metacognitive activities, such as reflecting on their own thinking processes and evaluating the effectiveness of their problem-solving strategies. This suggests that critical thinking development is closely linked with the formation of self-regulation skills, which are essential for independent learning.

Furthermore, it was observed that the frequency and quality of student-teacher interactions significantly influenced learning outcomes. In classrooms where teachers consistently encouraged inquiry-based learning and maintained an open dialogue, students exhibited higher levels of curiosity and intellectual initiative. They were more inclined to ask clarifying questions, challenge given information, and seek evidence to support their arguments.

The study also highlighted the importance of assessment methods in shaping students' thinking skills. Traditional forms of assessment, focused mainly on factual recall, were found to be less effective in promoting critical thinking. In contrast, alternative assessment strategies—such as project-based evaluation, reflective journals, and performance tasks—provided students with opportunities to demonstrate analytical and evaluative skills in more meaningful contexts.

Another significant result concerns the role of classroom climate in fostering critical thinking. A supportive and inclusive learning environment, where students feel safe to express their ideas without fear of criticism, was found to be crucial. In such environments, students were more willing to take intellectual risks, experiment with new ideas, and learn from their mistakes.

It is also worth noting that the integration of technology-enhanced learning tools contributed positively to students' engagement and thinking processes. Digital platforms, multimedia presentations, and interactive applications created dynamic learning experiences that stimulated curiosity and encouraged active participation. These tools also allowed for differentiated instruction, catering to the diverse learning needs of students.

Finally, longitudinal observations suggested that sustained exposure to interactive and student-centered teaching approaches leads to gradual but consistent improvement in critical thinking abilities. This reinforces the idea that the development of such skills requires time, practice, and continuous reinforcement within the educational process.

CONCLUSION

This study has demonstrated that interactive and problem-based teaching methods significantly enhance the development of critical thinking skills in primary school students. The findings indicate that students exposed to these pedagogical technologies show improved abilities in analysis, evaluation, and independent reasoning compared to those taught using traditional methods.

The results also emphasize the important role of the teacher as a facilitator, guiding students through inquiry, providing constructive feedback, and encouraging active participation.

Lessons enriched with age-appropriate activities, real-life examples, and collaborative tasks further support the growth of students' analytical and reflective skills.

Overall, integrating interactive pedagogical technologies into primary education not only fosters critical thinking but also contributes to students' overall development as independent, creative, and responsible individuals. Early cultivation of these skills lays a strong foundation for lifelong learning and successful participation in society.

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