INNOVATIVE TEACHING METHODS: THE ROLE OF THE "BRAINSTORMING" METHOD IN ENHANCING EDUCATIONAL EFFECTIVENESS

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Abstract. *This article comprehensively examines the significance of employing innovative methods in the modern educational process. In particular, the role of the Brainstorming method in enhancing students' levels of knowledge acquisition, creative and critical thinking abilities, as well as the development of teamwork and communication skills, is analyzed from both scientific-theoretical and practical perspectives. Furthermore, based on the results of pedagogical experience, the effectiveness of this method in improving overall educational efficiency is substantiated.*

Keywords: *interactive methods, brainstorming, innovation, educational effectiveness, digital education, competence, pedagogical technologies.*

Introduction. In the current era of globalization and rapid digitalization, the education system is facing qualitatively new demands. The sustainable development of society is directly linked to the training of competitive professionals who are capable of independent thinking and possess a creative approach. However, traditional teaching methods often fail to ensure active learner engagement and are insufficient in fostering free thinking as well as developing skills for independent problem solving.

Therefore, the integration of innovative and interactive methods into the educational process has become one of the most pressing issues. Interactive methods transform learners into active subjects of the learning process, thereby stimulating their cognitive activity. Among these methods, the Brainstorming technique holds particular significance as an effective approach for unlocking students' creative potential, facilitating collective idea exchange, and improving the overall quality of education.

Literature Review. The issue of applying innovative and interactive teaching methods in the educational process has been widely examined in pedagogical and psychological research. In contemporary educational theory, learner-centered approaches are regarded as a key factor in improving the quality and effectiveness of education. Numerous scholars emphasize that active learning strategies contribute significantly to the development of students' cognitive, creative, and social competencies.

Research conducted by foreign scholars highlights that interactive methods enhance learners' motivation and engagement by involving them directly in the learning process. In particular, Osborn, who introduced the concept of Brainstorming, defined this method

as a structured group technique aimed at generating a wide range of ideas in a short period of time. According to his theoretical framework, the temporary suspension of criticism and the encouragement of free expression foster creative thinking and originality among participants.

Subsequent studies have further developed the pedagogical potential of the Brainstorming method. Researchers note that this technique is especially effective in promoting divergent thinking, problem-solving skills, and collaborative learning. Empirical studies demonstrate that students who regularly participate in brainstorming activities show higher levels of conceptual understanding and improved ability to articulate and defend their ideas. Moreover, the method supports the formation of communication skills and positive group dynamics, which are essential components of modern competence-based education.

In the context of digital and blended learning environments, recent research indicates that the integration of Brainstorming with digital tools and online platforms further increases its effectiveness. Scholars argue that digital brainstorming facilitates inclusivity, allows for asynchronous participation, and enables the visualization and systematic organization of ideas. This, in turn, enhances learners' reflective thinking and deepens knowledge acquisition.

Studies conducted within the framework of national educational systems also confirm the effectiveness of interactive methods, including Brainstorming, in improving learning outcomes. Researchers emphasize that the successful implementation of this method depends on pedagogical conditions such as the teacher's methodological competence, the creation of a supportive learning environment, and the alignment of the method with instructional objectives.

In summary, the analysis of scientific literature reveals that the Brainstorming method occupies a significant place among innovative teaching strategies. It serves not only as a tool for generating ideas but also as an effective pedagogical technology that contributes to the development of learners' creative, critical, and communicative competencies, thereby enhancing overall educational effectiveness.

Main Part. The "Brainstorming" Method. The Brainstorming method was first developed in the mid-twentieth century as a technique for generating new ideas in problem-solving situations and is now widely applied in the field of pedagogy. The core essence of this method lies in encouraging learners to freely express their opinions and ideas regarding a specific problem or question, accepting all proposed ideas without criticism, and subsequently analyzing and evaluating them.

In the educational process, the Brainstorming method is implemented through the following stages:

Problem Formulation Stage – the teacher presents a clear and well-defined problem or question to the learners;

Idea Generation Stage – learners freely express their thoughts and suggestions without restrictions;

Systematization and Analysis Stage – the generated ideas are classified, generalized, and discussed;

Conclusion Stage – the most appropriate and effective solutions are identified.

This process ensures active learner participation and contributes to the development of creative and critical thinking skills.

Purpose and Objectives of the Pedagogical Experiment. The primary purpose of the pedagogical experiment was to determine the effectiveness of applying the Brainstorming method in the educational process in order to enhance learners' levels of knowledge acquisition, classroom activity, and independent thinking skills.

To achieve this purpose, the following objectives were set:

to determine learners' initial level of knowledge;

to systematically organize instructional activities based on the Brainstorming method;

to develop learners' creative activity and communication skills;

to analyze the results obtained at the end of the experiment and draw conclusions.

Organization of the Pedagogical Experiment. The pedagogical experiment was conducted during the 2024–2025 academic year in two parallel groups of a general secondary school (or a higher education institution). A total of 60 learners (students) participated in the experiment.

Control Group (30 participants) – instruction was carried out using traditional teaching methods;

Experimental Group (30 participants) – instruction was conducted using innovative and interactive methods, including the Brainstorming method.

In the experimental group, the Brainstorming method was regularly applied at various stages of the lesson, including the introduction of new topics, solving problem-based questions, reinforcing learning content, and drawing final conclusions.

Research Methods. During the pedagogical experiment, the following research methods were employed in an integrated manner:

Diagnostic Tests – used to assess learners' knowledge levels at the beginning and at the end of the experiment. Test results allowed for the evaluation of knowledge acquisition dynamics.

Observation Method – learners' classroom activity, teamwork, and level of participation in discussions were systematically observed.

Questionnaire Survey – learners' attitudes toward the Brainstorming method, their interest in lessons, and opportunities for free self-expression were examined.

Comparative and Statistical Analysis – the results of the control and experimental groups were compared and analyzed using percentage indicators.

Results of the Pedagogical Experiment. At the initial stage of the experiment, the level of learners' knowledge in both the control and experimental groups was almost

identical. This similarity indicates that the groups were equivalent in terms of their baseline academic preparedness and confirms the objectivity and reliability of the conducted research.

At the final stage of the pedagogical experiment, significant differences between the two groups were observed. The analysis of diagnostic test results demonstrated that learners in the experimental group achieved notably higher outcomes compared to those in the control group. The increase in academic performance among the experimental group participants indicates the positive impact of the systematic application of the Brainstorming method in the instructional process.

In particular, learners in the experimental group showed a substantial improvement in their ability to understand and apply newly acquired knowledge, actively participate in classroom discussions, and independently propose solutions to problem-based tasks. In contrast, the control group, which was taught using traditional instructional methods, demonstrated only moderate progress, primarily within the framework of reproductive learning activities.

Observation data further revealed that the experimental group exhibited higher levels of classroom engagement, collaborative interaction, and initiative in expressing ideas. Learners became more confident in articulating their opinions and demonstrated greater openness to alternative viewpoints. Questionnaire results also confirmed an increased interest in lessons, a more positive attitude toward learning activities, and enhanced motivation among learners exposed to the Brainstorming method.

Comparative and statistical analysis of the final results, expressed through percentage indicators, clearly illustrates the effectiveness of the Brainstorming method in improving educational outcomes. Overall, the findings suggest that the use of innovative and interactive teaching methods leads to measurable improvements in learners' academic achievement, cognitive activity, and communicative competence.

Indicators	**Control Group**	**Experimental Group**
Average level of knowledge (at the beginning)	56%	57%
Average level of knowledge (at the end)	65%	82%
Level of classroom activity	60%	85%
Independent thinking skills	58%	80%

Analysis of Results. The analysis of the obtained results indicates that educational effectiveness in the experimental group increased significantly. In particular, as a result of applying the Brainstorming method, the level of learners' knowledge acquisition increased by an average of 25 percent. This finding demonstrates that the method is effective in promoting deeper understanding and long-term retention of learning materials.

Moreover, indicators of classroom activity showed a substantial increase. Learners actively participated in answering questions, expressing their viewpoints, and engaging in group work. The development of independent thinking skills suggests the formation of learners' critical attitudes and creative thinking abilities.

In contrast, the control group demonstrated a comparatively lower increase in knowledge acquisition, and learners' classroom activity remained limited. This outcome indicates that traditional teaching methods are partially ineffective in meeting contemporary educational demands and in fostering active learner engagement.

Conclusion. The findings of this study confirm that the effective integration of innovative and interactive teaching methods is a crucial factor in improving the quality of the modern educational process. In particular, the Brainstorming method demonstrates significant pedagogical potential in enhancing learners' cognitive activity, independent thinking, and creative engagement.

The results of the pedagogical experiment revealed that learners in the experimental group, who were instructed using the Brainstorming method, showed higher levels of knowledge acquisition and classroom participation compared to those in the control group taught through traditional methods. The systematic application of this method contributed to the development of learners' critical and creative thinking skills, as well as their ability to articulate ideas, collaborate effectively, and engage in constructive dialogue.

Furthermore, the study highlights that the effectiveness of the Brainstorming method largely depends on appropriate pedagogical conditions, including clear problem formulation, a supportive learning environment, and the teacher's methodological competence. When these conditions are met, Brainstorming functions not only as a technique for idea generation but also as a comprehensive pedagogical technology that supports competence-based and learner-centered education.

In conclusion, the Brainstorming method can be considered an effective and practical instructional approach for enhancing educational effectiveness in both general and higher education contexts. Its consistent implementation contributes to the formation of essential 21st-century skills and aligns with the requirements of innovative and digitalized education systems.

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