ORGANIZATION OF CHEMISTRY LESSONS BASED ON CREATIVE THINKING AND INNOVATIVE INSTRUCTION

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Contemporary chemistry education increasingly requires learning environments that develop learners' creative thinking, problem-solving, and scientific communication skills. This thesis focuses on organizing chemistry lessons through innovative instruction that shifts the classroom from memorization to inquiry, modeling, and evidence-based reasoning. The proposed approach integrates problem-based and project-based learning, interactive discussion techniques, and the purposeful use of digital tools such as simulations and virtual laboratories to visualize abstract concepts and support safe experimentation. Lesson organization is structured around clear learning outcomes, motivating real-life contexts, collaborative tasks, and formative feedback that guides learners' reflection and improvement. As a result, students are expected to demonstrate higher engagement, deeper conceptual understanding, and improved ability to generate original explanations, test hypotheses, and apply chemical knowledge to everyday and environmental contexts [1].

In contemporary education, chemistry teaching should go beyond the transmission of factual knowledge and focus on developing students' creative thinking, problem-solving, and independent reasoning skills. Traditional teacher-centered approaches often limit students' active participation and creative engagement. The integration of innovative instructional strategies such as problem-based learning, project-based learning, interactive methods, and digitally supported instruction – creates opportunities for deeper conceptual understanding and meaningful learning. Therefore, organizing chemistry lessons on the basis of creative thinking and innovative instruction is a highly relevant issue in modern chemistry education. The purpose of this research is to identify the pedagogical potential of organizing chemistry lessons based on creative thinking and innovative instructional approaches, and to examine their impact on students' cognitive engagement, learning motivation, and conceptual understanding. Additionally, the study aims to develop methodological recommendations for chemistry teachers on designing student-centered and creativity-oriented lessons.

This study proposes an integrated instructional model for organizing chemistry lessons that systematically combines creative-thinking tasks with innovative teaching strategies (problem-based and project-based learning, interactive classroom techniques, and digital learning tools such as simulations and virtual laboratories). The novelty lies in (1) structuring lesson design around creativity-focused learning outcomes and measurable indicators of creative performance, and (2) linking innovative instructional methods to concrete stages of a chemistry lesson (motivation, exploration, modeling, argumentation, reflection, and formative assessment) to ensure consistent classroom implementation [2].

The research contributes to chemistry education methodology by clarifying the theoretical relationship between creative thinking and innovative instruction in science learning. It develops a conceptual framework that explains how inquiry, modeling, and evidence-based argumentation can function as mechanisms for fostering creativity in chemistry. The study also suggests criteria and indicators that can be used to evaluate students' creative engagement and conceptual understanding in chemistry lessons. The practical value of the study is that it provides chemistry teachers with actionable guidance for designing and conducting creativity-oriented lessons. The proposed lesson organization model includes task examples, activity structures, and formative feedback strategies that can be adapted to different topics and grade levels. The findings can support teacher professional development, lesson planning, and the selection of digital and interactive resources aimed at improving student motivation, engagement, and learning outcomes. The study concludes that organizing chemistry lessons based on creative thinking and innovative instruction increases students' active participation, strengthens conceptual understanding, and improves their ability to generate original explanations, propose hypotheses, and justify solutions using evidence. The integration of interactive methods and digital tools helps students visualize abstract chemical concepts and engage in safer, more meaningful experimentation. Overall, the proposed approach supports the development of transferable competencies such as collaboration, scientific communication, and reflective reasoning while enhancing the quality and effectiveness of chemistry teaching.

References

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