THE ROLE OF INTERACTIVE LEARNING TECHNOLOGIES IN BUILDING A COMMUNICATIVE ENVIRONMENT IN CHEMISTRY EDUCATION

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This study examines how interactive learning technologies contribute to building a communicative environment in chemistry education. The research focuses on classroom practices that promote dialogue, collaboration, and scientific communication, including cooperative learning, guided discussions, inquiry-based tasks, digital interactive tools, and peer feedback. The findings suggest that systematically designed interactive learning environments enhance students' use of scientific terminology, clarity of explanations, evidence-based argumentation, and collaborative communication during problem solving and laboratory activities. The study highlights that interactive technologies support both communicative competence and deeper conceptual understanding in chemistry[1].

In modern education, communicative competence is a key outcome that ensures students can express scientific ideas, participate in academic dialogue, and collaborate effectively. Chemistry, as a conceptually demanding subject, requires learners not only to understand abstract concepts but also to communicate reasoning, justify conclusions with evidence, and interpret experimental results. Traditional teacher-centered approaches often limit students' opportunities for meaningful communication. Therefore, exploring the role of interactive learning technologies in building a communicative classroom environment is highly relevant to improving the quality and effectiveness of chemistry instruction.

The purpose of this study is to determine the role of interactive learning technologies in building a communicative environment in chemistry education and to identify instructional strategies that strengthen students' scientific communication, collaboration, and argumentation skills.

The study proposes a chemistry-specific model that connects interactive learning technologies with measurable indicators of communicative environment quality and student communicative competence. It introduces a structured system of classroom and laboratory tasks (Claim–Evidence–Reasoning prompts, micro-debates, role-based group work, and collaborative reporting) aimed at developing communication alongside conceptual learning. In addition, the study outlines assessment criteria for evaluating students' communicative progress in chemistry, including scientific language accuracy, explanation coherence, evidence-based justification, and interaction culture [2].

The research provides teachers with practical guidance and ready-to-use tools for designing communicative chemistry lessons: discussion protocols, cooperative roles, inquiry task templates, peer-feedback checklists, and formative assessment rubrics. These tools help teachers diagnose communication difficulties, support inclusive participation, and improve classroom engagement. The proposed approach can be adapted to different chemistry topics and grade levels, strengthening both learning outcomes and communication culture.

The study concludes that interactive learning technologies play a significant role in building a communicative environment in chemistry education. When applied systematically, they increase students' participation in scientific dialogue, improve their ability to explain concepts and justify reasoning with evidence, and enhance collaborative learning during problem solving and laboratory work. As a result, interactive technologies should be considered an essential component of modern chemistry teaching, supporting the formation of communicatively competent and scientifically literate learners.

References

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