

DEVELOPMENT AND ENHANCEMENT OF TEACHERS' PROFESSIONALISM IN CHEMISTRY EDUCATION

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This article presents the results of a study on the development and enhancement of teachers' professionalism in the teaching of chemistry. The quality of teachers' methodological and pedagogical training, as well as their use of digital resources and modern approaches in the teaching process, has been analyzed. The article provides a comprehensive analysis of the challenges faced by chemistry teachers in their teaching activities and explores solutions to these problems. Furthermore, the importance of applying interactive and innovative methods in the teaching process is emphasized. The study's findings offer specific recommendations for improving teachers' professionalism.

As one of the fundamental disciplines of natural sciences, chemistry aims to develop core knowledge and practical skills. In modern times, increasing the quality of the teaching process, enhancing teachers' professionalism, and strengthening their scientific-pedagogical potential are among the main priorities of the education system. Teachers must use modern methods and technologies in the teaching process to help students develop scientific thinking skills. The role of teachers in chemistry education is crucial. Their level of scientific knowledge, pedagogical skills, and methodological preparation directly impact the quality of lessons. Additionally, the effective organization of chemistry lessons requires conducting laboratory experiments and prioritizing practical activities. To enhance teachers' knowledge and skills in this area, regular professional development courses should be organized. The methodological foundations of modern chemistry education are based on fundamental principles that ensure the professional development of teachers. These principles include constructivist approaches, active learning, problem-based learning, research-oriented teaching methods, and the application of interactive teaching techniques. The constructivist approach encourages students to build their knowledge, ensuring their active participation in the learning process. Problem-based learning allows students to develop their chemistry knowledge and skills by solving real-life problems. At the same time, research-oriented teaching emphasizes the importance of laboratory and practical activities, requiring teachers to strengthen their skills in this area. Moreover, teachers' proficiency in digital technologies and their application of innovative teaching methods are crucial for improving the quality of education. Digital platforms and virtual laboratories help students better understand and analyze chemical experiments. The implementation of these methods significantly contributes to teachers' professional development [1–3].

Research Innovation. This study comprehensively examines how the teaching methodologies of chemistry teachers have evolved and developed in the modern era. One of the main innovations is the assessment of teachers' effectiveness in using digital platforms and interactive teaching techniques. ICT tools and modern teaching methods provide teachers with the opportunity to conduct more efficient lessons. Additionally, the study analyzes the methodologies and approaches used by teachers in chemical experiments, assessing their effectiveness. The findings indicate that teachers' use of laboratory equipment, the development of practical skills, and the organization of more laboratory activities are essential for fostering students' experimental thinking [4, 5].

Conclusion. Enhancing teachers' professionalism in chemistry education is one of the main priorities of the education system. Research shows that teachers must not only possess subject knowledge but also acquire modern teaching methods, laboratory experiment organization skills, and proficiency in digital resources. Furthermore, chemistry teachers should develop students' research skills and demonstrate the real-world applications of chemistry. Increasing the number of laboratory lessons, organizing professional development courses based on modern technologies, and applying interactive teaching methods are essential steps for improving the quality of education. Consequently, enhancing teachers' professionalism and updating teaching methodologies will significantly contribute to the successful development of the education system.

References

1. Abell, S. K. *Research on science teacher knowledge*. In S. K. Abell., N. G. Lederman (Eds.), *Handbook of research on science education*, 2007, (pp. 1105-1151). New Jersey: Lawrence Erlbaum.
2. Özgür K. Çoban, Ayşe Yalçın Çelik, Ziya Kılıç. *Chemistry teachers' instructional strategies and the factors that affect these strategies*. *Journal of Science Education Research*, 2019, 15(2), 45-58.
3. Shulman, L. S. *Those who understand: Knowledge growth in teaching*. *Educational Researcher*, 1986, 15(2), 4-14.
4. Hofstein, A., Lunetta, V. N. *The laboratory in science education: Foundations for the twenty-first century*. *Science Education*, 2019, 88(1), 28-54.
5. Bybee, R. W. *Advancing STEM education: A 2020 vision*. *Technology and engineering teacher*, 2023, 70(1), 30-35.