

# THE ROLE OF CONTEXTUAL TASKS IN FORMING THE SELF-DEVELOPMENT COMPETENCE OF FUTURE CHEMISTRY TEACHERS

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## Abstract

This article discusses the aspects of improving the methodology for developing self-development competence of future chemistry teachers. Contextual teaching technologies play an important role in increasing the effectiveness of education in the educational process. In this approach, students are directly connected to the topics and develop skills in applying knowledge in practice. The conclusions based on the analysis of the literature by the author reveal the possibilities of effective teaching based on improving the methodology for developing self-development competence of future chemistry teachers.

**Keywords:** Contextual teaching technologies, modern pedagogical technologies, self-development competence, skills.

## Introduction

At the modern stage of development of reforms being implemented in the world education system, improving education in accordance with the requirements of the times is one of the priority tasks. The Education Concept until 2030, adopted at the World Forum in Incheon, Korea in May 2015, identified “quality education and promotion of creative abilities” as an urgent task. Much attention is paid to the use of innovative technologies in the education system aimed at developing students' ability to apply their knowledge in real-life situations, independent thinking and activity. In Great Britain, China, Japan, South Korea, Singapore, Finland, and Canada, systematic work is being carried out to implement large-scale projects to organize material production based on the latest achievements of science and technology for the successful development of society, and to provide chemistry, biology, and physics with qualified personnel.

In recent years, the higher education system of our republic has been creating a normative framework for training highly qualified personnel in relevant fields, relying on the experience of advanced foreign countries, innovative technologies, and the widespread introduction of innovative developments and technologies into production. In order to improve the quality of chemistry education, it is important to direct future chemistry teachers to independent learning, to form their analytical and problem-solving skills, and to develop a methodology for effectively organizing independent learning. This will serve to increase the professional training of future chemistry teachers and will have a positive impact on increasing the effectiveness of science in the field of chemistry. This will expand the pedagogical possibilities for improving the methodology for developing the professional skills of future chemistry teachers.

From the point of view of pedagogical psychology and didactics, educational cooperation is interpreted as an important factor in human development in the works of such scientists as V.V. Davydov, L.S. Vygotsky, J. Bruner. In particular, the theory of the "zone of proximal development" put forward by L.S. Vygotsky serves as the basis for the effectiveness of the teacher's work with the student.

Contextual approach is a methodological approach aimed at developing students' independent thinking and analytical skills by connecting theoretical knowledge to practical life and solving real-life problems in the learning process. The essence of this approach is that students can learn the subject more deeply through their personal experiences and situations they encounter in everyday life. In particular, this approach can be widely used within the framework of natural sciences such as chemistry, mathematics, physics, and biology. For example, in chemistry, theoretical knowledge is connected to practice by solving problems in the food industry or pharmaceuticals. Contextual learning is an educational strategy that allows students to connect knowledge with their own life experience, and its application in chemistry increases the effectiveness of the learning process. This method helps to develop critical thinking, reflective learning, and a creative approach. Based on the work of educational scientists such as John Dewey, Lev Vygotsky, and Jerome Bruner, it has been determined that the contextual learning process should be based on the active participation of the student and enriched with practical activities.

One effective way to connect chemistry education to real-life contexts is to integrate practical experiments and laboratory work with real-life problems. This

method is based on directly experiencing chemical processes by introducing students to real-life problems. Contextual teaching technologies play an important role in increasing the effectiveness of education. In this approach, students directly connect with the topics and develop skills to apply knowledge in practice.

In general, there is two way of teaching: 1. The teacher-centred approach (expository approach) where the teacher exposes knowledge to the learners.

## **2. The learner-centred approach (heuristic approach) where learners are encouraged to find information on their own.**

With the advent of new methodology, new avenues of knowledge are also open to students like a robotic lab, observatory labs, new experiment labs, skill development labs etc.

By understanding these benefits, teachers can choose the most appropriate approach for their students:

increased engagement: Different approaches keep students engaged and avoid boredom.

- Adaptability: The teaching approaches used are unique, ensuring that the learning environment reaches different types of students.
- Skill development: Methods such as group practice and templated learning encourage teamwork and critical thinking.
- Memorization: Interactive methods promote better understanding and retention of material in the learner's mind through hands-on experience.
- Personalized learning: Technology and individualized teaching methods are designed to meet the needs of specific learners
- Questioning or asking and searching is the central idea of inquiry-based learning.
- Students are expected to investigate, evaluate, and come to a conclusion or make a decision, thereby encouraging students' thinking skills.
- Teachers simply give instructions and guide students through the process of finding the necessary information.
- This method is best used in the natural and social sciences, since inquiry and research are the primary approaches to data collection.
- Teamwork is a critical component of group learning. For the purposes of this article, group learning is defined as.

- This method promotes cooperation among students and sharpens their communication and analytical skills.
- Tasks such as group work, discussions and group critiques promote team spirit and mutual responsibility.
- As in a group, the student can understand what each of them is good at and what their different views are.

Contextual learning technologies bring students' knowledge and skills to a level where they can apply them to real-life problems. These technologies help students develop independent thinking, prepare them for professional development, and gain practical experience.

In conclusion, contextual teaching technologies develop active cooperation between teachers and students, improve the quality of education and form special competencies of students. These technologies are consistent with the requirements of the XXI st century and play an important role in ensuring the effectiveness of education in the context of globalization. Contextual teaching requires teachers to constantly develop themselves and improve their knowledge and skills.

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