

THE 4P–KOLB INTEGRATIVE MODEL FOR CREATIVE COMPETENCE DEVELOPMENT

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Abstract

This article examines the theoretical and methodological foundations of a pedagogical approach based on the integration of the 4P model and Kolb's experiential learning cycle in developing the creative competence of pre-service teachers. During the research process, the interrelationship between the structural components of creativity and the stages of experiential learning was analyzed. It was substantiated that the educational process organized on the basis of the integrative model contributes to students' independent thinking, reflective analysis, generation of innovative ideas, and application of creative approaches in practical activities. The results of the study demonstrated that this integrative approach serves as an effective pedagogical mechanism for developing creative competence.

Keywords: creative competence, 4P model, Kolb cycle, experiential learning, creative thinking, pedagogical integration, innovative education.

In the modern education system, the development of creative competence in future specialists is considered one of the important pedagogical tasks. Due to global technological development, the growth of the innovative economy, and the expansion of the competency-based approach, the need for training educators capable of independent thinking and creative problem-solving is steadily increasing in higher education institutions.

Today, the issue of creativity is widely studied in pedagogy, psychology, and innovative education. In particular, the 4P model proposed by Mel Rhodes interprets creativity as a systematic phenomenon. This model identifies interconnected components of creativity such as person, process, product, and press (environment). At the same time, the experiential learning cycle developed by David A. Kolb explains the mechanism of acquiring knowledge through practical activity.

This article develops and scientifically substantiates a pedagogical model for the development of creative thinking competencies in pre-service teachers based on the integration of these two theoretical approaches.

The scientific novelty of the study lies in the integration of the structural model of creativity (4P model) and the experiential learning mechanism (Kolb cycle) into a unified pedagogical system. Based on this approach, a step-by-step algorithm for developing creative competence was designed.

The methodological foundation of the study consisted of systemic, competency-based, and activity-oriented approaches. The following research methods were employed during the study:

- analysis of scientific and pedagogical literature;
- comparative study of theoretical views on creativity;
- pedagogical modeling;
- observation and reflective analysis;
- experimental research.

To determine the effectiveness of the integrative model, problem-based tasks, project-based learning, laboratory experiments, and reflective analysis methods were applied during the research process.

The 4P model explains creativity through four main structural components:

Person. This component reflects the student's individual abilities, motivation, intellectual activity, and creative potential. Personal factors serve as the internal source of creative activity.

Process. The content and stages of creative activity are represented within this component. Identifying problems, generating ideas, conducting analysis, and creating innovative solutions are considered the main stages of the creative process.

Product. The practical or intellectual outcome resulting from creative activity is evaluated as a product. In the educational process, it may appear in the form of projects, methodological developments, innovative ideas, or technological solutions.

Press (Environment). The development of creativity is directly connected with the educational environment. A supportive pedagogical atmosphere, free communication, and a collaborative environment enhance students' creative activity.

Thus, the 4P model makes it possible to analyze creativity as a comprehensive pedagogical system.

We moved beyond the traditional "lecture-practice" system and organized the educational process based on a gradually developing integrative model. In organizing the lesson, the 4P model served as the primary framework: students' interest was stimulated through problematic situations (Press); knowledge was systematized during the Process stage using clustering and analytical methods; the results were generalized through conceptual tables at the Product stage; and practical application was carried out through case studies at the Person stage. This structure served as the instructional framework of the lesson.

According to Kolb's theory, knowledge is not delivered in a ready-made form but is formed through experience. This cycle consists of the following stages:

1. Concrete experience;
2. Observation and reflection;
3. Abstract conceptualization;
4. Active experimentation and practical application.

The pedagogical significance of Kolb's cycle lies in the fact that the student participates not as a passive listener but as an active subject. This activates

independent inquiry, reflection, and practical experience processes necessary for the development of creative thinking.

Kolb's experiential learning cycle determined the internal sequence of the lesson: concrete experience was implemented through problematic situations, reflective analysis through clustering methods, abstract conceptualization through conceptual tables, and active experimentation through case studies. This became the internal mechanism of the instructional process.

During the study, the methodological compatibility between the 4P model and Kolb's cycle was identified. While the 4P model represents the structural framework of creativity, Kolb's cycle provides the mechanism for developing these components.

This integrative approach contributed not only to strengthening students' theoretical knowledge but also to applying it in practical situations and developing creative thinking competencies. The student transformed from a "receiver of ready-made knowledge" into a creator of ideas.

As a result, creativity emerged not as an abstract concept but as a manageable and systematically organized pedagogical process.

Research Results. Experimental research was conducted among students of the chemistry education program at the Tashkent Institute of Chemical Technology. During the study, experimental and control groups were formed. In the experimental group, an integrative methodology based on the 4P model and Kolb's experiential learning cycle was implemented, while traditional teaching methods were applied in the control group.

Throughout the experiment, students' creative thinking, reflective analysis, innovative approaches, and independent decision-making skills in problem situations were observed and analyzed.

Table 1. Indicators of Creative Competence Development Based on the Integration of the 4P Model and Kolb's Cycle

Indicators	Experimental Group	Control Group
Level of creative thinking	High	Moderate
Independent decision-making	High	Low
Reflective analysis skills	Significantly developed	Average
Innovative approach	Active	Passive
Ability to create practical products	Formed	Partially formed

The results of the experiment demonstrated that lessons organized on the basis of the integrative model produced effective outcomes in developing students' creative competence. In particular, problem-based tasks, case studies, project activities, and reflective analysis methods significantly increased students' learning engagement and creativity.

Table 2. Integration of the 4P Model and Kolb's Experiential Learning Cycle

Pedagogical Mechanism of the Integrative Model

4P Component	Kolb Stage	Pedagogical Activity	Expected Result
Press (Environment)	Concrete Experience	Creating problematic situations	Increased creative activity
Process	Reflective Observation	Clustering, analysis, discussion	Development of analytical thinking
Product	Abstract Conceptualization	Conceptual tables, generalization	Formation of innovative ideas

4P Component	Kolb Stage	Pedagogical Activity	Expected Result
Person	Active Experimentation	Case study, projects, practice	Development of creative competence

Figure 1 illustrates the pedagogical mechanism of integrating the 4P model with Kolb's experiential learning cycle.

In conclusion, the integration of the 4P model and Kolb's experiential learning cycle proved to be an effective pedagogical mechanism for developing the creative competence of future teachers. The integrative model contributed to the enhancement of students' creative thinking, reflective analysis, innovative approaches, and practical activities. The findings of the study indicate that this model has strong potential for implementation in chemistry education and other areas of higher education. Therefore, the proposed integrative model can serve as an effective methodological framework for competency-based and innovative education.

This approach can be effectively used as a methodological tool for developing the creative competence of future educators within the higher education system.

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