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Research Approach to the Education of Students in Technical Fields at Higher Educational Institutions

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Abstract. *This article explores the intricate use of poetic devices in classical ghazals, emphasizing the transformative power of istiora (metaphor) and its superiority over tashbeh (simile). By analyzing key couplets, the study highlights how poets employ artistic techniques like hyperbole, personification, and metaphor to depict the intense emotions of love, separation, and despair. The repetitive refrain "yig'ladi" (wept) serves as a central motif to express the lover's anguish, which is vividly portrayed through lyrical imagery and aesthetic finesse. These stylistic choices not only enhance the emotional depth of the ghazals but also render them timeless expressions of human vulnerability and artistic beauty. The article concludes by reaffirming the enduring appeal of ghazals in capturing universal themes with unparalleled poetic mastery.*

Key words: *Ghazal, Istiora (Metaphor), Tashbeh (Simile), Personification, Lyrical Imagery, Hyperbole, Emotional Resonance, Separation and Sorrow.*

Currently, there is a significant increase in attention to the formation of professionals in universities who will actively participate in research activities when preparing future engineers and technical specialists. While the emphasis in teaching technologies used to be on developing educational models aimed at achieving certain standards of knowledge acquisition, the research approach shifts the focus to creating conditions for generating new knowledge, actions, and personal meanings. Thus, in the modern organization of the educational process for university students, the main focus is changing from teaching technology to education as a research process.

The organization of education in a research format has its unique characteristics. An analysis of contemporary scientific and pedagogical publications showed that the description of the peculiarities of conducting the educational process as research for students in technical specialties lacks systematicity and clarity. Since one of the key conditions for transitioning from a technological model of education to a research-based approach has not yet been fulfilled, the question of organizing research education for students in technical specialties remains relevant.

Research Objective

To systematize information about the specifics of organizing education in the research format when preparing future specialists in technical fields at higher educational institutions.

Materials and Methods of the Research

Analysis of scientific literature related to the problem and topic under consideration, formulation of hypotheses, conducting surveys of university teachers, implementation of a confirming experiment, expert evaluation, analysis of experimental data, synthesis and generalization of information, as well as formulation of conclusions.

Research Results and Discussion

The first key feature of organizing education based on a research approach is the increased degree of student autonomy in working with various types of educational information. The student independently assimilates basic ideas rather than receiving them ready-made. Familiarity with scientific concepts does not exclude the study of alternative views, identifying shortcomings in existing explanations, and questioning the validity of conclusions. This work requires students to actively identify the studied concepts in the context of specific applied tasks related to their future profession. At the same time, the student chooses how to work with new material.

When studying phenomena, processes, and natural laws, students are offered examples that allow them to investigate these phenomena, processes, and laws independently. The proposed concepts, ideas, and rules can be subjected to criticism and contribute to the search for alternative solutions.

Students are also given the opportunity to choose when completing practical laboratory assignments. The materials and methodological descriptions of laboratory work are presented in a differentiated format. Their goal includes motivating students to independently seek solutions to professionally oriented tasks, using knowledge gained in laboratory conditions. It should be noted that the topics of laboratory work may not coincide with the lectures in which the corresponding material is studied.

Experience shows that organizing research education and providing students with the opportunity to independently plan experiments, determine their stages, predict possible difficulties and outcomes overall contributes to more effective development of research competence among future technical specialists and their successful preparation for scientific activities.

The second feature of organizing education as a research process is the emphasis on forming and further developing students' critical thinking. The question of how to practically determine the level of students' critical thinking has been addressed in the literature [1], where general criteria are described that allow for varying degrees of accuracy in assessing this level. Students with critical thinking exhibit certain characteristics in their cognitive activities when solving tasks and problematic situations. Such characteristics include: seeking a clear formulation of the question and scientific justification; striving for a systematic and interdisciplinary approach; using reliable sources with mandatory references; holistic and multifaceted consideration of the situation; focus on the goal and initial task; seeking alternative solutions and openness to different viewpoints; the ability to change one's position when there are sufficient grounds; striving for maximum accuracy within the given discipline; step-by-step analysis of components of a complex whole; attempting to understand others' feelings, their level of knowledge, and the depth of their judgments; as well as a tendency to apply critical thinking in any situation.

To form critical thinking, it is essential that the educator possesses this ability themselves. The teacher must demonstrate a willingness to reconsider their knowledge and share it with students. It is also important for the instructor to clearly show students that their understanding cannot serve as a starting point for the students' own cognitive experiences.

An effective and reliable way to foster critical thinking is to create a paradoxical situation that prompts a cognitive conflict. This model is aimed at exploring the experience of systematic research. Ultimately, after forming, developing, and testing hypotheses, the teacher conducts a retrospective analysis of the collaborative work. The model includes: confronting a problem, gathering data, conducting experiments, explanations, and analysis [2]. Thus, research-based learning contributes to mastering a process in which generalizations are created and tested.

The third feature of organizing education as research is the so-called methodological reorientation-transitioning from reproductive methods based on samples, algorithms, and prescriptions to predominantly research-oriented and problem-based methods. This transition creates certain difficulties for educators. Often, students' experiences and knowledge prove insufficient to serve as a starting point for problem-solving. However, utilizing students' experiences in the research learning process is of great significance.

In recent years, there has been a clear trend in the academic literature towards researching issues related to students' life interests and needs, as well as developing criteria for selecting educational problems. Without claiming to present a comprehensive approach, let us outline the principles for selecting problems to organize research-based learning in higher education institutions for students in technical specialties. It should be noted that the selection principles were tested and refined during a pedagogical experiment.

The principle of relevance requires that the problem corresponds to the needs and interests of a specific group of students, which, in turn, entails flexibility in planning educational programs and activities.

The principle of activity implies increasing student involvement not only in the selection of problems but also in the development of action plans and methods for their solutions. In other words, students must genuinely perceive the problem as such. Otherwise, they will not show interest in solving it, and the lack of motivation and interest negatively affects the effectiveness of learning. An optimal option is for students to independently identify problems in their professional field.

The principle of selection allows for choosing methods to solve the problem (theoretical, numerical, experimental, empirical, etc.). This criterion is particularly important for assessing the degree of individuality in the decisions made. The principle of repeatability states that the problem under consideration must be relevant enough to justify the group's efforts to solve it. Momentary, specific, or rare problems are not taken into account [3]. The principle of global significance requires that the problem has a high level of importance, which can attract the interest of the group. The most significant problems contribute to a better understanding of issues that are of common interest to all.

The principle of resource availability considers the specific features of the problem, the discipline, and the group of students. This principle is related to the choice of formulations and the set of resources (organizational, methodological, personnel, didactical, informational, etc.) for addressing the given problem [4]. The principle of interdisciplinary nature implies that the teacher should find such tasks for the classes whose solutions require knowledge that goes beyond a single specific discipline. Working on such problems necessitates skills and knowledge from related areas.

Thus, the experimental data obtained and their analysis allowed for the identification of the main principles for selecting educational problems that are advisable to apply for organizing research-based learning: relevance, activity, selection, repeatability, global significance, resource availability, and interdisciplinary character.

Conclusions

Currently, the training of technical specialists in higher educational institutions emphasizes the formation of professionals as active participants in scientific research activities. In this context, the task of transitioning from technological training to research-oriented education becomes highly relevant. Based on systematic and research approaches, as well as the application of a comprehensive set of interrelated methods of scientific cognition, we have summarized years of experience in personnel training in higher education and highlighted the key aspects of organizing research-based learning for students in technical specialties. These aspects include: increasing the proportion of independent student work with various types of educational information; focusing on the development and maintenance of critical thinking in students; and shifting teaching methods from reproductive to predominantly problem-based and research-oriented approaches.

The results of the experiment demonstrated that the mentioned features of organizing research-based learning are interconnected and enhance the effect of practical application through the synergistic principle. For instance, it was observed that intellectual operations that cannot be directly transferred from the instructor to the students are formed more effectively when students independently engage in organizing their own learning processes. Conversely, the more cognitive difficulties and problematic situations an instructor creates during classes, the more successfully students' critical thinking develops. The ability to independently plan and conduct experiments (laboratory work)

contributes to more effective development of research competence, activating critical thinking mechanisms while overcoming cognitive conflicts.

In conclusion, it should be noted that practical application of knowledge regarding the specifics of organizing research-based learning will help educators shift their focus from achieving specific standards of assimilating educational information to developing new ways of action and forming personal meanings in students.

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