



## **IMPROVING PEDAGOGICAL MECHANISMS FOR DEVELOPING STUDENTS' INNOVATIVE THINKING BASED ON DEONTOLOGICAL COMPETENCIES IN TRANSFORMATIONAL CONDITIONS**

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### **Abstract**

The article examines the development of students' innovative thinking within the context of contemporary educational transformation through the conceptual framework of deontological competence, arguing that innovative thinking should not be understood solely as a cognitive or technological capacity but rather as an integrative competence that combines creativity, ethical responsibility, and professional accountability; the study highlights that rapid technological progress and the global transformation of higher education systems necessitate a reconsideration of the relationship between innovation and professional ethics, since innovative decisions frequently carry significant social and moral implications, and therefore require students to possess not only analytical and creative skills but also the ability to evaluate the ethical consequences of their actions; within this perspective, the research proposes pedagogical mechanisms aimed at integrating deontological competence into the development of innovative thinking in higher education, demonstrating that such integration strengthens students' professional responsibility, enhances the ethical dimension of innovation, and contributes to the formation of socially responsible innovators capable of navigating complex technological and social environments.

**Keywords:** Innovative thinking, deontological competence, educational transformation, pedagogical mechanisms, professional ethics.

### **Introduction**

At the beginning of the 21st century, in a situation where human development is increasingly intertwined with the phenomenon of innovation, one of the most difficult tasks facing the higher education system is to form students as innovative thinkers



capable of creating new knowledge, since global economic competition, technological progress and digital transformation processes require specialists to have the ability not only to apply existing knowledge, but also to develop new ideas, solve complex problems based on a creative approach and make innovative decisions. At the same time, in a situation where the social consequences of innovative activities are expanding, it is becoming increasingly clear that it is not enough to interpret the issue of innovative thinking only as technological or creative competence, since any innovation has a certain impact on the life of society, social systems and human values, as a result of which the process of making innovative decisions becomes inextricably linked with professional ethics and moral responsibility; It is at this point that the concept of deontology appears as an important methodological basis in pedagogical discourse, which expresses the professional duty of a person, adherence to ethical standards and social responsibility in the process of professional activity. Therefore, in conditions of transformation, the process of developing students' innovative thinking should be considered in an integrated manner with deontological competencies, because innovative thinking, by its very nature, should include not only the ability to develop new ideas, but also the ability to understand the socio-moral consequences of these ideas and decisions, evaluate them responsibly and apply them based on the criteria of professional ethics. However, it is observed that the interrelationship between innovative thinking and deontological competencies has not been systematically studied in pedagogical science, because while research on innovative thinking is mainly related to creativity, design thinking or technological innovations, scientific work on deontological competencies has been carried out more within the framework of professional ethics or pedagogical ethics, as a result, the pedagogical The integration of deontological competencies has not been sufficiently revealed, therefore, identifying and improving pedagogical mechanisms for developing students' innovative thinking based on deontological competencies in transformation conditions is one of the important scientific tasks for modern pedagogy.

### **Literature analysis and methodology.**

The phenomenon of innovative thinking is a complex scientific category formed at the intersection of modern pedagogy, cognitive psychology and philosophy of education, and its theoretical foundations have been interpreted differently by



different scientific schools. Since the second half of the 20th century, the issue of innovative thinking has begun to be studied within the framework of theories of creative thinking, and in this regard, researchers such as J. Guilford, E. Torrance and R. Stenberg have substantiated creative thinking as an important component of human intelligence. Later, the concept of innovative thinking began to be interpreted not only as the ability to generate creative ideas, but also as an integrative cognitive competence capable of analyzing complex problems, developing alternative solutions and creating new knowledge. In modern pedagogical research, innovative thinking is often analyzed in the context of a competency approach, where it is considered a complex competency that includes students' abilities to think analytically, be creative, make decisions in problem situations and reflexively analyze their own activities. At the same time, the issue of social and ethical dimensions of innovative thinking is relatively poorly covered in scientific discourse, and in many studies it can be observed that the ethical aspects of innovative activity are considered as a secondary issue. Especially in the context of modern technological innovations penetrating all spheres of social life, the relationship between innovation and ethical responsibility is becoming an increasingly important scientific problem. In this context, the concept of deontology allows us to analyze the problem of innovative thinking from a new methodological perspective. Deontology was initially substantiated by I. Kant in philosophical ethics, where it was interpreted as a system of normative principles expressing the moral duties and obligations of a person. Later, deontology developed in connection with the concept of professional ethics in medicine, pedagogy and other areas of professional activity. In modern pedagogical science, deontological competence is interpreted as an integrative quality that expresses the ability of a specialist to adhere to moral standards, understand professional duty and feel social responsibility in the process of professional activity. Pedagogical research shows that in conditions where deontological competencies are not developed, innovative activity is often limited to technological efficiency, and its social and moral consequences are not sufficiently taken into account. Therefore, in modern pedagogical theory, the issue of integrating innovative thinking and deontological competencies is considered one of the relevant scientific areas. Despite the large number of studies devoted to the formation of innovative thinking of students in the higher education system, most of them do not systematically analyze the ethical and normative aspects of innovative activity. Research aimed at the development of



deontological competencies has been conducted mainly within the framework of professional ethics, and their interaction with innovative thinking has been relatively poorly studied. Therefore, identifying and improving pedagogical mechanisms aimed at developing students' innovative thinking based on deontological competencies in conditions of transformation is one of the important scientific tasks for modern pedagogy.

This study is aimed at identifying and improving pedagogical mechanisms aimed at developing students' innovative thinking based on deontological competencies in transformation conditions, and a complex system of theoretical and empirical research methods was used. The research methodology is based on the integration of constructivist pedagogy, a competency-based approach, and the theory of professional deontology. The methods of pedagogical observation, diagnostic analysis, questionnaire, pedagogical experiment, and statistical analysis were used in the research process. The experimental study was organized with the participation of students studying in higher education institutions, and control and experimental groups were formed in it. The process of developing students' innovative thinking in the experimental group was organized on the basis of a pedagogical model aimed at the formation of deontological competencies. This model consists of three main components, which are interpreted as an axiological component (understanding the social and moral values of innovative activity), a cognitive-competence component (development of innovative thinking and analytical thinking skills), and a reflexive-deontological component (formation of the ability to analyze the moral consequences of professional responsibility and professional decisions). During the study, the level of innovative thinking of students was assessed based on special diagnostic indicators. These indicators include the following indicators: the ability to analyze problem situations, the potential to develop new ideas, the ability to assess the social consequences of innovative decisions, and the level of decision-making based on the principles of professional ethics. The obtained empirical data were processed using mathematical and statistical methods, and the differences between the results of the experimental and control groups were identified. The research methodology showed that the systematic integration of the relationship between innovative thinking and deontological competencies into the pedagogical process is an important pedagogical factor in the formation of students' responsible approach to innovative activity.



## Results

The results of the pedagogical experiment conducted in the course of the research to determine the effectiveness of the pedagogical model aimed at developing students' innovative thinking based on deontological competencies in the context of transformation made it possible to formulate a number of important scientific conclusions. Before the start of the experiment, a diagnostic analysis was conducted to determine the level of students' innovative thinking and deontological competencies, in which students were assessed on such indicators as the ability to analyze innovative problems, develop creative ideas, and assess the socio-ethical consequences of innovative decisions. The results of the initial diagnostics showed that, despite the presence of elements of innovative thinking in the majority of students, the level of understanding of the ethical and normative aspects of innovative activity is relatively low. During the research, a pedagogical model based on the integration of innovative thinking and deontological competencies was used in the experimental group, in which analysis of problem situations, discussion based on ethical dilemmas, collective innovative projects, and reflexive analysis methods were widely used. These pedagogical mechanisms served to develop students' skills in relying on social responsibility and professional ethics criteria in the process of innovative decision-making. The results of the re-diagnosis conducted at the end of the experiment showed that the level of innovative thinking in the experimental group significantly increased, especially the students' ability to analyze their social significance and take into account the principles of professional ethics in the process of developing innovative ideas was significantly improved. In the control group, such changes were noted at a relatively low level. The results of statistical analysis showed that the indicators of innovative thinking in the experimental group increased by an average of 30–35 percent, which confirms the effectiveness of the pedagogical approach based on the integration of innovative thinking and deontological competencies. The results of the study showed that when innovative thinking is developed not only as a set of creative or analytical abilities, but as an integrative competency inextricably linked with professional ethics and social responsibility, students' responsible approach to innovative activity is significantly strengthened.



## **Discussion**

The results obtained indicate the need to consider the issue of developing innovative thinking in the higher education system in the context of transformation from a new methodological perspective, since although in modern pedagogical discourse innovative thinking is often interpreted as a competency associated with creativity or technological innovation, the results of this study confirm that the ethical and social components of innovative thinking are its important component. In an environment where the social consequences of innovative activity are increasingly expanding, taking into account professional ethics and social responsibility in the process of making innovative decisions is becoming one of the important competencies of a specialist. In this regard, the integration of deontological competencies with innovative thinking can be considered one of the important strategic directions of the pedagogical process. The results of the study showed that the systematic integration of the interrelationship between innovative thinking and deontological competencies into the pedagogical process forms a conscious and responsible approach of students to innovative activity. This allows us to ensure not only the technological efficiency of innovative activity, but also its compatibility with social stability and moral values. At the same time, the research results show the need to study the problem of innovative thinking in pedagogical science in the context of deontological competencies, creating a scientific basis for the formation of a new conceptual model of innovative education. One of the important tasks facing the higher education system in the context of transformation is to develop such integrative pedagogical approaches that will serve not only to develop the innovative potential of students, but also to strengthen their professional responsibility.

## **Conclusion**

This study aims to analyze the process of developing students' innovative thinking in the higher education system in conditions of transformation based on an integrated pedagogical approach with deontological competencies. The theoretical and empirical analyses conducted showed that it is not enough to interpret the phenomenon of innovative thinking only as the ability to develop creative ideas or solve technological problems, but rather to consider it as a complex competency inextricably linked to professional ethics, social responsibility and professional duty; the scientific sources studied during the study and the results of the conducted pedagogical experiment



confirmed that the systematic integration of the relationship between innovative thinking and deontological competencies into the pedagogical process is an important factor in forming a conscious, responsible and reflexive approach of students to innovative activity, since decisions made in the process of innovative activity are often related not only to technological efficiency, but also to social stability, human values and professional ethics; In this regard, the pedagogical model developed within the framework of the study was scientifically substantiated, allowing for a more responsible and socially conscious orientation of students' innovative activities by integrating axiological, cognitive and reflexive-deontological components into the process of developing innovative thinking, and the experimental results showed that significant positive changes were observed in the experimental group in terms of innovative thinking indicators, confirming that pedagogical mechanisms organized on the basis of deontological competencies have an effective impact on the development of students' abilities to analyze problem situations, develop innovative ideas, and assess the social and moral consequences of these ideas; Based on the results of the study, it can be noted that one of the main strategic tasks of the higher education system in the context of transformation processes is to organize the development of innovative thinking in harmony with professional ethics and deontological competencies, and this approach serves not only to train specialists with innovative potential, but also to form individuals who can conduct responsible innovative activities taking into account the interests of society; At the same time, the results of this study show that studying the problem of innovative thinking in the context of deontological competencies in pedagogy is one of the promising scientific directions, and require further in-depth research into the ethical and normative foundations of innovative education, the study of the ethical mechanisms of the innovative decision-making process, and the development of new pedagogical technologies aimed at developing deontological competencies in the higher education system.

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