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A Model For Developing Project Competence Among Future Teachers In Higher Education

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Abstract: The article analyzes the new requirements for the process of training future teachers in the context of the continuous modernization of the education system, the widespread introduction of electronic learning technologies, and the use of open interactive and multimedia educational resources. The purpose of the study is to scientifically substantiate the need to form project competence of future teachers in the educational environment of a higher educational institution and to identify important pedagogical aspects of this process.

The article highlights the importance of modeling, forecasting and designing students' educational and cognitive activities, as well as planning the trajectory of personal professional development, in the professional activities of future teachers. Based on the requirements of regulatory legal acts on education policy, project competence is interpreted as an important component of modern pedagogical professional training.

The results of the analysis show that the potential of the educational environment in higher education institutions is not being used sufficiently and systematically to develop the project competence of future teachers. The organization of project activities disconnected from the interdisciplinary and professional context leads to a lack of project skills in future teachers. The article substantiates the need for a comprehensive analysis of the structural components and resources of the higher education environment and the identification of a set of pedagogical conditions serving this process in order to effectively form the project competence of future teachers. The results of the study are of practical importance in improving the system of training pedagogical personnel.

Keywords: future teacher, project competence, pedagogical congruence, educational environment, higher education, digital educational technologies, pedagogical conditions, reflective activity, interdisciplinary integration, pedagogical innovations, professional competencies, project activity.

Introduction: Currently, the reforms being implemented in the education system of our country require future teachers to possess not only deep professional knowledge and skills but also a high level of personal and psychological preparedness. In particular, the ability of congruence, which reflects the harmony between a teacher's personal qualities, internal state, and external behavior, is increasingly recognized as one of the key factors determining the effectiveness of pedagogical activity. Therefore, the formation and development of congruence abilities in future teachers has become one of the pressing issues of modern pedagogy. In the context of modern society, one of the priority tasks facing the education system is to develop the professional abilities and pedagogical competencies of future teachers in accordance with contemporary requirements, and even at a higher level. In this process, the congruence of abilities—that is, the harmonious and balanced development of the teacher's personal, professional, communicative, innovative, and creative abilities—acquires significant methodological and practical importance.

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Literature Review and Methodology: In scientific literature, the concept of congruence is interpreted as the consistency between an individual's inner experiences, values, and real behavior. In the pedagogical context, congruence is expressed in a teacher's ability to present their thoughts, emotions, and pedagogical influence naturally, sincerely, and consistently. A teacher possessing such qualities is able to establish trusting communication with students, create a positive psychological climate in the classroom, and enhance the effectiveness of educational and upbringing processes.

The issue of pedagogical congruence has occupied an important place in the development of historical and pedagogical thought, with its roots extending to the educational traditions of both Eastern and Western civilizations. In the VII–VI centuries BC, the development of productive forces and positive social transformations in Central Asia stimulated the growth of cultural and educational interactions. As a result of cultural and pedagogical relations formed between Turkic and Persian peoples, unique educational approaches emerged that were aimed at preparing the younger generation for independent life and were adapted to local traditions and customs. In this process, the harmony between the internal maturity of the teacher and their external pedagogical activity served as an important educational factor.

Eastern thinkers regarded the moral and spiritual maturity of the teacher as the main condition for the effectiveness of education. In particular, Abu Nasr al-Farabi emphasized the teacher's moral maturity and intellectual capacity as leading factors in the educational process. Abu Rayhan Beruni and Abu Ali Ibn Sina also stressed that the process of knowledge transmission yields the best results only when it is combined with personal example, moral purity, and scientific consistency. In the works of Unsur al-Ma'ali Kaykavus, Alisher Navoi, and Abdurahman Jami, sincerity, moral responsibility, and personal leadership in teacher–student relationships were interpreted as key indicators of pedagogical excellence. These ideas form the early theoretical foundations of pedagogical congruence.

In Western pedagogical thought, significant attention has also been given to the harmony between a teacher's internal qualities and professional activity. John Locke, Johann Heinrich Pestalozzi, and Adolf Diesterweg substantiated that the personal example, moral position, and teaching style of a teacher directly influence the intellectual and moral development of students. Within their approach, pedagogical congruence is interpreted as a factor ensuring the internal logical integrity of the educational process.

Representatives of the Russian pedagogical school, particularly Konstantin Ushinsky, further developed these ideas and emphasized the decisive role of the teacher's personality and professional mastery in the educational process. According to Ushinsky, no law, methodology, or curriculum can replace the teacher's personal competence and inner conviction. This perspective reveals the social and practical significance of pedagogical congruence.

In modern pedagogical research, this issue remains highly relevant. Pedagogical scholar Viktor Slastenin emphasized that pedagogical mastery is formed through the integration of theoretical knowledge and practical activity. According to his approach, the pedagogical process becomes purposeful and effective only when it is organized based on the synthesis of philosophy, pedagogy, and psychology. This perspective allows congruence to be interpreted as an integral component of the teacher's professional competence.

Organizing pedagogical activity based on philosophical and psychological principles contributes to the development of congruence in teachers, that is, the harmony between internal states and external behavior, between values and practical activity, and between emotions and communication culture. Congruence serves as a central characteristic of a facilitator-teacher, ensuring professional maturity, personal stability, and the ability to engage in dialogue-based cooperation.

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In the process of personal and professional development, congruence manifests itself in several important aspects.

First, congruence and the teacher's personal potential. Personal potential consists of the harmony of the teacher's internal resources, values, intellectual, emotional, and volitional capacities. Congruence enables the full realization of this potential, elevates pedagogical activity to a higher professional level, ensures effective and culturally appropriate communication, and strengthens self-awareness, self-acceptance, and self-regulation.

Second, congruence and facilitation activity. The main task of a facilitator-teacher is to support the personal development, independence, and creative potential of students. Congruence forms the foundation of this role by promoting competencies such as empathy, tolerance, readiness for dialogue, active listening, and supportive communication. A congruent teacher demonstrates sincerity, stability, and authenticity in interaction with students while accepting their opinions, questions, and individual needs.

Third, its influence on children's creative development. Teachers possessing congruence create favorable conditions for the development of students' independent thinking, decision-making abilities, sense of responsibility, curiosity, and creative thinking. Such teachers support students' autonomy, encourage questioning, avoid unnecessary restrictions, and maintain flexible and balanced communication. In this process, the teacher also acts as a creative personality and fosters a creative learning environment.

Fourth, the internal psychological mechanism of congruence. The aspiration toward congruence stimulates continuous reflection and self-improvement in teachers. This process is manifested through the ability to view oneself from new perspectives, recognize and accept emotions, increase self-confidence and emotional stability, set realistic goals, consciously regulate behavior, abandon negative habits, develop acceptance and understanding of others, and improve personal qualities. When these transformations occur, the integration of the teacher's internal and external worlds indicates the achievement of a congruent state.

Fifth, the congruent teacher as a pedagogical ideal. A congruent teacher–facilitator embodies moral maturity, empathy, creativity, inner stability, and psychological well-being. Such a teacher continuously strives for self-development. As emphasized in psychology, "creativity exists in every individual, but internal and external barriers often prevent its expression." A congruent teacher helps overcome these barriers and facilitates the development of children's creative potential.

Under these conditions, the demand for competitive representatives of the teaching profession has significantly increased. Such specialists must possess not only professional knowledge but also complex competencies that enable them to design and implement innovative projects in educational practice. This tendency requires the development of project-oriented functions in the professional activities of future teachers. In particular, alongside modeling, forecasting, and designing students' learning activities, it is important for teachers to consciously plan their own professional development trajectories.

In pedagogical science, this set of abilities is considered as a means of effectively solving project-type tasks within professional pedagogical activity. The relevance of this issue is also confirmed by normative and legal documents adopted at the state level. Conceptual documents in the field of education emphasize the necessity of developing competencies such as systematic and critical thinking, project design and implementation, and the development of core and additional educational programs among future teachers. This further increases the need for systematic and purposeful development of project competence within the higher education environment.

At the same time, current pedagogical training practices indicate that the potential of the higher education learning environment for developing project competence among future teachers is

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not fully utilized. Teaching experience in higher education institutions shows that many educators do not systematically use the resources of the educational environment and lack a comprehensive understanding of its possibilities. Often, project competencies are developed only within individual subjects and remain disconnected from the real context of future pedagogical activity. Such fragmentation leads to a deficit of project skills among future teachers, negatively affecting the quality of education and reducing the effectiveness of pedagogical activity in both real and virtual learning environments.

The above considerations highlight the necessity of conducting a comprehensive analysis of the structural components and resources of the higher education learning environment from the perspective of developing project competence. This problem becomes particularly acute in regions where teachers are required to work in multicultural social environments. The mismatch between the requirements of educational policy and the real possibilities of the higher education environment necessitates the development of scientifically grounded pedagogical solutions.

In this regard, identifying and scientifically substantiating the set of pedagogical conditions that ensure the effective development of project competence in future teachers is defined as one of the key objectives of this research (Figure 1).

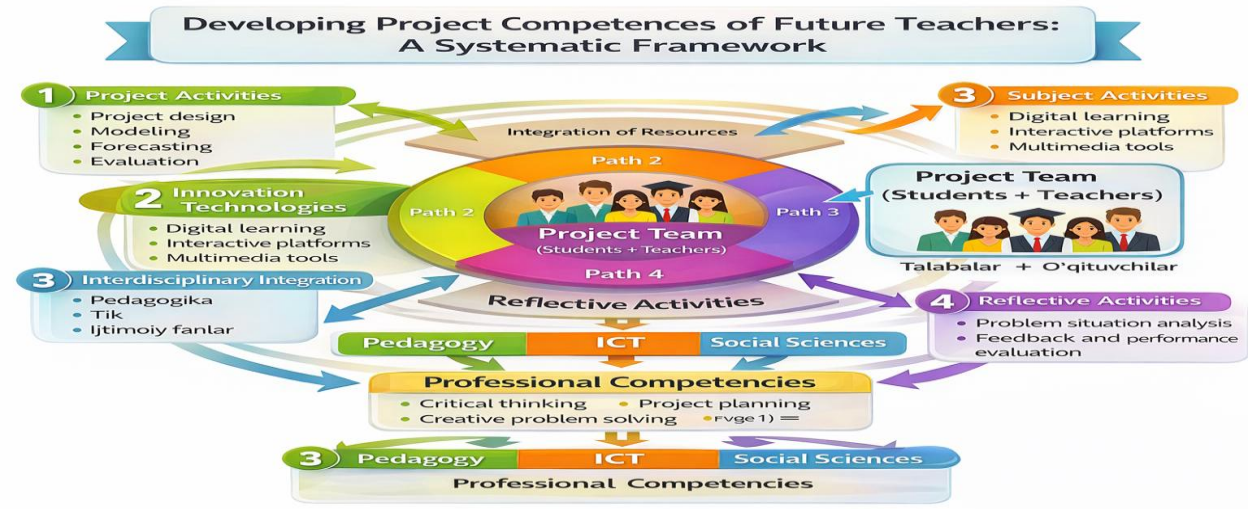

Figure 1. Model for the formation of project competence of future teachers in the higher education environment.

Results and Discussion. This section substantiates the effectiveness of the set of pedagogical conditions aimed at developing the project competence of future teachers based on the results of empirical research. The experimental work was conducted within the educational environment of a higher education institution and organized using a quasi-experimental research design**.**

Students of the 2nd–4th years studying in the field of pedagogy participated in the experimental study. The total sample size consisted of 60 students, who were divided into an experimental group (30 participants) and a control group (30 participants)**.** The groups were balanced in terms of students' age, year of study, and overall academic performance.

The experimental study was carried out in the following stages:

1. **Diagnostic stage (pre-test)** – determining the initial level of project competence among future teachers.

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2. **Formative stage** – implementation of the developed set of pedagogical conditions in the experimental group.
3. **Control stage (post-test)** – identifying and analyzing the changes in the level of project competence.

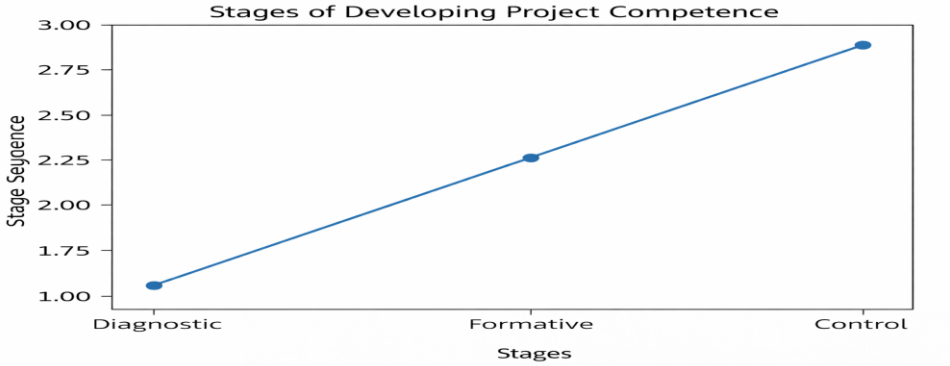

Figure 2 illustrates the sequential stages of developing the project competence of future teachers: the diagnostic, formative, and control stages. The logical and consistent implementation of these stages ensures the effectiveness of pedagogical intervention.
The assessment of future teachers' project competence was conducted based on the congruence approach**.** The competence was operationalized through the following four main components:

- **Reflective component** (self-analysis and clarity of professional self-concept);
- **Communicative component** (empathy, openness in communication, and appropriate responses to pedagogical situations);
- **Professional-ethical component** (professional values, responsibility, and adherence to ethical norms);
- **Innovative-creative component** (creativity, flexibility, and the ability to develop project-based solutions).

The diagnostic procedures were conducted using the following instruments:

- the author-developed "Project Competence and Congruence" questionnaire**;**
- observation sheets for micro-lessons and pedagogical situations**;**
- semi-structured interviews**;**
- reflective diaries**.**

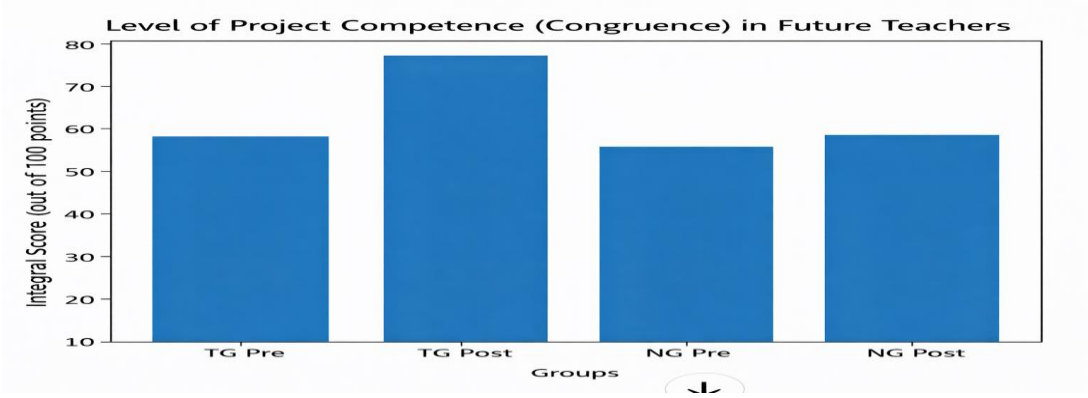

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Figure 3. The level of project competence among future teachers.

The results were evaluated using a 100-point integral scale, where three levels were identified: low, medium, and high**.** The results obtained at the pre-test stage showed that the overall level of project competence among future teachers in both the experimental and control groups was almost identical, with the medium level predominating. The integral score in the experimental group was 56 points, while in the control group it was 55 points**.**
In particular, relatively low indicators were identified in the reflective and innovative–creative components**.** This situation indicates that the future teachers' abilities to consciously design professional activities, forecast pedagogical situations, and conduct reflective analysis were not sufficiently developed. During the formative stage, a set of pedagogical conditions aimed at developing the project competence of future teachers was implemented in the experimental group. This set included the following elements:

- organizing project activities based on interdisciplinary integration;
- applying reflective training sessions and portfolio technology;
- providing feedback through micro-lessons and video analysis**;**
- systematic use of digital and multimedia educational resources**;**
- modeling pedagogical situations and using case-study methods**.**

In the control group, the educational process continued in a traditional format**.**
The results obtained at the post-test stage demonstrated a significant increase in the level of project competence in the experimental group. The integral indicator in the experimental group reached 78 points, which represents a positive increase of 22 points compared to the initial results. In the control group, the indicator reached 60 points**,** showing a relatively smaller increase.The analysis based on the diagrams revealed positive dynamics across all components in the experimental group. Particularly significant growth was observed in the reflective and communicative components**.** This confirms the effectiveness of the reflective and interactive methods applied during the formative stage.

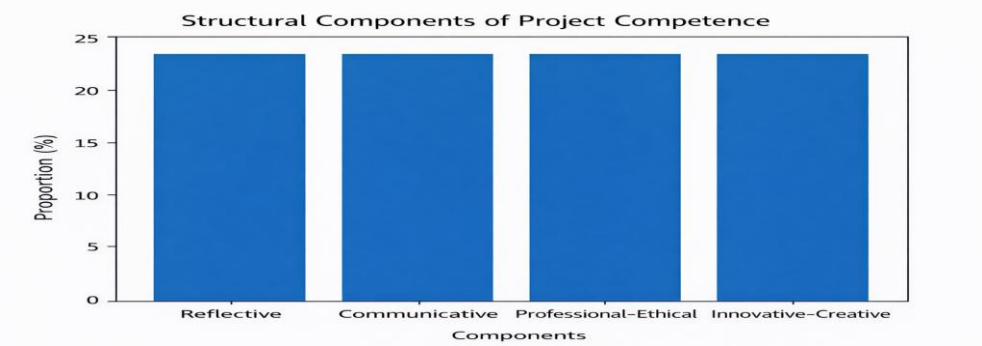

Figure 4. Structural components of project competence.

The results of the statistical analysis (Student's t-test) showed that the difference between the pre-test and post-test indicators in the experimental group was statistically significant ($p < 0.05$). In contrast, no statistically significant difference was identified in the control group.
The results of the experimental study indicate that the formation of future teachers' project competence based on the congruent approach significantly improves the quality of their professional training. The systematic and purpose-oriented use of the pedagogical resources of the higher education learning environment ensures the effectiveness of teacher training.

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Conclusion. During the research process, it was substantiated that the continuous modernization of the education system**,** along with the widespread implementation of digital and interactive educational technologies**,** is forming new requirements for teacher training.
Based on scientific analysis, project competence was interpreted as the harmonious development of personal-reflective, communicative, professional-ethical, and innovative-creative components within the framework of the pedagogical congruence approach**.** It was clarified that the academic, digital, pedagogical, and social resources of the higher education environment serve as important factors in the effective organization of the project activities of future teachers.
The experimental work organized on the basis of the developed set of pedagogical conditions demonstrated that it significantly increases the level of project competence among future teachers. The results of the experimental group showed a higher positive dynamic compared to the control group, with the greatest growth observed in the reflective and communicative components**.** The results of the statistical analysis confirmed the reliability of these changes. The findings of the study contribute to improving the process of developing project competence among future teachers in the system of higher pedagogical education, ensuring the systematic use of the pedagogical potential of the educational environment, and preparing competitive teaching professionals capable of effectively solving project-type professional tasks**.** The conclusions obtained and the recommendations developed can make a significant contribution to the development of pedagogical theory and practice and may serve as a methodological basis for future scientific research**.**

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