



# PEDAGOGICAL CONDITIONS OF FORMING PROFESSIONAL AND PEDAGOGICAL COMPETENCE IN FUTURE TECHNOLOGICAL EDUCATION MASTERS

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**Abstract.** Lecturer is formed in the process of master's preparation, which in the current situation should be reviewed from the standpoint of a new approach to content, forms and methods. Accordingly, a professional training of the future technological education master requires its grounding on the basis of new approaches. The effectiveness of the educational process of general technical subjects and methods of teaching technology teacher's training is not possible without providing a set of conditions for their implementation. The complex of conditions for effective specialist's training provides three main blocks. Each of them contains a number of conditions, such as: organizational and educational conditions of master degree studying; psychological and educational conditions of formation professional and pedagogical competence in future technology education professional; didactic conditions of formation teachers of general technical subjects and methods of teaching technology. The revealed conditions based on conceptual positions of individually oriented professional education contribute to the formation of high quality professional and pedagogical competence of teachers, which leads to a new level achievement.

**Keywords:** lecturer, master's preparation, professional and pedagogical competence, pedagogical conditions, technological education.

## Introduction

Modern requirements prevailing in society and production dictate new requirements for preparation of a lecturer that will ensure the successful integration of Ukraine into the European and world educational space. Such professional's training is carried out mainly at master's degree, hence the studying system in a university should be reviewed from the standpoint of a new approach to content, forms and methods of future lecturers training, including general technical subjects and methods of teaching technologies.

Therefore, a number of Ukrainian scientists (V. Madzihon, O. Kobernyk, M. Korets, G. Tereshchuk etc.) have a new approach to understanding the place and role of lecturer of general technical subjects and methods of teaching technology, content and study methods (methods, techniques, means, forms). That will allow to improve the quality level of training specialists in the technique and technology branches, capable not only of highly specialized solving of general technical problems, but mainly to the global analysis of technosphere problems, ability to find its solutions in the relationship of the «Man – technique» system.

The mentioned objectives accomplishment and studying the process of the formation of professional and pedagogical competence in future technological education masters require to set a complex of conditions for their implementation. It will play a special role in the learning process. Expanding the conditions, we tried to effectively influence the educational process of general technical subjects and methods of teaching technologies lecturers' training.

In the dictionary of vocational pedagogy the «pedagogical conditions» notion is the «circumstances that affect the integral productive educational process of specialists' professional training that is mediated by the activity of the person or group of people».

Unlike the dictionaries some scholars (Andreev, 2006; Arefev, 2003) consider the pedagogical conditions as a result of the selection and use the elements of content, methods and forms in order to achieve successful results in the educational process.

## Results

In the context of our research the pedagogical conditions act as a combination of certain elements and measures that improve the efficiency of the educational process in a university. Its result is the formation in technological education masters the required level of professional and pedagogical competence.

In considering the complex of conditions for professional and pedagogical competence formation in technological education masters, we restrict ourselves to the conditions established in a particular educational institution, bearing in mind that other conditions (influence of society, family, the state of production, etc.) also affect the present process.

The complex of conditions of professional and pedagogical competence formation is represented in the scheme, shown in fig. 1.



**Fig. 1** The complex of conditions for the effective formation of professional and pedagogical competence in future technological education masters

Developing a complex of conditions for effective specialist's training at master degree level, we consider it appropriate to distinguish three main blocks:

- organizational and pedagogical conditions for studying at master degree level in the universities;
- psychological and pedagogical conditions of professional and pedagogical competence formation in future technological education specialists;
- didactic conditions of professional and pedagogical competence formation in general subjects and methods of teaching technologies lecturers.

The grounded selection of reasonably necessary and, in our opinion, sufficient conditions is the next stage of optimization the process of professional and pedagogical competence forming in future lecturers of general subjects and methods of teaching technologies.

We shall show in more detail the highest priority, to our mind, conditions that are the most effective in the forming of professional and pedagogical competence in future master of technological education.

In our opinion, the most priority direction of vocational education development is humanization. Humanization as a multifaceted social and moral phenomenon of spiritual life leads to the inclusion of ideals in a vocational training system. Adequate moral values implementation in a university is directed toward creating conditions for the development of future master of technological education capabilities, his self-realization.

There is a clear discrepancy between the requirements that have been applied by the profession to the lecturer's life strategy, and the real level of life orientations of students. All this shows that spiritual development and improvement of the lecturer's personality cannot progress without deep reflection and review of their position in life, building a vital humanistic conception that defines the notion of the essence and purpose of their professional activity.

The tendency of lifelong learning exists in the harmonious unity with humanization. Requirements for teaching staff, methodological and technical providing, forms and methods of studying process organization are being consistently increased. During the general technical and methodological training a lifelong learning means the orientation focused on the systematic improvement of subject and teaching skills and experience, providing a methodical and professional growth of future technological education masters.

Self-education plays a significant role in a lecturer's lifelong learning. It is the process of purposeful

forming a professionally focused knowledge and skills, which provides progressive and coordinated development of professional skills and personal qualities. Our research has shown that the lack of long-term program (pre-university, graduate and postgraduate) of continuous methodical education of future technological teachers inhibits the improvement of their methodological skills.

Integrative nature of educational innovations in a lecturer's professional training sphere meets the requirements of post-industrial civilization development whereby an integration aspect of education involves knowledge and skills formation. They have interdisciplinary nature, creative skills of pedagogical tools, and the ability to interact with others in different situations.

In virtue of their social and professional significance the integration problem plays a vital role in the system of general technical and methodical training of future technological education master. Methodical competences of technological education master are integrative. The concepts and patterns of social, psychological, educational, natural and technological sciences are determined in order to understand the nature of the technical and technological knowledge and the search for the best ways of students training to the modern high-tech production, their familiarization with technical and technological picture of the world.

No doubt, standardization is one of the important directions of the effective lecturer's professional training. Social guarantee of specialists, their competitiveness in the domestic and international labor markets depend on the quality of masters' training standard. The scope and content of professional training are determined by interrelated social and economic, technological, psychological, physiological and other factors. In this regard, the educational standards of all qualification levels in a university should be differentiated by succession. Their help future professionals in the field of technique and technology to master necessary volume of general cultural, psychological and pedagogical, special knowledge and professional skills.

Analysis of future technological education masters' training in Ukraine gives the opportunity to ascertain the lack of a common professional's training standard. The content of its general technical and methodical training insufficiently takes into account the diversity of conditions and content of professional activities, masters' individual characteristics and capabilities. Therefore it does not fully ensure the formation of their competitiveness, convertibility in career's determining. In accordance with the idea of research, we consider it appropriate in the framework of the standard:

- 1) to put such subjects as «Methods of Teaching General Techniques Disciplines» and «Scientific Fundamentals of Theory and Methods of Teaching Technologies» into the normative cycle of professionally oriented training; after graduation a master receives «Lecturer of General Technical Subjects and Methods of Teaching Technologies» qualification;
- 2) to expand the psychological and pedagogical component in the professionals training, introducing such subjects as «Higher Education and the Bologna Process», «High School Pedagogy», «High School Psychology» with enough amount of hours for their study;
- 3) to provide not only regional and university components, but also to expand the bloc of subjects «by choice» ensuring special educational needs and the content of professionally-oriented courses block to enhance by learning and practical implementation of professional self-knowledge and reflection. Implementation of such courses as: «Pedagogical Projecting Fundamentals», «Career», «Methods of Pedagogical Research» ensure future lecturers the ability to predict the path of methodical self-development and methodical creativity formation;
- 4) to ensure compulsory introduction of practical training or internship of pedagogical direction;
- 5) to establish the state certification in High School Pedagogy, Methods of General Technical Subjects Teaching and / or studying technologies.

Democratization and pluralism, which, in turn, lead to diversification, are taken into consideration along with the above conditions of successful technological education masters' training. Democratization of professional training is shown in the development of an educational services network, variability and flexibility of educational programs (structures).

Flexible educational structures target higher pedagogical establishments to train professionals who possess occupational mobility that can provide fast, efficient adaptation of the educational process to specified conditions, adaptation of educational content, forms and methods of teaching, creating a flexible mechanism to monitor the educational process and maintaining a high quality of training.

Fundamentalization of educational content provides a professional training orientation to master the deep, essential fundamentals and relationships of various events and world's phenomena, the radical

development of the individual's intellectual potential.

Fundamentalization of the content of general technical and lecturer's methodical training provides the assistance of intellectual and creative personality's direction through identity formation and consolidation of sustainable intellectual qualities. Fundamentality of general technical subjects and methods of teaching technology lecturer's training is showed in a generalized ability to think pedagogically. It provides for the experts with analytical, projective and reflective skills, and the desire to realize their creative possibilities and future self-education.

According to our ideas, humanization of vocational education content plays a significant role along with continuity and humanization in the process of future technological education master's professional training. Humanization of vocational education content - is the choice of human knowledge, reflecting the inner world of man and his activities in the spiritual sphere.

Deepening knowledge of humanities (law, philosophy, ethics, aesthetics, literature, psychology, etc.) contributes to the formation of future lecturer's self-consciousness. He takes part in cognition and transformation of the world; perception of human rights, freedoms, respect for his dignity and ethno-cultural characteristics; mastering cultural values and morality; optimizing the content of liberal education (Belozercev et al., 2004).

Humanitarization of the content of lecturer's professional training - is the promotion of person's intellectual and creative direction by formation and consolidation of sustainable intellectual qualities.

Improving the process of general technology subjects and methods of teaching technology lecturer's professional training is impossible without the deliberate intensification and optimization of the educational process. Intensification involves the inclusion in the educational process of advanced educational technologies based on the use of active teaching methods and modern technical means of education. Studying optimization is the scientifically grounded choice of the best option for these conditions in terms of learning achievement of its problems solving and rationality of time-consuming for students and lecturers.

In grounding the second block of conditions, we conclude that the first psychological and pedagogical condition of formation professional and pedagogical competence of future technology education masters is the purposeful formation of technological orientation of thinking. Another psychological and pedagogical condition of professional and pedagogical competence is the development of master's abilities to display objects and processes of the world as ideal models. Masters can build their own ideal models that reflect their imagination about the possible direction of the reality change.

Studying the formation of student's knowledge system Yu. Samarin identified three main areas in this process: the formation of a single method of mental and physical activity, the formation of the system of theory and practice correlation and the formation of independent theoretical generalization of their own practical experience (Samarin, 1962). Experience the future technological education specialists' mental activity should include these operations; we consider their formation as the third psychological and pedagogical condition of professional and pedagogical competence formation. We agree with the opinion of many scholars that the studying process of technology education specialty should include learning activities in many ways close to future professional activity.

The fourth psychological and pedagogical condition of professional and pedagogical competence formation is a logical combination of both theoretical and practical activities in technological education masters.

The fifth psychological and pedagogical condition of professional and pedagogical competence of formation of future general technical subjects and methods of teaching technology lecturer is the transfer of knowledge or transfer the known mode of action. They are rather abstract concepts, and it is difficult to attach them directly to practice activity without understanding the mechanism of this process, which, in our opinion is as follows. Firstly, knowledge or mode of action (skills) is formed in other subjects in the form of concepts, laws, theories and methods. This process is necessary condition for transfer. Then in the subject studied in this point the lecturer creates a situation that contributes to actualization of previously acquired knowledge and skills. The fifth psychological and pedagogical condition of professional and pedagogical competence formation is the organization of mental activity with the transfer of earlier formed knowledge and skills to new objects of study.

The sixth psychological and pedagogical condition of professional and pedagogical competence formation is knowledge and skills inversion in technological education masters.

Technical, technological, natural, mathematical, economic and other knowledge acquire professional and pedagogical orientation, yielding inversion.

The seventh psychological and pedagogical condition of professional and pedagogical competence formation in future technology education masters is in the process of studying. The material should be provided for its repetition and consolidation, for example, in the individual work.

Next, significant for our study block of formation of professional and pedagogical competence conditions in future technological education masters includes didactic conditions of studying process organization.

As the first didactic term, we can distinguish the ensuring of the integrity of the process of professional and pedagogical competence formation. This condition is ensured in the process of defining the structure of the professional training content in future technological education master and establishes interdisciplinary connections of subjects. Separate parts of the professional and pedagogical competence are formed in the studying process.

The second didactic condition is the creation of didactic preconditions for the synthesis of new knowledge. Such knowledge is not the only element of professional and pedagogical competence, but is the basis of its content.

The third condition is to ensure didactic unity of content and procedural learning sides. The content of studying material, teaching and learning are interconnected and conditionality, as education cannot really exist outside of the learning process. This condition contributes to the formation of content of all professional and pedagogical competence's components as a single process. The fourth didactic condition is wide use of projecting methods in the university educational process.

The fifth didactic condition is the ensuring of continuity and succession of the professional and pedagogical competence formation. This condition means that the process of technological education masters' professional training should be carried out in the study of all subjects in the curriculum.

The sixth didactic condition is the determining the optimal number and volume of the content of educational, research and practical tasks. The optimality parameters are formed primarily in the pedagogical experiment. The content and other elements of the didactic system must ensure guaranteed achievement these goals by all members of the educational process.

The seventh didactic condition is the ensuring of independence in the performance of educational, research and practical tasks.

### **Discussion**

Based on the developed set of conditions that are based on conceptual positions of individually oriented professional education, we conclude that the formation of professional and pedagogical competence is a logical, feasible, manageable and self-governing change of key competencies that lead to the achievement of a qualitatively new level.

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