

## INFORMATION AND COMMUNICATIVE COMPETENCES AS THE HIGHEST LEVEL OF TRAINING FUTURE TEACHERS OF MATHEMATICS

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### ABSTRACT

The article discusses the main directions of the formation of information and communication competencies of future teachers of mathematics. The pedagogical conditions, principles and approaches in the formation of information and communication competences of future teachers of mathematics are scientifically grounded.

**Keywords:** Individuality, pedagogical activity, professional competence, professional activity, future teachers of mathematics, role-playing games.

### INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

In the context of the modernization of the national education system, a great responsibility falls on pedagogical science, especially on those areas of research that are associated with the search for and development of more advanced teaching methods, methods and ways of developing students. Modern society is determined by the need to move to a new level of education, as a result of which a university graduate will be able to respond to different life situations, independently formulate interests and realize opportunities. The state educational standard of the new generation of the Republic of Uzbekistan is aimed at ensuring the individual development of all students. The problem of the formation of a person who meets the requirements of a democratic civil, information society, an innovative economy, is among the priorities of state policy and acts as a guarantor of the achievement of the socially desirable result of the graduate's development.

Nowadays, the gap between pedagogical theory and pedagogical practice is widening, which leads to a significant contradiction between them. The existing categorical apparatus is not able to describe the processes occurring in the practice of education. The new content of this apparatus should be a synthesis of didactic theory with the appropriate technology, which in itself does not exclude the further development of the "high" didactic theory. Moreover, the role of this theory in modern conditions is only increasing, since it is intended to become the basis of a particular technology.

Thus, the relevance of the topic is due to the need to identify core professional competencies in the training of future teachers of mathematics for the subsequent successful implementation of its basic principles in the teaching and educational process, the need to develop additional programs and guidelines for teachers.

In pedagogical research, one of the leading places is given to the problem of information and communicative competence. Domestic and foreign scientists, such as I.A.Zimnyaya, V.I.Baydenko, V.D.Shadrikov, etc., deal with these problems. The researchers are asked to determine the set of competencies that a graduate of a higher educational institution should

possess. British psychologist J. Raven reveals competence as a specific ability necessary to effectively perform a specific action in a particular subject area, which includes highly specialized knowledge, a special kind of subject skills, ways of thinking, and an understanding of responsibility for their actions [3; 6].

In the course of the study, we found that the basic educational competencies are the following:

1. General cultural competence. Includes a range of issues on the content and characteristics of national and human culture, spiritual and moral foundations of human life.

2. Educational and cognitive competence. This is a set of student competencies in the field of independent cognitive activity, including elements of logical, methodological, general educational activities related to real cognizable objects.

3. Value-semantic competence. This competence reflects the elements of the world view, aimed at the formation of the axiological orientation of the student in the system of social relations, his ability to see and understand the world around him, to navigate in it. The individual educational trajectory of the student and his life activity program as a whole depends on this competence.

4. Communicative competence. Includes knowledge of the necessary languages, ways to interact with others and remote people and events, teamwork skills, knowledge of various social roles in a team.

5. The competence of personal self-improvement is aimed at mastering the methods of physical, spiritual and intellectual self-development, emotionally self-regulation and self-maintenance.

6. Informational competence. With the help of real objects (TV, telephone, fax, computer, printer, modem) and information technology (audio-video recording, e-mail, media, the Internet), the ability to independently search, analyze and select the necessary information, organize, convert, save and pass it on. This competence provides the skills of the student in relation to the information contained in educational subjects and educational areas, as well as in the surrounding world [1; 35-36].

Competences in the field of education is one of the priority areas for the renewal of modern education, the installation is being made on the creation of new knowledge, new socially significant experience in the formation of social and professional space in society. The solution of the set tasks requires a qualitatively new approach to the professional training of future teachers of mathematics.

Teachers of mathematics have the following tasks:

- provide high-quality training in mathematics;
- teach how to apply the obtained basic knowledge of mathematics in the process of studying natural science disciplines;
- to stimulate and increase the motivation to master the knowledge of mathematics based on the student's personal success;
- to promote the development of information and communication competencies [4; 23].

The training of future teachers of mathematics should be based on mastering the relevant competencies, which are the basis, base of higher education. Appeal to the competencies caused by a number of circumstances:

- The evaluation of the training of future teachers of mathematics should be based on the qualitative results of the pedagogical process and pedagogical activity;
- the training of competent future teachers of mathematics must proceed from the requests of production, the consumer of products produced by an educational institution;
- the training of future teachers of mathematics should be professionally-directed, based on personal potential, with the obligatory consideration of the requirements of innovative technologies;

- a level approach is needed to prepare future teachers of mathematics so that it can adapt to the rapidly changing conditions of life, developing technologies, to the change of types of professional activity;

- study of the readiness of future teachers of mathematics at the proper level to be carried out on the basis of the formation of professional competencies, their quality [6; 113].

The effectiveness of the educational process in the implementation of information and communication competencies is ensured in our opinion, the implementation of the basic principles of learning:

- consciousness, activity of students during the lesson;  
- visibility, used as a learning tool and a means of learning;  
- strength, i.e. preservation of educational material in the memory of students and the possibility of its use in various situations;

- availability of educational material and its feasibility;  
- accounting of individual psychological characteristics of the students' personality;  
- accounting of adaptation processes - processes of human adaptation to changing environmental conditions and life activity;

- interdisciplinary coordination, implemented input coordination of the various disciplines;

- the continuity of learning;

- professional orientation of training, accounting for future specialty;

- communicative activity of students during training.

In the course of the study, we developed a technological block of information and communication competencies of future teachers of mathematics (1-fig.).

With all the variety of learning technologies, the implementation of information and communication competencies remains with the teacher. "Professional mastery", as a concept is social in nature. Most scholars characterize this concept as the highest level of professional bachelor's training, the core of which is competence. Professional competencies include:

- professional activity, a special professional component;

- social component, including joint, collective professional activities, the activities of the bachelor;

- the personal component associated with the realization of the potential of the bachelor, his self-expression, self-development;

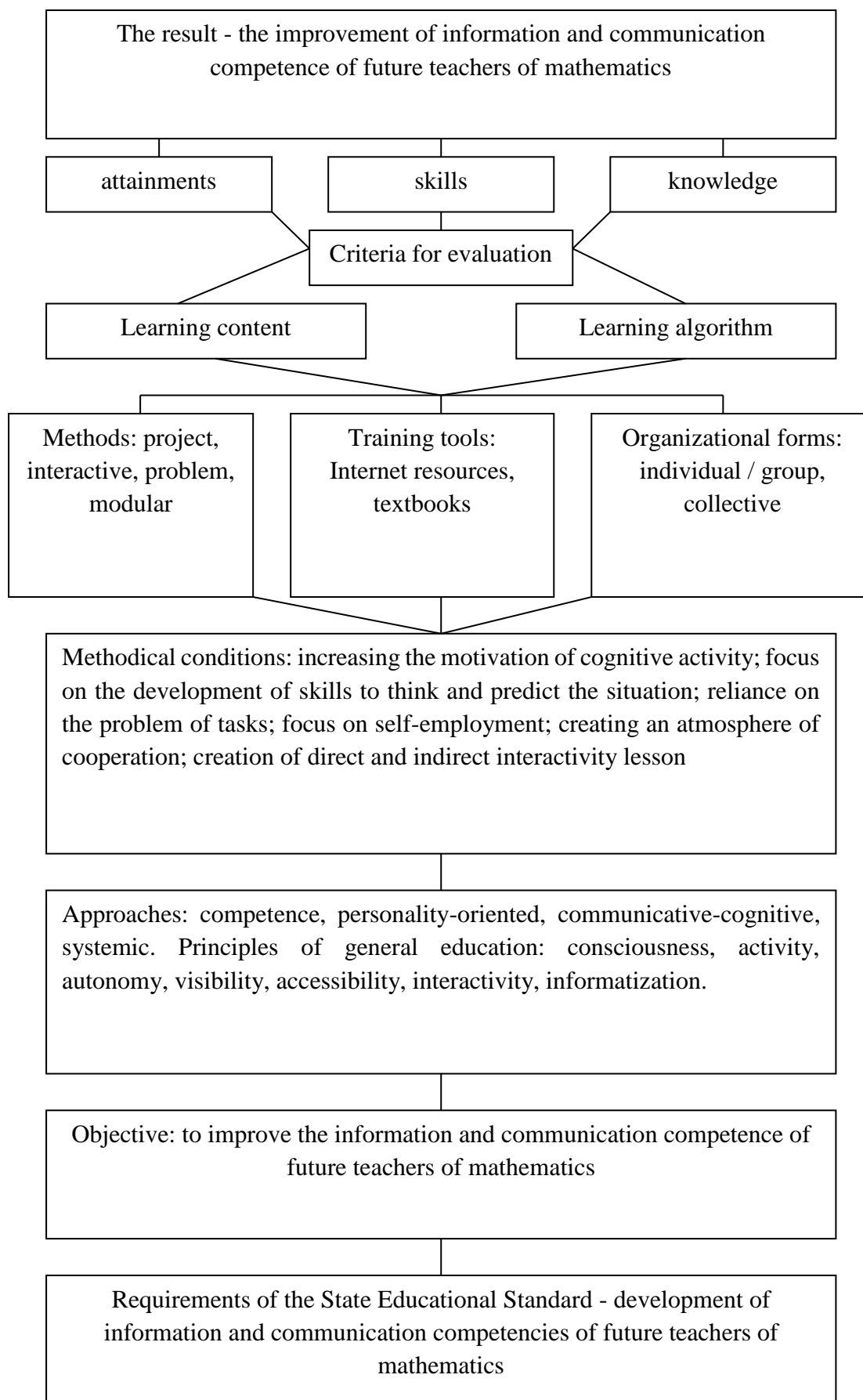
- the individual component, which includes individual development in the framework of the profession [2; 253].

Our experience with future mathematics teachers in the implementation of information and communication competencies allows us to highlight the use of the following learning technologies:

- reproductive technology of education - this technology is economical, it facilitates students to understand complex material, provides management of the educational process, but it poorly develops the intellectual potential of students, has little opportunity to individualize and differentiate the educational process;

- information technologies - the lecturer uses modern multimedia methods of presenting the material, which contributes to the written fixation of the perceived and revised educational text;

- learning technologies in cooperation - contribute to the formation of students' skills to work effectively together in temporary teams and achieve high-quality educational results; the development of students' personal qualities such as tolerance for different points of view and other behavior, responsibility for the results of teamwork;



**Fig-1.** Technological block of information and communication competencies of future teachers of mathematics

- technologies of communicative learning - the information and cognitive process arising in connection with the solution of educational tasks, involves, along with the search, selection, processing of information, the exchange of it between students as a subject of educational and cognitive activity;

- personality-oriented technologies - the formation of an active person in the process of learning, able to independently build their educational and cognitive activity, create partnerships between the participants of the educational process, most fully reveal the personal potential [5; 41].

The experience of universities that we have implemented in introducing learning technologies into educational practice suggests that their use has the following positive results:

- students are open to learning and actively engage in relationships and cooperation with other participants in the educational process;

- get the opportunity to analyze their activities and realize their own potential;

- can practically be prepared for what they have to face in their life and professional activities;

- they can be themselves, not to be afraid to express themselves, to make mistakes, provided that they are not condemned for this and do not receive a negative evaluation.

It is important to understand the training technologies used should contribute to the formation of a competent specialist who meets all the requirements of the modern labor market.

Solving this problem, we decided to focus on role-playing games. This form of work includes a number of exercises:

- 1) Role exercises - here students play their assigned roles. Requiring the use of interpersonal skills. These situations include: solving disciplinary issues, conducting various interviews.

- 2) Case study - students are invited either individually or in small groups to find a solution to the problem situation.

- 3) Business games are conducted according to the scenario that the teacher develops in accordance with the topic and objectives of the lesson. Participants act out roles from real-life situations, present imitations of decision-making through collective discussion according to rules set or developed by the game participants themselves.

The use of role-playing games in which we can both use one specific type of exercise and combine several techniques allows students to apply their theoretical knowledge and thereby gain or reinforce the professional skills that are so necessary for them in real professional activity. These theoretical ideas about the effectiveness of role-playing games can be supported by practical observations.

The main advantage of using such a technology of training is the active participation of students, and the initiative to implement and use the technology comes to a large extent from the students themselves.

The motivation of an individual to obtain professionally significant qualities expressed in the formation of information and communication competencies that a university graduate demonstrates in the labor market is provided by the social and professional environment and education system. The presence of all aspects of information and communicative competence means the achievement of maturity by a person in his professional activities, cooperation and communication, which is characterized by the development of personality as future mathematics teachers with a social orientation and professional individuality.

The most important goal of studying mathematical disciplines at the university is the formation of mathematical culture, as one of the elements of the general culture of modern specialists.

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