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TECHNOLOGY FOR DEVELOPING STUDENTS' COMPETENCIES IN WORKING WITH TEXT IN TEACHING THE BASICS OF MATHEMATIC

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Annotation: this article describes the technologies for developing students' text-based competencies in teaching the basics of mathematical logic. Lectures cover opportunities for students to develop text-based competencies. Recommendations for the development of a project of practical training based on the development of students' competencies in working with text.

Keywords: Pedagogical competence, professional competence, quality of education, higher education, educational process, competence in working with text, highly qualified specialist, innovative methods, working in small groups.

Annotatsiya: mazkur maqolada matematik mantiq asoslarini o‘qitishda talabalarning matn bilan ishlash kompetensiyalarini rivojlantirish texnologiyalari yoritilgan. Ma`ruza mashg`ulotlarida talabalarning matn bilan ishlash kompetensiyalarini rivojlantirish imkoniyatlari yoritilgan. Talabalarning matn bilan ishlash kompetensiyalarini rivojlantirishga asoslangan amaliy mashg`ulot loyihasini ishlab chiqishga doir tavsiyalar keltirilgan.

Kalit so‘zlar: Pedagogik kompetensiya, professional kompetensiya, ta’lim sifati, oliy ta’lim, ta’lim jarayoni, matn bilan ishlash kompetensiyasi, yuqori malakali mutaxassis, innovatsion metodlar, kichik guruhlarda ishlash.

Аннотация: в данной статье описаны технологии формирования у учащихся текстовых компетенций при обучении основам математической логики. Приведены возможности развития компетенций работы с текстами у студентов в лекционных занятиях. А также изложены рекомендации по разработке проекта практических занятий на основе развития у студентов компетенций работы с текстом.

Ключевые слова: Педагогическая компетентность, профессиональная компетентность, качество образования, высшее образование, образовательный процесс, компетентность в работе с текстом, высококвалифицированный специалист, инновационные методы, работа в малых группах.

At a time when the education system in Uzbekistan is rapidly being renewed through fundamental reforms, organizing the education and upbringing of the growing young generation based on national ideas and requirements, and ensuring that they become competitive specialists who can meet the prospects of social progress and global standards is a pressing issue today.

In the process of studying and analyzing technologies for developing students’ competencies in working with texts during pedagogical processes, we present reflections on engaging students in lessons, designing lesson plans using technologies that develop students’ competencies in working

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with texts while teaching the basics of mathematical logic, and recommending appropriate teaching methodologies.

Pedagogical competence is viewed as a factor ensuring the quality organization of teaching activities. Today, it is important to study by which criteria the competence of a teacher is defined.

Professional competence does not simply mean acquiring separate knowledge and skills by a specialist, but rather the mastery of integrative knowledge and actions in each independent field. Moreover, competence requires continuously enriching professional knowledge, learning new information, understanding important social demands, searching for new data, processing it, and being able to apply it in one's activities.

In this regard, activating the activities of educators in higher education institutions and scientifically substantiating new approaches that ensure the level of professional competence required today has become an urgent task.

The fundamentality of higher education is aimed at the ability to distinguish relationships between processes, objects, and phenomena in the real world, and it is accepted as a basis for training highly qualified specialists. State educational standards set high demands on the qualifications and skills of trained personnel. These demands arise directly from modern conditions and aim to form a national intellectual elite from the youth receiving education.

According to clause 4.4 of the section "General requirements for the content of curricula and educational programs of higher education fields and specialties" in the State Educational Standard of Higher Education approved by the Minister of Higher and Secondary Specialized Education of the Republic of Uzbekistan on October 19, 2021, elective course blocks in the bachelor's degree program should ensure that students acquire additional deep theoretical and practical knowledge and skills, expand their professional competencies considering innovative methods and regional factors of the field, and provide opportunities to master professional knowledge and skills in accordance with educational trajectories.

According to order No. 365 dated August 25, 2021, approved by the Ministry of Higher and Secondary Specialized Education of the Republic of Uzbekistan, the requirements for the professional competencies of bachelors in the 60110600 Mathematics and Informatics education program, section 2.1 on General Competencies, include:

- Possessing systematic knowledge related to worldview; understanding the fundamentals of humanitarian and socio-economic sciences, current urgent issues of state policy; being able to independently analyze social problems and processes;
- Having competitive general professional preparation in the relevant bachelor's program.

In the section on professional competencies:

- Be prepared to use knowledge related to modern problems of science and education when solving general professional tasks, and have skills to create and practically apply informational and didactic support for successful implementation;
- Have the ability to understand, analyze, generalize changes in the scientific field of professional activity, and make accurate conclusions;
- Provide opportunities for the development of professional knowledge, professional formation, and socialization based on primary sources;
- Possess skills to apply in practice model concepts, experimental methods, and knowledge related to processing obtained results;
- Be ready to solve interdisciplinary and practically oriented problems based on certain basic mathematical knowledge and methods.

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Discrete Mathematics and Mathematical Logic is an elective course taught in the bachelor's programs of 5110100 – Mathematics and Informatics, as well as 60110600 – Mathematics and Informatics.

Competence in working with text refers to the ability to search for necessary information from various sources, sort, process, store, use them effectively, and classify them.

Today, there are several methods to develop competence in working with text. Among the most effective are graphic organizers.

Graphic organizers (structuring tools) are means to visually organize cognitive processes. Graphic organizers help students develop skills to work with presentations, texts, and diagrams. Depending on the type of textual information, graphic organizers are used in the following order:

Structuring textual information and identifying its components, the interrelation between studied concepts (events, phenomena, topics), and teaching methods and tools include: Cluster, Classification Table, Insert, Venn Diagram Table.

Methods and tools for analyzing, comparing, and contrasting given textual information: T-table, Venn diagram.

Methods and tools for identifying, solving, analyzing, and planning problems:

"Why?", "Fishbone", "Pyramid", "Lotus flower" schemes, "How?" hierarchical diagram, "Cascade" structural-logical scheme.

Cluster method is a specific form of pedagogical and didactic strategy that helps learners freely and openly express thoughts and ideas about any chosen problem (topic), including given textual information. This method supports the continuity of cognitive activity until the learners deeply and thoroughly master the topic.

Venn diagram is a graphical tool used to summarize results obtained from textual information on a topic and draw a holistic conclusion. It is also used for comparing, analyzing, and studying two or more types of objects (appearances, facts, concepts). The diagram consists of two or more overlapping circles. The purpose of this method is to organize teaching through graphic representation expressed by two intersecting circles (or other geometric shapes). This method allows analyzing and synthesizing different texts, concepts, bases, and ideas from two aspects, identifying their common and distinctive features, and making comparisons.

By categories — there is no single method for distributing information. One small group's categorization may differ from another group's categories. Learners may distinguish pre-prepared categories differently.

K/W/L table (Know / Want to know / Learned) — allows conducting inquiry by topic, text, or section. It develops skills in systematic thinking, structuring, and analysis. Learners answer the questions "What do you know?" and "What do you want to know?" by filling in the first and second sections of the table. Then, they listen to the topic, independently read the given text, and fill in the third section.

Conceptual table — provides comparison of thoughts on the studied topic based on two or more aspects. It is filled individually or in pairs within a given time. Reasons are written on the left side, while opposite thoughts, factors, and so forth are written on the right side. This table develops critical observation skills.

Fishbone diagram — allows describing and solving a series of problems given in the text, developing skills in systematic thinking, systematization, and analysis. Drawing rules: (individually or in small groups) the upper "bone" represents a small problem, and the lower parts prove the existence of these small problems. The groups combine, compare, and complete their diagrams.

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Nilufar guli (Lotus Flower) Diagram – is a problem-solving tool that visually resembles a lotus flower. It consists of nine large rectangles forming its basis. When working with texts, it helps develop and activate students' abilities in systematic thinking and analysis.

In conclusion, graphic methods comprehensively support students in developing especially their skills in working with texts, fostering independent thinking and the ability to organize ideas systematically. Specifically, students can schematically visualize the key concepts of a topic, think independently and quickly, identify problems, and organize them into a coherent system. Thus, graphic methods enable students or learners to study the given topic in an engaging, unconventional way, ensuring effective learning through text without boredom.

When these methods are applied, students work in small groups and have the right to actively participate in the lesson, take on leading roles, learn from each other, and appreciate different viewpoints.

Using the small group work method allows the teacher to save time compared to other non-traditional methods because the teacher can engage and assess all students on the topic simultaneously. This pedagogical technology is aimed at helping students work with various literature and texts during and outside of class, retain learned material, be able to express themselves verbally, and freely share their thoughts, as well as enabling the teacher to assess all students within one lesson.

Today, improving the pedagogical skills of teachers is a demand of the times. This means working more actively with the younger generation and fostering a worldview and moral principles in them that correspond to the current requirements of society, which is one of the important tasks of our time.

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