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INNOVATIVE TECHNOLOGIES FOR DEVELOPING GEOMETRIC COMPETENCIES OF STUDENTS IN SECONDARY SCHOOLS

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Abstract
This article covers the issues of developing students' geometric competencies in the process of teaching geometry in grades 10-11 of general education schools in the context of New Uzbekistan. Innovative methods and technologies for distance learning based on information and communication technologies have been developed to improve this process. The pedagogical advantages, technical capabilities, and effectiveness of using distance learning have been practically studied and proposed.

Keywords: New Uzbekistan, Geometric Education, Information and Communication Technologies, Distance Learning, Geometric Competencies, Innovative Technologies, Pedagogical Process, Student Development.

UMUMIY O‘RTA TA’LIM MAKTABLARIDA O‘QUVCHILARNING GEOMETRIK KOMPETENSIYALARINI RIVOJLANTIRISHNING INNOVATSION TEXNOLOGIYALARI

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Annotatsiya:
Ushbu maqolada Yangi O‘zbekiston sharoitida umumiy o‘rta ta’lim maktablarining 10-11-sinflarida Geometriya fanini o‘qitish jarayonida o‘quvchilarning geometrik kompetensiyalarini rivojlantirish masalalari yoritilgan. Mazkur jarayonni takomillashtirish uchun axborot-kommunikatsion texnologiyalar asosida masofaviy ta’limning innovatsion metodlari va texnologiyalari ishlab chiqilgan. Masofaviy ta’limning pedagogik afzalliklari, texnik imkoniyatlari va ulardan foydalanishning samaradorligi amaliy jihatdan o‘rganilgan va taklif etilgan.

Kalit so‘zlar: Yangi O‘zbekiston, Geometriya ta’limi, Axborot-kommunikatsion texnologiyalar, Masofaviy ta’lim, Geometrik kompetensiyalar, Innovatsion texnologiyalar, Pedagogik jarayon, O‘quvchilarning rivojlanishi.

Introduction

In the context of New Uzbekistan, the main task is to implement the achievements of science and the educational process into practice. In this regard, achieving the effectiveness of developing students' geometric competencies in the process of teaching geometry in grades 10-11 of general education schools, equipping students with the ability to apply acquired knowledge in practice, is of paramount importance. Because the student of New Uzbekistan is a new generation of the new era. One of the important aspects of solving this problem is the development of an innovative information and communication distance learning technology for the development of geometric competencies of students in general education schools.

Information and communication teaching tools include modern technical capabilities, such as television, radio, mobile communication devices, and computers. Based on these modern technical means, it is necessary to develop and implement innovative technologies and methods for developing students' geometric competencies. Therefore, we draw your attention to the complex of information and communication distance learning technologies for developing students' geometric competencies in the process of teaching the subject "Geometry" in grades 10-11 of general education schools.

Distance learning is an educational process that is implemented online, relying on information and communication technologies in complex conditions. Distance learning enables the exchange of educational literature based on the aforementioned information and communication tools, as well as the implementation of education through a specialized information environment. This form of learning, along with enhancing the effectiveness of teacher training in the education system, fulfills the task of providing students with in-depth knowledge. In the distance learning system, regular virtual communication between the teacher and the student is carried out. As a result, students develop connections with teachers, and they develop basic and geometric competencies. Therefore, it is necessary to pay attention to the following possibilities of distance learning:

Distance learning ensures a positive approach to learning for students.

2) There are opportunities to guide the learner as the goal of the pedagogical process;

3) allows for a deeper acquisition of methodological, theoretical, and methodological knowledge;

4) allows for the independent organization of cognitive activity;

5) provides opportunities for learning to find and assimilate various information;

6) provides the student with the opportunity to apply the acquired knowledge in practice.

Using these possibilities of distance learning, it is possible to develop the geometric competencies of students in grades 10-11 of general education schools. After all, distance learning yields the expected result in the development of cognitive activity, organized based on modern pedagogical technologies. At the same time, distance learning plays a crucial role in meeting information needs, increasing the effectiveness of information acquisition and use. Furthermore, distance learning enhances the creative nature of pedagogical activity, meaning it expands the teacher's ability to search for necessary information, work with selected information, and teach students based on new information.

In distance learning, the communicative block plays a particularly important role. A communicative block is a process of implementing learning based on the interaction of

participants in the distance learning process, where computer capabilities, e-mail, testing technologies, and a complex of didactic materials are widely used. The information block of distance learning is also important. The use of educational materials in this block expands the possibilities of using questionnaires, tables, diagrams, and histograms. In this regard, one of the most important tasks of our research is the development of pedagogical technologies based on the capabilities of information and communication technical means of distance learning and their implementation in practice in the process of developing students' geometric competencies in the process of teaching the subject "Geometry" in grades 10-11 of general education schools. Because information and communication distance learning technologies have several possibilities. In this regard, information and communication tools provide the following opportunities for the development of geometric competencies of students in grades 10-11 of general education schools:

- interesting passage of each topic using information and communication technical means;
- solving assignments on topics using various methods and tools, relying on technical means;
- Providing additional assignments on each topic and recommendations for their solution;
- targeted orientation of students' interest, aspirations and abilities in the subject "Geometry";
- improvement of educational materials on the development of geometric competencies of students in grades 10-11 using the capabilities of information and communication technical means such as computers.

According to our approach, the development of students' geometric competencies, relying on information and communication tools, allows for the implementation of:

adapting the goals and content of developing students' geometric competencies to the requirements of modern innovative development. Because one of the requirements of the modern educational process is the development of the goals and content of education.

modeling methods, tools, and technologies for developing students' geometric competencies as a holistic pedagogical process. Because the current process of technical development requires updating traditional teaching methods, relying on its new tools, and rational use of technology capabilities.

Strengthening the educational and upbringing process through the development of students' geometric competencies. Strengthening students' educational and cognitive skills through ICT and organizing their upbringing based on modern requirements is one of the pressing issues.

The current process of developing our education system requires the assimilation of new information, data, and recommendations transmitted through information and communication tools in the teaching of subjects. In this regard, it is also advisable to use the experience of foreign countries in this regard. For example, the use of experiments from the educational laboratory "Project of Methods" by American educator W. Kilpatrick and British educator B. Russell is considered effective. In these laboratory experiments, it is justified to update textbooks completely and in each educational process, relying on the most convenient and easy approaches in their teaching methodology, relying on information and communication tools. In this regard, such experiments are useful in improving the development of geometric competencies of students in general education schools using information and communication tools. For example, updating the teaching materials of this subject and optimizing the means of its teaching are important in this regard.

Information and communication tools regularly provide a complex of new knowledge in subjects. Because pedagogical scientists in our country and around the world are conducting scientific research based on new technical capabilities and technologies. Such scientific research presents various recommendations for teaching subjects based on the capabilities of information and communication tools, improving teaching methods, and facilitating student learning. Therefore, it is advisable for teachers of "Geometry" in general education schools to regularly familiarize themselves with new information and information transmitted through information and communication technologies. After all, the internet network has been established in all secondary schools of our country.

Using pedagogical literature, recommendations for distance learning, and the possibilities of information and communication technologies studied in scientific research, an information and communication distance learning technology for developing geometric competencies of students in grades 10-11 of general education schools was developed and tested in practice. The essence of this technology is as follows (Fig. 2.1):

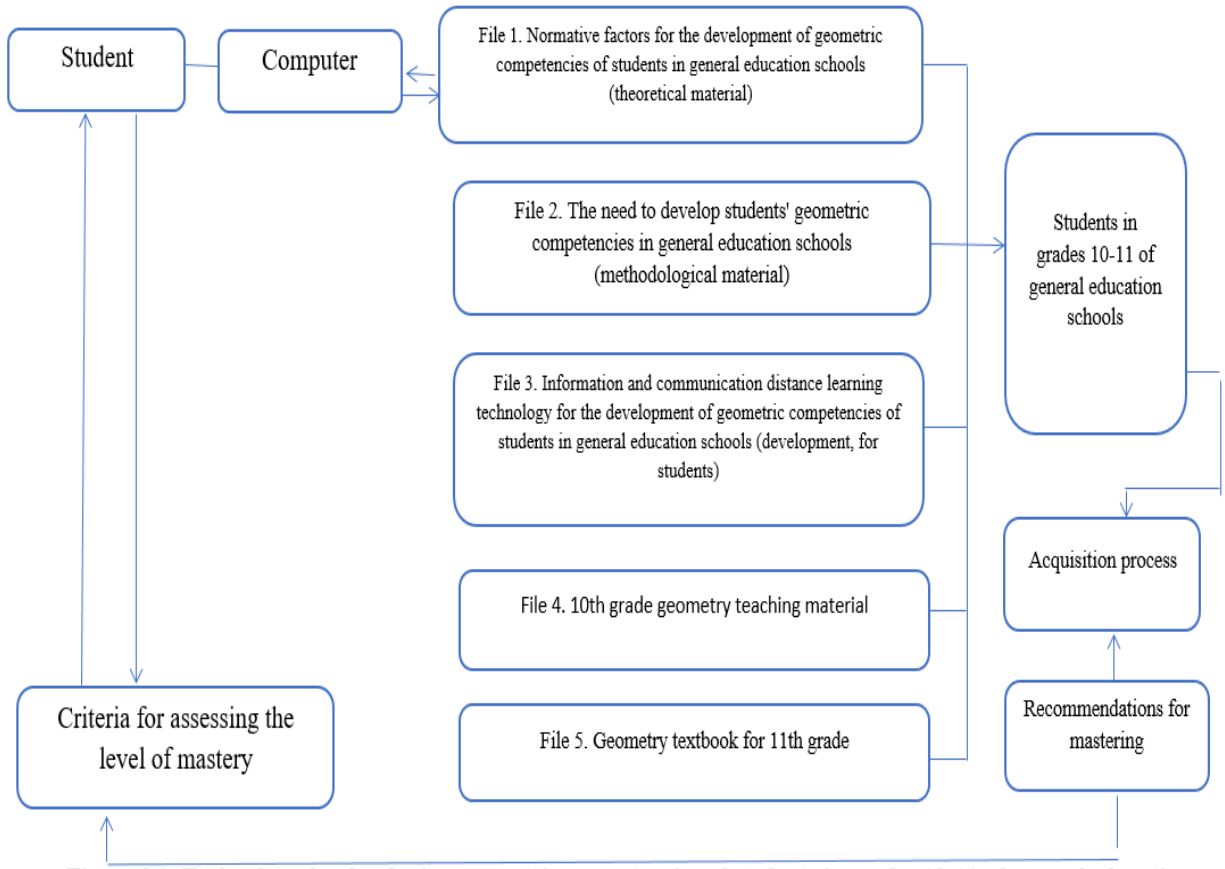

Figure 2.1. Technology for developing geometric competencies of students in grades 10-11 of general education schools using information and communication technologies in distance learning.

This technology is based on a special computer program, each of which contains relevant materials. In it, file 1 includes the materials analyzed in the first paragraph of the first chapter of our research, file 2 includes the materials of the second paragraph of the first chapter of our dissertation, file 3 includes the methodology for using the above-mentioned development; The 4th file contains materials from the "Geometry" course of the current 10th grade mathematics

textbook, while the 5th file contains materials from the "Geometry" section of the current 11th grade mathematics textbook. As a result, the use of this technological development was facilitated. At the same time, there are opportunities for using this technology in the traditional lesson process and in the form of distance learning. It should be noted that the computerization of general education schools allows for the full use of this new methodology. For the structure of this development, please refer to Appendix 1 of our study.
The mechanism for using this ICT is as follows:
A curriculum for geometry has been introduced for grades 10-11.
2) Materials from textbooks on each topic and additional educational materials enriching them are presented;
3) The content of the presented learning materials on mastering the topics is aimed at developing students' independent work and thinking skills;
4) Recommendations, materials, and information on each topic and lesson are included in the Teacher's book, which the teacher has the opportunity to use in preparing for classes;
5) Multimedia educational materials on topics are also provided, and this information can be used for conducting thematic classes in various variants;
6) The use of this technology is carried out by both the teacher and the learner, relying solely on a computer information and communication tool.
It should be noted that this technology is more adapted for use in the form of distance learning in the development of students' geometric competencies.
The possibilities of information and communication distance learning technology for developing students' geometric competencies in general education schools are high. Here, it is worth noting the following most important of such opportunities:
- increasing students' interest in this subject;
- the development of students' skills in independent task completion and reliance on analytical thinking;
- interesting presentation of each task based on modern technical means;
- saving the time of the teacher and the student and the availability of rational use of the time norm;
- conducting classes based on a free, creative and independent nature;
- enrichment of textbook materials;
- mobilization of opportunities to develop geometric competencies of students in general education schools.
All of this ensures the effectiveness of information and communication technologies in the development of geometric competencies of students in general education schools.
According to our approach, such new methodological developments should be taught in teacher retraining and professional development courses. It should be noted that in current conditions, there is an opportunity to present such new methodological developments on computer platforms in online professional development courses. Observations show that over the past five years, pedagogical research conducted in our country has introduced unique new methods, various teaching methods, and technologies. In this regard, it is advisable to use this new technological development, developed by us, in the process of developing geometric competencies of secondary school students.

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