FRONTLINE SOCIAL SCIENCES AND HISTORY JOURNAL
(ISSN – 2752-7018)
VOLUME 02 ISSUE 04 Pages: 179-189
SJIF IMPACT FACTOR (2021: 5. 376) (2022: 5. 561)
OCLC – 1276789625 METADATA IF – 7.569
Publisher: Frontline Journals

Journal Website: https://frontlinejournals.org/journals/index.php/fsshj

Research Article

POSSIBILITIES OF USING INTERACTIVE METHODS IN QUALITY TEACHING OF DESCRIPTIVE GEOMETRY

Submission Date: April 12, 2022, **Accepted Date:** April 20, 2022,
Published Date: April 30, 2022
Crossref doi: https://doi.org/10.37547/social-fsshj-02-04-21

Valiyev Azamjon Nematovich
Associate Professor (Tashkent State Pedagogical University, Uzbekistan)

Chorshanbiyeva Dilnoza Ashirovna
A masters' degree(Pedagogical Institute of Karshi State University, Uzbekistan)

Sheraliyev Sanjar Karimberdiyevich
A master's degree (Tashkent State Pedagogical University, Uzbekistan)

ABSTRACT

This article describes the didactic possibilities of using interactive methods to ensure high-quality assimilation by students of the subject of descriptive geometry.

KEYWORDS

Descriptive geometry, didactics, pedagogy, pedagogical technology, interactive method, classster, cinquain strategy.

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INTRODUCTION

Decree of the President of the Republic of Uzbekistan Sh.M.Mirziyoyev dated October 8, 2019 No PF-5847[1] "On approval of the Concept of development of the higher education system of the Republic of Uzbekistan until 2030" plays a special role in further improvement. In addition, in one of his speeches, President Mirziyoyev said that "the further development of not only academic science, but also science in higher education is an important task." [2]

The organization of the educational process, the training of intellectually gifted personnel, combining the materials of historical sources and the latest developments in modern technology, remains a requirement of today.

Traditional teaching technology is generally in the form of a “teacher-student” approach, in which the learner, as well as the student, is seen as the object of the learning process, i.e., the passive individual. In pedagogical technology, it is based on the system "Teacher - education - student", in which the student becomes a subject, that is, an active participant in the educational process. In this case, the teacher becomes the organizer and supervisor of the student, creating the conditions for self-research, self-observation.

And we do that through innovation in education. Interactive learning strategies are among the innovations in education. According to Angelevsky, "... all countries are trying to innovate as much as possible in education. Today's news requires them to be organized, planned, and mobilized. Innovation is a long-term investment in the future. To inspire interest in innovation, to nurture a person who is committed to innovation, education itself must be rich in innovation, with a creative spirit and environment”[3].

In order to increase the effectiveness of education, to ensure that the individual is at the center of education and young people to learn independently, well-prepared educational institutions and, in addition to solid knowledge in

[1] Decree of the President of the Republic of Uzbekistan Sh.M.Mirziyoyev No. PF-5847 of October 8, 2019
[2] Mirziyoyev Sh.M. Critical analysis, strict discipline and personal responsibility should be a daily rule of every leader. Speech at the meeting of the Cabinet of Ministers in 2016 on the results of 2016 and prospects for 2017. - T .: “O’zbekiston”, 2017. p.46.
[3] Педагогические технологии: понятия, принципы и методы внедрения: Сб. материалов из Интернета./ Сост. С.Махкамова. – Ташкент, 2003. – С.26.

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their field, know modern pedagogical technologies and interactive methods. We need teachers who know the rules of use in the organization of educational activities[4].

Like many other disciplines, the science of descriptive geometry is one of the most important disciplines in the development of society, in meeting the needs of the people, in mathematics, construction, engineering, fine arts and other fields. While mathematics is the gymnastics of the mind, descriptive geometry is a science that develops the spatial imagination of man.

The use of advanced pedagogical technologies and interactive methods in the teaching of descriptive geometry is also a topical issue today. Because descriptive geometry helps a student to develop spatial imagination, independent thinking and design skills.

Attempts to clarify the essence of modern pedagogical technologies and interactive methods can be said to have begun in our country in the 90s of the XX century.

The introduction of interactive methods and pedagogical technology in the educational process in the country, the recognition of it as a science was first interpreted by pedagogical scientists as B.L. Farberman[5], N.S. Saidakhmedov[6], M. Ochilov[7], M. Mahmudov[8], NI Azizkhodjaeva[9] and others. In the works of our scientists JG Yuldashev, SA Usmanov, NA Muslimov[10], M. Usmanbaeva, OK Tolipov, B. Hadjaev, R. Ishmuhamedov and others, pedagogical innovations and technologies, modular approaches to teaching and interactive methods were widely studied. R.Ishmuhamedov and A.Abdukadirov[11] focused on the study of innovative technologies in education.

[4] Ishmuhamedov R., Abduqodirov A., Pardayev A. Ta'limda innovatsion texnologiyalar. –T.: "Iste'dod" jamg'armasi, 2008 yil.

[5] Фарберман Б.Л.. Прогресивные педагогические технологии – Т.:, 1999 г 84 стр; Олий ўқув юртларида ўқитишнинг замонавий усуллари», -Т.:,2002; «Илғор педагогик технологиялар», -Т.:., 2000.

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[10] Муслимов Н.А., Усмонбоева М.Ҳ. "Инновацион таълим технологиялари ва педагогик компетентлик" модули бўйича ўқув-методик мажмуа. Низомий номидаги ТошДПУ ҳузуридаги Педагог кадрларини қайта тайёрлаш ва уларнинг малакасини ошириш тармоқ маркази. –Т.:, 2016– 42 б.

[11] Ишмуҳамедов Р., Абдуқодиров А., Пардаев А. Тарбияда инновацион технологиялар. –Т.:, 2010.

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A.Abdukadirov[12] and his students described in detail the method of "Case-study".

If the lessons are conducted with the extensive and effective use of innovative technologies, interactive teaching methods, game technologies, students will develop the ability to think actively and logically, mental abilities. In interactive teaching methods, students are the central figure in the learning process, where the learning process is tailored to the needs of the students. When lessons are taught in a way that combines teaching methods, it is more effective for students to master them.

Innovative methods and group forms of education are now widely used to help students acquire interactive learning, increase their interest in the subject, develop their independence and activism, and develop their critical thinking.

The organization of education on the basis of small groups implies the abandonment of the dialogue "teacher-learner" and the transition to a tripartite interaction in the form of "teacher-group-learner" . The study group is divided into active subgroups, each of which develops its own learning material. A strong bond is established between the teacher and the students, and the individual and team spirit is enhanced at the same time.

The "Find Your Partner" method of grouping. Divide the large group into four small groups. The four science or field concepts are written on the cards. For example, in drawing: *the words line, plane, surface, circle, circle, view, symmetry, projection*; fine arts: *color, light, shadow, pencil, reflex, landscape, portrait, blik words*; words related to upbringing: *mental, moral, aesthetic, physical, legal, economic, ecological, labor*, and words related to psychology: *intuition, cognition, memory, attention, imagination, thinking, speech, temperament*. Each student will receive one card. Students find partners in the group to which they belong, and students who choose concepts related to a subject or field join into a group. There are four groups of students.

In general, working in small groups teaches students to be more active, to feel responsible for

[12] Абдуқодиров А., Астанов Ф., Абдуқодирова Ф. “Case-study” услуби: НАЗАРИЯ, АМАЛИЁТ ВА ТАЖРИБА. –Т.: “Тафаккур қаноти”, 2012-132 бет.

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the group, and to develop their communication skills.

In the process of teaching graphic geometry, it is important to teach students to think creatively, to change situations, to organize activities on the basis of free competition, and to be able to use information technology, electronic textbooks, versions and multimedia in practice.

The best way to increase the effectiveness of teaching descriptive geometry is to organize classes using innovative pedagogical and information technologies, as well as interactive methods.

Interactive education (English - "interact", Russian - "interactive"; "inter" - interaction, "act" - action) - a course for students to acquire knowledge, skills, abilities and certain moral qualities 'education based on the organization of the mutual movement.

The ability of the participants in the interactive learning process to organize a movement based on mutual cooperation in the acquisition of knowledge, skills, competencies and certain ethical qualities.

In essence, interactivity refers to the ability of students to organize a movement based on collaboration, in the acquisition of knowledge, skills, competencies, and certain ethical qualities. Logically, interactivity refers primarily to the way in which social actors engage in dialogue, interaction, and action.

Interactive education is based on the interaction between the main participants in the teaching process - the teacher, the student and the group of students, a lively discussion, the opportunity to exchange ideas. Interactive learning is characterized by free thinking, unequivocal expression of personal views, joint search for solutions to problematic situations, and the creation of student intimacy in the study of learning materials, mutual respect, understanding and support of the "teacher-student-student group", a sincere relationship, the achievement of spiritual unity[13].

[13] Н.А.Муслимов.М.Ҳ.Усмонбоева. “Инновацион таълим технологиялари ва педагогик компетентлик” модули бўйича ўқув-методик мажмуа. Низомий номидаги ТошДПУ ҳузуридаги Педагог кадрларини қайта тайёрлаш ва уларнинг малакасини ошириш тармоқ маркази Т., 2016 й, 70 б

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Today, the following popular technologies are used in the organization of interactive education in educational institutions of the republic[14]:

- Interactive methods: “Case study” (or “Study cases”), “Bliss survey”, “Modeling”, “Creative work”, “Attitude”, “Plan”, “Conversation” and others;
- Strategies: "Brainstorming", "Boomerang", "Gallery", "Zig-zag", "Stairs", "Icebreaker", "Rotation", "T-table", "Round snow" and others;
- Graphic organizers: “Fish Skeleton”, “B-B-B”, “Conceptual Table”, “Venn Diagram”, “Insert”, “Classer”, “Why?”, “How?” and others.

The following are exemplary methodological developments for the use of interactive methods in the teaching of a number of topics in graphic geometry.

“The Water-wheel method” allows students to self-assess. The purpose of the method is to test students' knowledge of a previous lesson or a new topic. The method can be used to divide students into groups, rather than a single student. In this way, the teacher not only provides students with theoretical knowledge, but also can test their knowledge. In the table below, the task of mastering the geometric apparatus of perspective is given by the method of "Wheel". Its condition is: "Define the names of the terms in the geometric apparatus of the perspective given in the figure"

[14] Н.А.Муслимов.М.Ҳ.Усмонбоева. “Инновацион таълим технологиялари ва педагогик компетентлик” модули бўйича ўқув-методик мажмуа. Низомий номидаги ТошДПУ ҳузуридаги Педагог кадрларини қайта тайёрлаш ва уларнинг малакасини ошириш тармоқ маркази Т., 2016 й, 74 б

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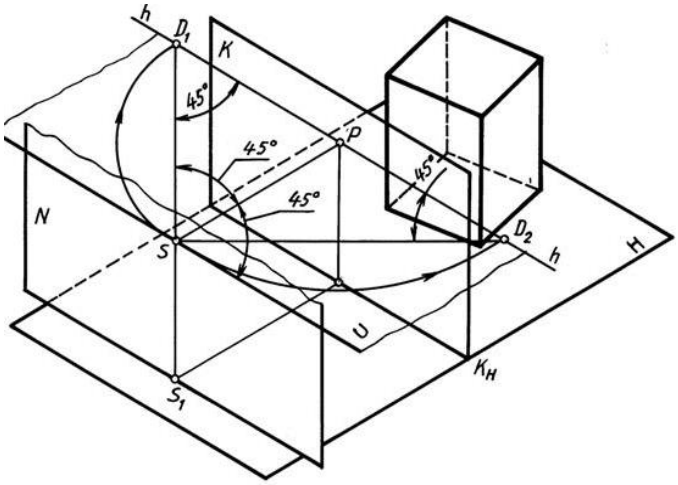

№	The term in the image is a symbol in the drawing	The correct name of the term in the image								The correct answer
		Remote points	The plane of things	The horizon plane	Horizon line	Neutral plane	Observation point	he plane of the picture	he basis of the picture	
1.	N plane									
2.	K plane									
3.	H plane									
4.	U plane									
5.	K_H line									
6.	h line									
7.	D_1 va D_2 points									
8.	S point									

Evaluation criteria
A student who correctly identifies the names of 1-4 terms - a grade of "2".
A student who correctly names 4-6 terms - a grade of "3".
A student who correctly names 7 terms - a grade of "4".
A student who correctly names 8 terms - a grade of "5".

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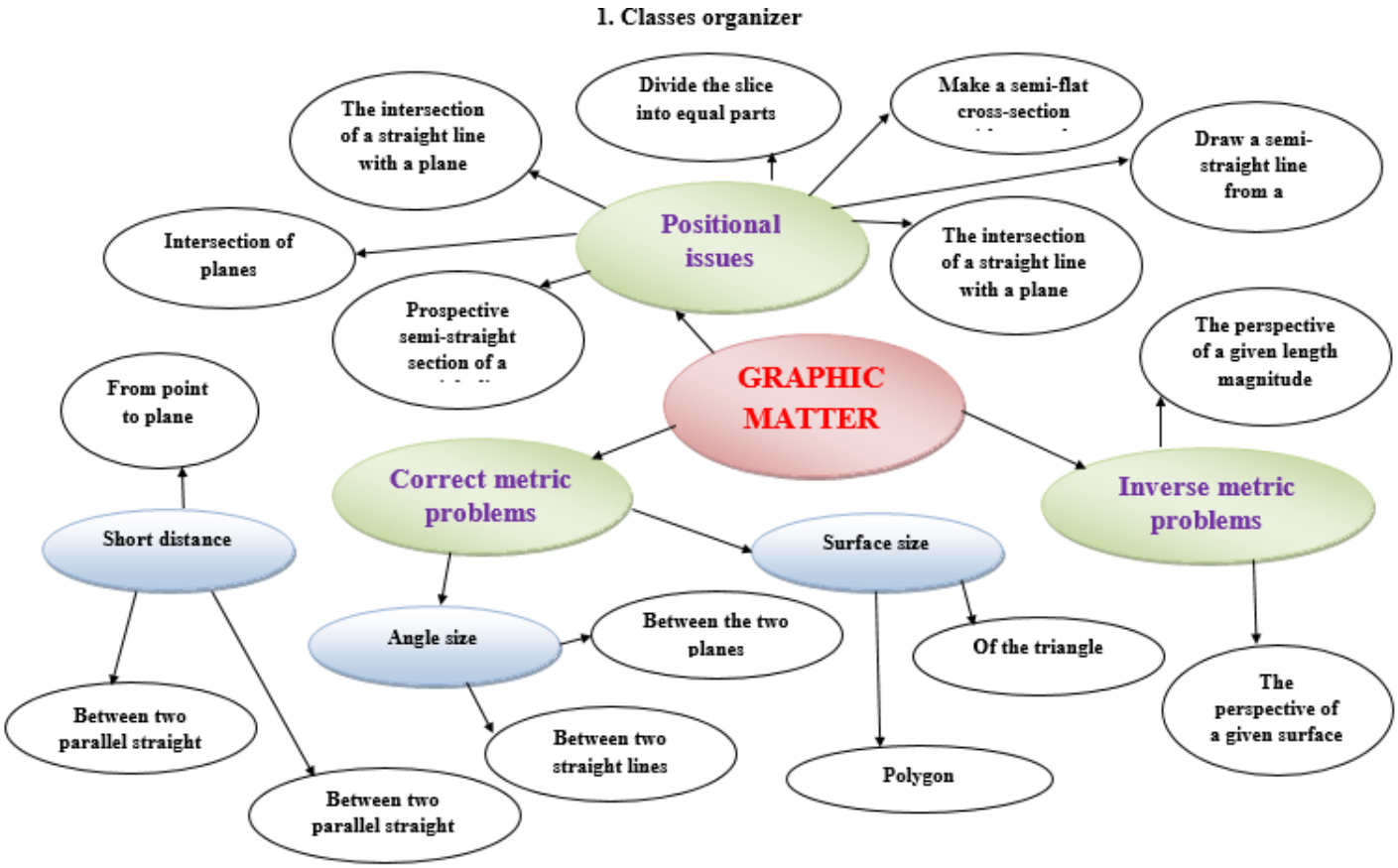
Another method is called “Classes” and this method is a pedagogical strategy. It helps students to explore a topic in depth and teaches them to branch out a concept or clear idea related to a topic in a free and open way that is inextricably linked. During the clustering process, student feedback will not be discussed or criticized.



Another interactive method is the Syncline Strategy, which is derived from the French and means "five lines". “Syncline Strategy” is a non-rhyming poem that helps to synthesize data (forming integrated ideas based on individual data), on the basis of which information on the studied topic (concept, event, event) is collected. . Each student has the opportunity to express this set of information in their own words through a variety of options or perspectives. Syncline making is the art of expressing complex ideas, feelings, and emotions in a few words. This process helps to better understand the topic and better understand the information.

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LIGHTING WITH SINKVINE STRATEGY

1st row. *Issue* (One noun)

2nd row. *Position and metric* (Two adjectives)

3rd row. *Determines short distances, determines the actual size of surfaces, determines the actual size of angles* (Three verbs)

4th row. *Problems are used to construct and analyze an object perspective* (Four words)

5th row. *Geometric construction* (A word)

Problem solving develops the student's spatial imagination and is used to construct object perspectives

Such interactive methods can be used effectively in teaching descriptive geometry. Examples include the Venn Diagram, the Decision Tree, the Written Debate, the Classification Table, and more. Through the effective use of interactive methods, active communication between teacher and student, student and student is achieved. The student learns to express and defend his or her point of view. It also involves listening to the opinions of others, treating them with respect, analyzing one's own opinions and those of the peer and the teacher, and making the right decision.

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