

TEACHING DRAWING LESSONS USING MODERN INTERACTIVE METHODS**Rustamova Zaringiz Botir kizi**

Samarkand State Pedagogical Institute

Specialty: Theory of Engineering Graphics and Design

Graduate Student, Group 104

Annotation: The article analyzes the significance of using modern interactive methods and technologies in teaching drawing, and their impact on students' knowledge levels, thinking development, and efficiency of mastering the subject. Moreover, it elucidates opportunities offered by organizing lessons on the basis of digital technologies, and through visual and practical activities for forming students' spatial imagination and technical thinking. Interactive approaches help students not only comprehend theory but also acquire deep practical skills in drawing.

Keywords: drawing, interactive methods, digital technologies, spatial thinking, visual teaching, graphic culture, educational technologies

Introduction

Nowadays, in the education system increasing efficiency in the teaching of subjects is a pressing task, and alongside traditional methods, using modern pedagogical technologies and interactive methods is among the top priorities. Especially in teaching drawing this approach carries great importance. Drawing is one of the core subjects within engineering and technical disciplines; it shapes students' spatial thinking, their ability to represent forms, and graphic culture. Therefore, teaching this subject in an interactive way, using visual and practical methods to provide knowledge enhances students' interest in the subject and improves comprehension.

Using modern interactive methods brings students closer to the subject of drawing, raising their curiosity and nurturing an inventive approach. From this perspective, the STEAM approach (Science, Technology, Engineering, Arts, Mathematics) is being widely used in drawing lessons. This approach combines technical and creative thinking, increasing student interest in carrying out complex drawings and projects. In modern drawing education, development of students' practical skills occupies crucial place. Because this subject involves not only theoretical knowledge but also creating precise graphical expressions, which serve the development of technical thinking. From this perspective, drawing lessons guided by the principle "learning by doing" are effective. Students can achieve deep assimilation through assigning them the creation of drawings based on real details and objects, modeling them, and gradually carrying out practical tasks creating complex graphic representations.

Interactive lesson methods give students opportunity to reflect and analyze the work they have done. This enables them to see their work critically, to identify mistakes and correct them. Especially, recording one's drawing process via video and reviewing it after the lesson directs students toward independent learning.

Visual interactive platforms used in drawing — for example, GeoGebra, Tinkercad, AutoDesk Viewer — help animate even simple drawings. These tools allow the student to view two-

dimensional graphics in three-dimensional environments. Especially in projects integrated with 3D printing technologies, the practical value of the drawing subject is further increased.

Differentiated approach is also an integral part of interactive methods. Tailoring lessons according to individual abilities, learning styles and technical readiness of students makes the teaching more effective. The teacher can give more complex projects to advanced students, and for beginners, simple drawings, taught step by step. Such methodology helps each student to fully realize their potential.

Interactive methods enrich not only the content of the lesson, but also strengthen communication between teacher and student. Students freely express their thoughts, propose alternative approaches to drawings, and learn to make decisions independently. This forms them not only as knowledgeable, but as initiative and responsible persons.

Organizing drawing lessons on a project basis also yields effective results. For example, assigning small groups of students to design real objects: models, structures, interior design, architectural forms. They express these projects in drawing form using graphic software, testing theoretical knowledge in practice. In this process students do not only create drawings, but also acquire problem-solving skills, decision-making, time management and other important skills. In distance learning conditions, teaching drawing lessons is also carried out successfully with interactive tools. Through online platforms (Zoom, Google Classroom, Moodle) graphical assignments are assigned, reviewed online, and teacher's interactive feedback gives analysis. This was widely used during the pandemic and remains useful now to improve the quality and convenience of lessons.

AR (augmented reality) and VR (virtual reality) technologies also reveal great prospects in the teaching of drawing. Students using VR headsets or AR applications can transform 2D drawings into 3D forms, view them in space, analyze them from every angle. This significantly enhances spatial imagination and helps in more perfect understanding of drawings.

In recent years, empirical studies have confirmed that integrating digital drawing tools into art and design education significantly enhances students' learning outcomes. A mixed-methods study at Jadara University found that students who used digital drawing tools in a visual communication course improved their academic performance compared to those using only traditional methods. The experimental group reported higher engagement, enjoyment, and confidence in their design work. This suggests that digital tools can meaningfully support the learning of drawing skills, not as mere novelty but as effective pedagogical means.

Another relevant method is Drawingvoice 2.0, which merges collaborative drawing with online interaction to foster metacognitive reflection and awareness in the creative process. In this approach, students engage in group sessions where they sketch together while sharing thoughts and feelings via social media or asynchronous platforms. This coteaching of visual and verbal reflection promotes deeper understanding of the artwork and enables the emotional and cognitive dimensions to interact. Thus, drawing becomes not just a technical activity but also a medium of self-expression and group dialogue.

In teaching geometrical or descriptive drawing (which is closely related to your field of "engineering graphics"), interactive methods such as gamification, virtual visualization, and problem-based learning have been shown to increase comprehension of spatial concepts. A study on interactive methods in descriptive geometry highlighted that such practices shift the classroom from teacher-centered to student-centered, promoting not only acquisition of technical knowledge but also teamwork, creative thinking, and professional readiness. This

underscores that drawing education can benefit from the same research insights applied in geometry teaching.

One promising area lies in augmented reality (AR) sketching tools, such as RealitySketch, where graphic elements drawn by the user dynamically bind to real-world objects in real time and respond to physical motions. For drawing education, such tools permit students to sketch in virtual space while visualizing how forms interact with a real environment. This makes the transition from 2D to 3D more intuitive and helps in developing spatial imagination.

Similarly, interactive projection systems like SketchMeHow use user sketches as inputs for real-time guidance. In a scenario where a student begins drawing, the system projects guidance overlays, subdivides tasks, and gives spatial cues to correct or refine the sketch. In drawing classes, such feedback can act like having a tutor guiding each student piece by piece, improving learning efficiency.

However, the use of interactive methods in drawing instruction is not without challenges. Some commonly observed limitations include:

- **Resource constraints:** Some schools or institutions lack the hardware (tablets, AR/VR gear, powerful computers) or software licenses needed.
- **Teacher training and readiness:** Even when tools are available, teachers may lack pedagogical knowledge to integrate them effectively.
- **Overreliance on technology:** There is a risk that students may lean too heavily on digital aids and neglect manual drawing practice, weakening foundational skills.
- **Inequality in access:** Students from underprivileged backgrounds may have limited access to required devices or stable internet.
- **Distraction and cognitive load:** Complex digital interfaces or flashy features might distract learners or overload them cognitively, reducing the learning effectiveness.

To address these challenges, some recommendations are:

1. **Hybrid blended learning:** Combine traditional manual drawing with digital tools, allowing students to benefit from both tactile skills and visual enhancements.
2. **Scaffolded introduction of technology:** Gradually introduce interactive tools, beginning with simple ones (e.g. digital sketching apps) and moving to advanced AR/VR.
3. **Continuous professional development:** Organize workshops, peer learning sessions, and mentoring to build teachers' capacity in integrating digital methods.
4. **Open and cost-effective tools:** Encourage use of free or open-source software (e.g. SketchUp Free, Tinkercad, GeoGebra) to reduce cost barriers.
5. **Monitoring and feedback systems:** Use reflective assignments, peer review, and meta-cognitive prompts to ensure that students are not just using tools superficially but internalizing drawing principles.
6. **Localized content and culturally responsive design:** Ensure that digital drawing tasks, interfaces, and examples align with students' cultural context to increase relevance and engagement.

By including such enriched content in your main section, you deepen the theoretical foundation, provide concrete examples from research, acknowledge challenges, and offer actionable suggestions. This will strengthen your article's academic weight and practical relevance.

Another important aspect is that the teacher themselves should be digitally literate — that is, fully mastering modern software and technologies. It is not enough for technological tools to be present; using them pedagogically correctly affects lesson effectiveness. That is why regular professional development courses and experience-sharing seminars for teachers are essential. Thus, application of interactive methods in drawing lessons increases the quality and efficiency of education, and aids in the simultaneous development of students' technical thinking, creativity, and practical skills. Such an approach not only corresponds to today's educational needs but also prepares students for engineering and technical professions in real life.

Conclusion

Organizing drawing lessons based on modern interactive methods plays a vital role in shaping students' graphic culture, technical thinking, and fostering independent creative thinking. Knowledge conveyed through digital technologies becomes not only clear and understandable, but also engaging. Interactive lessons help students develop skills in constructing and analyzing drawings and prepare them to tackle engineering and technical challenges in real life. Therefore, introducing modern technologies into drawing lessons is among the most urgent tasks of education today.

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