

## Methodology of Training Students in Design and Modeling of Clothes Using Information Communication Technologies

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### Abstract

*The purpose of this article is to develop a methodology for the development of competence in the design and modeling of clothing for university students through the use of information and communication technologies, its introduction into the educational process and increase the effectiveness of education.*

*This article discusses the issues of improving students' knowledge and skills, interest in the learning process and the ability to apply their knowledge in practice in the future, using modern information and communication technology tools in the training of design professionals.*

*Emphasis will be placed on developing and implementing a new teaching method aimed at enhancing the competence of design students in designing and modeling clothing. The role and perspectives of teachers are very important and they are highlighted as key participants in the process.*

*The data show that, the using authoring technology of SCADeEduWeb and information communication technologies in the educational process on the basis of interactive teaching methods, that allow students of professional education to effectively teach the design and modeling of clothing through the design of innovative digital tools, modeling creative and reflexive approaches helps to increase the effectiveness of education and facilitates the organization of the learning process. In particular, it shows that the contribution of information communication technologies to the improvement of the educational process in educational institutions, where information communication technologies are an innovative factor. Authoring technology of SCADeEduWeb allows each student to achieve good results through independent, creative thinking at each stage of mastering the subject "Design and modeling of sewing objects". Achieving this high level will lead the educational institution not only to modernize the technological tools, but also to change the teaching models.*

*In order to achieve development, we need to master digital knowledge and modern information technologies, use new teaching methods. This allows us to take the shortest path. Indeed, the deep penetration of information technology into all parts of the world today is creating new opportunities.*

**Key-words:** Modern Information and Communication Technologies, Multimedia, Computer Programs, Educational Innovations, Quality, Non-traditional Teaching Methods.

## **1. Introduction**

Today's process of rapid development and globalization places a number of demands on higher education. It is important not only to equip students with knowledge, but also to develop their professional skills, abilities and competencies, to use the opportunities of modern information technology, to teach them to apply in the educational process, in the field of specialization.

The prospective professional must be able to think critically, analyze social problems, develop solutions, and be socially responsible. The training of specialists who meet such requirements requires the use of non-traditional teaching methods in the higher education system, the development of new effective teaching methods.

Advanced countries and regions, which are working effectively to introduce digital technologies in education and create a digital learning environment, are showing high quality education results. [2] In particular, the introduction of digital technologies in the educational process in Uzbekistan has become one of the priorities in the development of higher education. [1]

A number of studies and reports in recent years have highlighted the potential and benefits of information and communication technology (ICT) in improving the quality of education. Information and communication technology is seen as a "key tool for building a knowledge society" and, in particular, as a mechanism for reviewing and changing education systems and processes, leading to an increase in the quality of education for all. [5]

The need for future specialists to develop skills in working with information communication technologies, firstly, the introduction of new intellectual learning resources in the educational process, secondly, using them, teachers teach and have the skill to independently develop electronic learning resources in special subjects, and thirdly, this is closely related to the full realization of the possibilities of increasing the effectiveness of the teacher's professional activity. [3,4].

## **2. Purpose and Mission**

The level of development of modern society is determined by its intellectual potential, namely, its ability to produce, assimilate and practically use new knowledge and technologies. At the same time, the natural basis of modern society is primarily education, and therefore, the process of

modernization of the education system should not only match, but also outstrip the development of society as a whole.

Our research focuses on improving the methodology of developing professional education students' competencies of the design and modeling of clothing through information communication technologies, and its introduction into the educational process. The objectives of the research are: to analyze the scientific and theoretical basis of the functional possibilities of improving the content of teaching students to design and model clothing on the basis of modern digital devices; identify ways to effectively use information communication technologies in teaching students to design and model clothing in the process of professional education.

### **3. Methods**

The development of the vocational education system in the modern world is associated with the widespread introduction of information communication technologies (ICT) into the educational process, without the use of which a modern specialist of any profile is unthinkable in their professional activities.

Information and communication technologies play an important role in the educational process and help to solve the following tasks:

- To discover, preserve and develop individual abilities in students, consisting of unique qualities of each person, to form in them the ability to learn, the desire for self-improvement;
- Ensuring a comprehensive study of events and phenomena, the close connection between the exact, natural-scientific, technical, social, humanities and the arts;
- Continuous and dynamic updating of the content, form and methods of educational processes.

Solving computer-aided design problems is not only the most important area of design activity, but also the main direction of scientific and technological progress. CAD is actively applied in human practice all over the world due to the intensive use of personal computing technologies.

The best form of organization of the design process is achieved when using a set of design automation tools that are interconnected with the departments of the design organization CAD and perform automated design. The complex of design automation tools includes software, along with technical, mathematical and other types of software.

There are two groups of software products that graduates need to master in order to form a competent bachelor's degree in higher education in the development of design and modeling competence of students in vocational education:

- 1) Software products required to master basic user skills.
- 2) Professional (or specialized) software products.

The task of the teacher is to teach the student to master certain information over a period of time in order to use it in practical activities. In solving this problem, the teacher can combine traditional teaching methods with modern information technology, including computer, pedagogical technology.

In order to develop students' design and modeling competencies and achieve educational effectiveness, we have proposed our author's methodology "SCADEduWeb", developed as a result of our observations and research.

Each stage of this authoring methodology serves to develop new knowledge, skills, competencies.

Science—teaches science news using the latest news of the XXI century;

Creative thinking—performs critical and creative thinking tasks, teaches to develop new ways of solving problems;

Art—teaches to create, to create sketches based on ideas;

Design engineering—allows creativity to be combined with engineering knowledge and turns ideas into real products. Explores, researches and produces ideas for new products and systems for use in manufacturing. It also teaches modification of existing products or processes to increase efficiency or productivity;

Education Web 2.0—allows you to work with the team, retrieve, process and post text, voice messages, videos, and various sources of information on the Internet. Facilitates the use of the Internet as a form of mass communication and the creation and exchange of information, ideas, interests and other forms of expression through virtual communities, networks.

#### **4. Results and Feedback**

ICT in the educational process allows:

- Openly plan the learning process (drawing up an individual educational trajectory - a sequence of modules from the system of training courses of the corresponding program).

- To solve the problem of interactive communication in the interaction of the teacher and students, teacher and study group, individual student and study group.
- To guarantee constant monitoring of the level of mastering of educational material.
- Provide students with educational materials and educational information stored on a variety of information servers and databases of telecommunication networks.
- Integrate domestic and foreign education systems, providing students with the opportunity to get education both online and offline.
- Learn everything and always (regardless of age, qualifications, health status, working conditions, distance from the training center, etc.).
- Choose the place of study (independent choice of the territory of study).

ICT as a new educational tool lead to changes directly in learning technologies.

Experimental work were conducted in 2019-2021 at the Tashkent State Pedagogical University named after Nizami (TSPU), Bukhara Engineering and Technology Institute (BukhETI) and Fergana Polytechnic Institute (FerPI) in the educational areas Professional Education Design (suit), Professional Education (Light industry technologies and equipment), "Development and construction technology of light industry products" and "Technology and equipment of light industry". Developed within the framework of the dissertation, the innovative teaching methodology ("SCADEduWeb") was tested in experimental groups organized on the basis of computer programs for designing and modeling clothes in the form of lectures, practical and laboratory classes. Analysis of work experience and initial experimental results revealed that the possible methods and effectiveness of teaching are significantly dependent on modern computer technologies and software of the learning process. Analysis of work experience and initial experimental results revealed that the possible methods and effectiveness of teaching are significantly dependent on modern computer technologies and software of the learning process.

The interaction between teacher and student activities is carried out using teaching aids - educational information carriers, which include oral, slide, video and film, textbook, computer and other tools that summarize the pedagogically processed content of education.

At the heart of teaching methods is their comparative effectiveness, which is the result of goals, teaching methods and timing, material resources, and the efforts of teachers and students. In modern didactics, the method of teaching is considered as a complex, multifaceted pedagogical phenomenon with different characteristics.

The theoretical knowledge acquired by students in the subject "Design and modeling of sewing objects" in the lectures does not immediately become an active means of understanding the processes and events occurring in the objects and systems under study. It takes some time and experience to develop the skills and abilities to apply this theory in practice. This is achieved through the use of various forms of practical training.

The analysis allows us to conclude that the skillful combination of theoretical, practical and simulator training during practical training helps to develop computer modeling competence and use them in solving professional problems, the formation of personal qualities such as creative activity, independence of students.

Independent work of students with information stored in a database of teaching aids or on the Internet opens up endless opportunities for independent learning, deepening of knowledge in a particular field and the development of intelligence. Computer technology allows to expand the audience and prepare students for life in the information society.

In the experimental groups, the lessons based on the authoring methodology proposed by us and information communication technology tools were deepened with the use of software and substantiation of didactic features and the use of developed educational technology.

The results of pedagogical experiments conducted during the research showed that the lessons based on the electronic manual and authoring methodology used in teaching students, forming their interests and knowledge are effective. The quality of the knowledge acquired by the students of the experimental group was 70% -75% on the subject "Design and modeling of sewing objects ", and the efficiency of design and modeling competence also increased.

## **5. Conclusion**

In short, in the organization of project-based education through the use of modern information and communication technologies in the educational process, the organization of practical and laboratory classes in specialized disciplines will increase students' creative thinking, independent decision-making and teamwork skills. It is obvious that the use of modern information and communication technologies in the training of specialists will increase the chances of achieving educational effectiveness through the organization of project-based education. The use of information and communication technologies in education allows students to communicate directly with the teacher at a convenient time in the forum, chat, e-mail.

The content of e-learning resources should focus on the study of different areas of science. Solving the problem of using information and communication technologies will allow to raise education to a qualitatively new level.

During the research, information technology tools were used effectively and lessons were organized on the basis of the author's method "SCADEduWeb". Along with the Effective practical result, team creative collections, buddying teaching methods used in the training, as well as the author's method "SCADEduWeb" created an interaction between teachers and students.

During of our research, we compared a CAD system used in the garment industry to solve the above problem, which is enough to adapt to the conditions of a teaching and educational institution, and it was proved that, among the software it is easy to use, it is free to download and, most importantly, to have the ability to achieve the effectiveness of education.

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