



EFFECTIVENESS OF TEACHING CARPET WEAVING TECHNOLOGY TO SCHOOL STUDENTS USING INFORMATION AND COMMUNICATION TECHNOLOGIES

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Annotation. *This article highlights the effectiveness of teaching carpet weaving technology to school students using information and communication technologies. It was found that the efficiency of delivering topics to students increased by 20-30%. Additionally, the opportunities for students who struggle with comprehension have improved.*

Keywords: *carpet, weaving, pile carpet, felt.*

1. Introduction

Carpet weaving traditions in Uzbekistan are incredibly ancient, reflecting the labor and creative pursuits of many generations. Primarily, carpets woven by skilled rural women working from home are both artistically and technically refined.

2. Experimental Methods

Uzbek carpets are classified into three types: short-pile carpets (gilam), long-pile carpets (julkhirs), and flat-woven carpets (palos). Short-pile Uzbek carpets are often decorated with deep brown geometric shapes, harmoniously arranged with colorful circular elements. The finest examples of Uzbek short-pile carpets are highly valued for their decorative qualities, color depth and transparency, as well as the simplicity and perfection of their weaving.

At the beginning of the 20th century, around 50 Uzbek tribes resided in the Samarkand region. Some tribes lived in unity, while others led a more scattered lifestyle but remained in frequent contact. However, with the gradual spread of agriculture and farming, carpet weaving significantly declined. According to statistical and archival data, by the late 19th century and the 1870s, only about 25%

of the Uzbek tribes in the Samarkand district were engaged in carpet weaving. The annual production from several villages amounted to around ten carpets and palos, which were frequently seen in the markets. The decline in carpet production continued into the early 20th century.

In the examined settlements, only ancient samples of pile-carpet products remained. Researchers did not encounter any carpet weavers who knew the weaving techniques or patterns used in these pile carpets. Additionally, the tools and equipment for weaving these carpets were no longer preserved. The production of more technically complex palos had ceased, though some women were still familiar with the palos weaving techniques. Many women only knew the technical names of palos patterns, such as "Ettita ipli" (seven-thread) and "Tortta ipli" (four-thread), though these terms had nearly faded from use. However, all carpet and palos weaving activities were carried out by the local population, primarily older generations of women.

By the 1920s, only simple striped palos and kojimalar were produced. Women in rural areas wove carpets not for sale but for household use. However, in regions such as Zomin and Jizzakh, some carpet weavers produced carpets and palos for commercial purposes (notably in Zomin, Ravot, Korpasat, Kayli, and Yoyishla).

The Uzbek groups in the Samarkand district engaged in weaving various types of carpets, both **pile** and **non-pile (palos)**. Pile carpets, known for their soft texture, are classified into two groups based on technical features and artistic appearance: **long-pile** and **short-pile** carpets.

- **Long-pile carpets** were large and primarily used as floor coverings, including types such as *julkhirs* and *julvarak*.
- **Short-pile carpets** were more diverse, including **small carpets, palos, and other household textile products**.
- The weaving technique of **short-pile carpets** was more widespread among the Uzbek population than that of pile carpets.

Unlike in the past, modern technologies have significantly transformed carpet weaving, making the process **more efficient and precise**. **Computer-assisted carpet weaving** refers to the use of computers for designing carpets or automating the weaving process. These technologies **enhance accuracy and streamline production**. Below are the key aspects of computer-assisted carpet weaving:

1. Computer-Aided Carpet Design

- Specialized **computer programs** allow designers to create digital carpet designs.
- Designers can **adjust patterns, colors, and aesthetic details** directly on the computer screen.
- Various design elements, including **patterns, color combinations, and geometric shapes**, can be generated with ease.
- **Examples of software:** *Adobe Illustrator, CorelDRAW*, and specialized carpet design programs (*e.g., Wilcom*).

2. Automated Weaving Systems

- **Computer-controlled weaving machines** automate the carpet weaving process.
- The process consists of the following steps:
 - **CAD (Computer-Aided Design)** software is used to input the carpet design into the computer.
 - **CAM (Computer-Aided Manufacturing)** systems generate commands for the weaving machines.
 - **Jacquard weaving machines** allow for precise and high-speed weaving, digitally controlling the patterns.

3. Automated Control of the Weaving Process

- **Computer systems manage the entire carpet weaving process** for higher accuracy and efficiency.

- The system not only **creates the design** but also **controls thread placement** and other materials.

- Machine settings such as **thread length, density, and color distribution** are **automatically adjusted** by the computer.

4. Advanced Carpet Weaving Technologies

- **Tufting Technology:** Uses special machines to insert yarns into a base fabric, forming the primary pattern.

- **Jacquard Weaving Technology:** Automates pattern weaving using a **digital program**, allowing the production of complex and intricate designs.

5. Advantages of Computer-Aided Carpet Production

- **Speed:** Automated weaving significantly reduces production time.
- **Precision:** Digital designs and machine-controlled weaving ensure **high design accuracy**.

- **Flexibility:** Design modifications can be easily made using software.
- **Mass Production:** These systems enable the **fast and efficient** manufacturing of **large quantities of carpets**.

The **integration of modern computer-aided carpet weaving** has revolutionized production, making it possible to create **high-quality carpets** more **efficiently**. This method **surpasses traditional hand-weaving** by **improving quality, reducing labor costs, and saving time**. [2]

Large **floor carpets** have historically been woven in **sizes ranging from 2.0–2.5 meters in length and 1.2–1.4 meters in width**. These carpets were mainly woven **for household use**.

Initially, **only urban residents** showed interest in these carpets, but over time, demand for **Samarkand carpets** grew across **other regions of Central Asia and neighboring countries**.

Special types of carpets were produced for various purposes, including prayer rugs, carpets hung on the inner side of doors, those placed above doors, floor

coverings for large rooms, seat covers, and carpets for courtyards or gardens. These textiles, including palos, sholchalar, and koxmalar, were crafted using various weaving techniques.

Carpet weaving requires several years of work and significant labor, which is why there is a considerable price difference between felt (kigiz) and carpets (gilam). The higher price of carpets compared to felt is attributed to their historically labor-intensive craftsmanship, maintained for centuries.

Since the 19th century, carpet production has been commercialized, attracting merchants, antique collectors, and traders who have profited from the industry. This commercialization led to the widespread popularity of carpets, making them symbolic gifts in the 20th and 21st centuries.

Today, carpets are regarded as a symbol of wealth, prosperity, and luxury. However, their modern symbolic meaning differs from their historical significance. In medieval times, carpets held two distinct symbolic meanings, which were deeply rooted in the culture of that era. [1]

Teaching carpet weaving technology using information and communication technologies (ICT) creates significant opportunities for students to acquire new knowledge. This approach not only enhances students' technical and aesthetic skills but also fosters creative thinking, problem-solving abilities, perception, and cognitive skills.

The integration of information technologies into the educational process makes learning more interactive and engaging, thereby improving the effectiveness of teaching. Thus, teaching carpet weaving technology with the help of ICT serves as an effective tool for implementing innovative approaches in education and ensuring high-quality learning for students.

Conclusion

The integration of information and communication technologies (ICT) into carpet weaving education has significantly enhanced the learning process, making it

more interactive and efficient. This approach has improved students' technical and aesthetic skills, while also fostering creativity, problem-solving abilities, and cognitive development. The use of modern digital tools in carpet design and automated weaving has streamlined production processes, increasing accuracy, speed, and efficiency.

Additionally, the historical significance of carpet weaving in Uzbekistan highlights its deep cultural roots and traditional craftsmanship. Despite a decline in manual weaving over time, the adoption of modern technologies has ensured the preservation and advancement of this ancient art. The commercialization of carpets since the 19th century has further solidified their symbolic value as representations of wealth, luxury, and cultural heritage.

Thus, teaching carpet weaving technology through ICT not only preserves a rich historical tradition but also equips students with innovative skills, ensuring the sustainability and modernization of this craft in the 21st century.

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