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# PREPARING STUDENTS FOR MODERN PROFESSIONAL ACTIVITIES THROUGH TEACHING NATIONAL CRAFTS BASED ON THE STEM APPROACH

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**Abstract**

This article explores the pedagogical potential of teaching national crafts based on the STEM (Science, Technology, Engineering, and Mathematics) approach, its significance in developing students' professional competencies, and innovative methods for preparing students for modern professional activities. It also analyses the integration of national craftsmanship traditions with modern technologies, engineering thinking, mathematical calculations, and creative design.

**Keywords:** national crafts, STEM approach, professional training, innovative education, technology education, project-based learning, creative thinking, digital technologies.

Today, one of the main objectives of the education system is to prepare students for modern professions and develop their independent thinking, problem-solving, creativity, and practical skills. In this process, teaching national crafts through modern educational approaches is of particular importance. This is because craftsmanship represents not only the rich cultural heritage of our people but is also closely connected with production, design, entrepreneurship, and technological activities.

The STEM approach helps connect students' theoretical knowledge with practical activities through the integration of science, technology, engineering, and mathematics. Applying this approach to national craft lessons makes it possible to increase students' professional interests, strengthen their respect for national values, and develop competencies relevant to the modern labour market.

National crafts encompass pottery, embroidery, wood carving, gold embroidery, jewellery making, textile production, and other forms of applied art. These activities require skills such as understanding material properties, measuring, calculating, creating shapes, planning technological processes, and evaluating product quality.

The STEM approach makes it possible to connect these processes from scientific and practical perspectives. For example, studying the physical properties of clay in pottery is related to science; designing the shape of an object is associated with engineering; calculating dimensions and proportions involves mathematics; and using modern tools and equipment is connected with technology.

In embroidery lessons, studying the geometric structure of patterns, identifying principles of symmetry and repetition, and calculating material consumption help develop students' mathematical literacy. In wood carving, producing objects based on

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technical drawings, selecting materials, and following safety rules contribute to the development of engineering and technological competencies.

Therefore, teaching national crafts through the STEM approach transforms traditional practical lessons into an interdisciplinary educational process. The following innovative methods are appropriate for preparing students for modern professional activities.

1. Project-Based Learning

Through this method, students independently or collaboratively design and produce a particular craft product. For example, they may be assigned to create a souvenir decorated with national patterns, a textile product with a modern design, or a decorative wooden object. Students develop an idea, prepare a drawing, select materials, and present the final product. This process develops planning, teamwork, and problem-solving skills.

2. Problem-Based Learning

Students are presented with problem situations related to the production or improvement of craft products. For example, they may be asked to reduce material consumption, improve product durability, or adapt a traditional pattern to a modern object. Students explore different solutions, compare them, and select the most appropriate option. As a result, their critical and engineering thinking skills are developed.

3. The Use of Digital Technologies

Computer software, digital drawings, graphic images, and three-dimensional modelling tools improve the design process for craft products. For example, students can create national patterns using graphic design software, develop a 3D model of an object, or present a digital design of a finished product. Such activities enhance students' digital literacy and their ability to adapt to modern production technologies.

4. Design and Practical Experimentation

Using this method, students undertake creative tasks while considering a product's appearance, convenience, durability, and functional characteristics. An initial prototype is created and tested, its shortcomings are identified, and the product is subsequently improved. This approach develops skills related to design, technological production, and product quality control.

5. Entrepreneurship-Oriented Education

In addition to creating craft products, calculating their production costs, material expenses, selling prices, and market demand helps develop students' economic thinking. For example, students may develop a name and logo for their products, create advertising materials, and present their work. These activities foster entrepreneurship, marketing skills, and professional initiative.

When organising lessons based on the STEM approach, students should not be limited to acquiring ready-made information. Instead, they should be encouraged to conduct independent research and achieve practical results.

For example, consider a project entitled "Creating a Modern Souvenir Based on a National Pattern." First, students study the origins and meanings of national patterns. They then analyse the geometric shapes, dimensions, and symmetry of the patterns. At the next stage, they develop the product design, select appropriate materials, and manufacture the item. Finally, they evaluate its quality, aesthetic appearance, and practical value.

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The following competencies can be developed through this project:

- **Scientific competence** — studying materials and their properties.
- **Technological competence** — using tools, equipment, and digital resources.
- **Engineering competence** — designing, constructing, and testing products.
- **Mathematical competence** — measuring, calculating, and analysing geometric shapes.
- **Creative competence** — developing new ideas and creating original products.
- **Entrepreneurial competence** — calculating costs, presenting products, and analysing market demand.

In such lessons, students' active participation, independent decision-making, and achievement of practical results are regarded as key criteria. The teacher acts as an organiser, adviser, and facilitator who guides students throughout the learning process.

Teaching national crafts based on the STEM approach helps students prepare not only for traditional occupations but also for modern manufacturing and service industries. In particular, students develop skills related to design, digital modelling, product manufacturing, technological process planning, and small business development.

Furthermore, integrating national crafts with digital technologies creates opportunities to preserve national heritage, adapt it to contemporary requirements, and enable young people to demonstrate their creative potential.

To improve the effectiveness of this approach, educational institutions should be equipped with the necessary tools and equipment, cooperation with skilled artisans should be established, and practical projects and career-orientation activities should be expanded. In addition, when assessing students' performance, attention should be paid not only to the finished product but also to the design process, independent thinking, technological solutions, and teamwork skills.

Teaching national crafts based on the STEM approach is an effective way to connect students' theoretical knowledge with practical activities, develop creative and engineering thinking, and prepare them for modern professional activities. Project-based learning, problem-solving tasks, digital modelling, design activities, and entrepreneurship-oriented lessons can contribute to the development of students' professional competencies.

Thus, integrating national crafts with the STEM approach creates important pedagogical opportunities to combine national values with modern technologies, increase students' professional interests, and prepare them for their future working lives.

## References

1. Law of the Republic of Uzbekistan "On Education." No. O'RQ-637, September 23, 2020.
2. Decree of the President of the Republic of Uzbekistan No. PF-6079, "On Approval of the Digital Uzbekistan–2030 Strategy and Measures for Its Effective Implementation," October 5, 2020.

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3. Bybee, R. W. The Case for STEM Education: Challenges and Opportunities. Arlington: NSTA Press, 2013.
4. Kelley, T. R., & Knowles, J. G. "A Conceptual Framework for Integrated STEM Education." International Journal of STEM Education, 2016, 3, Article 11.
5. Yakman, G. STΣ@M Education: An Overview of Creating a Model of Integrative Education. 2008.
6. UNESCO. UNESCO Strategy for Technical and Vocational Education and Training (TVET) 2022–2029. Paris: UNESCO, 2022.