



The Concept Of A Modular Approach In Technological Education And The Methodology Of Teaching The “Skullcap Art” Module

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Abstract. This article examines the history of the formation, theoretical foundations, and application areas of the modular approach. The stages of development of the idea of modularity from the Industrial Revolution to the present day are highlighted, and its importance in programming, engineering, and the education system is revealed. The article also analyzes the essence, structure, and basic principles of modular learning. Particular attention is paid to the effectiveness of applying the modular approach in technological education, especially in teaching the art of skullcap making. It is emphasized that this approach contributes to the development of students' independent activity, practical skills, and creative thinking. As a result, the important role of the modular approach in improving the quality and effectiveness of education is concluded.

Keywords: modular approach, modular learning, educational technology, independent learning, practical skills, technological education, skullcap art, educational effectiveness.

Introduction. The history of the modular approach has gradually developed across several fields. It initially appeared in engineering and manufacturing and later spread widely to programming, education, and business. The modular approach is studied through various stages of development.

Early Stages. The roots of modular thinking date back to the Industrial Revolution (18th–19th centuries). During this period:

- complex mechanisms began to be manufactured in separate parts;
- the concept of spare parts (standardized components) emerged;
- dividing systems into parts increased efficiency.

This approach later became one of the fundamental principles of engineering design.

20th Century and Scientific Development. In the 20th century, the idea of modularity acquired a scientific basis. In particular:

- systems analysis developed;
- modular structures began to be used for managing complex systems.

The famous scientist Herbert A. Simon emphasized that complex systems possess hierarchical and modular structures. This significantly influenced the theory of the modular approach.

Emergence in Programming. During the 1960s–1970s, with the development of computer technologies, the modular approach entered programming:

- programs began to be divided into functions and modules;
- code management and understanding became easier.

At the 1968 NATO Software Engineering Conference, modularity was proposed as an important solution to software problems. Scientist David Parnas also scientifically substantiated the principles of modular programming. He proposed the principle of “information hiding.”



Further Development. During the 1980s–2000s:
object-oriented programming developed;
modules expanded in the form of “classes” and “components”;
architectural approaches for large systems emerged.

Modern Period

Today, the modular approach is widely applied in:
microservice architecture;
component-based programming;
modular systems in education and other fields [1].

Literature Review. The problem of the modular approach has been studied by many foreign and local scholars, including M.A. Choshanov, P. Yusavichene, L. Vygotsky, N. Azizkhojayeva, N. Saidakhmedov, B. Ziyomammedov, and U. Tolipov. In particular, the systems analysis approach played an important role in the development of modularity theory. Scientific sources emphasize that complex systems can be effectively managed by dividing them into parts. In education, modular teaching technology serves to individualize the educational process, develop independent learning, and form practical skills. Furthermore, the application of the modular approach in technological education is regarded as an effective method for improving students’ professional training.

Methodology. The following methods were used in this study: analysis and synthesis methods — in studying the theoretical foundations of the modular approach; comparative method — in comparing traditional and modular education systems; modeling method — in developing a modular structure for teaching skullcap art; pedagogical observation — in evaluating the effectiveness of the modular approach in the educational process. During the research process, special attention was paid to the step-by-step organization of the educational process and the effectiveness of each module.

Analysis and Results. The analysis results showed that lessons organized on the basis of the modular approach increase students’ activity and develop independent working skills.

As a result of teaching skullcap art through modules:
students systematically master theoretical knowledge;
practical skills are formed step by step;
creative approach and interest increase;
opportunities for evaluating results at each stage are created.

It was also found that the modular approach enables teachers to effectively plan the educational process and implement an individual approach.

The modular education system is a modern pedagogical technology based on the block structure of educational material, which is sequentially mastered by students and assessed by teachers through rating points accumulated for classroom activity and independent work.

The term “module” (from the Latin *modulus* — “small measure”) refers to a set of parts of an educational subject that possess logical completeness in relation to established goals and learning outcomes.

A module includes both cognitive (informational) and professional sections. The first section is aimed at developing theoretical knowledge, while the second focuses on forming professional skills and competencies based on acquired theoretical knowledge.

A module may include the following main sections:

- introductory assessment section;
- theoretical section;
- application section;
- current assessment section;
- correction section;
- final assessment section.



In the modular education system, students work independently or with teacher support according to the established curriculum. For this purpose, they study special literature, consult with the teacher, and master methods for completing specific tasks.

This form of developing abilities eliminates the monotony of transcribing teacher monologues and overcomes student passivity.

An essential element of modular teaching is the rating system for evaluating students' activities based on learning outcomes of module elements.

The modular teaching system helps acquire theoretical knowledge, methodological, professional, and procedural skills and competencies. The knowledge and skills obtained through this system are necessary not only for mastering the subject but also for forming the foundation of future professional activity.

Essence of the Modular Approach. The modular approach is a method of solving a complex system or problem by dividing it into small, independent parts (modules). Each module performs a separate task and operates relatively independently from other modules.

In the modular approach, instead of working with one large system, work is carried out through smaller parts. Each module:

- has a clear function;
- is developed separately;
- is later integrated into the overall system.

For example, in software development:

- the user interface is one module;
- database management is another module;
- calculations form another module.

These modules work together, but each can also be modified independently.

Advantages of the Modular Approach

- Simplicity: understanding complex systems becomes easier;
- Reusability: modules can be used in other projects;
- Easier debugging: identifying the problematic module becomes convenient;
- Teamwork: different people can work on different modules.

Disadvantages

- Connections between modules must be properly organized;
- Excessive division may complicate the system.

The modular approach is applied in:

- software development;
- education systems;
- engineering and manufacturing;
- organization of business processes.

Beginning from simple manufacturing ideas, the modular approach has now become one of the main principles for managing complex systems. It increases efficiency, flexibility, and opportunities for development.

Structure of Modular Education

Motivation Stage

At the beginning of the lesson, a short conversation is conducted to prepare students for independent work. The teacher explains how future activities will be organized and provides clear instructions.

Working with Educational Modules

The main part of the lesson is devoted to completing tasks combined into modular elements. These elements are arranged in a certain sequence, numbered, and provided individually to each student. It is recommended not to use more than seven such elements in one lesson.

Reflection and Homework



At the end, students evaluate how effectively they completed the tasks. Depending on the results, individual homework is assigned to strengthen or deepen knowledge.

Principles of Modular Education

Principle of Structuring

During the study of an educational module, it is important to gradually increase the complexity of information and learning requirements. This not only ensures effective learning but also serves as excellent mental training.

Principle of Flexibility

At any time, lessons can be adapted to the learner’s abilities. If a student does not understand certain material, more time or alternative methods may be used.

Principle of Dynamism

Learning begins from the student’s individual level. First, basic knowledge is mastered, after which more complex concepts are introduced [2].

Difference Between Modular and Traditional Education

№	Criteria	Modular Education	Traditional Education
1	Course Structure	Divided into independent modules	Rigid and linear structure
2	Knowledge Assessment	Step-by-step after each module	Usually final examination
3	Individualization	Possibility to choose modules and learning paths	Same program for the whole group
4	Practical Orientation	Each module includes practical tasks	Practice often separated into blocks

Teaching Skullcap Art through a Modular Approach

Teaching skullcap art in technological education through a modular approach means organizing instruction step by step, with clear objectives and practice-oriented modules. This method is especially effective for teaching traditional crafts.

Folk handicrafts are practical activities passed down from generation to generation, reflecting people’s lifestyles, customs, and traditions. They satisfy daily needs while serving as an important component of national culture and spirituality [3].

Teaching skullcap making in a modular format divides the subject into several independent sections:

Module 1: Introduction and Theoretical Foundations

- History of skullcap art;
- Regional styles (for example, Chust skullcaps);
- Meanings of patterns and symbols [4].

Module 2: Tools and Materials Used in Skullcap Art

- Fabrics (atlas, velvet, etc.);
- Threads and needles;
- Safety rules for using tools.

Module 3: Technology of Skullcap Sewing

- Basic sewing methods;
- Pattern application;
- Manual work and precision.

Module 4: Practical Training

- Preparing a simple skullcap;
- Decorative embroidery;



Finalizing the finished product.

Module 5: Assessment and Presentation

Checking the finished product;
Student presentation and defense of work;
Correcting mistakes.

The essence of the modular approach consists of:

step-by-step learning;
independent mastery of each module;
practical orientation;
formation of clear competencies after each module.

Advantages of the Modular Approach

deepens the teaching of national values;
develops practical skills;
increases creativity;
provides opportunities for individual development.

Teaching handicrafts such as skullcap making through a modular approach:

simplifies complex processes;
increases student interest;
strengthens professional training.

Through this approach, students learn not only sewing techniques but also national culture.

Conclusion and Recommendations

According to the research results, the modular approach demonstrates high effectiveness in technological education, especially in teaching handicrafts. It develops students' independence, practical skills, and creativity.

Recommendations

widely introduce modular teaching into technological education;
redesign curricula based on modules;
develop clear assessment criteria for each module;
increase the share of practical lessons;
improve modular teaching of national handicrafts, including skullcap art.

Thus, teaching skullcap art based on a modular approach is an effective and modern pedagogical method that enables students to master theory and practice in harmony.

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