

Joint study programmes based on thematic modules

Eubica Vitková & Andrea Šeligová

Slovak University of Technology in Bratislava
Bratislava, Slovakia

ABSTRACT: The contribution presents teaching concepts based on the module principle - modular teaching, and the resulting effectiveness. The objective is also to highlight the potential of this teaching method in the development of collaborative teaching and joint study programmes with partner institutions. The contribution points out the possibility of enhancing the quality of education through the synergies created by partner institutions, which involve sharing unique educational procedures, methods, knowledge and specialised focus areas. This positive diversity supports the reinforcement of specific knowledge and skills among future graduates. The presented research was centred on the application of module-based teaching in the structure of study programmes in architecture, urbanism at the partner universities, as well as in the Faculty of Architecture and Design at Slovak University of Technology in Bratislava (FAD-STU), Slovakia. Upon completion of all modules at individual partner universities, supplemented by supporting subjects within the study programme at the parent institution, the graduate is well prepared for the role of a competent, creative architect, urban planner, or expert capable of managing the transformation of cities with special characteristics and existing problems.

Keywords: Architecture and urban studies, modular teaching and learning, university partnership, joint study programmes, graduate profile

INTRODUCTION

Applying teaching based on the module principle - modular teaching offers numerous advantages that contribute to the overall effectiveness of the educational process. A number of authors have been involved in systematic and longitudinal research aimed at the application of the principle of module in education [1-3]. One significant advantage of modular teaching is the ability to divide the teaching of a study programme into integrated units, creating a structured and coherent curriculum. By dividing the curriculum into modules, educators can better organise the content and ensure a more efficient learning process. Abdurazakov and Odinaboboev provide an explanation for organising teaching content in a modular way:

The modular learning system is predicated on the cognitive processes of the human brain, which perceives information not as a continuous stream but as discrete units. Therefore, the most effective approach to organizing education is to align the system with the brain's assimilation patterns [4].

A modular learning approach promotes a deeper level of understanding through logical connections tied to a specific area, as well as a closer connection between theory and its practical verification. This also leads to better retention of acquired knowledge. At the same time, the module-based teaching approach allows for greater flexibility, as it enables a swift and functional response to current trends in education, and it can be easily adapted to different learning styles and individual needs of students. An individualised approach promotes inclusivity and supports the success of all students.

A study programme module can be described as an *independent, comprehensive, obligatory, time- and content-specific educational unit*. Typically, a module focuses on a specific area within a larger topic related to the study programme, consisting of a set of essential subjects relevant to that particular area. The primary objective of a module, as a cohesive compilation of subjects employing innovative teaching methods, is to impart graduates with comprehensive and contemporary knowledge in the respective field. As succinctly pointed out by Shaifuddin and Nashir:

The adoption of teaching based on the module principle brings about numerous advantages to the educational landscape. From the structured curriculum organization to enhanced student achievement, increased engagement, individualized instruction, and interdisciplinary connections [5].

One of the problems that complicates the creation of joint study programmes, respectively the teaching of their parts between partner universities, is their diverse structure. The educational programmes of the European Commission within

the framework of selected Erasmus+ schemes, therefore focus on the harmonisation and synergy of the content of parts of the study programmes among co-operating universities. Harmonisation and better compatibility of study programmes can be solved by a teaching application based on modules.

The search for overlaps and synergies offered by related programmes at partner universities was also the goal of the Erasmus+ project *Creative Danube*. The project was focused on the verification and proposal of joint teaching, based on the flexible model principles with their gradual implementation:

- Short-term model: applying modules based on existing thematic courses of individual faculties.
- Mid-term model: joint study programmes based on a system of comprehensive educational thematic modules offered by partner universities within the engineering degree for the field of architecture and urban planning.
- Long-term model: postgraduate study programme focused on different professions.

EXPERIENCE WITH TEACHING MODULES AT THE FAD-STU

The Faculty of Architecture and Design at Slovak University of Technology in Bratislava (FAD-STU), Slovakia, has provided teaching in the form of modules since 2004, particularly within the Bachelor's degree programme:

In relation to the increasing competencies of its graduates, a structure was established of competency models that reflect the specifics - particulars of the profession of an architect or of a Bachelor's study programme graduate. The models include universal and specific competencies and become a tool for identifying strengths in the educational process [6].

This pedagogical approach has a longstanding tradition, particularly at the Master's level where specialised modules are utilised. These modules and focus areas have been structured around building typologies (residential, civil, industrial buildings), as well as thematic orientations, such as ecological architecture, urbanism, landscape and garden architecture, interior and exhibition design, and monument protection and restoration. These modules are offered in both the Bachelor's and engineering degree programmes [7][8].

In the Bachelor's degree, the modules followed a fixed structure, consisting of two theoretical subjects, a design studio and a supporting seminar. This arrangement aimed to provide a comprehensive foundation encompassing theoretical knowledge, creative skills and research within the specific module. The module spanned one semester, typically in the winter semester of the fourth year of study, with a total duration of 18 teaching hours and a credit allocation of 23 points. The theoretical subjects comprised two hours of instruction with a three-credit allocation, the studio work encompassed 11 hours of instruction with a 13-credit allocation, and the seminar included three hours of instruction with a four-credit allocation. Consequently, the module represented a comprehensive and thematically focused study unit.

In the engineering degree programme, the focus area was integrated as a compulsory elective component spanning four semesters. It served as a complementary element to the core curriculum defined by mandatory subjects. The focus area was allocated 78 credits out of a total of 120 credits required for the engineering degree. Thus, the focus area supported the specialisation and profiling of the graduating students. By implementing teaching in the form of modules, the FAD-STU provides a structured and specialised learning experience that enhances students' knowledge and skills in specific thematic areas. This approach allows for a comprehensive and focused study unit within the Bachelor's degree and enables students to pursue a particular area of interest and expertise within the engineering degree programme [7].

After 2021, such an organised form of teaching at the Faculty was abandoned in favour of offering a comprehensive and universal study programme in architecture in the Master's degree, as well as in the Bachelor's degree in the architecture and urbanism study programme. In regard to individual profiling of students, greater weight was transferred to a wider range of optional subjects, but above all to profiling through the so-called vertical studios. The studios were led by professors and associate professors of the Faculty and external practicing architects.

The personality and focus of the studio head thus represent a certain degree of specialisation [9]. Currently, in view of the Faculty's social structure and the urgency of educating qualified experts in the field of urban development and spatial planning, it is proposed to re-introduce the urbanism module in the engineering degree, respectively the preparation of a separate urbanism study programme.

MODULAR TEACHING AT PARTNER UNIVERSITIES

Educators from the FAD-STU carried out research work aimed at mapping the structure of study programmes at partner faculties involved in the project Erasmus+ KA2 project: *Creative Danube: Innovative Teaching for Inclusive Development in Small and Medium-sized Danubian Cities*. Seven universities and their faculties were involved in the project: Ion Mincu University of Architecture and Urbanism (UAUIM) in Bucharest, Romania, which was the leader; University of Belgrade (UB), Serbia; University of Novi Sad (UNS), Serbia; Budapest University of Technology and Economics (BME), Hungary; University of Technology (TU Wien) in Vienna, Austria; University for Continuing Education Krems (UWK), Austria; and Slovak University of Technology in Bratislava, Slovakia [10].

The project was aimed at solving the problems faced by small and medium-sized cities on the Danube. This required an analysis focused primarily on the teaching of urbanism within the study programmes architecture, urbanism, spatial planning and landscape architecture. The objective was to explore the potential of creating thematic modules within these study programmes that would equip students with comprehensive knowledge and skills essential for effectively managing the pressing issues encountered by settlements in the Danube regions [11].

Through the conducted analysis, it was observed that teaching based on the module principle was only implemented at three faculties within partner universities: *Ion Mincu* University of Architecture and Urbanism in Bucharest, the Faculty of Architecture and Planning at TU Wien, and the Faculty of Technical Science at the University of Novi Sad.

A differentiated model of modular teaching is applied at the mentioned partner universities. The Faculty of Architecture of TU Wien applies a wide range of modules, focused on selected specific areas of study of architecture or spatial planning. The modules are aimed at supplementing certain specific knowledge and skills. They represent a fixed teaching unit (a set of theoretical and creative subjects), evaluated by a fixed proportion of credits per semester.

At *Ion Mincu* University, modules are also based on a comprehensive set of subjects (theoretical, creative and research-oriented), but implemented over the course of several semesters. The modules are tied to a certain form of professional specialisation (urbanism, landscape architecture), while the volume of credits exceeds the scope of one semester.

Despite the fact that the module system of teaching is applied only at some partner universities, the research revealed that each school has strong specific thematic areas of teaching. These are necessary to solve specific problems faced by the investigated settlements. This indicated that the participating schools could significantly enrich each other's knowledge and expertise within the consortium.

To validate and examine the data provided by individual partners in the project, a comprehensive system of joint teaching was tested through the implementation of pilot thematic modules within collaborative workshops.

The pilot modules contained a theoretical basis, on-site research, carried out in close co-operation with local governments and supported by thematic lectures, which were followed by a creative design part. Special study material and applied and verified innovative teaching methods were created for each workshop and module (Figure 1).

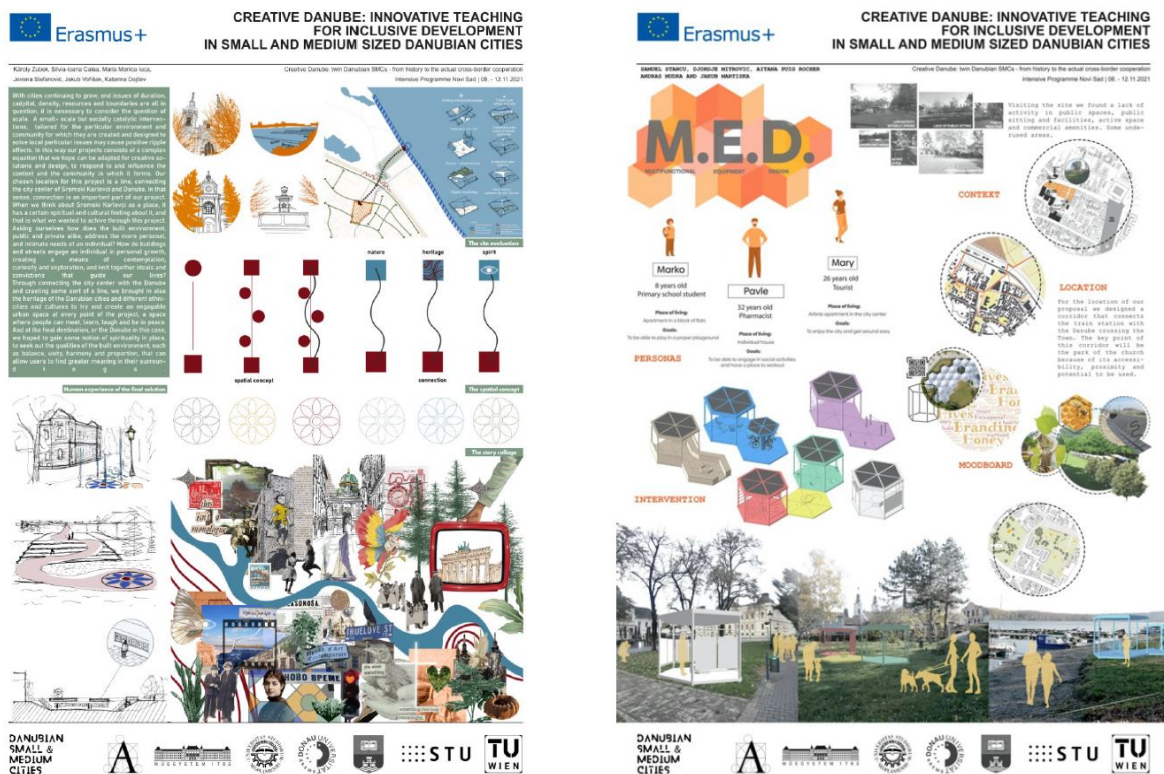


Figure 1: Student proposals realised within a workshop in Novi Sad, as part of the verification of the teaching methodology on the thematic module *acupuncture* [12].

The educational approach adopted within these modules was designed to address the specific problems encountered by cities in Central and Eastern Europe, with a particular emphasis on border regions and economically disadvantaged areas.

As part of the project, a methodological manual was developed to serve as the guiding framework for the concept of joint teaching. This manual provided the necessary foundations and guidelines for the effective implementation of collaborative teaching practices within the project.

The teaching structure and credit amount of three credits (so-called microcredits) corresponded to the standards of the KA2 projects, implemented within the Erasmus+ scheme.

DESIGN OF A JOINT STUDY PROGRAMME

One of the outputs of the project Erasmus+ KA2: *Creative Danube: Innovative Teaching for Inclusive Development in Small and Medium-sized Danubian Cities*, was the proposal of a joint study programme. The STU, specifically the Faculty of Architecture and Design, was responsible for its preparation and conception.

The basis for the creation of individual modules was the above-mentioned characteristic thematic focus and the successful application of innovative methods at individual schools linked to the issue of the transformation of urban structures. These were reflected in differentiated models that create a comprehensive mosaic of knowledge and skills that lead to a comprehensive coverage of the given issue [10].

The proposal of the study programme arose from the methodological instructions outlined by Hărmănescu et al [10]. Determined thematic areas, relevant to the issue of small and medium-sized Danubian cities, as well as innovative teaching methods were tested during joint workshops. The topics were set to cover the complexity of the issue. The basis for the creation of thematic modules was a comprehensive subject database linked to the module topic, which had already been verified at individual universities, and which was specified on the basis of an analysis of the subject composition at individual universities.

Based on the experience gained during the verification of the appropriateness of the composition of thematic areas, the effectiveness of innovative teaching methods, affecting both the theoretical base and practical experience (consisting of the analytical, evaluation and design phase), the basic thematic modules were specified:

Module 1 - Sustainability and resilience;

Module 2 - Sensing and mapping the cities: new technologies;

Module 3 - Inclusive design: cities for all (as a sample, an information sheet for module 3 is included at the end of the article);

Module 4 - Urban acupuncture based on participatory place-making;

Module 5 - Urban renewal of Danube small and medium cities;

Module 6 - Danube urban-rural landscape and blue-green infrastructure;

Module 7 - Multilevel stakeholder co-operation and involvement for sustainable projects in Danubian urban-rural regions [12].

Teaching based on the module principle is the basis for a different form of joint teaching, which can be implemented in different time phases and with differentiated training requirements. These are the following models:

- A. Short-term model: uses the project-verified existing subject composition of the selected thematic area within the existing study programmes at individual partner universities. It is supported in the form of joint workshops within the blended intensive programme (Erasmus+ scheme) (Table 1);
- B. Medium-term model: the thematically composed set of subjects within the specific modules at individual universities forms the basis for a joint study programme in the engineering degree in the architecture and urbanism study programmes (Table 2);
- C. Long-term model: lifelong professional education aimed at various professions and their synergy, necessary for successfully managing the transformation processes of small and medium-sized cities in the Danube regions [12].

Table 1: The principle of the short-term model based on the thematic module system within the existing study programmes at partner universities [12].

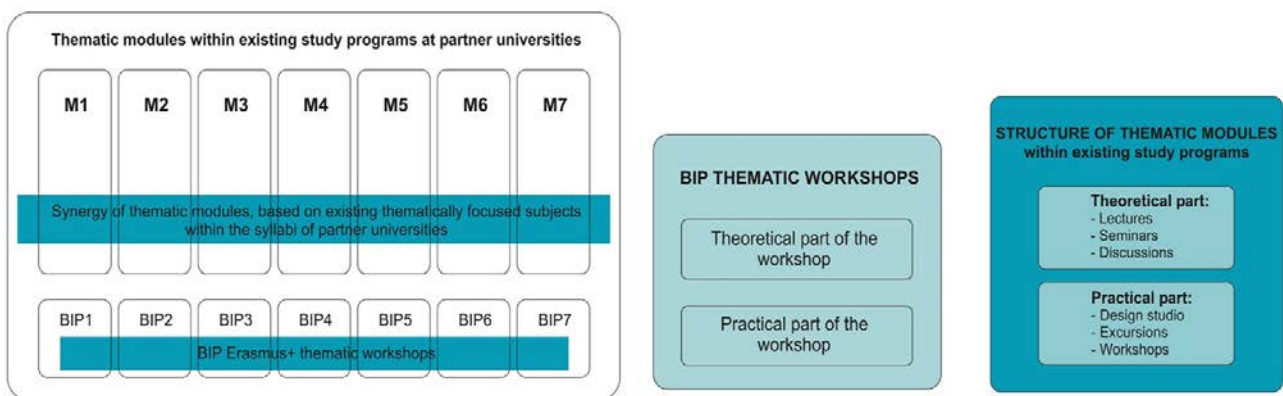
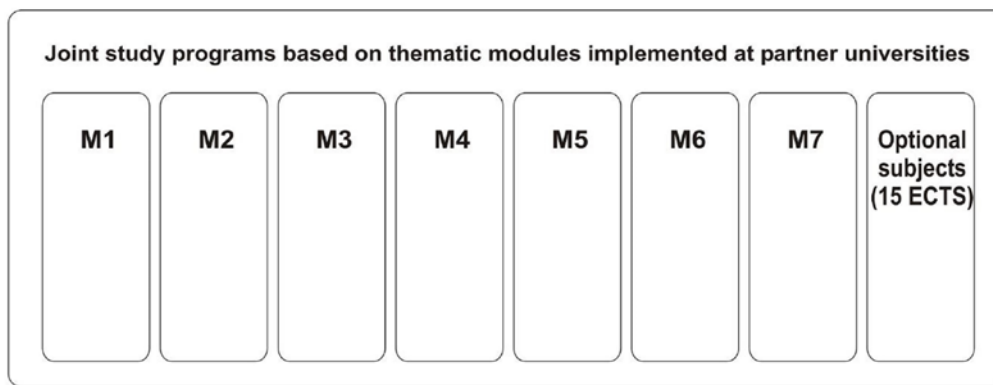


Table 2: The basic structure of the medium-term model: a system of the thematic modules implemented at partners universities as the bases of the joint study programme [12].



The mentioned models should be implemented gradually. From elementary, immediately implementable forms to joint study programmes, the introduction of which requires longer preparation due to the necessity of synchronising study programmes and their syllabi at individual universities.

CONCLUSIONS

The verification of teaching through comprehensive thematic micro-modules during the implementation of the *Creative Danube: Innovative Teaching for Inclusive Development in Small and Medium-sized Cities* project laid the foundation for the design of a joint study programme. Its preparation was simultaneously based on practice-verified experiences at partner universities with the teaching of the modules.

Based on the analyses carried out at universities that apply thematic modules within their study plans, it is possible to generalise two basic teaching models:

- **Model A** is based on a comprehensive set of subjects (theoretical, creative and research-oriented), implemented over the course of several semesters. This principle is tied to a certain form of professional specialisation within the field, for example, in the field of urban design, landscape and garden architecture, in the field of spatial planning (study programmes at Czech Technical University in Prague, FAD-STU and UAUIM). The credits amount exceeds the scope of one semester.
- **Model B** represents a certain degree of self-profiling within the study programme. It is aimed at supplementing certain specific knowledge and skills and usually does not exceed the number of hours and credits of one semester (TU Wien).

The proposed model of joint teaching, which represents the output of the Creative Danube project, includes both principles.

Upon completion of all modules at individual partner universities (7 universities x 15 credits), supplemented by supporting subjects within the study programme at the parent institution (worth 15 credits), profiles the graduate through his/her knowledge and abilities. They prepare him/her for the role of a competent, creative architect, urban planner, or expert capable of managing the transformation processes of cities that require special attention due to their special characteristics and existing problems.

Completing only some of the proposed models will enable its graduates to self-profile in a certain specific area.

The proposed structure of the modules thus represents a flexible system that can be operatively changed and adapted to the changed requirements based on social needs and the current development. This means modifying and supplementing thematically oriented modules, as well as changing their content and teaching methods.

The proposed structure of the integrated system of modules represents at the same time an open system for its completion. Completion of a comprehensive study programme will prepare its graduates for a complex solution to the specific problems of the Danube regions and their cities. Completion of the selected module or modules will expand the knowledge and skills of future experts in a certain comprehensive thematic area.

The mentioned forms of joint teaching and the sharing of thematic modules offered by individual partner universities bring a significant effect - a synergy of high-quality knowledge, experience and teaching methods. The concept of the European Universities project is based on a similar principle, where individual university consortia are focused on certain current topics, essential for the future of Europe.

In their intentions and implementation, individual partner universities expend the co-operation into joint research and especially joint teaching connected with practice. Their joint teaching models are also based on the mentioned specific topic, where individual universities offer whole teaching units (modules, micro-modules) in which a given university excels.

Table 3: Sample module information sheet for module 3: Inclusive design: cities for all [12].

Module 3: INCLUSIVE DESIGN: CITIES FOR ALL	
Defining the module and its structure	
Aim of the module	The aim of the module is to adopt the principles of accessibility, usability, safety and comfort for everyone, regardless of age, disability or status in life to the greatest extent possible.
Key words	Inclusive design, design for all, public space design, accessibility, permeability, participation, vulnerability
Module disciplines	Urban design, landscape design, architecture, urban planning, sociology, human geography - the aim is to ensure multidisciplinary.
Responsible partner	STU Other partners: UWK, BME, TU Wien, UB, UAUIM, UNS
Learning outcomes of the programme	In the overall context and mosaic of theoretical knowledge and practical skills aimed at the inclusive development of small and medium-sized Danube cities, universal design has a key role. This is achieved through the ability to evaluate the level of environmental barriers and social inclusion. For the attractiveness of urban structures, both for residents and visitors, it is fundamental to create a well-accessible, barrier-free environment for everyone. An important aspect in the learning process is also the acquisition of participatory methods linked to communication with a wide range of social groups.
Learning outcomes of the course unit	The module's focus on the topic of universal design/design for all is concerned with the creation of a non-discriminatory environment to ensure the inclusion of all people in society. Universal design/design for all are the concepts (methods) to create the built environment according to the principles specified in the aim of the module. Theoretical knowledge related to social inclusion is focused on: basic principles of universal design; legislative frameworks and European initiatives linked to social inclusion; good examples and case studies of inclusive environments; discussions aimed at people with disabilities. Students will acquire practical skills aimed at evaluating the urban environment and public spaces from the point of view of inclusion. In the design part, they will verify the application of the acquired knowledge on specific proposals for selected territories. They will focus on creating a complex inclusive environment. An integral part of the process is the participation of representatives of local governments, residents and interest groups.
Teaching and learning methods	The subject Universal Design consists of lectures and exercises. The introductory lectures and exercises are focused on the basic principles of creating an accessible, inclusive environment. The principles of universal design in various types of urban environments and types of public spaces and buildings are explained to students within the various lectures, exercises and discussions. The most suitable teaching methods include the support of practical experiences, such as personal encounters with different types of barriers and field work.
Assessment methods	Development of the solution concept, of its graphic elaboration in a group of students and their presentation before the evaluation committee, participation in lectures, discussions, on-site observation and consultations.

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BIOGRAPHIES



Lubica Vitková, PhD, DSc, is a professor in the Faculty of Architecture and Design at Slovak University of Technology in Bratislava (FAD-STU), Slovakia, and is based in the Department of Urban Design and Planning. Between 2010 and 2018, she served as Dean of the FAD-STU, and since 2019, has been the Vice-Rector of the STU for International Relations. Her pedagogical, research and creative activity focuses on the area of urban design and urban planning, with particular emphasis on the monitoring of qualitative and quantitative aspects of urban structures. She has carried out and led several international and domestic scientific and educational projects, and published numerous works. She has served on several scientific boards and associations, including the Editorial Advisory Board of the *Global Journal of Engineering Education* (GJEE).



Andrea Šeligová, PhD, is a researcher in the Institute of Urban Design and Planning in the Faculty of Architecture and Design at Slovak University of Technology in Bratislava (STU), Slovakia. Her work is focused on sustainable and resilient cities, intensification, recycling and reuse of urban tissue, and methods of urban regulation, with a particular use of GIS methods.