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ЈАЧАЊЕ СВЕСТИ О НАСЛЕЂУ И ОДРЖИВОСТИ ИЗГРАЂЕНОГ ОКРУЖЕЊА У ВИСОКОМ ОБРАЗОВАЊУ У ОБЛАСТИ АРХИТЕКТУРЕ И УРБАНИЗМА: ПРЕГЛЕД НАЈБОЉИХ ЕДУКАТИВНИХ ПРАКСИ

Апстракт

Међународни научни пројекат под називом *Јачање свести о наслеђу и одрживости изграђеног окружења у високом образовању у области архитектуре и урбанизма* (*Enhancing of Heritage Awareness and Sustainability of Built Environment in Architectural and Urban Design Higher Education*), *HERSUS* настоји да побољша и тестира иновативне наставне праксе у пољу одрживости грађене средине и наслеђа, те да оснажи компетентност и мотивацију наставника и истраживача у области архитектуре и урбанизма да у наставне планове и програме укључе елементе који ће имати иновативне резултате, припремајући студенте и наставнике да постану стварни актери промена животне средине.

Рад представља иновативне курсеве и ваннаставне активности у оквиру постојећих студијских програма високошколских установа (Србија, Италија, Кипар, Грчка и Шпанија), који могу допринети премошћавању јаза између одрживости и наслеђа. Имајући у виду да је Архитектонски факултет Универзитета у Београду водећа институција у овом пројекту, у раду ће бити представљени – преглед најбољих пракси у образовању о одрживости и наслеђу као резултат прве пројектне активности, као и закључци изведени из *HERSUS* вебинара *Учење кроз дизајн за одрживост грађене средине и јачање свести о наслеђу (Teaching through Design for Sustainability of the Built Environment and Heritage Awareness)*.

Кључне речи: едукација, одрживост, наслеђе, урбано наслеђе, грађена средина

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ENHANCING OF HERITAGE AWARENESS AND SUSTAINABILITY OF BUILT ENVIRONMENT IN ARCHITECTURAL AND URBAN DESIGN HIGHER EDUCATION: REVIEW OF BEST PRACTICES

Abstract

International scientific project entitled Enhancing of Heritage Awareness and Sustainability of Built Environment in Architectural and Urban Design Higher Education (HERSUS) strives to enhance and test innovative teaching practices in the field of sustainability of the built heritage, and boost the competence and motivation of educators and researchers in the field of architecture and urban design to include in curricula innovative elements so as to prepare students and educators to become real actors of the environmental change.

The main purpose of the paper is to present new innovative courses, groups of courses, and extracurricular activities within the existing study programs of participating HEI (from Serbia, Italy, Cyprus, Greece, and Spain), which can contribute to bridging the gap between sustainability and heritage. Having in mind that University of Belgrade Faculty of Architecture is the Lead organisation of the project, the paper will present review of best practices in educating sustainability and heritage as a result of the first project activity and lessons learned from the HERSUS Webinar *Teaching through Design for Sustainability of the Built Environment and Heritage Awareness.*

Keywords: education, sustainability, heritage, urban heritage, built environment

INTRODUCTION

Urban continuity and future qualitative development of cities and urban landscapes in a rapidly changing world have become crucial challenges for the sustainability of built environment and heritage, but also in the education and practice of architects. This statement is also recognized within the *UNESCO/UIA Charter for Architectural Education*, where the architectural heritage education is highlighted as a particular field essential to (1) understanding sustainability, the social context and sense of place in building design, and (2) transforming the professional architectural mentality so that its creative methods are part of a continuous and harmonious cultural process (refer to Appendix X, UIA paper on Heritage Education, of UIA Education Commission Reflection Group 7, on Heritage Education, Torino 2008). Accordingly, in architectural education the emphasis should be on architecture as a cultural practice, with a strong focus on creative engagement development as a foundation for professional life. Besides, contemporary research in architectural education, which has built heritage as a central pillar of curriculum, aims to (1) promote a design philosophy that supports the integrated approaches of revitalizing heritage values of the traditional communities (Embaby, 2014), (2) develop new didactic analytical tools towards the foundation of value-based design from built heritage (Clarke, Kuipers & Stroux, 2020), and (3) affirm specific types of local built heritage, such as education for adaptive reuse of modern heritage (Melenhorst, 2019; Clarke, Zijlstra & De Jonge, 2019). Everything said points to a complex system of research questions and challenges when it comes to educating architects about the contemporary position and treatment of heritage.

This paper aims to illustrate the response to the aforementioned challenges and current perspectives in the research of architectural heritage education and to present a statement for the initiation of the international project HERSUS. A very important step in recognizing the problems and gaps in contemporary education in the field of sustainability of the built heritage was made by the implementation of the Survey, which opened discussion between the academic community, professionals, policymakers and decision-makers in 5 European countries – Serbia, Italy, Cyprus, Greece and Spain. The Survey analysis indicates that most experts see low or medium conditionality between sustainability and heritage within contemporary studies and practices in architecture and urban design and that there are still many opportunities for new exploration and establishing new linkages. Regarding the reasons behind the conditionality between sustainability and heritage within contemporary studies and practices, experts involved in the Survey stress, on the one hand, the lack of connection between theory and practice (lack of know-how methodologies and methods, low level of awareness of theoretical advancements, long-lasting exclusion of the topic of heritage from the sustainable development debate), and on the other hand, a limited number of courses and inadequate attention paid to this relation in design studio projects. Additionally, experts point out the importance of more robust engagement of these topics into academic curricula, believing students would become citizens that take action for a sustainable society.

ABOUT HERSUS

International scientific project entitled Enhancing of Heritage Awareness and Sustainability of Built Environment in Architectural and Urban Design Higher Education (HERSUS) strives to enhance and test innovative teaching practices in the field of sustainability of the built heritage. The ERASMUS+ Agency in Serbia (Tempus Foundation) selected the HERSUS project as one of the two projects to be funded as a part of strategic partnerships in the field of higher education programme (KA203) based on the terms and conditions announced in the Erasmus+ call for participation.

The competition was announced as a part of the General Call for 2020 (EAC/A02/2019). In selecting project proposals for financing, the following advantages of the HERSUS project were recognized: relevance of the project, the quality of the project design and implementation, the quality of project team and the cooperation arrangements, as well as impact and sustainability. Accordingly, this paper strives to inform the professional public interested in theory and practice, and theoretical practice of heritage and urban planning, of the basic structure of the project and its first results in the form of the Review of the Best Practices on Educating Sustainability and Heritage.

HERSUS brings together 41 researchers from five higher education institutions (HEI) from Serbia, Italy, Cyprus, Greece, and Spain, who work together to design and develop courses and disseminate them through international training courses, workshops, and jointly built Sharing Platform. The partner organizations are Universita IUAV Di Venezia (UNESCO Chair: Heritage and Urban Regeneration) – IUAV, University of Cyprus (Department of Architecture) – UCY, Aristotelio Panepistimio Thessalonikis (School of Architecture AUTh) – AUTH, Universidad de Sevilla (UNESCO Chair on Built Urban Heritage in the digital era) – USE, and University of Belgrade (Faculty of Architecture) – UB-FA in the capacity of the lead organization in the project.

The above-mentioned challenges require vital research and continuous improvement of curricular and extracurricular activities in higher education, which in order to have a successful outcome, must be transnationally carried. The implementation of new, innovative courses, designed following contemporary education trends in the subject area as part of the HERSUS project, is expected to improve the existing master programs.

ACTIVITIES FRAMEWORK

The HERSUS project proposes a number of cooperative activities between the research, private and public sectors, targeting both local and regional support towards higher education practical arena cooperation. That cross-sectoral cooperation will be developed through five types of activities: learning, training and teaching; presentation of project results; development of intellectual outputs; transnational project meetings; and general activities on project management and implementation. All the mentioned activities are focused on design-based learning as primary educational approach in architectural and urban design. A series of interactive and cooperative activities such as seminars, wor-

kshops and trainings, are the background for development of tangible project results that can generate new values in architectural heritage education.

The activities towards the development of intellectual outputs are divided into six groups with the following results: (1) Review of the Best Practices in Educating Sustainability and Heritage (activities lasting 3 months); (2) Questionnaire for the State of Art (activities lasting 5 months); (3) Statements for Teaching through Design for Sustainability of the Built Environment and Heritage Awareness (activities lasting 8 months); (4) HERSUS Sharing Platform (activities lasting 33 months); (5) Book of courses (activities lasting 20 months); and (6) International Handbook for Students on Research and Design for the Sustainability Heritage (activities lasting 22 months).

The project will be implemented from November 2020 to August 2023.

THE FIRST HERSUS RESULTS

"Review: Best practices in educating sustainability and heritage" presents data collected by every HERSUS partner school of architecture, and other relevant organisations and individuals. The purpose of this Review is to support the participating schools of architecture in establishing high-quality standards in terms of built heritage sustainability, through cross-cultural communication and responding to challenges in an international environment.

This publication presents the results of the first four months of the project implementation, and is structured in three main parts: (1) Built Architectural and Urban Projects (20 projects, four from each partner country); (2) Pedagogical and Educational Models (20 courses, four from each partner organization); Influence of National Policies on the Sustainability of Heritage (one report per each partner organization). Architectural offices, individuals, public bodies, and students whose works were used to illustrate the specific course methodologies, all added to the quality of the publication.

This paper focuses on the project specificities and the subject curriculum in relation to sustainability as complete presentations of case studies (good practice examples) are available on the project website (hersus.org) in the form of a publication (Đokić et al, 2021).

BUILT ARCHITECTURAL AND URBAN PROJECTS IN RELATION TO SUSTAINABILITY

Examples of good practice from all participating countries range from small-scale reconstruction to historical area revitalization (Figure 1).

Small-scale projects (reconstruction of buildings up to 800m^2) were in the focus of all HERSUS partner countries, but Cyprus put a particular emphasis on small-scale reconstruction projects. Medium-scale projects (reconstruction of buildings and complexes from 800m^2 to 4,000m^2) also featured in the analysis of all HERSUS partner countries, but in the case studies from Greece, Serbia and Spain, medium-scale projects make 50% of the presented examples. Apart from Italy, which turned out to be the leader in this type of reconstruction

SERBIA	ITALY	CYPRUS	GREECE	SPAIN
Conservation and Reuse of Nebojša Tower in the City of Belgrade and Founding of a Museum and Cultural Centre **HISTORIC URBAN CORE**	"Punta della Dogana" – François Pinault Foundation **HISTORIC URBAN CORE, COASTAL**	Urban Landscape Rehabilitation in Lefkara **RURAL AREA**	Bioclimatic upgrade of the greater area of Hrimatistirio Square **HISTORIC URBAN CORE**	Rehabilitation of Casa Diañez, Alcalá de los Gazules **HISTORIC URBAN CORE**
Office Building Bulevar 79 **URBAN AREA**	Ca' Tron Real Estate - H-Farm **RURAL AREA, NATURAL REGIONAL PARK**	HYBUILD Aglantzia Case Study **URBAN AREA**	Restoration of a timber framed traditional building, Kleious 24 Ano Poli **HISTORIC URBAN CORE**	Recovery of the Cerro de San Miguel and the Darro river area. Rehabilitation of the wall of San Miguel Alto and its surroundings **PERI-URBAN AREA, MOUNTAIN**
Regional Centre of Industrial Heritage, The Museum of Coal Mining **MOUNTAIN**	Restoration of the former military bakery of Santa Marta – Università di Verona **URBAN AREA**	Restoration of Alexandros Dimitriou Tower **URBAN AREA**	Restoration and creative reuse of a building block consisting of 13 historic structures in Plaka Athens to house the State Museum of Modern Greek Culture **HISTORIC URBAN CORE**	Recovery of King's Path, Gaitanes Gorge **RURAL AREA, MOUNTAIN**
Detailed regulation plan for the Historic Downtown of Zemun **HISTORIC URBAN CORE**	The reconstruction of the downtown Venzone **HISTORIC URBAN CORE**	Restoration of a vernacular dwelling in Kapedes **RURAL AREA**	Creative Reuse of the barracks in the Pavlos Melas metropolitan park **HISTORIC URBAN CORE**	Rehabilitation of Former Pottery Centre of Triana **HISTORIC URBAN CORE**

Figure 1. Case study projects presented by each partner

and revitalization projects, presenting several of them, every other country presented one large-scale project (reconstruction and revitalization of larger areas or settlements).

As for the sustainability, all the projects are briefly described from social, economic and environmental perspective.

Serbia presents four examples of good practice: Nebojša Tower (Belgrade), Office Building Bulevar 79 (Belgrade), The Museum of Coal Mining (Senjski rudnik), and Historic Downtown of Zemun (Belgrade). The social aspects of sustainability are presented through publicly available content and engagement of local population, while the environmental aspect is presented through the application of local materials and environmental sensitivity, such as flood protection of the area. The economic aspect of sustainability is engaged in the context of improving the energy efficiency standards of buildings.

Italian examples highlight the role of the participatory process and the availability of new activities for the local community in response to the social aspects of sustainability. The response to the environmental sustainability aspects is given through the application of soft mobility technology and energy efficiency using renewable energies, including photovoltaic, geothermal, and other green technologies. From the economic perspective, the focus is on the creation of start-up space, the development of a new economy in the environment and the use of funds for recovery from natural disasters.

Cyprus bases the analysis of social sustainability on the development of places for social interaction and improvement of living conditions in historical settlements. The economic aspect is represented through the engagement of traditional crafts and construction techniques, passive and active systems in providing thermal comfort. Use of traditional materials, recycling existing building materials, exploring benefits of smart digitized home solutions for neighbourhood, introducing vegetation and water elements to improve microclimate and maintain passive environmental strategies, are presented as means of improving environmental aspects of sustainability.

Good practice in Greece demonstrates the availability and safety of pedestrian routes as well as improving living conditions in historic urban cores as results important for the social aspect. Energy upgrades, replacement of concrete pavements and asphalt with high albedo and high emissivity materials in open space, reuse of the existing building materials and new plantings are stressed as a means of environmentally sensitive approach to sustainability. Economic effects are based on the development of commercial area and activities. Greek examples also include a critical review of those changes that do not support sustainable goals and standards, such as extensive reconstruction of timber structures and elements.

Spanish reconstruction cases are presented as a delicate response to social and environmental proposals of a sustainable approach. Those projects are based on building access to pedestrians, developing pedestrian traffic, engaging memory of local inhabitants, establishing visual relations with other heritage elements in the surrounding area, as well as hiding the existence of modern urban development near the historical area. The attempt to limit the number of visitors in the field of botanical, geological and anthropological interest show concern for the environment. In the economic sense, those projects represent a specific approach based on the thesis that minimization of spaces to be conditioned implies a reduction of total energy demand. Minimal interventions on the existing elements maximize the effects of the availability of content by allowing visits and views from the outside, from the open space.

PEDAGOGICAL AND EDUCATIONAL MODELS IN RELATION TO SUSTAINABILITY

All the partner universities offer graduate programs and courses of studies relevant to the themes of sustainability and cultural heritage. Specifically, most universities offer programs on Conservation of Historic Buildings, Historical Heritage or Landscape Heritage:

Course Type / Participants	Design Studio	Design Studio, seminar, workshop	Design Studio, Theoretical Project, Workshop	Lecture, Design Studio	Lecture, Theoretical Project, Design Studio	Lecture, Design Studio, Theoretical Project, Seminar	Lecture, Theoretical Project, Design Studio, workshop	Lecture, Theoretical Project	Lecture	Lecture, Seminar	Lecture, Design Studio, Practical work	Lecture, Theoretical Project, Practical work	Workshop
UB-FA	+	+						+					+
IUAV					++		+		+				
UCY			+					+		+	+		
AUTH	+			++		+							
USE						+						++++	

Figure 2. Type of presented courses by participants

UCY, AUTH, USE, IUAV, and nearly all universities offer programs on Energy Efficient / Green Architecture / Energy Technologies / Sustainable Design or Architecture / Environmental Architectural and/or Urban Design: UB-FA, UCY, AUTH, USE. Most of the courses selected belong to these programs. Many of these graduate programs are interdisciplinary and inter-departmental, thus incorporating courses offered by different departments. The academic background of students attending the above courses vary, e.g., Architecture, Engineering (i.e., Civil Engineering), Humanities (Geography, Anthropology, Archaeology, Sociology), Science (Environmental Sciences, Biology, Biotechnology), Economics, and Law (based on the HERSUS Report on IO1).

Regarding the general program of the courses content, it can be noted that theoretical as well as studio-based courses are selected, as well as courses that combine theory with design (Figure 2). Almost all courses include lectures, critical essays or design projects, and some of them also comprise workshops, seminars and/or practical work. In these courses, various methodological/teaching tools were used, such as lectures, overview and case study analysis, student presentations, teamwork, design studio, site visits, discussions, workshops, laboratory work, etc.

Subject in relation to sustainability

The comparative analysis of 20 courses shows that social aspects of sustainability are highly developed in all schools, followed by the environmental ones, while economic aspects are less present (Figure 3). On the one hand, AUTH deviates from this trend, having social and economic aspects of sustainability equally developed in the analysed subjects, while the environmental perspective is less present; on the other hand, the UB-FA boasts strongly presented environmental perspective in all subjects, but weak economic aspects

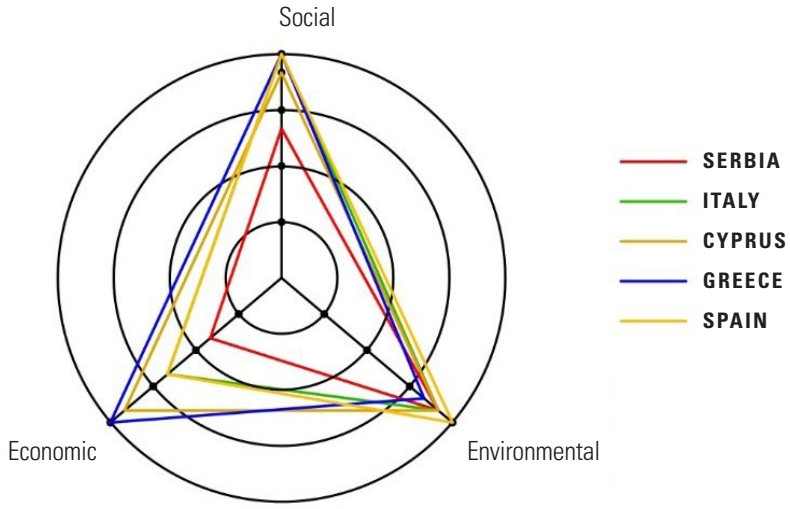

Figure 3. Distinct directions toward sustainable goals represented in projects

of sustainability. USE has highly developed both social and environmental perspective and a satisfactorily presented economic aspect of sustainability. When it comes to sustainability, it can be stated that the analysed subjects curriculum offered at UB-FA are specifically oriented towards the environmental approach.

Patterns of effort to bridge the gap between theory and practice

One of the leading research questions in the course analysis is directed to recognizing the extent to which practitioners are involved in the teaching process. Depending on the type of subject and the available teaching hours, experts from different fields present in the educational process of all schools participate in the HERSUS project. The courses presented as examples of educational models can be classified into three types – design studio, lectures, and theoretical/research-oriented projects and workshops. In all the schools involved in the study, the design studio has the status of a compulsory subject with a large fund of hours, while lectures and workshops are elective subjects with small number of hours in the curriculum. Although the need for a more intensive exchange of knowledge between academic and practice-oriented experts is expressed, this cooperation is mostly developed through direct involvement in teaching, it being a common feature in all schools.

Some schools, such as IUAV, have established cooperation with architects from the Ministry of Cultural Heritage of the local Superintendencies, while UB-FA and AUTH cooperate with local self-government and representatives of local cultural institutions. UCY has developed inter-departmental cooperation without the involvement of practicing experts.

USE is specific for its cooperation with laboratories and research centres at the University, on top of the participants from the City Council or architects with heritage interventions in case studies, as well as for the interventions of sociologists, anthropologists, economists, environmentalists. It has been stated that all those cooperation are established with the view to enriching students' critical capacity and bringing another point of view to heritage management from the perspective of sustainability.

CONCLUSION

Insight into the education practices of architects and urban planners in five higher education institutions in Europe, the possibilities of improving the teaching process when it comes to relations between sustainability, resilience and the restoration and reuse of cultural heritage were considered. Examples of good practice confirm the need to include experts in the education process, but also the need to strengthen the competencies and develop tools of future experts in the field of protection and development of future heritage.

The analysis of urban policies related to sustainability and heritage reveals that many policies and laws focus on urban regeneration as well as on heritage landscapes. At the same time, laws and policies that cover both sustainability and heritage seem to aim at integrating cultural heritage in the context of sustainable development. In addition, many new regulations relate to energy performance, as well as to energy retrofitting of existing structures. Despite the fact that all countries incorporate policies on sustainable development of historic and rural areas, they apply insufficient number of tools towards energy retrofitting of heritage buildings. On the other hand, as for the presentation of sustainability pillars in the educational process, the need to create an integrated approach to critical reading and reprogramming of cultural heritage is unequivocally recognized. Also, the importance of initiating a discussion on a contemporary, multicultural definition of heritage and the perception of its multiscale nature is recognized.

In relation to the labour market, the current practice of educating architects, at least in Serbia, has shown traces of creating professional profiles that our labour market does not recognize, so we consider it a key challenge to respond to labour market needs that come under the influence of European regulations and standards. Accordingly, HERSUS activities are directed towards the establishment of (1) a new profile of an architect/urban designer, a professional trained in the broad architectural domain, who possesses technical, technological, socio-humanistic and artistic skills and is therefore equipped to respond to socio-environmental challenges, (2) a new profile of architectural educator ready to assume responsibility for the improvement of education and training of future architects to enable them to meet the expectations of 21st-century societies worldwide for sustainable human settlements in every cultural heritage, and (3) a new linkages in-between educational and professional arena which will overlap the challenges in response to the labour market needs. As the education of architects in the field of heritage is about individual courses within general or focused programs, it can be said that a small number of students take these courses, and semester courses that provide the necessary knowledge in the field of

heritage are insufficient to profile experts in this professional area. That is a clear reason for creating a specific educational module, but before that to spark the interest of future architects for contemporary approaches in this field. Therefore, it is equally important to raise the awareness of the importance of goals and standards of sustainability and cultural heritage, both among academic or practicing professionals and young graduates and students. Creating digital platforms (such as HERSUS Sharing Platform) and the visibility of the HERSUS project on social media is a step closer to creating a broader platform for the exchange of information, resources and experience in education, practice, and regulation in the field of heritage protection.

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