The role of education on the enhancement of heritage awareness and sustainability of the built environment; learning from experts and students

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Abstract. This paper presents the outcomes of Intellectual Output 2 (IO2) of the HERSUS research project. The scope of the survey was to create an argumentative and critically analysed report on the state of learning of sustainability and heritage in higher education. The study is based on the dissemination of two online questionnaires within the five HERSUS participating countries/institutions (Serbia, Italy, Cyprus, Greece and Spain). The first addresses experts in the fields of cultural heritage conservation and sustainable environmental design, occupied in academia, public administration, NGOs and the private sector. The second directs queries to students at master level studies, PhD researchers and recent alumni from academic institutions, in the five participating countries, regarding their experience from their study programs, their expectations and future prospects in the professional environment. The survey analysis was conducted independently for each country and comparisons derive from the review of the international summed outcome. The results of the survey conducted in Greece, are discussed here, reflecting the views of 10 experts and 120 students. The analysis reveals comparable results among responses, with similarity and variation between the views of experts and students. Common ground between the two groups of respondents is found for the establishment of further links between academic education and professional practice, interdisciplinarity in education, and the need for a more systematic correlation between concepts of sustainability and heritage.

1. Introduction; learning from experts and students

This paper presents an outcome of the first-stage Intellectual Outputs of the HERSUS research project [1, 2]. Funded under the Erasmus + Call 2020 Round 1 KA2 - Cooperation for innovation and the exchange of good practices / KA203 - Strategic Partnerships for higher education [3], HERSUS brings together researchers from five countries across Europe, aiming to enhance the awareness of cultural heritage and sustainability of the built environment in the field of Architecture and Urban Design academic studies and support the participating Architectural Schools in establishing high-quality standards, through cross-cultural communication and problem solving at an international context.
The survey scope was to create an argumentative and critically analyzed report on the state of learning of sustainability and heritage in higher education. “IO2: Questionnaire for the State of Art” [4] is the product of a survey design, dissemination and analysis strategy, managed by the AUTH HERSUS Team and undertaken by all HERSUS Participating institutions. The survey consisted of a two-pronged approach focusing on experts and students in the Hersus respective countries.

The study was founded on the dissemination of two online questionnaires within the five participating countries (Serbia UBFA, Italy IUAV, Cyprus UCY, Greece AUTH, and Spain USE). The first questionnaire addresses experts in the fields of cultural heritage conservation and sustainable environmental design, occupied in academia, public administration, NGOs and the private sector. The second questionnaire directs queries to students at master level studies, PhD researchers and recent alumni from academic institutions in the five countries.

The main research questions that the survey processes sought to approach are:

1. How much students and experts have developed an awareness of the importance of enhancing issues of the sustainability of the built environment and heritage in education and practice?
2. What is the level of understanding of what sustainability and heritage concepts are, in the field of urban / architectural design and what is the scope for their applicability?
3. What would be the most effective way to include sustainability and heritage knowledge in the existing curricula?

The elements of innovation of IO2 include two inquiry-based perspectives: a. Questioning how students have developed competences in themselves and what they think employers will expect, on the level of competencies that could be further developed in the practical design arena, and b. Questioning about learning habits and the relevance of design strategies.

The IO2 student Questionnaire dissemination was initiated across all HERSUS Countries on 02.04.2021 and expired on 26.04.2021. In Greece, it attracted 285 responses out of which 120 were complete, accounting for 15.67% of the total of complete student questionnaires received in the five HERSUS countries. The questionnaire dissemination initially sought to engage students beyond the critical level of study (4th year) at the School of Architecture AUTH, through targeted disseminations (email) in the classes – studios of the integrated diploma and relevant Master’s Courses and also through mass dissemination through the School’s website and social media. The questionnaire was subsequently also disseminated through the social media of other schools of architecture in Greece.

The IO2 expert Questionnaire dissemination, also took place within the above timeframe. After an initial selection process, twelve Greek experts were contacted to provide feedback and ultimately ten submitted complete responses to the questionnaire (accounting for 18.52% of expert questionnaires received in the five HERSUS countries). The experts’ list is composed of an equal ratio of 20% per category, i.e., Researcher Academic Educator, Practitioner, Policy Maker, Decision Maker in Public Administration, Decision Maker in NGO / Professional Society. In terms of their gender, there is an imbalance favouring female respondents (70%) over male (30%). Most of them (70%) are very experienced, declaring to have more than 20 years of experience in the field, while only one respondent declared having 1-5 years of experience. Out of the ten experts, five are holders of PhD titles, while out of the remaining five, three hold Masters’ degrees in either heritage or sustainability studies. Furthermore, eight out of ten experts declare to have made contributions to academic programs in the past, possibly indicating a sufficient understanding of current academic practices and procedures. As for the experts’ professional activity, they deal with a wide range of design scales, confirming the variety of expert profiles that the research sought to engage.

2. Survey Methodology
The first phase of IO2 consisted of a background and literature review which informed the draft Survey questionnaires. This phase was facilitated through the creation of a shared folder available to all project partners and was successful in pinpointing thematic areas that former attempts had mapped in researching learning styles and preferences in the architectural domain [5,6,7,8]. The consultation process on the drafts that ensued, involved all HERSUS partners’ views consolidating the common
English Version of the Experts and Students Questionnaires. These were then translated in the four languages used in the HERSUS participating countries, concluding the Survey Questionnaire Design, while also producing a valuable multilingual agreement on terminology and phrasing.

The two questionnaires were structured in separate sections to correspond to the initial general research questions. Both included an initial section which aimed to identify the respondent’s background and profile and to ensure adequate and balanced representation in the sample population. Two more sections were also included in both questionnaires referring to the awareness of issues of sustainability and heritage in practice or in study programs and to the competences related to sustainability and heritage in professional practice. The experts’ questionnaire contained one additional section referring to the expectations from academic programs.

Regarding the questions’ style, the experts’ questionnaire focused on qualitative open type questions allowing elaboration and opinion statements, also applicable for oral interviews but included quantitative questions as well in the form of tables to fill in ratios and ratings. The students’ questionnaire included only quantitative questions in the form of tables to fill in with numerical values, checkboxes, and ratings, applicable for statistical analysis. In both questionnaires, the ratings were requested in a scale from 1 to 5, representing minimum and maximum evaluation of e.g., impact of academic activities, significance or applicability of key concepts, evaluation of skills etc.

Questionnaires were supplied in all participant countries’ languages and in English to support the multilingual approach of the HERSUS project, thus allowing experts and students an easier way to express themselves. Having reviewed varying routes for dissemination (Google forms / interactive word documents, etc), the research ultimately concluded upon the use of the Lime Survey platform, available through the AUTH IT centre. This route allowed survey processing that was readily available for administrators through dedicated links provided by AUTH IT to all HERSUS Teams.

3. IO2 HERSUS Questionnaire for the State of Art; Survey Results and Analysis
The experts’ background, the variability of their roles, the high degree of their involvement in academia and their considerable experience in practice/research confirm the validity and quality of the survey. The Greek student sample accounts for 15.67% of all student questionnaires received in the five HERSUS countries. The study was successful in engaging students with a background in Architecture. The majority of responses came from students attending 2nd Cycle structured studies while the remaining can be attributed to PhD students and recent alumni of 2nd/3rd Cycle higher education programs. This section reviews the questions and analyses the results of the IO2 surveys under the aforementioned structural / thematic headings.

3.1. Presence – awareness of issues of sustainability and heritage in education and practice
Typical of the structure of the experts’ questionnaire, the theme of Presence/Awareness is approached through pairs of a/b questions that introduce an issue and then expand on it with a follow-up question. In this vein, the first questions focus on the importance and awareness of sustainability and heritage in the experts’ everyday practice/research (Q2.1a, Q2.1b, Q2.2a, and Q2.2b) and on the relevance of key concepts in practice/academia/decision making/policy making (Q2.4a, Q2.4b, Q2.5). Specifically, they introduce the focus on sustainability and heritage and enquire on the importance that these have in everyday practice, while also asking experts to reflect on the number of projects that they have undertaken in the last 10 years that specifically focused on these concepts (Q2.1a) and enquire on the driving force behind the focus on sustainability and heritage in contemporary practice, e.g. strict requirements and legislation restrictions, their own initiative, or client and public sensitivity (Q2.1b). Next questions shift focus from the project/research to the project team, enquiring on the awareness of key concepts and principles of sustainability and/or heritage, among the experts’ colleagues, collaborators, and other associates, and on whether such key concepts are adequately integrated in the main corpus of architectural academic studies (Q2.2a, and Q2.2b). Finally, a question on the scales of architectural and urban design which are more relevant in their work field, completes an image of the experts’ involvement in research/practice focusing on sustainability and/or heritage (Q2.3). Moreover
the experts are asked to comment on the relevance of the HERSUS’ key concepts of Reuse, Restoration and Resilience, in their work environment (Q2.4a), to rate, in a scale from 1 to 5, the relevance of 20 key concepts in the context of the different scales of design/research practice in their work field (Q2.4b comparable to Q2.4 of the student questionnaire) and to comment on the importance of the pillars of sustainability (Society / Economy / Environment / Culture) and the emphasis needed in the decision-making processes in their research and professional projects (Q2.5).

Under the same theme, the students’ questionnaire focused on the Presence/Awareness of issues of Sustainability and Heritage in study programs. Thereby, students are required to assign approximate numbers of courses pertaining to the Program of Studies that they currently attend (Q2.1). More specifically, each student is required to indicate the approximate number of courses necessary for the Completion of their Degree, and out of those, the number of courses focusing mainly on Documentation / Conservation / Restoration of Cultural Heritage, the number of those focusing mainly on Sustainability / Environmental Design, the number of courses focusing or raising issues on both Sustainability & Cultural Heritage. The purpose of this question is to enable the analysis of existing curricula that different categories of students attend (2nd or 3rd cycle) and to diagnose the ratio of courses that focus on sustainability and heritage in relation to the total number of courses in the degree. Next question expands on the theme, asking students to indicate the type(s) of available courses in their current program of studies, which focus or raise issues on sustainability or heritage or both (Q2.2); selecting all options that apply, students can thus provide a further comprehensive mapping of the typology of courses currently available while the inclusion of “other” also enables further expansion during the analysis of results. Besides mapping of what is available, students are asked to rate, in a scale from 1 to 5, the impact of specific 16 educational activities, in strengthening students’ comprehension of principles related to Sustainability or Cultural Heritage or both (Q2.3). Moreover, the students are invited to rate, in a scale from 1 to 5, the relevance of 20 key concepts of sustainability and heritage, in the context of the different scales of design practice (Q2.4 comparable to Q2.4b of the experts’ questionnaire).

3.1.1. Experts’ and students’ responses under the theme of Presence / Awareness. Depending on the experts’ professional practice and their educational background, the emphasis on sustainability and heritage varies, while neither one is marginalized. Furthermore, despite their different perspectives, they all agree on the need to balance the pillars of sustainability as a necessary condition for serving the needs and achieving the goals of contemporary societies. Most of their answers converge on the view that their immediate colleagues and collaborators are mostly specialized through 2nd Cycle specialization postgraduate programs. They generally accept that the concepts of sustainability and heritage are better addressed in relevant postgraduate programs but not in relation to each other. Furthermore, they appear satisfied from their cooperation with graduates of 5-year Architecture and related specialisation postgraduate programs, pointing out a fragmentary knowledge of issues, by the former, while at the same time acknowledging architecture graduates as the most knowledgeable on matters of sustainability and heritage with regards to related disciplines/professions. Experts suggest that interdisciplinarity is lacking in the context of academic programs and should be enhanced through cooperation between diverse postgraduate programs and the public sector (Ephorates, public authorities, etc). Within the same context, they point out the lack of training in terms of management/legislation issues, as well as social parameters and hands-on training.

Students’ views indicate that larger percentages of courses are included in the Greek integrated Masters’ curriculums than those observed across all Hersus countries focusing mainly on sustainability and cultural heritage or raising issues that pertain to the two. Heritage-related Master’s programs are found to be more inclusive of the two disciplines while sustainability-related Postgraduate programs of study are found to be able to better interface the two disciplines in the context of interdisciplinary courses (focusing equally on sustainability and heritage).
Figure 1. The impact of academic activities in strengthening students’ comprehension of principles related to (a) sustainability, (b) cultural heritage or (c) both (in Greece).
3.1.2. Academic activities and their impact on the comprehension of key principles of sustainability and heritage (Figures 1, 2). Greek Student respondents (in line with what is perceived at the international sample) suggest that the educational activities with the highest impact on the comprehension of key principles are Lectures and Design Project, while Research Thesis, Fieldwork, Study and Analysis of Literature, Site visits, Co-commitment outside the academia, Seminars, Practical training skills, Internship, Participatory learning, and Public Presentation of work are perceived as having a major influence. They had less confidence in specific activities that have enhanced their comprehension of issues pertaining to the interface of heritage and sustainability. The activities of Laboratory work, Fieldwork, Site visits, Design Project, Research Thesis and Co-commitment outside the academia receive higher rankings, indicating a preference for a hands-on approach to learning. The activities with the lowest impact are those of Applied Arts Projects, Interactive tutorials and Exams.

The Greek Experts (figure 2) express the view that Methods of Knowledge transfer should form the highest proportion of academic studies focusing on the two fields, while indicating that practical and technical training are also important. Experts agree with the students in assigning marginal impact of evaluation methods/Exams on the consolidation of knowledge. Most of them adopt a balanced and complementing relationship between theoretical knowledge, tools and practical training required for the composition of new academic programs. The importance of an adequate theoretical background in combination with the knowledge of methodological and other tools, as well as their practical application is well underlined. Social issues and the connection of academic education to practice are highlighted.

Figure 2. Experts’ Mapping of the proposed proportion of activities in academic education.

3.1.3. Relevance of Key concepts of sustainability and heritage in different scales of design practice. Students’ responses (in line with the international sample) reveal a wide array of concept applicability across all three scales, at the same time indicating concepts related to conservation, restoration, cultural enhancement, are more prevalent along with key concepts of sustainability at the building level but diminish in the rankings at the urban and landscape scales.

In the case of experts, their responses reveal a slightly different perspective on the applicability of key concepts in the different scales of design in practice since they exclude some key concepts as not relevant to their own everyday practice. They, nevertheless, are found to generally agree with the views of students in the applicability of heritage-related Key concepts, only within the context of the Architectural scale.
3.2. Competences in relation to Sustainability and Heritage in education / practice

The third section of the experts’ questionnaire shifts attention to the competencies in the practical arena, enquiring on the number and frequency of cooperation that experts have had with graduates from academic study programs dealing with sustainability and/or cultural heritage and on the adequacy of their training (Q3.1), on the quality and level of skills and knowledge of recent graduates, by rating them according to 15 categories, differentiating between skills obtained from academic education and skills expanded in the work environment (Q3.2a), and on “other skills/knowledge” that graduates should obtain through their studies for sufficiently addressing challenges related to sustainability and heritage in the professional context (Q3.2b). The last two are intended to yield results that will be comparable to those obtained from the student questionnaire (Q3.1 and Q3.2).

The relevant section of the students’ questionnaire seeks to engage them in a self-rating exercise. Specifically, they are asked to rate themselves (in a scale from 1-5) in terms of the Skills and Knowledge that they have gained through their current program of studies, in relation to sustainability or heritage or both (Q3.1) and to rate their perceived importance in improving their employability in posts dealing with sustainability or cultural heritage or both in a professional context (Q3.2). The two questions can thus be comparable to each other and at the same time be compared to the experts’ views as obtained through Q3.2a and Q3.2b of the experts’ questionnaire.

3.2.1. Experts’ and students’ responses on competences in relation to Sustainability and Heritage.

Experts find that graduates have a good level of presentation-communication skills, knowledge of analytic tools and methods, while interdisciplinarity, fundamental knowledge and awareness raising are also considered as skills that have been consolidated through academic education. Most of them emphasize that graduates lack the managerial skills needed for formulating strategies and implementing them and have less developed practical experience/training skills. Furthermore, they find a lack in specialist environmental design skills in relation to Heritage. Experts rate highly the contribution of practice in consolidating most of the skills of their collaborators, some indicating that in this sense education offers the framework of knowledge on which one builds through practice.

In judging their skills, students indicate that the knowledge of fundamentals, their awareness raising and presentation communication skills are their most prevalent assets. Furthermore, they declare to have specialist / technical / analytic skills on the two domains but not any that possibly transgress the two. They also find that the knowledge of fundamentals, their awareness raising, presentation communication and technical skills will be the most important in allowing them employment in the relevant domains of sustainability and heritage. Knowledge of the international context in terms of the two disciplines is considered to be small amongst the students while the same parameter is also ranked of least relevance in terms of the employability that it allows.

3.3. Requirements in the context of academic programs on Sustainability and Heritage

The fourth section of the experts’ questionnaire asks for their proposals for new academic programs focusing on the interface between sustainability and cultural heritage. More specifically the questions focus on potential knowledge gaps in the existing academic programs (Q4.1) and asks for proposals for overcoming them (Q4.2), and for proposals for achieving a balanced combination of academic educational activities (Q4.3a). A relevant numerical output on the structure of academic programs is also asked (Q4.3b) that can be compared to the relevant views of the student target group. Shifting from structural concerns to the content of such academic programs, there is a query for ranking 20 Key concepts of sustainability and heritage, according to the prevalence they should have in the context of academic education (Q4.4) and one for suggesting a key factor for the improvement of architectural education in terms of sustainability and cultural heritage awareness and training (Q4.5).

3.3.1. Key factors for the improvement of architectural education in terms of sustainability and cultural heritage awareness and training.

Most experts express the need to link academic education with professional practice, suggesting that studio courses and specialized intensive workshops should
be enhanced in academic curricula. This is found to be in agreement with the proposals of students on the possible activities that had a significant impact on their comprehension of principles related to both disciplines – a hands-on approach. Experts find that the gap between education and practice can be addressed through interdisciplinary education and the involvement of relevant stakeholders, institutions, and professionals in postgraduate studies. All of them express the wish for a more systematic effort to correlate the concepts of sustainability and heritage, both at undergraduate and postgraduate levels.

4. Discussion and Conclusions
The preliminary findings of the Greek sample of the IO2 HERSUS Questionnaire for the State of Art reveal that students and experts alike identify a gap in the educational practices that transcend both sustainable design and cultural heritage studies at a postgraduate level. Notably, the ratio of modules on sustainability and heritage is found to be higher than average in the Greek context, compared to the international sample. Postgraduate courses focusing on heritage seem to integrate a larger number of courses on both sustainability and heritage albeit dealing with them as separate modules. On the other hand, sustainability-focused postgraduate courses do not entail dedicated modules on heritage but are rather more inclusive of heritage aspects in the sustainability context teaching. The study has also found considerable scope for the wider integration of public sector and NGO representatives / consultation into the academic practices, with emphasis being put on the hands-on training that real projects can offer. Furthermore, the study has identified that such practices could enrich the educational filed of urban design and architecture with experts that are mostly well trained (holding Masters and PhD Degrees in their respective disciplines) and that have considerable experience in their posts and that already make frequent contributions to academia. Overall, the systematic correlation of concepts of sustainability and heritage, both at undergraduate and postgraduate level, in the relevant domains of Architecture and Urban design, is found to be a valuable resource that could be key to the sustainable management of cultural heritage, having wider impacts to the employment and career practices in the field.

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