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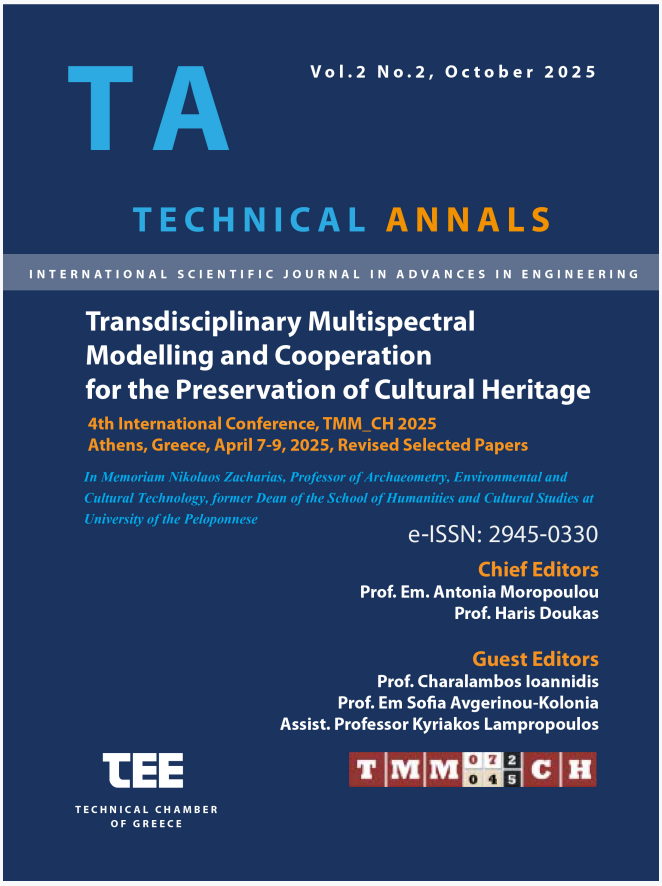

Education “Technology” in Heritage Conservation: from Concept to Methodology - a Methodological Mechanism

Anna Lobovikov-Katz

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Education “Technology” in Heritage Conservation: from Concept to Methodology - a Methodological Mechanism

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Abstract. Heritage education for the general public has been recognized as a crucial component of the contemporary inter- and multi-disciplinary Conservation of Cultural Heritage (CCH). However, educational methodologies in this area, and specifically those dedicated to education for preservation and conservation of cultural heritage for the general public, are still limited in number. This paper proposes a “technology” in heritage education, and presents a methodological mechanism in this area, which was developed in the first phase of the EU project “Educational Linkage Approach in Cultural Heritage (ELAICH)”, and enabled the project development through its different stages. The paper outlines an intrinsic research mechanism (the Methodological Mechanism of the Educational Approach), through basic “Why,” “What,” and “How" of its structure, development and implementation; and analyses its efficacy through a glimpse at some selected results. The Methodological Mechanism, presented and analyzed in this paper, proved to be useful for diverse types of the research and development activities, including shaping the core definitions, the educational methodological development; course design; structural development of an e-learning platform, and others. Developed for a specific project, Methodological Mechanism might be useful to other emerging projects and initiatives in the field of heritage education and CCH education for the general public and experts in other areas.

Keywords: Methodological Mechanism, Teaching Methodology, Educational Approach, Heritage Education, education for preservation and Conservation of Cultural Heritage (CCH education) for the general public, Conservation of Cultural Heritage (CCH), conservation study, conservation research, e-learning

1 Introduction

1.1 The framework of the development of Methodological Mechanism EA

With the importance of public education for heritage preservation becoming widely understood (ICOMOS 1993, Jokilehto 2006, Thornton 2008, UNESCO / UIA 2011, Della Torre et al. 2022), a large-scale European project was initiated to reach the general public. Through its three-year period, the project (Euromed Heritage Project ELAICH - Educational Linkage Approach In Cultural Heritage - ENPI 150583) produced a number of significant outcomes.

An educational methodology underlying the ELAICH project was initiated, formulated, and developed by the author before and during the project period, with the first pre-test results published in 2008 (Lobovikov-Katz 2008). It was formulated through experimental teaching of the architecture non-conservation undergraduate students at the Technion - Israel Institute of Technology. The first experiment showed that second-year architecture students, who entered the course without previous knowledge of preservation of cultural heritage, were able at the end of it to analyze and produce a multi-layer mapping of a complex historic compound. This mapping included the presentation and analysis of geometrical, historical, structural, and material data on a historic structure. The ELAICH project (2009-2012) was designed to go far beyond that experiment – to develop the methodology, and, in turn, an educational tool suitable for the non-experts, i.e. the general public, with high-school students as the main target audience.

While the outcomes of the ELAICH Project and ELAICH educational methodology have been discussed in publications (Lobovikov-Katz et al 2012, 2014, 2022; Quattrini et al. 2023), this paper reveals, for the first time, the development and the implementation of the core research Methodological Mechanism of the Educational Approach, named Educational Approach (EA) at the time of its formulation. It was developed at the early stage of the project, and used throughout project's development and production, and facilitated the achieving of the project's goals and objectives.

1.2 Goals of the development of Methodological Mechanism EA

The overall objective of the ELAICH project was to narrow the gap between the general public and cultural heritage. It was designed to link people to cultural (architectural) heritage and to enable their contribution to its conservation, through developing and then providing them with a valuable educational tool.

The objectives of the ELAICH project and methodology, formulated in 2008 and in early 2009, stated that the project's output (Annex I 2008):

"…will be a tool for educating a non-trained audience for understanding CH [Cultural Heritage] in general and basic conservation principles in particular, mainly the first and decisive stage of conservation—study, investigation, the principle conservation (direct and/or indirect intervention) stage, and also at post-conservation-intervention stages -monitoring and maintenance; all these stages are based on CH buildings and sites documentation, recording and research (and understanding). All these are connected directly to the most important [...] way of thinking and behaving with CH - i.e. preventive conservation…".

The core idea of ELAICH was to bring together the two groups related to cultural heritage – conservation experts and the general public, thus enabling intellectual contribution of the latter to the conservation of cultural heritage (CCH). The rationale was that participation in learning and becoming familiar with advanced research and knowledge in the field of heritage conservation would lead to the development of understanding of the values of cultural heritage, and to the improvement of the attitude of the general public towards it.

Furthermore, the author suggested that a specifically targeted and developed methodology based on the pre-test would enable the students to create an educational product of a real conservation value, namely - a primary mapping and the analysis of a historic building or site. Such mapping could be useful for further analysis by the conservation experts, and would contribute to the study, conservation and monitoring of historic sites. Therefore, the learning process would contribute not only to the learning achievements and education of the audience, but also to the conservation of cultural heritage.

Three solid obstacles could put at risk such an education program:

1. The two groups would not be able to communicate, due to lack of common language;
2. Learning material would be too difficult for the target audience;
3. The students would not be able to provide an output of suitable quality

ELAICH aimed at solving these problems, and at enabling its target audience to join and contribute to one of the sophisticated areas of professional conservation, usually blocked from the general public – analysis and study and documentation of cultural (built) heritage.

Although developed as part of the Mediterranean program and tested on Mediterranean cultural heritage, ELAICH has reached beyond the boundaries of its designated region and target audience. In the first five years after its launch in 2012, the ELAICH educational toolkit and the e-learning platform has been visited by users from about 150 countries across the globe and has been nominated as the best Israeli e-learning and science platform for the World Summit Award 2013. In 2014, ELAICH was selected the Project of the Year - First Prize in the Research category within the framework of the International Competition of Architecture of Israel and the European Union. The ELAICH Methodology and educational outcomes of the project have been also applied to university courses, and other types of education frameworks.

2 Overview of the development of the Methodological Mechanism EA

The project's methodological development consisted of two efforts. One of them was the development of the ELAICH Methodology, which enabled and empowered the project's final product – the ELAICH Educational Toolkit. Previously, however, an internal research mechanism - "Educational Approach", or "EA", was developed, to allow and facilitate all the project's productions, including the ELAICH methodology. The development of this internal Methodological Mechanism - EA, - is the main subject of the present paper.

2.1 Main steps of the Development of the Entire Project

The project's aims were achieved in three phases (Lobovikov-Katz et al 2012):

Phase I: Developing a methodology for teaching conservation of cultural heritage to the target audience (the general public, and especially youth); Phase II: Testing the

methodology, through actually teaching courses in different countries; Phase III: Developing the conceptual and didactical structure of the e-learning platform, and designing it, on the basis of the knowledge and methodological tools developed in the first two phases. The principal development scheme is presented in Figure 1.

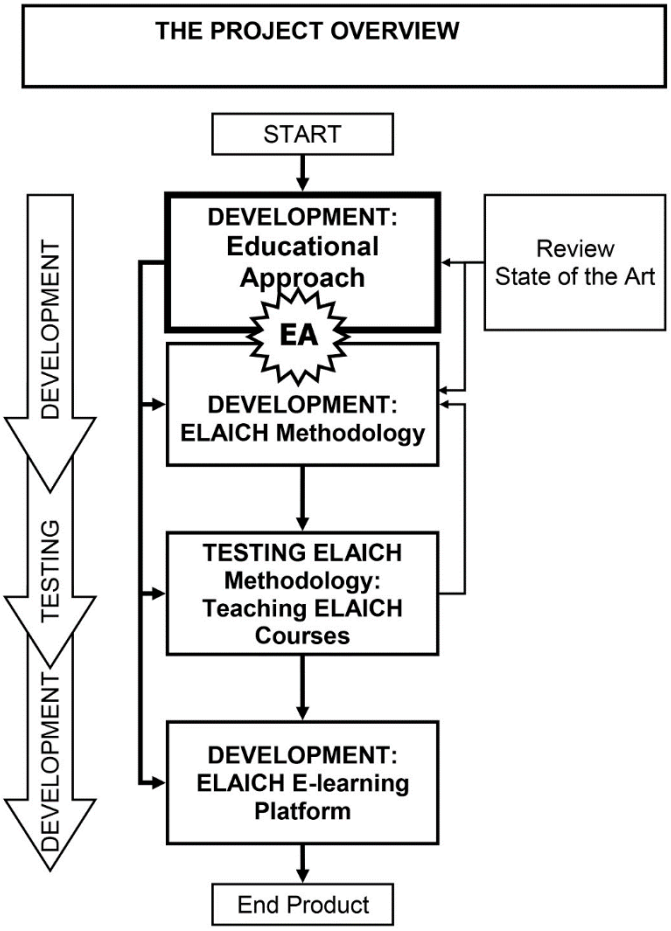

Fig. 1. Schematic illustration of the overall development of project, and of the role of the intrinsic Methodological Mechanism (EA) in this development (© A. Lobovikov-Katz)

The development of the EA, the main subject of this paper, was undertaken in first phase of the project. EA was developed by author (head of the project) and adopted by the project's consortium (see ACKNOWLEDGEMENTS).

2.2 The Context and the Tasks of the Development of the Methodological Mechanism EA

The project began with two simultaneous processes: (1) conducting research for the review State of the Art in heritage conservation education for the general public, executed by all partners according to the author's instructions and template (overall data processed and analysed by the Technion ELAICH research team), and (2) the development of the EA.

According to the review State of the Art, intellectual in-situ activities (i.e., documentation and study of historic buildings or sites) were rare in heritage preservation courses for the general public. Of some 600 courses reviewed in a number of countries, of which 281 were thoroughly analysed, only six included some kind of on-site intellectual work. (Lobovikov-Katz et al. 2022) Based on the conclusions of the above review, including aims and methods in CH education for non-experts, ELAICH partners (all of whom had taught conservation/ preservation at universities, some also to the general public) analysed their teaching methods and their applicability to the target audience. This was done through special attention to the visual perception issue in architectural conservation, because of the ELAICH project special focus on intellectual (eyes-on) in-situ activities by the students.

With regard to the EA, the main considerations that guided its development were:

- What are the requirements and needs of contemporary conservation of cultural heritage? Which of them can be enhanced by educating the general public in conservation of cultural heritage?
- What structure and which themes of the contemporary conservation of cultural heritage should be taught to the general public?

The development of the EA was aimed at developing an intrinsic research mechanism which would enable the development of the ELAICH methodology, thus facilitating the development of project's final product – the educational toolkit. The basic EA structure has been developed flexible, so as to enable flexible inclusion of the teaching material and learning activities into the toolkit, and flexible structure of the course around a central obligatory learning route.

3 The development of the intrinsic research Methodological Mechanism EA

The Methodological Mechanism EA includes three main tools:

1. A Schematic Map for the didactic modular development of EA ("Schematic Map")
2. Teaching Modules & Areas of Responsibilities Scheme ("Areas of Responsibilities Scheme")
3. A Scheme of Educational Approach of ELAICH ("SEA-ELAICH")

The first and the third tools are specifically delineated in this paper.

3.1 What" to Teach? – The Schematic Map for Didactic Modular Development of EA

The general public is not familiar with cultural (built) heritage and its preservation and conservation. Therefore, it is necessary to enable the ELAICH general public students to develop a basic understanding of the full spectrum of the principal components of cultural heritage: causes and types of deterioration – agents and dangers as well as the principles, techniques, and processes of contemporary conservation. As the first step in the development of the research mechanism, and as part of a systematic approach to contemporary conservation of cultural heritage, the Schematic Map for the Didactic Modular Development of EA (short - Schematic Map) has been elaborated by the author and adopted by the ELAICH Consortium (Figure 2). The Schematic Map is actually a mapping of the main teaching topics, through the intersection of the main elements of conservation of cultural heritage. These elements are organized into two main groups:

- Main components of conservation objects (e.g. building material, structure)
- Main processes (e.g. deterioration processes; conservation activities and processes)

The Schematic Map aims to split the contemporary interdisciplinary conservation of cultural (architectural) heritage into its basic elements, thus providing a general picture of the possible ways they combine into an integrated didactic scheme, enabling the teaching of conservation to the general public. This splitting is aimed at facilitating the construction of a general, flexible, adjustable teaching structure and teaching modules to fit into it.

The Schematic Map provides a two-dimensional check-list and reference source for formulating teaching topics and course structuring. The Schematic Map is part of the EA, and was used for the duration of the project as an instrument for the development of the ELAICH methodology and for the construction of the Educational Toolkit.

An important feature of the project is that both the general public and the cultural heritage (namely, its study and conservation) mutually benefit from ELAICH through the educational process. This feature is especially relevant with regard to the intellectual in-situ work by the students – the study and documentation of the historic buildings and structures. The in-situ study could be, in large part, operated via visual investigation. Therefore, and because of the special role of visual perception in the built heritage and its conservation, “perception” is one of the important components of the schematic map.

The Schematic Map, in accordance with the original plan of the project, among others, enabled and facilitated two processes:

- Examination of the needs and character of the contemporary interdisciplinary conservation of cultural heritage, in order to formulate what should be taught to the general public;
- Providing a framework to the ELAICH partners for examining their own experience in the teaching of conservation, both as related to teaching methodology and to their first-hand acquaintance with different types of audiences

Structure and Elements of the Schematic Map for Didactic Modular Development of Educational Approach. The Schematic Map facilitates easy reference by providing a clear address for each table unit. For example, the topic "Perception – structural failure issues" can be found in cell 5/g (Figure 2).

Main topics refer to the main components of a building or site, environmental impact, and issues of perception. The Schematic Map (Figure 2) is color coded by topics:

- Environmental Issues – Peach
- Architecture and Arts – Light blue
- Material – Yellow
- Structure – Blue
- Material and Structure Integrated Issues - Green (Yellow & Blue)
- Perception – Gray

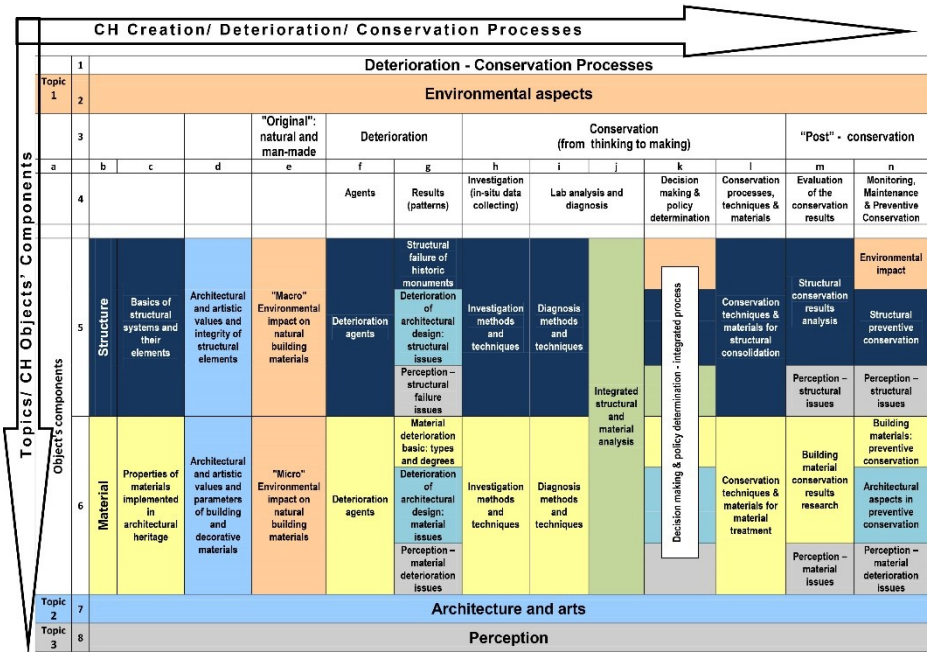

Fig. 2. Schematic Map for Didactic Modular Development of Educational Approach (© A. Lobovikov-Katz)

As seen in Figure 2, the main processes of creation/ deterioration/ conservation of cultural heritage include:

Deterioration

- Agents
- Results (patterns)

Conservation (from thinking to making)

- Investigation (in-situ data collecting)
- Laboratory analysis and diagnosis
- Decision making and policy determination
- Conservation processes, techniques, and materials

Post- conservation

- Evaluation of conservation results
- Monitoring, maintenance, and preventive conservation

Details of interrelations of "Object Components," using "Structure" (row 5) as an example, include:

- Basics of structural systems and their elements
- Architectural and artistic values and integrity of structural elements
- "Macro" environmental impact on natural building materials (such as materials used for buildings construction and decoration)
- Deterioration agents
- Structural failure of historic monuments
- Deterioration of architectural design: structural issues
- Perception of structural failure issues
- Investigation methods and techniques
- Diagnosis methods and techniques
- Integrated structural and material analysis
- Decision making and policy determination
- Conservation techniques and materials for structural consolidation
- Structural conservation results analysis
- Perception - structural issues
- Environmental impact
- Structural [issues in] preventive conservation
- Perception - structural deterioration prognosis issues
- Architectural aspects in preventive conservation

"Material" (row 6) was treated in a similar way.

3.2 HOW - 1: Designing Teaching Modules - Development of the Mechanism of Teaching of CCH Topics through their Interrelation

The final product of the project, - ELAICH Educational Toolkit, - was designed as a modular structure. The Schematic Map for Didactic Modular Development of EA was developed as a "static" instrument, and because it alone could not solve the development of the ELAICH methodology, a mechanism allowing to handle this scheme was achieved in a two-step process – first, defining the areas of responsibilities, and second, suggesting a mode of interaction between the two schemes: "Schematic map" and "Areas of Responsibilities Scheme".

The first step was to build up a new instrument, Areas of Responsibilities Scheme, based on the areas of responsibilities of each of the five partners of the project consortium for the various teaching areas, according to their fields of specific expertise. The areas were detailed and split into sub-topics, ultimately resulting in the Teaching Modules & Areas of Responsibilities Scheme. Following the interdisciplinary and multidisciplinary character of contemporary conservation of cultural (built) heritage, it was obvious that the effort should be combined.

The Areas of Responsibilities Scheme was actually developed by head of the project as a scientific management tool, which facilitated scientific management of the combined effort of the ELAICH consortium in designing the ELAICH modules and development of the ELAICH content. The Teaching Modules & Areas of Responsibilities Scheme presented a structure of the main areas in conservation of cultural heritage with indication to each partner's area of responsibility, within the teaching context. Actually, this scheme is a snapshot of the conservation process through its basic stages, as it was being transformed into the preliminary structure of a teaching mechanism. Therefore, the Areas of Responsibilities Scheme provided further detailing of a process of conservation, represented as titles on a basic level in the Schematic Map for Didactic Modular Development of EA.

The main idea and target of the project – to develop a didactic basis and tools to teach CCH (Conservation of Cultural Heritage) to the general public –influenced the location and the interrelation between the main conservation areas. Each area Director was responsible for its development. Each Director was supported by other relevant partners, who contributed their experience and knowledge to the development of specific subjects and areas in question (e.g., Area: Conservation processes, products & methods; Director: University of Malta; Topic: Conservation techniques; Subject of contribution: Conservation of bricks; Contributor: University Ca' Foscari, Venice).

This scheme was developed in such a manner that it would be compatible with the Schematic Map for Didactic Modular Development of EA which is based on the same color code:

- Environmental Issues - Peach
- Architecture and Arts - Light blue
- Materials - Yellow
- Structure – Blue

Some other areas were added, in relation to conservation process:

- Material & structural diagnosis, quality assessment & planning - Green (Yellow & Blue)
- Conservation processes, products & methods – Brown
- Monitoring & evaluation of conservation intervention – Orange

The Schematic Map allowed for a methodological analysis and planning of interaction between different CCH topics for CCH teaching.

The second step was to suggest a mode of interaction between the two schemes. The suggested mode, as depicted below, was indeed applied to the development of the final product of the project – the Educational Toolkit, and was applied in the designing of the ELAICH course as consisting of a number of modules. It also provided a framework

and appeared to be a useful mechanism for work and decision making in the course of the partner meetings and working sessions.

3.3 How-2: Scheme of Educational Approach ELAICH (SEA-ELAICH): Main Structure and Application

The Scheme of Educational Approach ELAICH (SEA-ELAICH), outlined in Figure 3, schematically shows course design and implementation (planning and actual teaching) via interactive realization using both schemes – the Schematic Map for Didactic Modular Development of Educational Approach (Figure 3) and Teaching Modules & Areas of Responsibilities Scheme as tools. The source for modules (a course consists of several modules) is the Schematic Map, and the modules' further description and actual provision are operated through the Areas of Responsibilities Scheme.

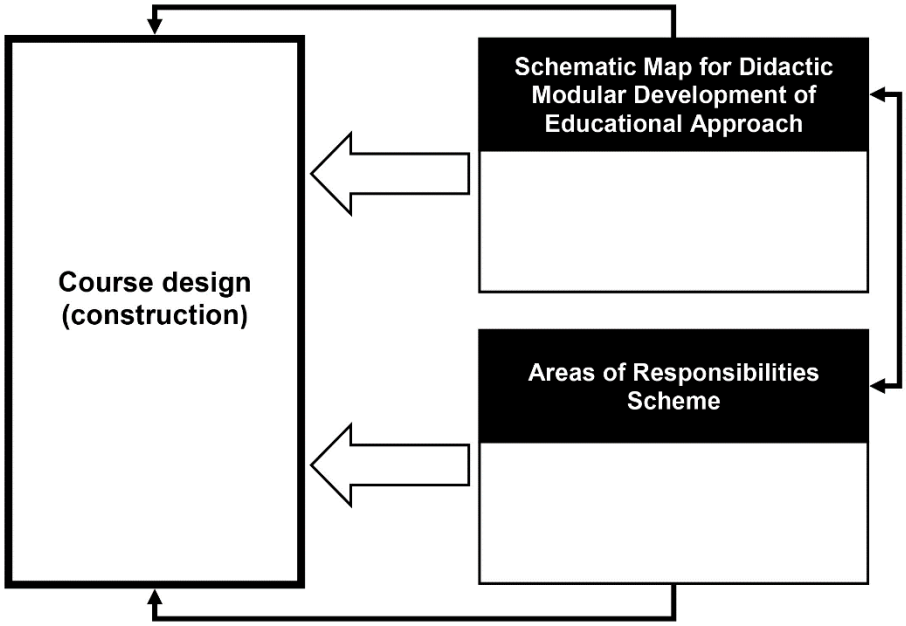

Fig. 3. Overview of the Scheme of Educational Approach ELAICH (SEA-ELAICH) (© A. Lobovikov-Katz)

The use of these tools and the main mechanisms of the SEA-ELAICH scheme are explained more closely in Figure 4. This illustrates a course design and the process of implementation of EA in this design. It shows how each module can be built up separately, while at the same time, the whole process is coordinated. Figures 3 and 4 do not represent a specific course. Rather, they illustrate how a course is designed using SEA-ELAICH, when interactive building (design) on the level of primary units is provided. They illustrate the correlation between each and every unit in the schematic map of teaching topics, and areas of partners' expertise and responsibilities.

SEA-ELAICH enabled creative, coordinated and manageable cooperation between the ELAICH partners during the development of the modular structure of the ELAICH Educational Toolkit. It facilitated formulating the 6 basic ELAICH Modules (Lobovikov-Katz et al. 2012) and decision making regarding the location of mutual contribution of the partners within the modules in other partner's responsibility (e.g. Topic 2.3. - part of Module 2, under the responsibility of NTUA (National Technical University of Athens), was developed by the Technion; Topic 3.4. - part of Module 3 under the responsibility of University of Antwerp, was developed by NTUA, etc.) (ELAICH Manual 2012).

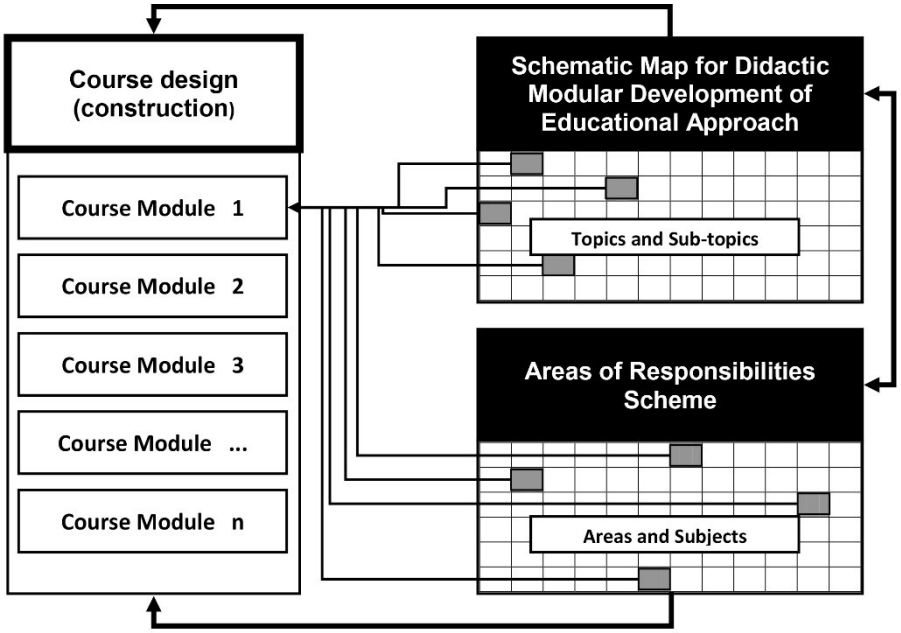

Fig. 4. An example of the implementation of the Methodological Mechanism EA: mechanism of application of the Scheme of Educational Approach ELAICH (SEA-ELAICH) to the course design (© A. Lobovikov-Katz)

Teaching and learning process is not always linear. Indeed, several loops would be needed within the same course, in order to help students to acquire a deeper understanding of CCH, and to make their own effort to study CCH during the course. This loop access to the core topics of the course has been taken into account during course design, as presented in Figure 5.

Figure 5 demonstrates the "documentation-understanding" link/correlation and its development in ELAICH teaching. The project has proved this to be helpful for the development of the students' understanding of CCH, with a further advancement of this basic understanding to a well-formed, sensitive attitude toward cultural heritage combined with basic ability for primary in-situ documentation (Figure 5); Figure 6 provides a more detailed visualization of the learning process according to ELAICH (Figure 6).

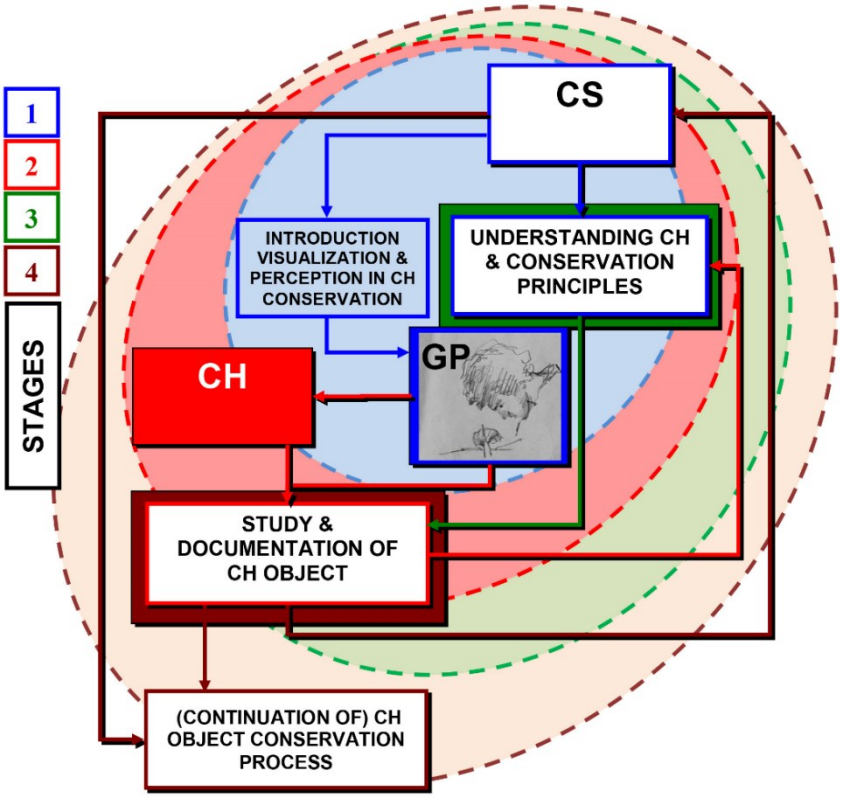

Fig. 5. Initial schematic vision and representation of teaching-learning process ELAICH (CH – Cultural Heritage; CS – Conservation Scientists; GP – General Public) (The Scheme was developed and produced by A. Lobovikov-Katz in 2009; its black and white version was presented in: Moropoulou, A., Konstanti, A. & Lobovikov-Katz, A. (2014). "Hands-on Cultural Heritage" Educational Approach Interconnecting Secondary with Tertiary Level Education, 6th International Congress Science and Technology for the Safeguard of Cultural Heritage in the Mediterranean Basin, 22-25 October 2013, Athens, Greece, Vol. III, (pp 326-334) ISBN 978-88-97987-05-5)

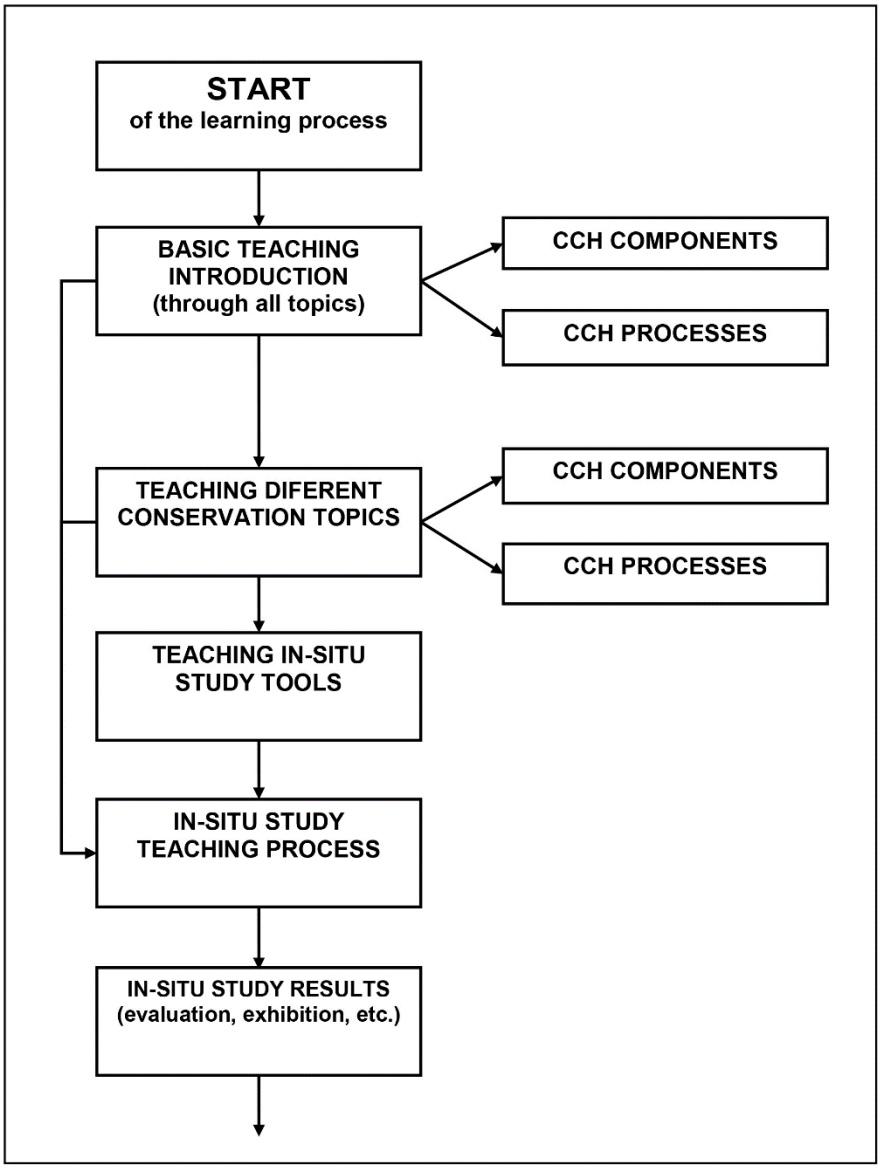

Fig. 6. Visualization of the learning process according to the ELAICH Course (© A. Lobovikov-Katz)

4 Methodological Mechanism EA: Application and the Selected Results

This section of the paper exemplifies the application of the EA methodological mechanism to the central aspect of the ELAICH project – the intellectual in-situ learning and study, as shown by the selected results presented here. While the project teaching modules, which enable learning before the actual on-site instruction, implement hands-on activities in their broad sense (Holstermann et al. 2010, Wittman 2010), the on-site intellectual activities, being hands-on and minds-on in their nature, can be defined as "eyes-on", in the specific context of this project and its aims.

4.1 Methodological Mechanism EA application to the development of the teaching processes for enabling the in-situ investigation - conservation processes correlation

The discussion now turns to intellectual in-situ learning – the core issue of the ELAICH project in teaching CCH to the non-experts. The principal idea of ELAICH is to enable them to perform basic on-site investigation of historic buildings and sites. The means to achieve this goal are:

- To plan and include introductory class/laboratory/e-learning studies for in-situ investigation;
- To use extensive in-situ investigation, analysis, and mapping in the teaching process;
- To develop and apply specific teaching methods and teaching content to enable the participants to carry out such investigation and mapping;
- To follow the sequence of an actual conservation process in teaching CCH to the target audience;
- To develop an interactive mode for laboratory–in-situ teaching of relevant CCH issues;
- To plan topic sequence and ratio for class/in-situ/laboratory/e-learning, so that they provide a flexible course structure

It is essential to clarify the meaning of the "class" and "e-learning" components of the ELAICH course. As outlined above, the project consisted of three phases: Phase I – development; Phase II – testing, when actual courses were taught; and Phase III – design and production of the e-learning toolkit. Two types of courses should be distinguished: lessons given by the project partners to high-school students (as part of Phase II), and online courses. In the educational activity in Phase II, "class" meant classroom lessons taught by project partners who were conservation experts. After the completion of Phase III, classes were taught by school teachers, assisted by the ELAICH Manual which was downloadable from the ELAICH e-learning website. "E-learning" during Phase II meant e-learning with lessons supported by Moodle, used for introduction, exercises, and follow-up of the students' progress. After the completion of the project, the entire Educational Toolkit had been available on-line, through a specially designed e-learning platform, so that the entire toolkit could be defined as "e-learning". At the

same time, the application of the e-learning as active learning enabled through electronic support, the interactive exercises and other activities stimulated by certain interactive modules should be specially pointed out. It is important to mention that the entire ELAICH Educational Toolkit could be taught independently through its e-learning platform, without any outside help, by users of a compatible level (school teachers), or used for self-learning by high-school students or others (Lobovikov-Katz et al 2022).

As mentioned earlier, the guiding idea was to organize the order of teaching to follow the sequence of processes and procedures as they usually occur in actual conservation, starting from investigation and laboratory analysis and diagnosis procedures. Nonetheless, participants of actual or e-learning ELAICH courses should be prepared for the understanding of a series of conservation (preservation) issues. To ensure this, the Schematic Map was used by the project partners at each step of the planning of the educational process.

Figure 7 illustrates the application of the Schematic Map for the designing of in-situ learning intellectual activities.

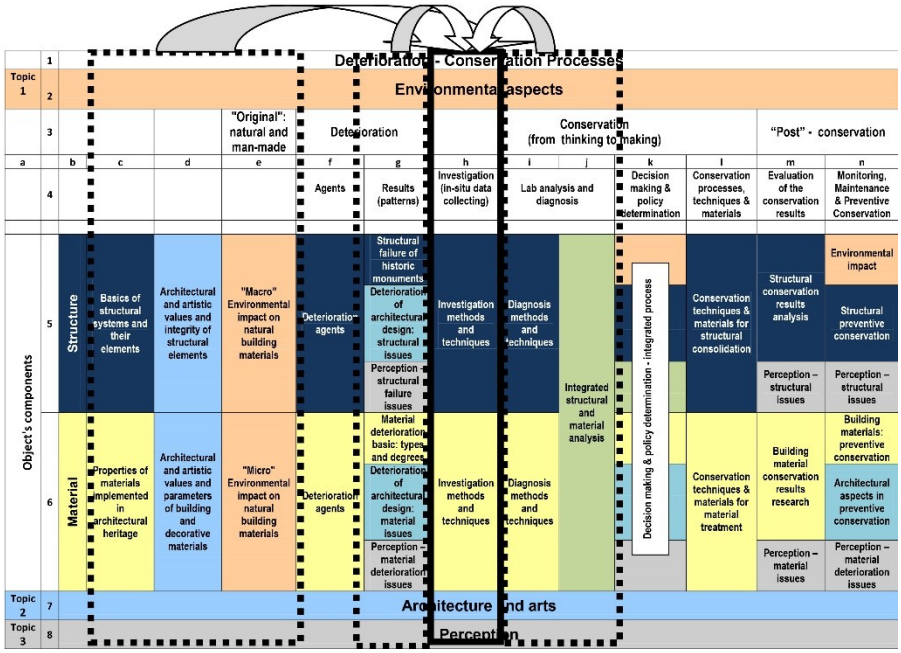

Fig. 7. In-situ learning, investigation and data-collection: material, structure; architectural surfaces (© A. Lobovikov-Katz)

This scheme (Figure 7) focuses on the specific spot of the Schematic Map (2, 5, 6, 7, 8/h), dealing with in-situ investigation. At the same time, it shows what other topics should be involved in preparing the in-situ teaching package, and points out the correlation between other relevant topics, including causes, patterns, and degrees of deterioration and properties of materials, structure and architectural surfaces alongside environmental issues and those of architecture and perception.

Participants should acquire a basic knowledge of all these course elements before approaching the historic site for investigation. However, a better understanding of these issues by the course participants should undergo further development during the in-situ investigation.

This application of the Schematic Map has proved to be useful for the analysis and mapping of different conservation topics. In the final stages of the project, it was used for searching and organizing of additional learning material which was part of the body of the advanced topics of the e-learning educational toolkit.

The following factors influence teaching in the framework of ELAICH, both in general terms, and as related to the intellectual + in-situ teaching CCH to the general public:

Teaching methods; teaching processes; Teaching topics; Conservation principles, methods & techniques, and Teaching technology (e.g. e-learning, etc.).

4.2 ELAICH Project: Selected Results

The immediate result of the ELAICH Project was three-fold: EA methodological mechanism and ELAICH methodology were developed, courses were taught, and the e-learning platform was constructed and launched, making it available for the general public, and especially for its target audience – the young people. As demonstrated here, the EA educational approach was instrumental for delineation of teaching topics, and for the development of the project, including its methodology. It served as a core structure and a mechanism for the development of the project until its final stages. Using the ELAICH e-learning platform for in-situ investigation, students studied and analyzed selected historic buildings, structures and sites, both in "real" and on-line courses. The selected results of this on-site data collection and its subsequent analysis were provided in the "Adopt a Site" section of the ELAICH Educational toolkit e-learning platform (Lobovikov-Katz et al 2014). These consisted of visual and textual material, analysis and mapping related to historical data and conservation state of the structure, including data on geometry and material of an historic structure (e.g., types of building material, types and grades of material and structural deterioration, traces of past interventions, etc.). It was also important to provide a wider view of the historic surroundings relevant to location in space and time of a historic building/ site under study. Examples of the results of on-site intellectual study by the ELAICH high-school students were presented and discussed (e.g., ELICH Manual 2012, Lobovikov-Katz 2014). While students, after a relatively short learning process, obviously could not become conservation experts and provide an educated explanation to all the patterns they face, they could be educated by means of the ELAICH methodology to analyze, for instance, geometrical and material data, and to point out conservation problems. This proved to be feasible, useful for students from the educational point of view, and to conservation experts as assistance for a primary analysis of historic sites, e.g. an expert glance at the students' drawing could reveal a wide range of geometrical and material data on a historic site, such as different types and shapes of stone, thus, in turn, assisting formulation of specific questions for further on-site research, on-site sampling, etc. The analysis of historic buildings investigated by students in the framework of ELAICH project, or guided by the ELAICH methodology, also included mapping of types of deterioration and degrees of deterioration (Lobovikov-Katz et al. 2014).

The results of the on-site intelligent study by the ELAICH students in several courses of the project were examined and verified by conservation experts at the end of the courses. The educational toolkit and the results of its application in general have been found useful by educational and heritage authorities in several countries, including Italy, Greece, Malta and Israel.

5 Conclusions

The Methodological Mechanism, presented and analyzed in this paper, proved to be useful for diverse types of research and development activities in CCH education for the general public, and can be applicable to other emerging projects in this area. Results of the ELAICH project have been partially discussed (Lobovikov-Katz et al. 2012, 2014, 2022; Ortiz et al. 2018; Hazan and Lobovikov-Katz 2017). However, the actual methodological "technology" of the project and the internal research mechanism of its development have not been published. The development tools, presented here, served as a flexible framework and enabled creative and coordinated cooperation within the given research and development structure, while providing the foundation for the construction and definition of this structure in the first place.

The Methodological Mechanism EA has proved to be of multiple value. It shaped and facilitated the integrated approach to teaching multi-facetted, inter-disciplinary contemporary conservation of cultural heritage, and provided a scientific development and management foundation for the consortium discussions between representatives of different CCH areas. It facilitated the development of the ELAICH project until its later stages, starting from the development of educational content for the courses. This insight into the "technology" of methodological development might be of assistance to other projects in heritage education, and especially – for education for the conservation of cultural heritage (CCH education for the general public). The development of Methodological Mechanism has made an important contribution and brought about the formulation of recommendations to the major feature of ELAICH: "intellectual + in-situ" teaching conservation of cultural heritage to the general public. In its final stage, the ELAICH project achieved all its objectives, and an important credit for this accomplishment goes to the Methodological Mechanism - the methodological "technology". While the methodological mechanism described in this paper aimed at achieving goals of the Project ELAICH, its application allowed for the development of educational outcomes that were helpful in educating diverse types of audience and preservation of CCH beyond the original scope of the project. The use of ELAICH Educational Toolkit, based on the ELAICH methodology and originally intended for the Mediterranean region, has spread into about 150 countries from various parts of the world.

A significant progress in the number and types of heritage education activities for the general public has occurred in recent years (Moropoulou and Konstanti 2013; Fontal and Martínez 2017; Monteagudo-Fernández et al. 2021). At the same time, no evidence has been found so far of large-scale changes with regard to the overall situation with educating the general public for CCH, or the involvement of the general public in so-

phisticated research and intellectual activities as part of their contribution to the understanding and analyzing cultural heritage for its conservation (Lobovikov-Katz et al 2022). The Methodological Mechanism can also be applicable to the areas beyond CCH education for the general public; it might be useful for the development of educational mechanisms for a better understanding and collaboration between experts from different areas of science and technology involved in the contemporary interdisciplinary CCH (Lobovikov-Katz et al 2018). Further research and development is needed, for the advancement of CCH education for the general public, and for the preservation of cultural heritage.

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