Addressing Key Challenges in Intangible Cultural Heritage Education

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Abstract
The paper draws on the i-Treasures EU project which adopts cutting-edge sensors and ICT technologies to sustain Intangible Cultural Heritage (ICH) learning and transmission. It highlights how some of the main educational challenges that are characteristic of this peculiar field have been addressed in the project by relying on consolidated Technology Enhanced Learning (TEL) practices and related tools. In particular, it focuses on pedagogical planning as a means to sustain the design, deployment and sharing of educational interventions, which are suitable and effective from the viewpoint of contents, structure and learning /teaching methodologies.

1. INTRODUCTION
Cultural Heritage Education is gradually assuming increasing relevance [1] [2] and digital technologies are giving a significant contribution to its take off [3] [4].

The concept of Cultural Heritage Education refers not only to tangible artefacts such as literature artefacts, architecture, sculpture, paintings etc… [5]. It rather extends up to encompass “the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their culture”: in one word it includes what is defined by UNESCO “Intangible Cultural Heritage” (ICH) [1].

Along this line, nowadays, most EU countries have promulgated specific educational policies and recommendations encouraging schools to sustain and promote awareness of local cultures and heritage [6].

A few attempts have been done so far to promote teaching/learning of specific ICHs for the wide public (to increase awareness) or for apprentices (in order to widen the opportunities of transmission of specific know how).

For example, the Oral Traditions Project of the Vanuatu Cultural Centre is a relevant case in point as to the awareness increase (for more details on the project see [7] [8]). The project grounds on a network of volunteers, called fieldworkers, representatives of different communities who each year conduct research on traditional customs and cultural expressions. The project has a role in raising awareness about the importance of traditional culture in the years following decolonization of the Vanuatu islands from the French and British Condominium government in 1980. Its primary function is to create a ‘memory-bank’ of traditional culture and languages, but the collected materials are not only kept for posterity but used in educational programmes for schools, the museums and the radio and community development.

Technologies can support this scope; for example MelOdysseia1, which was developed by the “Lilian Voudouris” Music Library of Greece “, is an online interactive tool for teaching the history of music in Greek from the medieval period until today. It is designed to preserve heritage by introducing and familiarising classical music to secondary school pupils, and those who love music and are in the early stages of their acquaintance with it.

In other cases, the attention has been oriented to the concrete transmission of ICH practices or

1 http://melodisia.mmb.org.gr/
traditions. For example, the Living Human Treasures project\(^2\) was set up in the early 1990s in different national contexts, following existing programmes set up in Japan and Korea\(^9\). The project supports the transmission of traditional skills to young generations through a system of nationally sponsored apprenticeships. Apprentices learn the skills involved in traditional arts and crafts by living and working closely with master craftspeople (so called Living Human Treasures, i.e. LHT). Although its impact varies, this practice presented some limits anyway, considering that in this way the audience was clearly broaden but the knowledge transmission was restricted to the chosen apprentices as well and occasionally the transmitted knowledge is treated as something fixed and monolithic.

Another example, mediated by technologies, is the I-maestro project that aims to build a multimedia environment for technology enhanced music education. This employs self-learning environments, gestural interfaces and augmented instruments promoting new methods for music training.

In any case, it is a fact that ICH transmission poses a number of challenges to educators, directly linked to the intrinsic characteristics of the ICHs themselves (often relying on “implicit knowledge” and characterized by lack of standardization) and to their traditional transmission modalities (mostly based on oral/in person tradition and imitation).

This paper discusses how to carry out effective educational interventions in the very peculiar field of ICH education and raises some issues, potentially affecting their effectiveness. What exactly is to be taught and how? How can we guarantee repeatability and sustainability of learning/teaching interventions? How can best practices be turned into well established, repeatable didactical approaches?

To tackle these issues, this paper draws on the experience gained in the framework of the i-Treasures project, which, beyond preservation and dissemination purposes, aims to set the conditions for establishing new teaching/learning practices in the field of ICH\(^10\).

In the following, after providing a brief picture of the i-Treasures project, this paper identifies the main challenges one can face when dealing with ICH education. Actually, it refers to the challenges that emerged in the framework of i-Treasures; in doing so, it looks at the matter “ICH education” as a whole and deliberately doesn’t focus on one single ICH among those considered in the project. In particular, it deals with relevant educational aspects and illustrates the methods and tools adopted in i-Treasures as to: a) identify what is to be taught in the lively field of the ICH expressions considered; b) design and plan innovative teaching/learning interventions in the ICH field (how ICH should be taught)\(^11\)\(^12\) c) guarantee repeatability and sustainability of the above mentioned teaching/learning interventions.

Final considerations are proposed on how appropriate technological choices can contribute to provide suitable solutions to existing challenges in ICH education, thus also overcoming existing barriers and innovating the passing down of the rare know-how behind these valuable artistic expressions.

2. **THE CONTEXT**

i-Treasures (Capturing the Intangible Cultural Heritage and Learning the Rare Know-How of Living Human Treasures) is an Integrated Project (IP) of the European Union’s 7th Framework Programme\(^3\).

The project considers a number of different ICHs, belonging to the four different areas of singing, dancing, music and craftsmanship, namely:

1. singing: Cantu a Tenore, Canto in Paghjella, Byzantine music and Human BeatBox;
2. dancing: Tsamiko, Căluș, Walloon and contemporary dances;
3. craftsmanship: the art of pottery;
4. music: contemporary music composition.

Some of these ICHs are listed by UNESCO in the List of Intangible Cultural Heritage in Need of Urgent Safeguarding (Canto in Paghjella), or in the Representative List of the Intangible Cultural Heritage of Humanity (Cantu a Tenore and Căluș dance), others are however valuable expressions of specific cultural traditions. Lastly, two are contemporary artistic expressions.

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\(^2\) [http://www.unesco.org/culture/ich/?pg=00061](http://www.unesco.org/culture/ich/?pg=00061)

\(^3\) [www.i-treasures.eu](http://www.i-treasures.eu)
All the ICH expressions considered form a complex and multifaceted whole that will serve the scope of acquiring a considerable amount of data, allowing a global view of the ICH transmission phenomenon.

At the very beginning of the project the traditional transmission modalities were explored together with a set of other dimensions [13]; the picture we gathered was that the different ICH considered have in common several aspects but some differences can be found.

Most of the ICH are transmitted orally or by imitation; these processes have different level of formalization and can happen in informal or formal contexts.

In the case of Cantu a Tenore, for example, in the past it was only learnt by imitation, transmitted by listening to the master singers and by practicing together with peers; in recent times some dedicated schools have been founded at local level, but these are mainly places where experienced singers sing together with young apprentices, who still learn by imitation. The process is not driven by a curriculum, but is based on the expert singer’s experience. The same can be told for the Paghjella singing style or the Calus dance. On the contrary, in the Tsamiko dance case or in Byzantine music, the learning process is of course mainly based on imitation (and therefore on the teacher’s ability and experience), but it is more formalized and happens in schools. Moreover, for most of the considered cultural expressions, it is evident that knowledge is partially implicit and lies in persons, moreover some aspects remain hidden to the experts themselves.

i-Treasures, as it will be further explained in this paper, has the aim of disclosing these implicit and hidden aspects and builds on the adoption of different types of innovative sensors to capture key aspects of the different ICHs considered. A process of data modelling is carried out, by relying on advanced Semantic Multimedia Analysis techniques, in order to identify specific media patterns (e.g. postures, gestures, audio patterns, actions etc.). These data are stored and made available for preservation and research purposes, as well as for supporting teaching and learning processes.

Thus, the project will “develop an open and extendable platform to provide access to ICH resources, enabling knowledge exchange between researchers and contributing to the transmission of rare know-how from Living Human Treasures to apprentices” (Project Description of Work - DoW4). The i-Treasures platform is conceived for managing different contents (e.g. texts, audios, images, videos, 3D graphics) and for making a variety of multimedia resources available related to the various ICHs considered. This will give the opportunity to different kinds of users (teachers, experts, students, people generically interested in one or more ICH, etc.), to use them for different purposes including teaching and learning. In the following, we will briefly define the main challenges in ICH education and then describe the approaches and means adopted by the project to sustain the design and planning of effective teaching/learning interventions in this field.

3. ICH EDUCATION: MAIN CHALLENGES

ICH education presents a number of peculiarities with respect to other, more ‘traditional’ disciplines.

The first element to consider is that often contents to be transmitted (what is to be taught) are not clearly and formally defined; what is usually taught depends mainly on choices made by the expert performers (who often act as ‘teachers’), but there is no formalized knowledge domain. Besides, most ICHs are “living” expressions, that vary from time to time, place to place, and that are constantly and creatively recreated by their performers. Although they are usually based on a common core of traditions and fixed ‘rules’, they are susceptible of considerable variations, mainly due to the transmission modality (which is mainly oral/in person) and to individual expressions/behaviors during the performance [14].

Consequently, we can say that one of the main challenges we encounter when dealing with ICH education is that we address knowledge domains that are “lively” and continuously changing, so what is to be taught is not well established or defined.

A further challenge regards the teaching/learning methods (how ICH is to be taught). Usually teaching/learning processes happen in informal contexts, where newbies observe and imitate experienced performers. Given the informality of such situations, even in those cases where the experts provide some kind of ‘active scaffold’ to learners, this is hardly planned in advance, and even less often are there structured ‘learning paths’ that learners may follow. Thus, finding approaches able to design and plan teaching/learning activities in these unexplored domains, is

4 http://www.i-treasures.eu/filedepot?fid=4
extremely important, as you need to carefully consider the constraints of your context, the peculiarities of the knowledge domain, as well as the characteristics of the target population.

All these aspects make it very hard to define appropriate teaching/learning methods in the ICH field.

Furthermore, once you have designed and tested more formalized learning activities, you should guarantee their sustainably and repeatability even in contexts different from the original ones, i.e. beyond the boundaries of the local communities where the ICH at hand is usually practiced. This is to support further dissemination and preservation of these cultural expressions, especially those that are at risk of disappearing.

In the following, we describe how the i-Treasures project is addressing these challenges, namely: 1) what is to be taught (definition of the knowledge domains in the ICH field); 2) how this should be taught (definition of methods and tools to design and plan effective teaching/learning interventions); 3) how to guarantee sustainability of these teaching/learning interventions.

3.1. i-Treasures: “capturing” ICH

The first challenge that needs to be faced is the exact definition and identification of what should be taught. In most of the cultural expressions considered, the knowledge domain is not yet defined and formally represented. Expert performers draw on their personal background; teach what is worth being taught from their personal point of view, instead of referring to an established syllabus. For most of these cultural expressions, knowledge lies in persons, not in books. Actually, we are dealing with a complex and “intangible” matter.

Furthermore, often learning these cultural expressions is more related to procedural knowledge (you should know how to perform some tasks), rather than to declarative knowledge (i.e. knowledge that can be declared or stated through words or symbol systems, e.g. dance or music notation). So far, in most cases, knowledge has been transmitted mainly in informal contexts or in sorts of apprenticeships: apprentices acquire procedural knowledge by observation or imitation.

Lastly, some features in ICH are still ‘hidden’ and need to be “discovered”; this is the case, for example, of the very peculiar way in which the vocal cords produce some of the sounds in Cantu a Tenore.

One of the main strengths of i-Treasures is the way it approaches the issue of defining what exactly has to be taught, that is by making use of the most innovative sensors and ICT technologies to “capture” and bring to light the hidden aspects of existing performances.

Through the adoption of innovative technologies, (such as optical, depth or inertial sensors, EGG and EEG sensors, etc.) key aspects of the different ICHs considered are captured. By extracting low (e.g. motion tracking) and medium features (e.g. postures, actions, etc.) and transforming them into reliable/manageable data (by means of advanced Semantic Multimedia Analysis techniques and the subsequent process of data fusion), i-Treasures will be able to make data available on the platform (about body movements, vocal tract movements, sounds, etc.) for each of the ICHs considered.

Based on these technological affordances and through continuous interactions with expert performers, new teaching and learning landscapes will emerge, that are oriented to procedural knowledge acquisition. Innovative applications will be developed, based on 3D representation of users able to visualize their motions using multimodal inputs from different sensors. An AI based virtual tutor will support the learner, by providing visual and audio feedback about the ‘correctness’ of her performance. The application will compare user’s inputs with the master’s inputs in the database so as to evaluate the user’s performance [10]. This affordance will give the learner the opportunity to get personalized feedback and will increase the level of competence in a direct and effective way, also in self-regulated learning activities.

Thus, i-Treasures will offer new learning contents, which, of course, need to be integrated into structured and carefully designed learning activities. In the project, particular attention is thus devoted to the design and planning of pilot learning interventions in the field of ICH, as illustrated in the following section.
3.2.  i-Treasures: designing effective learning paths in ICH

The second challenge is the definition of how the educational process should be structured and carried out in the ICH field, so as to best exploit the innovative technologies and data provided by the project.

As mentioned above, in most cases ICH transmission is based on the expert performers’ personal inclinations, rather than on consolidated teaching/learning practices. In most cases, the level of ‘subjectivity’ of the teaching/learning process is very high, thus leading to quite different educational experiences in the same field and to a low level of exchange and sharing of resources, practices and methodologies.

Thus establishing more solid methodological backgrounds seems crucial, especially because we are introducing new variables (the new technologies and the data provided by the project) into a context which is usually very ‘traditional’ and not always open to innovation.

This is the reason why in the i-Treasures project, the need was felt to develop and adopt an ad hoc tool, aimed at identifying the most appropriate methodologies to foster ICH learning and transmission, and at supporting the design of effective learning paths.

The tool, called “Pedagogical Planner (PP)”, is rooted in the Technology Enhanced Learning (TEL) research field, where considerable attention has been devoted to learning design [15] and pedagogical planning [16], [17], [18], [19], [20], [21], [22]. The main outcomes of these research fields include tools and approaches to support representation, sharing and delivery of design ideas on the one hand, and pedagogical reflection on the other.

The idea is that, in order to design effective educational interventions, the designer needs to consider several factors which contribute to defining the learning situation (such as the context, the population involved, the knowledge domain to be taught, the learning objectives, etc.) in order to tailor the learning intervention to them. She needs to reflect on the various elements at play and on the interactions between them, so as to ensure that these form a coherent, manageable whole that responds effectively to learners’ needs - insofar as this can be determined a priori [23].

Thus i-Treasures, by taking into account the work conducted in these fields, has developed the PP, which is able to support the design of sequences of meaningful activities, meta-reflection on the teaching/learning process, as well as the sharing and exchange of practices [24].

The PP allows the designer of a learning activity to reflect on the learning context and on the population she is going to address. This aspect is particularly important in the ICH context where we want to offer meaningful learning opportunities not only to learners belonging to the local community where the ICH at hand originated, but also even to people potentially very distant (geographically distant, but also culturally or socially distant) from the ‘usual’ learners.

The Figure 1 shows the main page of one ‘plan’\(^5\) conceived for the Cantu a Tenore. Besides the general information about the plan (upper part of the page), through the middle bar the designer is supported in the definition of the target population and the context in which the educational intervention will take place.

Moreover, the PP requires the designer to clearly define the content domain to be addressed, as well as the learning objectives to be reached (Figure 1, see middle bar). Again, this is very important in a context where, as previously mentioned, the knowledge domain is often vague.

\(^5\) A ‘pedagogical plan’ is a conceptual tool, which is the result of the design and planning process [22]. In i-Treasures a plan is defined as: “a detailed description of the learning path to be followed and illustrating the flow of the activities to be carried out” [24]).
Figure 1. Main page of a plan

Figure 2 shows a map conceived and developed on the PP by one of the experts to define the contents to be addressed in one of the plans.

Finally, the flow of activities (Figure 3) helps the designer to reflect on which kind of activity to propose, the order in which activities should be delivered, possible alternative paths that could be conceived, and/or on the optionality/mandatoriness of activities to effectively reach the learning goals.

In i-Treasures the conceived plans are usually composed of a variety of activities; some of them are based on traditional methods (e.g. live imitation of experts), others are oriented to deliver traditional contents with technologies (e.g. listening online activities vs. live listening activities). Furthermore, all the plans include activities based on the use of the 3D platform for sensorimotor learning, which allows the learners to best exploit the innovative technologies and the data extracted by the project, by allowing them to practice the ICH and receive immediate feedback on their performance.

A detailed description of each activity gives the opportunity to match the general goals of the plan with the specific objectives of the single activity. Moreover, operative indications and instructions to the learners are provided on how to carry out the activity (see Figure 3).
3.3. Beyond i-Treasures and the local diffusion of ICH

A further challenge we encounter when dealing with ICH is the need to preserve and further disseminate these cultural expressions beyond the boundaries of the local communities where it took root, especially when they are at risk of disappearing.

The i-Treasures Pedagogical Planner is also aimed at fulfilling this objective and at contributing to the dissemination of the results of the i-Treasures project in the field. This entails both spreading information on each ICH and fostering knowledge about the adoption of innovative tools and methods in ICH education.

As a matter of fact, the adoption of a tool for pedagogical planning will offer the opportunity to build up sound educational plans of intervention that will be demonstrated and evaluated within the project life span. Then they will also remain as a legacy after the project end and will be further shared within the broad ICH community, possibly also customized and exported outside the project boundaries.

Moreover, the plans will be available for teachers/experts/performers and learners also in form of ‘educational scenarios’6. This is because the Pedagogical Planner will be integrated with the Learning Management System (LMS), so that each plan will give birth to a corresponding scenario on the LMS, ready to be delivered to learners. In these scenarios the most innovative resources and teaching/learning solutions will be made available, integrated with more traditional ones, in order to reach specific learning goals. Besides, experts and performers in charge of teaching will also be able to access one path on the PP, further customize it (or parts of it) and then create the corresponding scenario(s) from the Pedagogical Planner to the LMS. Persons in charge of teaching will thus be enabled to select the most suitable path for their learners and profitably use the resources of the i-Treasure platform, ensuring the fruitful adoption of them even beyond the time limits of the project.

A thorough description of all the educational scenarios conceived in i-Treasures (and regarding all the different ICH considered) is out of the scope of this paper, but can be found in [25].

4. CONCLUSIONS

In this paper we have taken the viewpoint of the i-Treasures project to explore some challenges posed by ICH education and, drawing on the choices made within the project, we have outlined some ideas for boosting a positive change in the field.

Actually, the i-Treasures project intends to go beyond the mere digitalization of already existing contents and wants to create new knowledge through novel methodologies for the analysis and modelling of ICH based on multisensory technology. In doing this, it also takes into account the some important related experiences conducted by researchers who have tackled the issue of enhancing and renewing the learning processes in the fields of dance and other ICH artistic expressions [26] [27] [28] [29] [30]. Our focus was nevertheless slightly different, since we deliberately decided to take a general perspective and didn’t want to go deeper in analyzing the specific challenges/problems posed by each single ICH expression (dance, singing etc…).
If we take such a global perspective and look at the novelties introduced by the i-Treasures project, we must acknowledge that its main added value consists of bringing to light important hidden aspects of the ICH expressions considered and making them available to support transmission and education interventions.

Another important innovation is represented by the creation and adoption of the Pedagogical Planner, the online tool used to design, describe and share the main features of the pedagogical plans underpinning the enactment of the i-Treasures innovative teaching/learning actions, irrespective of which specific ICH they deal with. Its flexibility and adaptivity to a variety of learning needs (in terms of constraints and challenges posed by the peculiar contents to be transferred) copes well with the demands of the complex and multifaceted field of ICH.

The i-Treasures project, indeed, through the Pedagogical Planner:

- makes available as OER (Open Educational Resources) a number of “plans” supporting the learning/teaching of specific aspects of relevant ICHs;
- paves the way to the production of other plans and to the carrying out of similar interventions in the ICH field;
- instantiates an innovative methodological approach to ICH transmission, which goes beyond, or rather builds on, existing challenges.

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