DESIGN THINKING AND INNOVATION IN LEARNING

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INTRODUCTION: CONSIDERING THE NEED FOR APPLIED INNOVATION IN EDUCATION

Ellen Taricani

> *As we look ahead into the 21st century, leaders will be those who empower others.*
>
> *Bill Gates, Co-founder of Microsoft*

Empowering today's learner to find innovative and enriching experiences will bring about a deeper desire to learn and develop skills. This book offers a combination of innovative design ideas related to education and uses of creative pedagogy. Educational impacts are experienced and modified as the successful techniques are found. For global graduates to obtain quality experiences, they will require a blend of both knowledge and practical ability. They will thrive with these competencies enabling them to impact and lead in the global workforce. Cross-cultural functionality along with the awareness of opportunities can provide expansive value to the learner. Developing global leaders who are able to work across world boundaries using new techniques is important and necessary. Boundaries throughout the world continue to be less noticeable and more permeable with open forums of ideas and implementation.

As you read through each chapter, there are many concepts that cross the cultural boundaries and present numerous possibilities to assist in constructing new design ventures in the classroom. Each author offers a unique perspective in teaching and learning. The world is very complex and consists of many different socio-cultural contexts. Many authors take steps outside their comfort zones of keeping work similar to what was done in the past. These ideas can generate potential for innovation and lead to empowering others to dig deeper. Each of these chapters presents creative ideas that have opened spaces for new possibilities and application in design of learning.

Some of the topics that you will find in this book include digital storytelling, online tasks and performance, plagiarism, trends in international mathematics education, design thinking, collaborative construction of knowledge, innovation in pedagogies and reflections of changes in education.

Each chapter reflects on specific topics that will look at specific studies. In Chapter 1, there is a very distinct international dimension. The aim is to analyse the results of field-research looking at the differences there are among EAU, Portugal and Ukraine. Digital storytelling provides a short form of digital media production that allows everyday people to share aspects of their story as it relates to education. Some are differences between their educational systems and policies as well as between their educational patterns. The next chapter presents and discusses the multinational study of students concerning the use of technology and performance related to online tasks. It is very connected with important phenomena and practice in education. In most settings especially when more work is online, academic cheating can be a problem. Chapter 3 addresses issues that are different local/national/cultural attitudes. The assessment structure included a mixed methods approach to determine a statistically significant decrease in plagiarism, changes to perceived accountability of academically dishonest actions, increased knowledge of plagiarism, and a lowered amount of administrative time spent on plagiarism cases in practice.

Looking at the mathematics curriculum (chapter 4) in Hong Kong provides a glimpse of the socio-cultural background. This study consists of 10 curriculum components, including the rationale of the curriculum, aims and objectives, content, learning activities, teacher role, materials and resources, grouping, location, time and assessment.

Design Thinking is meant to construct a point of view that is based on a design user's needs and insights. It is important to consider the needs of the students and represent concepts to the specific needs. This method (found in chapter 5) is similar to the sequence of phases of the project life cycle, namely initiation, planning, execution and completion. Design Thinking method, namely empathy, definition, idea, prototype and test, is similar to the phases of project execution.

Student engagement through collaborative construction of knowledge in Makerspaces (Chapter 6) presents a case-history of new trends and innovative methods of engaging students using objects. These techniques provide active learning. Many times, groups gather and discuss ideas without really making connections with each other's ideas. Objects, such as found in maker spaces, can be introduced to enhance thinking and processing of concepts towards a better and more comprehensive product.

The final research study in Chapter 7 considers issues that look at higher education in a changing society. There is a need for an evolution of existing higher educational models. In this study, there are two case studies to release modern pedagogy for higher education. It involves a pedagogy that has a focus on real world problems and sees transfer of learning as utterly important. Technological development driven by global competition continuously increases the complexity of work and the related skill demands, whereas the educational sector should meet these demands by preparing and upgrading the skill level of the working population. The last essay discusses issues related to pedagogy and cultural changes. While exploring various innovative means of pedagogical approaches in education, we need to deliberate upon the following questions: Why do we need to seek innovative educational practice? What learning outcomes do we intend to achieve through innovative approaches in education? These are some of the questions to be considered as you read through these chapters.

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LITTLE-KNOWN HERITAGE AND DIGITAL STORYTELLING. SCHOOL AS PROTAGONIST IN THE REDISCOVERY OF THE LOCALITY

Camilla Casonato, Nicoletta Di Blas, Manuela Fabbri and Luca Ferrari

1. INTRODUCTION

The school as the driving force behind an action of rediscovery, enhancement and communication of cultural heritage: this is the 'heart' of the ScAR project ('School Activates Resources') by Politecnico di Milano, the largest technical university in Italy.

ScAR is one of the winning projects of PoliSocial 2017, a social responsibility programme by Politecnico di Milano, which in that year had as theme 'the suburbs'. ScAR puts some schools (levels 1 to 12) at the centre of knowledge-building processes (Scardamalia & Bereteir, 2006; Conole, 2013; Vuopala et al., 2015; Gillies, 2016) aimed at understanding and conveying, through technologies, the value of their everyday landscape: less 'glaring' with respect to 'official' cultural heritage, but not less interesting.

The students, in their own words, have turned 'from seeing to looking', realising 'that there is no need for planes and exotic destinations' since also 'your neighbourhood, after all, can be the starting point of a journey [...] if there is the spirit of discovery'. ScAR has put in place a wide range of activities, both tech-based and not, to prompt this discovery attitude. One of these, on which the article is focussed, is digital storytelling: a creative way of

presenting a topic using an interactive, multimedia language (Lambert, 2013). In the light of the project data, elaborated through the analysis of the educational reports teachers were required to prepare, this study aims to investigate whether and how digital storytelling can prompt pupils, of different ages, to care for their territory and its cultural assets.

The study focusses on the Italian context, where the (well-known) abundance of cultural heritage of all kinds and ages somehow inevitably leads to neglecting scattered, little known heritage. Italy therefore proved to be the ideal testbed for the project.

2. HERITAGE EDUCATION AND TECHNOLOGIES

The centrality of 'heritage education' as a tool for citizenship training has long been established in Europe (Council of Europe, 1998; De Troyer, 2005; Calcagno Maniglio, 2017, Van Lakerveld & Gussen, 2011). In the document produced in 2006 for the Council of Europe entitled 'European democratic citizenship, heritage education and identity', Copeland jointly explores the concepts of citizenship and heritage, examining their mutual relationships and examining their possible applications in the pedagogical field, in order to fight 'the mistaken belief that heritage and heritage education are marginal in the development of the European citizen' (Copeland, 2006, p. 7). Moreover, European policies identify heritage education as a means of guaranteeing the right of every citizen to participate freely in cultural life (Faro Convention, 2005).

Since 2015, the Italian government, in harmony with the reflection that was developing in Europe (European Landscape Convention, 2000; Faro Convention, 2005; Florence Declaration on Heritage and Landscape as Human Values, 2014), established the long-term objective of creating a heritage education system capable of involving a plurality of subjects and devising substantial forms of involvement in the management and safeguarding of cultural heritage and the acquisition of new and qualified knowledge, with mutual benefit for society and the heritage itself. Indeed, the training linked to cultural heritage offers the possibility of contributing to improve the life of each individual from a cultural point of view, developing a sense of belonging to one or more cultures and to the territory. However, current deficiencies in training actions and promotion of research favouring synergy between universities and schools are still significant.

An important contribution that universities can offer to schools in the field of heritage education consists, on the one hand, in the development of participatory methodologies of knowledge construction and communication (Prince, 2004; Healey et al., 2014) and, on the other hand, in the introduction

of advanced (but accessible) technologies within the processes. The usefulness of introducing forms of participatory culture related to communication technologies in schools has long been established.

> *A growing body of scholarship suggests potential benefits of these forms of participatory culture, including opportunities for peer-to-peer learning, a changed attitude toward intellectual property, the diversification of cultural expression, the development of skills valued in the modern workplace, and a more empowered conception of citizenship. (Jenkins, 2009, p. 3)*

The new media literacies, under this respect, should be seen as ways of interacting within a larger community, i.e. as social skills.

The use of new technologies may facilitate the approach to cultural heritage, due to the potential of the instruments and the strength of their attraction on new generations (Luigini, 2019; Ott & Pozzi, 2011). Students are immersed in a society that is technologically rich and pervaded by the media and digital technologies and cannot be left alone. It is important to encourage students to go from being mere consumers to being 'critical consumers' and 'producers' of digital content.

The ScAR project aims to face these questions putting into place an experimental set of actions in a context rich in critical issues and dealing with a fragile and neglected heritage such as that of the urban peripheries.

3. PROJECT DESCRIPTION

ScAR is a participatory project that involves diverse actors and interacts with multiple interlocutors such as municipal institutions (Municipalities 4 and 5 of the City of Milan), cultural institutions (the Prada Foundation, by the famous Italian brand, and the Urban Ecomuseum of South Milan), school districts, as well as local associations. The project involved five schools, located in southern Milan, with 16 classes ranging from primary to upper secondary schools. Students and teachers from other regions were also involved, thanks to the partnership with a larger digital storytelling project, called PoliCultura, which involved more than 700 students in 2018–2019.

The fieldwork activities were preceded by a phase in which the teachers were trained on the main principles of cultural heritage education and communication and on the potential of new technologies in relation to the representation and enhancement of landscape and cultural heritage. The projects that were conducted in these classes varied and were the results of the participatory nature of the project and its many facets. The activities that were carried out without any technological support (e.g. neighbourhood

visits, mental mapping, model making, interviewing witnesses, landscape drawing and participatory planning), are combined with other tech-based activities (e.g. digital storytelling, gamification, social media communication, multimedia guided tours, virtual reality tours in the neighbourhoods).

Various topics were tackled and conveyed a sense of exploring territory and reading a value system that is undergoing constant transformation. It is not a matter of opening a guide and visiting the official cultural places that are recommended, but rather constructing narrations and representations within an interpretative process that identifies landscape in a broad sense and in relation with those who live in it, as 'a determined part of the territory, as perceived by the populations, whose character stems from the action of natural and/or human factors and from their interrelations' (European Landscape Convention, 2000). In this sense, the most significant tasks investigate the landscape along paths that are connected to personal experience, like the roads from home to school, or a treasure hunt in the neighbourhoods through the most significant places of collective memories. Journeys into intangible heritage, for instance along a pathway traced by primary school students connecting the artisan businesses located along their way to school, traditional and historical or newly established ones, are also significant. They have also become an opportunity to entwine the cultures in the neighbourhood and reflect the multicultural composition of the class.

Through these processes, a territory that is generally considered 'peripherical' turns into a repository of values, a resource for exchanges among generations and cultures.

4. DIGITAL STORYTELLING AT SCHOOL

Digital storytelling was proposed to all the schools participating in the project. The opportunity arose from the partnership between ScAR and PoliCultura, a competition by HOC-LAB (Politecnico di Milano) active since 2006 and open to schools all over Italy, from K to 12.

Digital storytelling has a 20-year history: it is a form of expression mediated by technologies that has found different applications in different fields. Among these, cultural heritage and education are particularly relevant (Di Blas & Ferrari, 2014). ScAR has the merit of crossing these two strands, which normally run on parallel tracks, prompting schools to use digital storytelling to communicate their local heritage.