VIRTUAL MUSEUMS AND LEARNING INNOVATION

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Abstract: The paper puts forward the idea that Virtual Museums (VMs) can effectively support learning innovation. In the light of a comprehensive definition of learning innovation where the adoption of both innovative tools and methods is taken into account, the paper presents the concept of Virtual Museum and discusses around their educational potential and value. Actually, VMs are innovative software applications that use vision, narration and interaction to create immersive experiences that bring visitors, students, scientists inside history, past landscapes, art, towns etc....They deal with a wide variety of contents and adopt various approaches to support information delivery, awareness raising, knowledge creation and, ultimately, learning. In order to correctly frame the adoption of VMs for educational purposes, three different Virtual Museums are briefly presented by also underlining how, despite the specificity of the contents displayed, all of them can contribute to foster the students' motivation and effectively engage them in the learning process.

Keywords: Cultural Heritage; Virtual Museums; Learning Innovation; Pedagogical planning, Motivation, Flow.

I. INTRODUCTION

The concept of learning innovation is strongly linked to the adoption of new educational tools, mainly those ICT-based. In the following, we briefly discuss whether and how the new generation of digital museums, that are commonly called Virtual Museums (VMs) [1], can contribute effectively and genuinely to innovate learning [2]. Of course, we refer to Cultural Heritage Education, which is a specific field where the adoption of technological tools is not yet consolidated around Europe [3], but also where expectations are high and the potential of technology is widely regarded as huge and promising [4].

VMs can be employed in formal, non-formal as well as in informal educational settings with different implications, for different scopes [5]. In this paper, we will mainly focus on their adoption in formal educational contexts and envisage the possible benefits of their use in standard curricular activities.

As a matter of fact, as it happens for other innovative tools (such as Serious Games) the employment of VMs in formal educational settings is not straightforward but needs accurate planning and appropriate deployment on the teachers'/educators' side [6].

Only if these two conditions (accurate and appropriate design of the intervention and in-depth teachers' involvement) are fulfilled we can reasonably expect that these tools can contribute to carry out genuinely innovative learning processes. If so, it has been demonstrated that they can effectively support the development of the so called 21st Century skills [7] and it can also be argued that they can provide significant added value to sustain, at a more general level, "learning innovation".

In the following, after briefly discussing around the concept of learning innovation, we present three examples of VMs and pinpoint the common trend that could make them appropriate and effective educational tools.

II. EXPLORING THE CONCEPT OF LEARNING INNOVATION

If we follow the definition by the Center for Educational Research and Innovation (CERI) of the Organisation for Economic Co-operation and Development (OECD) [8] Learning Innovation should be regarded as: "*any dynamic change intended to add value to the educational process and resulting in measurable outcomes, be that in terms of stakeholders satisfaction or educational performance*".

The concept of Learning Innovation, thus, directly recalls the idea of a "positive change" of something that is different from what has been done before and provides the educational process with significant added value (which is, hopefully, also measurable) [9].

In order to define as genuinely innovative a learning process we should then take into account both the inputs (the new elements that trigger and/or "inform" the learning process) and the outputs (the outcomes of the learning process itself).

In particular:
1) The change can be represented by the educational tools, educational approaches/strategies or by both of them in tandem.
2) The change in terms of expected augmented learning outcomes could be that students:
   - learn more (new concepts, ideas but also new ways of thinking, managing data, etc.…) and also become more able to find strategies for solving problems
   - are more confident and learn more easily
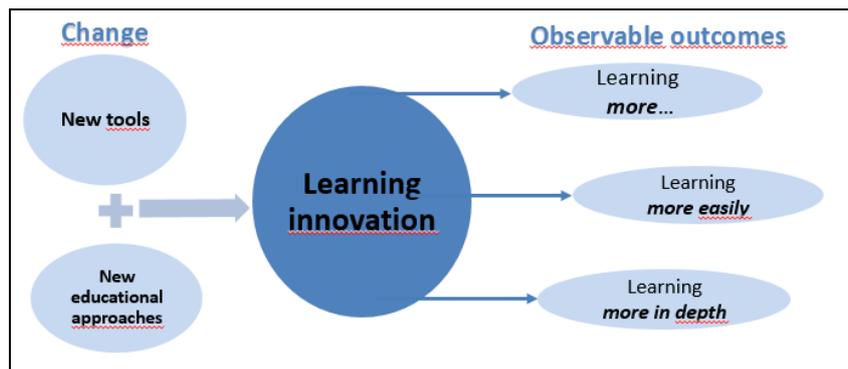   - acquire more in-depth knowledge of topics and concepts

Figure I. Framing the concept of "Learning Innovation"

III. VIRTUAL MUSEUMS IN EDUCATION

VMs are software applications that use vision, narration and interaction to create immersive experiences that bring visitors, students, scientists inside history, past landscapes, art, towns etc…

Following the definition agreed in the network of excellence V- MusT [1] they are also intended as means for supporting dissemination and learning and for fostering communication among actors in the Cultural Heritage sector: "*A Virtual Museum is a communication product accessible by a public, focused on tangible or intangible heritage. It uses various form of interactivity and immersion, for the purpose of education, research, enjoyment, and enhancement of visitor experience*"

Actually, VMs are relevant examples of how cutting-edge ICT technologies can be embedded into software applications oriented to knowledge raising and learning in the field of both tangible and intangible cultural heritage.

Many types of VMs exist, which differ as to the internal structure, the specific objectives addressed, the presentation methods, the implementation techniques and the interaction approaches adopted. They deal with a wide variety of different contents and adopt various approaches to support information delivery, awareness raising and, ultimately, learning.

Actually, their educational potential is widely acknowledged, although their actual use for educational purposes is still very limited (at least in formal educational contexts) [7].

IV.   CONCLUSIONS

We have drafted a few notes on the educational potential of VMs.

From what said and from the examples provided, one can see that VMs can be employed for a variety of educational goals involving aspects of both formal and informal education. They can be used in schools, to respond to personal interests and for serious entertainment (edutainment) or even to back up and augment the educational impact of real museums and exhibitions.

If we look at their employment in schools teachers and educators have an important role to make the most and fully exploit their educational potential by applying appropriate and suitable educational strategies.

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