New educational and technological methodologies for digital museum tours in the COVID-19 era. The VISITOR project

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Abstract

Training curricula must be led by strategies to reinforce learners' skills and engagement in different ways to adjust the particularity of any school content. Towards this end, technology-assisted learning can provide valuable assistance in terms of tools and appropriate educational methodologies. This need is highlighted in emergencies like the recent Covid-19 pandemic, which has caused the closure of many schools globally, posing a stress test to the education system and its smooth continuity, turning the focus on distance teaching and virtual classroom methodologies. To achieve this, teachers should be trained and provided with digital learning opportunities to use digital training resources effectively to create educational scenarios. Following the above priority, five European organizations from France, Greece, the United Kingdom, and Belgium decided to design and implement the project "Virtual Museums In The Covid era" (Visitor), a European collective project funded under the framework of the Erasmus+ program. VISITOR project promotes innovative methods and digital tools. Specifically, it supports teachers in developing digital competencies and safeguarding the inclusive nature of learning opportunities. For this purpose, a creative e-training course for teachers grounded on a

Problem Based Learning (PBL) process designed with innovative pedagogical strategies (e.g. the digital storytelling process, lesson plans and citizen science), a content aggregator of digital museum exhibits and a digital application for virtual tours are adopted.
This paper presents the structure of the Visitor project, highlights the methodology followed to establish the appropriate educational tools and explains the pedagogical dimension formed based on the results of a quantitative and quantitative need analysis research. The qualitative study was conducted to identify the academic and technological skills and knowledge that might be lacking to establish an initial framework with the appropriate educational tools and technics to structure the e-training course profile. The second study identified teachers' previous experience, motivation, activity settings and challenges to increase the pedagogical effectiveness of the selected VISITOR's pedagogical tools according to the new training needs established by the pandemic.

The study highlighted the significance of designing an e-learning training course based on needs analysis processes in light of the evidence. Furthermore, this paper can be used as a methodological framework for a comprehensive approach to design and implement an effective e-training strategy grounded on the needs of the educational, technological and social conjunctures (e.g. the problem of the pandemic).

Keywords: digital skills, inclusive education, new digital pedagogies, text-based game, virtual museums

1. Introduction

The concept of learning is directly related to the permanent change in the individual's behaviour, which is the result of experience and practice. Learning is a purely personal process with an individual character and is not only completed through a specific educational system. It is a continuous process that takes place throughout life and uses various ways and means. This constant process of acquiring knowledge and skills is the most distinguishing feature of the human species. However, multiple types of learning can be identified by how to organize the curriculum content and the teacher's degree of intrusiveness (Ryan & Bowman, 2022).

The European Commission has defined lifelong learning as the set of activities throughout life in the context of a perspective that concerns the individual himself, society, citizenship or employment (Brine, 2006). From an educational viewpoint, the didactic utilization of museum collections can be a breeding ground for lifelong learning. In the modern museum of the 21st century, the appropriate landscape for achieving a multitude of educational goals formed, such as the development of the student's critical thinking, who, by coming into contact with the objects, formulates assumptions and reflections that sharpen the mind and cultivate the thought. Fertile ground is formed, therefore, for the collaboration of the museum with the school, which is the primary body of transmission of formal knowledge, so that the final recipient, who is none other than the student, benefits and establishes a non-formal learning relationship, which perceives knowledge not as a product of coercion, but of search source.

From the United States of America to the European Union and as far as Singapore, educators and policymakers are talking explicitly about 'twenty-first-century skills and competencies as the tools for the 'twenty-first-century citizen': a confident person who has a sense of right and wrong, is adaptable and resilient, knows themself, thinks independently and critically, and communicates effectively (Pellegrino & Hilton, 2012). Meeting the goal for the new skills and competencies means investing in a new approach to school and lifelong education, which promotes skills such as 'critical and systems thinking, information literacy, creativity, adaptability, conscientiousness, persistence, global awareness, self-regulation, cultivation of interests, the building of social capital, positive orientation to academic subjects. This calls for individualized, self-directed approaches in which learners 'collaborate with educators and with experts in their communities and around

the world to customize rigorous learning experiences based on competency and interest instead of time and age (Alt & Raichel, 2022).

Consequently, the term "educational" program for museums is not one-dimensional as it does not concern a single method or group of visitors but is characterized by methodological variety, such as narration, guided tour or storytelling, discussion with the application of the obstetric process, or even exploration of the museum space and addressed to separate target age groups, to keep the interest of the participants undiminished, but also to respond differently to the particularities of the visitors, through its particular characteristics of each method.

When developing an educational program, the main concern is the achievement of general and specific individual goals that derive from the same themes of these programs. The general objective could be to introduce visitors to local history through finds and objects or to raise students' awareness of cultural heritage and the importance of its protection. However, the pedagogical goal-setting, such as cooperation, an active approach to the material through the senses and experiential learning, could not be omitted. It is noteworthy, according to the International Council of Museums, that the primary motivation for the implementation of the educational programs is "to achieve the combination of knowledge acquisition and entertainment, to create inspiration and attract the interest of the public and finally to shape observation skills and develop of interest regarding historical events, to shape cultural consciousness. (Yun, 2022).

Digital technologies have radically changed the way we perceive museum education. More specifically, augmented and virtual reality applications give the museum a "digital presence" and create a new ecosystem for museums and museum education. Either with the use of augmented reality applications, where digital content is projected onto the natural one-user environment through appropriate media, such as text, information and graphics, 3D graphics or video, or by applying virtual reality systems, which differ from the previous ones in that they transport the user to a different world, where they can still they have the feeling of flying, while their feet are on the ground, the museum experience is enriched, thus contributing to learning. Digital technologies have radically changed the way we perceive museum education.

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This new enriched experience follows a specific path that begins with an impulse of internal or external motivation, with pure goals and rules that create an authentic interest in the user, who experiences it as a state of "flow". The "flow" is related to the positive state of mind, in which the person is entirely focused on what he is doing, loses the feeling of time, does not feel tired and, above all, is entertained by the activity. Thus, by extension, learning takes place. To maintain the flow and not lose o visitor's interest and still wants to participate, their engagement with the exhibit (e.g. a digital touch screen) should have ever-increasing levels of difficulty, which the visitor should face by making more use of his skills (Csikszentmihalyi & Hermanson, 1995).

Another application in the hands of technology is digital storytelling. When made interactive, it acquires even more significant meaning as it involves the subject in the learning process, inviting it to create its personal stories and incorporate its interpretations and perspectives (Wyman et. al. 2011). The latest years, digital games, digital stories or constructions with the help of digital media are also introduced.

Beyond, however, the degree to which digital tools contribute or not to the learning process, what the inclusion of digital technologies in cultural spaces primarily achieves is the concept of participation in the shaping of cultural experience, in the light of active mediation and co-creation, through group activities that allow participants to act simultaneously as creators, distributors, consumers and critics of content, while at the same time being able to collaborate - connect.

2. Background

The Covid-19 has signaled the closure of many schools globally posing a stress test to the education system and its smooth continuity. As the personal development of the human capital is at stake, the problem should urgently be addressed. While confronting the second wave of the pandemic, national Governments put a lot of effort so that the schools will be able to deliver the curricula even in the event of a second lockdown (Viner, et al, 2022).

As the situation is urgent and there is no precedent for that, not all needs can be simultaneously addressed and with success. The project aims to deal with the prohibition of cultural visits to museums and other exhibition areas in the Covid- 19 era, even now that the schools are open and proposes its digital integration in the school curricula. Outdoor cultural activities definitely support not only school education in the field of history, technology or science in general but also the personal development and the emotional state of the students

In this vein, five European organizations from France, Greece, the United Kingdom, and Belgium designed to implement the project "Virtual Museums In The Covid Era" (VISITOR), a European-funded collective project under the framework of the Erasmus+ program. VISITOR aims to be a solution for visits to museums virtually, united European culture, and fostering intercultural awareness and conscience through a virtual and inclusive educational process.

The first crucial step for the VISITOR's research team was to define a practical pedagogical framework for designing, developing and evaluating the Visitor's digital deliverable tools and activities that will develop. For this purpose, the Hellenic Open University (HOU) and the Open University (OU) of the United Kingdom implemented two need analysis research, a qualitative and a quantitative one. The quantitative research, which leader organization is HOU, focused on defining Greek teachers' skills in inclusive pedagogies and approaches they use and their opinion on using technologies as supporters of inclusive education. The quantitative research, which leader was OU, focused on exploring teachers' views on the use of virtual museum tours in their classrooms. The first research guided the VISITOR team to define the pedagogical context of the VISITOR Project. The second one investigated which knowledge the teachers already have in virtual museum environments. Based on these results, the VISITOR team defined the learning content the Visitor project must deliver to teachers.

By Gould, Kelly, White & Chidgey (2004), training need analysis is the primary initial step in a cyclical process, contributing to the definition of the overall educational strategies that must be followed. Zagora, Kurth & MacFarland (2017) claimed that the need analysis could highlight and investigate teachers' preparedness for

inclusive education, including their skills and knowledge in digital literacy. Need analysis is crucial to define the pedagogical methodologies in a training process for digital inclusion.

3. The Hellenic Open University Qualitative Study

The the study brought to the light evidence for two basic thematic areas. The data higligted that the teachers face obstacles in applying inclusive pedagogical practices and planning procedures. Furthermore the teachers have available ICT competencies that can be expanded.

The study highlighted misconceptions in teaching methods issues related to the need for systematic training of teachers in inclusive digital education higtlighed. To address these barriers, Visitor designed based on a structure educational framework to adrees on thsese specific needs. The Visitor decided to involve the use of informal learning environments by teachers, such as digital museums and digital applications (Kouvara et al. 2022).

4. The Open University Quantitative Study

The study aims to understand the experiences and expectations of teachers who have joined or plan to join Virtual Museum Tools in their classrooms. Findings from this study indicate teachers' motivations and challenges when engaging in VMTs and their expected or desirable support. Teachers' motivations in joining VMTs with their classrooms were associated with their desire to increase students' interests in museums and use novel teaching methods in their classrooms. Both types have been encountered in previous research studying teachers' motivations with VLE.

According to Aristeidou et al. (2022), teachers' motivations for joining VMTs were mostly to increase students' interest in museums and use novel teaching methods in their classrooms. On the other hand, the main challenges teachers mentioned were designing activities around the visit, finding time and devices to organize the visit, and aligning it with the curriculum aims.

To address these challenges in the context of the project artefacts and exhibits in the VMT can be accompanied by use cases of different levels. In addition, the introduction of group activities with relevant learning material could help the lack of devices.

While students' engagement is the primary motivation for teachers, they are still concerned with designing VMT learning activities that target specific curricular objectives and learning outcomes.

5. The Visitor Project

The combination of the research results with those published in the literature recently brings to the surface the educational framework followed by the teachers regarding inclusivity and their teachers' ICT competencies in the field of the virtual learning environment. Thus,

The VISITOR project introduces an e-learning training course for teachers based on the PBL method. The teachers have to implement virtual tours gathering educational materials through the content of digital museums.

The e-learning training course includes various ICT tools activities, such as digital storytelling, text-based games, and citizen science. Teachers have to:

- Define their stories' topic through learning techniques such as brainstorming and critical thinking, using videos and portfolios of gathered material and synthesizing information.

- Gather digitally available material from museums
- Plan the map of their story via brainstorming, quick comparative writing, drafting, redrafting, rearranging content and, ultimately, peer evaluation
- Pick the technological equipment they will use for the digital story production through a proposed list.
- Assess their projects according to a Rubric assessment.

Additionally, VISITOR aims to deliver:

- A content aggregator of digital museum exhibits toolkit. The specific element will facilitate teachers to search, locate and retrieve digital materials from museums
- A digital application for virtual tours. A text-based game will lead the trainer in a virtual 3D futuristic exhibition. It will allow learners to earn knowledge in culture, history, arts and science. Specifically, the specific tool will enable teachers to design their interactive quizzes into different modules, each corresponding to various thematic aspects
- Exemplar use cases for digital exhibits and citizen science resources. Exemplar use cases of the museum digital exhibits will involve the presentation of lesson plans, or practices that build towards the creation of an effective lesson plan, such as the concept or objective to be taught, the time duration, procedures and processes, the required museum exhibits, questions to be asked, and the evaluation of the lesson. Teachers can use the exemplar use cases as models to facilitate them in achieving curriculum goals or structuring extracurricular activities.

6. Conclusions

The needs analysis methodology highlighted the gaps that an educational design must cover, considering the school and time context. In particular, through the qualitative and quantitative data brought to the surface by the two surveys, the visitor project combines technology and modern digital environments with the educational process, aiming through the art tour to create a pleasant and flexible environment that adapts to the needs every student.

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