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Microcredential as a Teaching Tool for Digital Humanities: The Case of the Imperial College of the Jesuits (Madrid). Use of Virtual Reality.

Microcredencial como instrumento docente de humanidades digitales: el caso del Colegio Imperial de los Jesuitas (Madrid). Uso de Realidad Virtual.

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Abstract- The microdential on the Imperial College of the Jesuits (Madrid) aims to integrate microcredentials into university education, focusing on the Master's in Integral Heritage. It involves creating a virtual reality recreation of the 17th-century Imperial College Library and its Chapel, combining historical knowledge with technological tools. This interdisciplinary approach enhances the learning experience, making it more immersive and interactive. The project emphasizes the importance of blending humanistic and technological skills to meet modern job market demands. Microcredentials offer flexible, specific learning units that improve employability and lifelong learning. The project follows key principles for high-quality microcredentials, ensuring transparency, relevance, and student-centeredness. It aims to democratize higher education and prepare students for future professional challenges.

Keywords: Microcredential, Integral Heritage, Imperial College of the Jesuits, Digital Humanities, Gamification, Long Life Learning

Resumen- La microcredencial del Colegio Imperial de los Jesuitas (Madrid) tiene como objetivo integrar las microcredenciales en la educación universitaria, centrándose en el Máster en Patrimonio Integral. Implica la creación de una recreación en realidad virtual de la Biblioteca del Colegio Imperial del siglo XVII y su Capilla, combinando conocimientos históricos con herramientas tecnológicas. Este enfoque interdisciplinario mejora la experiencia de aprendizaje, haciéndola más inmersiva e interactiva. El proyecto enfatiza la importancia de combinar habilidades humanísticas y tecnológicas para satisfacer las demandas del mercado laboral moderno. Las microcredenciales ofrecen unidades de aprendizaje flexibles y específicas que mejoran la empleabilidad y el aprendizaje a lo largo de la vida. El proyecto sigue principios clave para microcredenciales de alta calidad, asegurando transparencia, relevancia y enfoque en el estudiante. Su objetivo es democratizar la educación superior y preparar a los estudiantes para futuros desafíos profesionales.

Palabras clave: Microcredencial, Patrimonio Integral, Colegio Imperial de los Jesuitas, Humanidades Digitales, Gamificación; Aprendizaje a lo largo de la vida

1. INTRODUCTION

The development of microcredentials in university teaching is a good option for the training of graduates and professionals, leading to the professionalization or specialization of their knowledge. In a changing job market, where the demand for profiles is evolving towards a mixed condition between humanistic knowledge and technological proficiency, microcredentials provide a viable solution to meet this demand. Following previous projects and experiences, we present a case that can serve as an example in this direction. It involves the creation of a microcredential based on two courses from the Master's in Integral Heritage at the University. Specifically, the course that relates engineering and heritage with the one that addresses heritage in modernity. Thus, we have created a virtual reality recreation of the Imperial College Library in Madrid and its chapel, built in the 17th century. This requires collaboration between humanists, who provide knowledge from historical and literary sources, and engineers, who apply technological tools, assuring therefore the precision and accuracy of the contents.

2. CONTEXT & DESCRIPTION

A. Context

The Master's in Integral Heritage at the University is a novel and underexplored concept in the Spanish university educational offerings, which emphasizes the value of both

material and immaterial heritage and its relationship with nature. The distinguishing feature of our proposal lies in incorporating the evolution of the concept of cultural heritage into university teaching, replacing it with integral heritage, which includes the valuation of the natural environment and spirituality within cultural and identity heritage, offering an innovative perspective.

The general objective of microcredential is to optionally provide students of the Master's in Industrial Heritage with more technological training that they may not have. The value of this proposal lies in the close collaboration between the Faculty of Humanities and Social Sciences and the Department of Mechanical Engineering (DIM) at ICAI, which allows for the integration of co-teaching methods to maximize benefits for students. This microcredential enhances contributions made through mentorship from the Mechanical Engineering Department (DIM) by applying Virtual and Augmented Reality, along with innovative teaching methodologies that allow students to visualize and interact with heritage environments in a versatile manner.

University microcredentials are gaining relevance in the educational and labor fields. They are smaller learning units (less than 15 credits) than traditional programs. They focus on specific skills and are flexible. The benefits they offer are significant, as they facilitate lifelong learning, improve employability and adaptability, and foster innovation and collaboration. Our goal is to integrate this microcredential format into postgraduate education at Universidad Pontificia Comillas, related to the subjects offered in the Master's in Integral Heritage: Culture, Identity, and Innovation. Considering the guidelines and recommendations for Development, Implementation, and Recognition published by the European Commission (June 16, 2022) and the BOE, and more recently the reports from the Organization for Economic Cooperation and Development (OECD), we believe that microcredentials offer flexible opportunities for learning and skill enhancement.

Our microcredential is based on the profile of students belonging to Generation Alpha or digital natives (born in a context of widespread use of New Information Technologies, especially AI). It can be said that digital natives learned to use a tablet before they could speak. They are a generation constantly connected to the internet, skilled in using current technology, permanently exposed to screens, vulnerable to fake news and misinformation, impatient, open to visual rather than literal learning, and with an attention span of no more than 8 seconds (Gibson, 2016; Rothman, 2016; Shatto & Erwin, 2016). As a result, we are faced with a generation of students who not only passively receive digital content but also become its creators (Nagy & Kölcsey, 2017). This implies, as Félix de Azúa pointed out, that virtual and augmented reality is at least as important to them as the tangible: "the real seems significant to them when it appears on a screen" (interview in El Correo, 22/05/2010).

Given this profile, it is evident that microcredentials are an especially suitable format for contributing to the learning of "Google youth" who, like throughout history, will innovate and create from what already exists. Microcredentials are, in this sense, an extraordinarily useful tool. In conjunction with "virtualization of culture" tools, they can significantly contribute to exposing this new generation to the cultural past in which their leisure consumption and cultural creation are consciously or unconsciously embedded, allowing them to re-signify the legacy of previous generations.

Moreover, the advent and implementation of new technologies imply, in the short and long term, the "decentralization" and "demonopolization" of Education (Collins & Halverson, 2009). We are already witnessing this process, which means the transfer of educational practice to institutions that could be considered peripheral, such as companies, distance education, learning centers (companies themselves – Lidl, corporate training centers, Sylvan, Kaplan, Airbus, CEM, etc.), which, due to their internal logic, resort to virtualized and self-contained teaching formats in short teaching/learning experiences.

In this microcredential, we will understand the virtualization of digital content in the context of the UNE 71362 standard, the creation of educational or didactic digital material as any digital entity that has defined at least one didactic objective to be used in learning, teaching, and training. The other definitions included in the mentioned standard will also be considered in this microcredential, as some participants have actively collaborated in the generation of this work in UNE.

From the Ignatian pedagogical framework, which has been built and enriched through more than 450 years of educational experience, and considering pedagogical advances in the field of teaching innovation, we propose an active learning methodology. The study of cultural heritage, from the case of the Imperial College of Madrid, through Digital Humanities, seeks to generate a learning environment where the student can cognitively approach reality, experience what they learn, work on critical thinking, deepen humanistic knowledge, and mobilize it into action (Ignatian Pedagogical Paradigm, 1993/2002). To achieve this, the course was programmed using problem-based learning (PBL), challenge-based learning (CBL), and co-teaching, specifically the team teaching model. Regarding the first, we highlight that the aim is to work from a real problem, from which a learning situation is constructed in which the student, accompanied by the faculty, will delve into the study object. Creating a learning context that closely resembles the work environment helps students develop the competencies they will need for good professional performance in the future (Escribano González and Valle López, 2008; Guitert Catasus et al., 2022)). On the other hand, through challenge-based learning, the approach will focus on how to improve heritage accessibility, among other issues, for which Digital Humanities are a perfect tool. Thus, the teaching-learning process aims to form committed, compassionate, and competent individuals who know how to put their knowledge at the service of others. Finally, co-teaching allows interdisciplinary teaching and the construction of a discourse that favors complexity, avoiding any type of reductionism (Cía Blasco et al., 2022; Strotmann and Custodio Espinar, 2021). In short, we believe that this methodological approach will favor offering a microcredential through which students acquire the necessary knowledge and competencies, not only to successfully enter the job market but also to continue growing as people with and for others.

B. Description of the stages in the development of the microcredential

When designing microcredentials (McGreal, R., Olcott, D 2022), some key principles must be followed. The ten principles to consider specify the nature of microcredentials and provide

guidance on their high-quality design and issuance. These ten principles highlight the key characteristics of the European approach to microcredentials. They are universal and can be applied in any area or sector (Varadarajan et al. 2023). They must be planned with quality, transparency, relevance, evaluable according to accepted standards, flexibility to achieve learning, recognition, portability for the holder, guaranteed data protection according to current EU law, student-centered, and designed to meet the needs of the target student group. They must contain sufficient information to verify the identity of the credential holder (learner), the legal identity of the issuer, and the date and place of issuance of the microcredential. In this sense, information and advice on microcredentials should be incorporated into lifelong learning guidance services.

The Microcredential has been developed in the following stages:

- Contents are designed, taking into account the profile of the students enrolled in the Master's program. There are specified the “chapters” of the microdential.
- Development of contents: Video recording, Classes to be uploaded on Moodle, models for the Virtual reality, questionnaires and gamification. Nowadays, all the contents are available.
- Launch of the microcredential for students, in short.
- Analysis of the students' experiences. The analyses will focus on two main aspects: a. Evaluating the progression of student learning in key variables such as self-efficacy and cooperative work. b. Assessing the difficulties, limitations, and benefits of the project to propose conclusions that may serve as a reference model for other courses and subjects.
- The microcredential will be restructured and refined, if necessary, to reoffer it to a broader profile of students, including those outside the master's program.

C. Tools for the development

The microcredential is fully supported by the e-learning tools available at Comillas, especially Moodle.

For the development of the project, the following ICT tools and specialized programs has been used:

- Video recording with OBS Studio, Openshot, iMovie and Touchcast.
- Virtual Reality development with Sketchup 2023, TinkerCAD, Fusion and Pepakura
- Virtual Reality sharing with Sketchup Viewer and SketchFab.
- QR Generators for links to the models shared
- Microsoft Forms for the questionnaries
- Moodle analytics and reports for indicators on students learning.
- VindozAI Online for shorts videos with “talking” photos.
- Accredible, for the implementation of the microcredential.
- Genially, for the gamification activities.

One way to motivate students to pay attention to important artistic details is through playful activities, known as gamification. In this microcredential, we integrate several online Escape Room activities, programmed in Genially. For example, we present the case of a puzzle in the reconstruction of a scene from the Chapel of the Imperial College. First, the history of the scene is detailed, and in the "game," students are invited to "place the puzzle pieces."

One of the puzzles is focused on the whole painting of the dome:

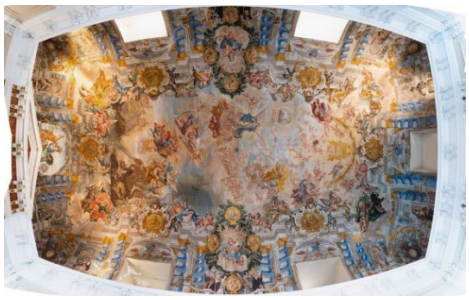

Figure 1: Painting on the dome of the Chapel

Figure 2: Puzzle Game with Painting on the dome (start) and QR code for ccess.

https://view.genially.com/6814a5f3ebfb8f5182d42b21/interactive-content-cinaic-demo

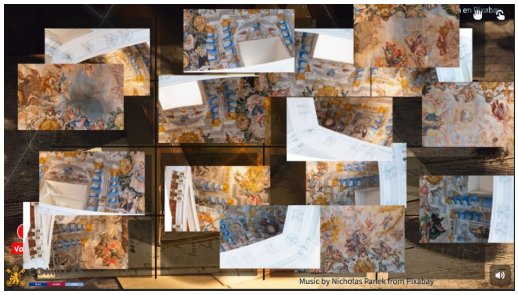

Figure 3: Puzzle Game with Painting on the dome (puzzle)

As support for this activity, students can access virtual reality (VR), which allows them to "move" within the chapel and observe all the details from any perspective they choose.

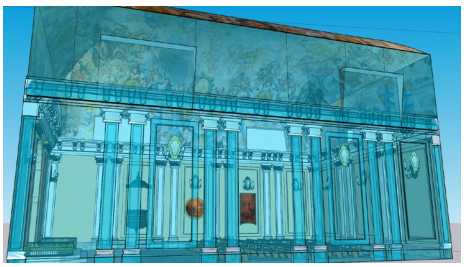

Figure 4: RV model of the dome

3. RESULTS

The microcredential has been "piloted" in small groups with students from the Christianity and Social Ethics course. However, the experience will be implemented in the next

academic year as a voluntary activity, once it is approved in the course guide, in addition to being offered as a microcredential.

Based on this experience, we can highlight the main learning outcomes as follows:

- The microcredential showed up to be a great tool for longlife learning and as a complement to the inroom learning .
- It is shown to the educational community the value of sharing resources, spaces, and time among teachers to plan and design interdisciplinary proposals in a consensual and coherent manner.
- Develop an action model to exemplify how to cooperate across different disciplines.

It is demonstrated that the reports provided by the Moodle platform can show very valuable information about student learning, as long as the content development has been very well sequenced.

4. CONCLUSIONS

The project demonstrates the sustainability of integrating microcredentials into university education, particularly in the field of Digital Humanities. The use of Virtual Reality to recreate historical sites, such as the 17th-century Imperial College Library and its Chapel, provides an immersive and interactive learning experience. This approach not only enhances the educational process but also prepares students for the modern job market by blending humanistic and technological skills.

The transferability of this project to other contexts is evident. The principles and methodologies applied can be adapted to various educational settings and subjects, promoting interdisciplinary collaboration and innovative teaching practices. The project highlights the importance of co-teaching and the integration of digital tools to create a versatile and engaging learning environment.

Final recommendations for future application are:

- Sustainability: Ensure the continuous development and updating of digital content to maintain its relevance and effectiveness.
- Transferability: Adapt the project's principles and methodologies to different educational contexts and subjects to maximize its impact.
- Interdisciplinary Collaboration: Foster collaboration between different academic departments to enhance the learning experience and provide a comprehensive education.
- Use of Technology: Leverage digital tools and virtual reality to create immersive and interactive learning environments.
- Student-Centered Approach: Focus on the needs and preferences of students to ensure the effectiveness of the educational process.

The proper development and recognition of the microcredentials are essential. They are designed to be shorter and more specific than traditional programs, generally completed in weeks or months. In our case, since the experience will begin development next year, when the Master's program starts in the next academic year, its implementation will allow for the evaluation of its incorporation within the timeframe covered by this project.

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