



FACULDADE DE LETRAS
UNIVERSIDADE DE
COIMBRA

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PHYGITAL APPROACHES AND INTANGIBLE
CULTURAL HERITAGE AS TOURISM
EXPERIENCE ENHANCER

TRADITION AND INNOVATION FOR A 21ST CENTURY
ACADEMIC MUSEUM OF THE UNIVERSITY OF
COIMBRA

Dissertação de Mestrado em Turismo, Território e Patrimónios, orientada pela Professora
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Turismo da Faculdade de Letras da Universidade de Coimbra

Julho de 2022

FACULDADE DE LETRAS

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Ficha Técnica

Tipo de trabalho	Dissertação
Título	Phygital Approaches and Intangible Cultural Heritage as a Tourism Experience Enhancer
Subtítulo	Tradition and Innovation for a 21st Century Academic Museum of the University of Coimbra
Autora	Germana Costeira Torres
Orientadora	Claudete Carla Oliveira Moreira
Júri	Presidente: Doutor Paulo Manuel de Carvalho Tomás Vogais: 1. Doutor Norberto Nuno Pinto dos Santos 2. Doutora Claudete Carla Oliveira Moreira
Identificação do Curso	2º Ciclo em Turismo, Território e Patrimónios
Data da defesa	14-07-2022
Classificação	19 valores

ABSTRACT

In the last decades, travel and tourism have changed intensely. 21st Century travelers seek new forms of tourism and leisure that fulfill their needs while simultaneously embracing their desires. To this, operators are now connecting people and destinations with authentic, participative, and inclusive encounters, so much so that tourism and museum management are bursting with new creative industry opportunities. As so, the (co-)creation of immersive experiences resorting to information and communication technologies is now blending environments to what is known as phygital reality. In fact, traditional commodities are resorting to mixed realities that behave according to the novel paradigm that shape today's state of being.

In this line of ideas, this research pondered if the *University of Coimbra – Alta and Sofia's* intangible cultural heritage blended into information and communication phygital technologies could enhance the tourism experience. For this purpose and by asserting the student community, we sought to comprehend the importance of combining phygital reality with the intangible cultural heritage of the University of Coimbra, the UC Identity, the World Heritage property, and the Academic Museum as tourist experience enhancer. Additionally, UC Student's contributions will supply decision-makers with valuable information as this study falls under a turn-off moment for the Academic Museum and the *University of Coimbra – Alta and Sofia's* heritage and tourism investments.

Thus, the research conducted an online inquiry – resorting to LimeSurvey – entitled *Tradition and Innovation: The Academic Museum as Collective Memory Space*, between July 7th and October 14th, 2021, addressed to UC Students of Courses Granting an Academic Degree. The output (461 participants) allowed us to elaborate an exploratory research project – analyzed through the SPSS software applying hypothesis testing and non-parametric tests such as the Kolmogorov-Smirnov Test

or the Spearman's Rho Correlation Coefficient Test – weaving an introductory approach to preferences, values, behaviors, and future opportunities for the asset as a tourist attraction, the Academic Museum of the University of Coimbra as a renewed museological outline, and the University of Coimbra as an institution of reference in education and science directed towards the future. The results also revealed the high importance that phygital assumes, as well as the relevance of the Academic Museum, not only as a *University of Coimbra – Alta and Sofia* tourist enhancer but as a vital asset for the UC Community (students and Alumni) and the University of Coimbra in the national and international framework. Results also allowed us to conclude that if an average of 50% of UC Students have never experienced immersive technologies, then their introduction to the museum context is essential when wanting to grant democratic access to (diverse) knowledge, (different) experimentation, and (mind-opening) perspectives.

All in all, it is crucial to consider that this investigative analysis also comprises the conceptual and evolutionary study of heritage, (intangible) cultural heritage, world heritage, and universities as world heritage through political treaties and nomination file processes for a deeper understanding of the *University of Coimbra – Alta and Sofia* property, as well as the evolutionary framework of the Academic Museum of the University of Coimbra in its four phases of existence.

Keywords: Immersive Technologies, Intangible Cultural Heritage, Phygital Heritage, Tourism Experience, Academic Museum of the University of Coimbra

RESUMO

Nas últimas décadas, as viagens e o turismo têm registado intensas modificações. O/A viajante do século XXI procura novas formas de turismo e lazer que satisfaçam as suas necessidades e simultaneamente atendam aos seus desejos. Como tal, os promotores turísticos têm procurado unir pessoas e destinos através da criação de experiências autênticas, participativas e inclusivas. Tal, por sua vez, tem gerado novas oportunidades para as indústrias criativas que ao (co-)criar experiências imersivas, com recurso às tecnologias de informação e comunicação, vão cruzando ambientes físicos e digitais, originando realidades *phygitalis*. Em verdade, a oferta tradicional, ao investir continuamente em realidades mistas, comporta-se de acordo com um novo paradigma da atualidade.

Nesta linha de ideias, esta investigação procura compreender se o património cultural imaterial da *Universidade de Coimbra – Alta e Sofia* em combinação com as tecnologias *phygitalis* de informação e comunicação valorizarão a experiência turística. Para tal, partindo da comunidade estudantil procurou-se compreender a importância que a combinação de realidades *phygitalis* com o património cultural imaterial da Universidade de Coimbra, a Identidade UC, o Bem e o Museu Académico da Universidade de Coimbra apresentam na valorização da experiência turística. Adicionalmente, e atendendo que este estudo surge num momento de viragem para um novo Museu Académico, os resultados desta análise revelam-se essenciais para não só conhecer a Academia, mas também contribuir para tomadas de decisão ancoradas em investigação científica.

Assim, foi realizado um inquérito online – com recurso ao LimeSurvey – intitulado *Tradição e Inovação: O Museu Académico como Espaço de Memória Coletiva*, entre 7 de julho e 14 de outubro de 2021, dirigido aos Estudantes de Cursos Conferentes de Grau da Universidade de Coimbra. O resultado da amostra (461 participantes) permitiu elaborar uma investigação exploratória – recorrendo ao programa SPSS, aplicaram-se testes de hipóteses e testes não-paramétricos como o Teste Kolmogorov-Smirnov ou o

Teste de Coeficiente de Correlação Spearman's Rho – que oferece uma abordagem introdutória às preferências, valorizações, comportamentos e futuras oportunidades para o Bem como atração turística, o Museu Académico da Universidade de Coimbra, com um renovado enquadramento museológico, e a Universidade de Coimbra, como uma instituição de referência em educação e ciência orientada para o futuro. Os resultados permitiram igualmente apurar a elevada importância que o *phygital* assume, bem como a relevância que o Museu Académico apresenta não só para a valorização da visita à *Universidade de Coimbra – Alta e Sofia*, mas também para a Comunidade UC (estudantes e Alumni) e a Universidade de Coimbra no quadro nacional e internacional. Os resultados permitem igualmente concluir que se 50% dos estudantes da UC nunca experimentaram tecnologias imersivas, então a sua introdução no contexto museológico revela-se essencial quando se pretende garantir o acesso democrático ao conhecimento (diversificado), à experimentação (diferenciada), e a (novas) perspetivas.

Por fim, é importante referir que para melhor compreender o Bem *Universidade de Coimbra – Alta e Sofia*, no seu enquadramento nacional e internacional, a investigação abrange igualmente o estudo evolutivo-conceitual dos conceitos de património, património cultural (imaterial), Património Mundial e universidades como Património Mundial, através da análise de tratados políticos e processos de candidatura à UNESCO, bem como o enquadramento evolutivo do Museu Académico da Universidade de Coimbra nas suas quatro fases de existência.

Palavras-chave: Tecnologias Imersivas, Património Cultural Imaterial, Património *Phygital*, Experiência Turística, Museu Académico da Universidade de Coimbra

Acknowledgments

The development of a medium-length scientific study - as a Master's Dissertation - revealed to be a journey of mixed feelings: sometimes, the journey is lived in loneliness, although marked by the joy of discovery and academic enrichment; other times, it would not be accomplished without the support of family, the Supervisor, Teachers in a broad sense, Institutions, friends, and colleagues.

Thus, it is with my most tremendous gratitude that, first of all, I turn to my husband João Pedro Martins. Companion, friend, and loved one who so often supported, read, listened, and sustained the moments of despair and fatigue without ever failing to share an equal enthusiasm and happiness.

Next, I would like to express my gratitude to Professor Claudete Carla Oliveira Moreira, who greatly honored me with the acceptance of being the supervisor of this Master's Dissertation. Professor Claudete is a person of singular personal and professional value whose dedication to Science and Teaching shows an undoubted vocation to the cause.

In this context, I would also like to express my gratitude to Professors Adélia Nunes, Ana Maria Silva, António José Bandeirinha, Eunice Carrilho, João Rui Pita, José Augusto Ferreira, Maria Constança Providência, Paulo Carvalho, Sílvio Correia Santos, and Urbano Nunes for disseminating the questionnaire survey among their students.

I would also like to thank the Students' Union of the Faculty of Law, the Students' Union of the Faculty of Pharmacy, the Students' Union of the Faculty of Psychology and Education Sciences, the International Relations Division, and RUAS Association. They promptly offered to promote the survey through their social networks.

Lastly, I address my most heartfelt thank you and esteem to my long-time friends João Gouveia Monteiro and Nonô, Luísa Lopes, Maria João Rodrigues, and Carlos Ramos; to my colleagues Ana Quental, Graça Antunes, Lília Parisseaux, Raquel Rodrigues, and Sofia Jesus; as well as to the Director of the Museums of the University of Coimbra Paulo Renato Trincão. To the Director, I express my most significant appreciation for integrating me into the Museum's team, allowing my professional growth by challenging me with substantial undertaking and responsibility projects.

Agradecimentos

A elaboração de um estudo científico de médio folgo – como é o caso duma Dissertação de Mestrado – revela ser um percurso de sentimentos mistos: ora a caminhada faz-se vivendo muitos momentos de solidão pincelada pela alegria da descoberta e do enriquecimento académico, ora a jornada jamais se concretizará sem o apoio da família, da Orientadora, dos Professores em sentido lato, das Instituições, dos amigos e dos colegas.

Assim, é com a minha maior gratidão que me dirijo primeiramente ao meu marido João Pedro Martins. Companheiro, amigo e amado que tantas vezes me apoiou, leu, ouviu e me amparou nos momentos de desespero e cansaço, sem nunca deixar de partilhar do meu igual entusiasmo e felicidade.

Seguidamente, quero prestar o meu maior agradecimento à Professor Doutora Claudete Carla Oliveira Moreira que me honrou ao aceitar ser a orientadora desta Dissertação de Mestrado. A Professora Claudete é uma pessoa com singular valor pessoal e profissional cuja dedicação à Ciência e ao Ensino demonstra uma indubitável vocação à causa.

Neste seguimento, gostaria igualmente de expressar o meu reconhecimento aos/às Professores/as Doutores/as Adélia Nunes, Ana Maria Silva, António José Bandeirinha, Eunice Carrilho, João Rui Pita, José Augusto Ferreira, Maria Constança Providência, Paulo Carvalho, Sílvio Correia Santos e Urbano Nunes pela divulgação do inquérito por questionário junto dos seus alunos.

Iguais palavras de gratidão dirijo ao Núcleo de Estudantes da Faculdade de Direito, ao Núcleo de Estudantes da Faculdade de Farmácia e ao Núcleo de Estudantes da Faculdade de Psicologia e Ciências da Educação, bem como à Divisão de Relações

Internacionais e à Associação RUAS que prontamente se disponibilizaram para promover o inquérito por questionário através das suas redes sociais.

Por fim, dirijo os meus mais sentidos agradecimentos e estima aos/às meus/às amigos/as de longa data João Gouveia Monteiro e Nonô, Luísa Lopes, Maria João Rodrigues e Carlos Ramos; às minhas colegas Ana Quental, Graça Antunes, Lília Parisseaux, Raquel Rodrigues e Sofia Jesus; assim como ao Senhor Diretor dos Museus da Universidade de Coimbra Paulo Renato Trincão. Ao Senhor Diretor expresseo o meu maior apreço, não só por ter-me integrado na equipa do Museu, mas também por ter permitido que eu crescesse enquanto profissional desafiando-me com projetos de grande empreendimento e responsabilidade.

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List of Acronyms

AC – Arts College
AMUC – Academic Museum of the University of Coimbra
ASGaming – Automated Storytelling & Gamification
CoE – Council of Europe
GO – General Objective
FAH-UC – Faculty of Arts and Humanities – University of Coimbra
FE-UC – Faculty of Economic – University of Coimbra
FL-UC – Faculty of Law – University of Coimbra
FM-UC – Faculty of Medicine – University of Coimbra
FPES-UC – Faculty of Psychology and Education Sciences – University of Coimbra
FPh-UC – Faculty of Pharmacy – University of Coimbra
FST-UC – Faculty of Sciences and Technology – University of Coimbra
FSSPE-UC – Faculty of Sport Sciences and Physical Education – University of Coimbra
H – Hypothesis(es)
III – Institute of Interdisciplinary Research
ICH – Intangible Cultural Heritage
ICICH – International Scientific Committee for Intangible Cultural Heritage
ICOM – International Council of Museums
ICOMOS – International Council on Monuments and Sites
NTU – Nomenclatures of Territorial Units
Ph.D. – Philosophiae Doctor
RECRIA – Especial Regime for Co-funding the Rehabilitation of Rented Properties
REHABITA – Support Regime for Housing Rehabilitation in Old Urban Areas
RO – Research Objective
TCH – Tangible Cultural Heritage
UC – University of Coimbra
UC – AS – University of Coimbra – Alta and Sofia
UC – CGAD – UC Students of Courses that Grant an Academic Degree
UMAC – International Council of Museums Committee for University Museums and Collections
UNAM – National Autonomous University of Mexico
UNESCO – United Nations Educational, Scientific, and Cultural Organization
UNIVERSEUM – European University Heritage Network
U-SCWH – University-Scientific Contributors to World Heritage
UWHCC – Universities in World Heritage City Centers
VRG – Virtual Reality Glasses
WHU – World Heritage Universities

INTRODUCTION

INTRODUCTION

1. Setting the Scene

Heritage shapes the legacy of humanity's diverse and abounding past. In truth, and following developments in favor of cultural democratization, we are witnessing a generalized tendency towards the awareness of the importance and richness of one's own and one's other legacy. As so, seeking and embracing an authentic cultural perspective of different societies and destinations has become an essential part of what visitors are now wishing to obtain.

To this extent, tourism experiences that grant authenticity, exceptionality, participation, immersive encounters, cultural enrichment, and broad-mindedness are some of the most pursued by visitors. Interesting, in fact, is to comprehend that sensitive, physical, and ever more phygital involving experiences correspond to what the economy experience itself asserts. In addition, the sense of belonging, identity, collaboration, and co-creation emerge as important assets that support community involvement and continuity while propelling visitors (national and international) to understand, feel, and build upon their personal lives.

In this line of reasoning, it is essential to underline the importance that information and communication phygital technologies hold. In reality, these technologies not only allow conservation, prototype restoration, and access to inaccessible information, but they also promote digital diffusion and

accessibility as so as interactive and immersive involvement that impacts societal enrichment, tolerance, and universal insight.

Attending to what is presented, this master's dissertation in Tourism, Territory, and Heritage, by the Faculty of Arts and Humanities of the University of Coimbra, wishes to understand if UC Students of Courses Granting and Academic Degree believe that phygital features and the Intangible Cultural Heritage of the World Heritage Property *University of Coimbra – Alta and Sofia* can enhance the visiting experience.

In this ground of ideas, to develop an exploratory study assumes utter importance as it allows us to furtherly commence a more extensive scope and detailed investigation. In fact, from this research study, we can develop future analyses that depict a descriptive representation of a wider community (professors, personnel, and alumni). On the other hand, and attending to the historical moment of the museological restructuring of the Academic Museum of the University of Coimbra, to embrace an investigation that asserts to UC Students' involvement confirms alignment with the mission and vision of the museological plan for the University of Coimbra as understood by the *UC Strategic Plan 2019– 2023*, and the *Cultural Extension and Training Support Units Action Plan 2019– 2023*.

Furthermore, and although we believe that this study represents a starting point for a future marketing analysis on tourism expectations, requirements, and opportunity trends for the tourist attraction *University of Coimbra – Alta and Sofia*, a broader sample size – the present research comprises 461 participants – and temporal study is needed – the produced inquiry comprehends a 99 day period (from July 7th to October 14th 2021) performance. In addition, we also believe that monetary investment in physical and human resources is recommended for a better outcome examination.

2. Research Approach

To this extent, it is important to refer that well-established literature supports the dissertation, namely Nofal's (2019) research on phygital heritage prototyping architecture in museological contexts; Neuhofer's (2014) work on experience design and transformation design in tourism and travel; or Lo Turco's (2019) studies on phygital reproductions and modeling. In fact, a new generation is creating the latest challenges for traditional skills development strategies and approaches to what phygital features and environments concern.

However, the same is not always valid for understanding intangible cultural heritage tourism experience in the urban context, intangible cultural phygital heritage, and intangible cultural heritage in University of World Heritage properties. Additionally, and to what the Portuguese panorama respects, a similar investigation on intangible cultural heritage phygital technology, immersive environments in tourist attractions, and phygital development for museums and monuments is necessary.

In this account, studies traditionally focus on intangible cultural heritage and preservation awareness, tourism and travel promotion on tours and events, or equality and sustainable social and economic development for local communities. As a result, the common body of theory does not present solutional approaches to the many challenges that urban contextualized intangible cultural heritage travel destinations and museums face.

As so, this research focuses on understanding how we can enhance the tourist experience at the *University of Coimbra – Alta and Sofia* by combining the asset's intangible cultural heritage with information and communication immersive technology. In truth, by resorting to impacting national and international investigation, on-site tourist experience in Portugal, Spain, and

France, diplomatic policy examination, online questionnaire inquiry¹ resorting to the LimeSurvey platform, and SPSS software analysis, the study aims to contribute with an opening approach to the investigative field on the Intangible Cultural Heritage of the *University of Coimbra – Alta and Sofia* targeted to the 21st Century.

2.1. Research Objectives

For so, the main research objectives (RO) that guide this master's dissertation are:

RO₁ – To identify a broader state-of-the-art conceptual understanding of what phygital heritage and (memorable) tourism experiences comprise in the national and international framework.

RO₂ – To recognize which Intangible Cultural Heritage and phygital approaches UC Students most relate to.

RO₃ – To evaluate the Academic Museum of the University of Coimbra's role as safe guardian and promotor of the Academic Community and the University as an Educational and Scientific Institution.

RO₄ – To determine communicational and developmental strategies and approaches for the museological context as a tourist attraction.

¹ It is important to underline that due to the COVID-19 pandemic circumstances, the study encountered several limitations to what participant collection concerns. As so, the outcomes serve as suggestions and guidelines for future studies concerning not only the *University of Coimbra – Alta and Sofia's* Intangible Cultural Heritage but also the role of Intangible Cultural Heritage in urban and university contexts.

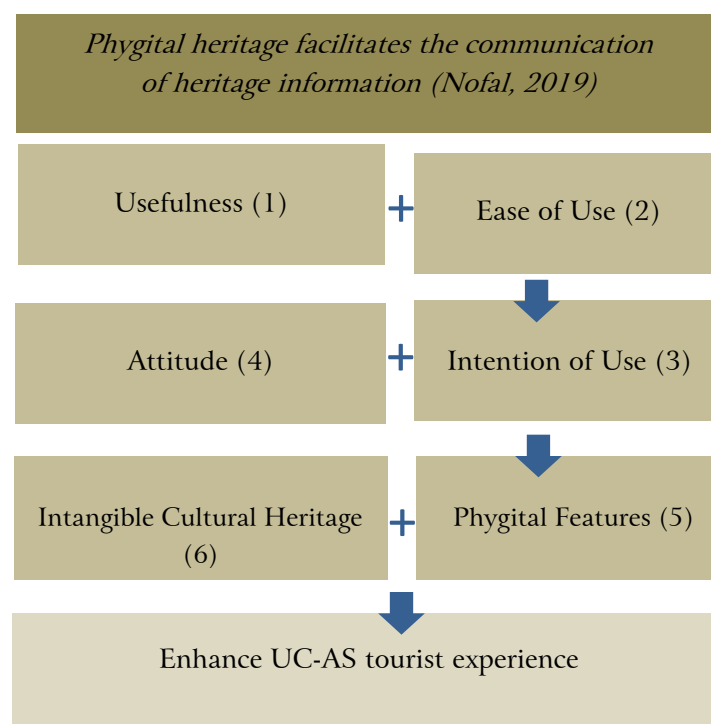
2.2. Research Question

Nevertheless, it is crucial to focus on the research question that leads us throughout this investigation. In fact - *Can Phygital Technology and the Intangible Cultural Heritage of the University of Coimbra enhance the Tourist Experience to the University of Coimbra – Alta and Sofia Property?* – not only narrows the study per se but pinpoints the direction to all subjects and momentums of the investigative process.

In this line of context, the research methodology applied to a sample size of 461 participants between July 7th and 14th October 2021 – a quantitative method based on an online survey questionnaire – is equally oriented by the research question. In addition, all fourteen-research hypotheses are drawn to answer the same guide lining problem – *Phygital Intangible Cultural Heritage as a Tourist Enhancer*.

On the other hand, by observing Figure 1, we can understand how the conceptual framework unfolds:

Figure 1
The Conceptual Framework



Note. The table was produced by the author of the dissertation and represents the conceptual flow of the study.

As so, and by accepting Nofal's (2019) theory that phygital heritage facilitates the communication of heritage information, we want to understand if the sample's technology acceptance – *usefulness* (1) and *ease of use* (2) – generates intention of use. Additionally, we assert if *Intention of Use* (3) and *Attitude* (4) generate interest in *phygital features* (5). Following, we comprise which phygital features and intangible cultural heritage (6) UC Students of Courses Granting an Academic Degree most relate to. And lastly, and overall, the combination of data will allow us to understand if *Phygital Technology and the Intangible Cultural Heritage of the University of Coimbra enhance the Tourist Experience to the University of Coimbra – Alta and Sofia Property*.

All in all, the present study aims to comprehend how a co-creational approach can generate a better tourist experience, while additional assertions on sample diagnosis, description, and necessities generate further information for an exploratory ground of assumptions.

3. Dissertation Overall

To better understand the conducted study, the master's dissertation is divided into three parts: *Literature Review*, *Case Study*, and *Methodology*. Lastly, the *Conclusions* raps the investigative research.

In Part I – *Literature Review* – we separate the body of theory that sustains the research into two analysis chapters. In Chapter I.1 – *A Phygital Approach to (Intangible) Cultural Heritage in the Museum and Monument Context* – we

begin by understanding the phygital approach to the intangible cultural heritage in heritage contexts. We study how *phygicality* is applied in domains such as marketing, learning and training, gaming, and tourism. Subsequently, we examine phygital heritage and museums' new state of being to understand the conceptualization that supports contemporary state-of-the-art practices.

Next, in Chapter I.2. – *The Tourist Experience Enhanced by Intangible Cultural Heritage* – we deepen theoretical understanding of the traveling experience in the 21st Century: (memorable) tourism experience, co-creational participation, and intangible cultural heritage as communal experience generator.

Both chapters will provide the needed theoretical support that sustains the empirical practice developed in Part III and offers knowledge on previous experimentations and outcomes for future development.

Following towards Part II – *Case Study: World Heritage and University* – in Chapter II. 1 – *Cultural Heritage: Policy Making* – we start by building knowledge on the concept of (world) heritage. As so, we firstly address UNESCO's international acts and assertions, then we channel into the European Council's declarations and role, while lastly, we derive towards the Portuguese context, laws, and actions. The drawn conclusions are sustained by confronting authors and theories analyzing data compiled in graphs and tables.

Secondly, in Chapter II.2. – *Universities as Guardians of World Heritage* – we focus on World Heritage Universities and how they function as heritage repositories. Comparative examinations of the five properties enlisted, emphasizing the *University of Coimbra – Alta and Sofia*, allow us to build premises that academically enrich our work.

Thirdly, in Chapter II.3. – *University of Coimbra – Alta and Sofia* – we assess the nomination file process, the asset’s outstanding universal value, and how it figures as a University of World Heritage, depicting its tangible and intangible legacy.

Lastly, in Chapter II. 4 – *The Academic Museum of the University of Coimbra* – we track its historical conception starting from the idealization of an Antiquity’s Museum and a Museum of the University to the foundation of the Academic Museum of Coimbra in 1951. The historical timeline is divided into four phases: 1951-ca. 1961; 1964-1987; 1978-2022, and 2022 onward.

At this point, in Part III – *Methodology* – we start, in Chapter III.1 – *Theoretical Assumptions and Research Question* – by reflecting on the theoretical hypotheses and research question that shapes the investigation. Later, in Chapter III.2. – *Research Method and Investigation Procedures* – we describe the research method and investigation practices, i.e., which paradigm, method, and technique are used to design, develop, and apply the empirical study in order to collect the outcomes that allowed, in Chapter III.3. – *Results and Analyses* – the sample characterization (sociodemographic and academic description), the statistical hypotheses testing, and other result analysis. Lastly, we flow towards Chapter III.4 – *Result Analysis and Discussion* – where assessments on the outcoming data are presented.

To the last and in the aftermath, the study ends by displaying the *Concluding Remarks*, followed by *Action Measures* proposals, as so as *Research Limitations and Fragilities*. To end, *Future Research Directions* appoint the closing outcome explanations and what further academic examination can research studies consider.

PART I
LITERATURE REVIEW



In Chapter I.1, the study commences by understanding phygital reality and how it is being applied in the directly related domains, e.g., marketing, learning and training, gaming, and tourism. An explanatory approach introduces the reader to theoretical assumptions and examples of best practices in state-of-the-art development. At this point, acknowledgments on the conceptualization of phygital heritage and the latest examples in technology, most of which were experienced on-site, will facilitate structural insight on the central theme. Lastly, considerations on museums in the 21st Century will contextualize what cultural and technological investments are being employed today.

In Chapter I.2, the research comprises theoretical perceptions on the economy experience and how it impacts the contemporary tourism and traveling sector, travel behavior, and tourist engagement with the travel-related experience. Additionally, advances in technology's pros and cons are asserted to determine a balanced understanding of tourist preferences and needs. In this line of context, discussions on tourism experience and the role of technology in creating memorable tourism experiences pushes forward the study's analysis generating insight on what to (and what not to) consider in the process of market-placement decision-making. While contemplations on cultural tourism, intangible cultural heritage tourism, authenticity, authentic experiences, and intangible cultural heritage experiences rap the literature review contextualization.

Chapter I.1 – A Phyigital Approach to Cultural Heritage in Museum Contexts

I. 1.1. Understanding Phyigital Approach in Different Domains

The subsequent rapid developments in modern technology extend the offer of information technologies to more dynamic and interactive formats (Nofal, 2019). Websites, applications, smart devices, augmented or virtual reality, artificial intelligence, the Internet of Things, and many other information systems are empowering the interaction between people, places, objects, and content to a degree never experienced.

From this perspective, it is from the phenomenon of overall connectivity and the penetration of the Internet in our daily physical reality (Uspenski, 2013) – to the point that technology is blurring the distinction between real and simulated (Gaggioli, 2017) – that the hybrid concept of phyigital² arises.

In the words of Nofal et al. (2017), phyigital conceptualizes the blending of the physical and the digital spheres in a way that they not only complete but also reinforce each other. Gaggioli (2017) will add that it refers to a new concept of space originated from the increasing convergence of physical and virtual dimensions, whereas Van Tichelen (2019) argues on the importance of personalized experiences that engage the user in on-site encounters.

Most recently, Mikheev et al. (2021) defend that phyigital marries both online and offline environments with the purpose of providing a unique and

² The term phyigital was used for the first time in 2013 by Momentum, an Australian marketing agency, and is a neologism that results from the synthesis of the terms “physical” and “digital”.

interactive experience. Different from Lo Turco (2019: 163), that supports a bi-dimensional approach stating:

In a more humanistic sense, it [phygital] can be used to indicate a generation of people for whom the real world and the digital world overlap. In a more technical context, it is used to define the interconnection between the physical and digital layers that increase the meaning and value of the original object.

Altogether, these conceptualizations reflect the transversal hybridized significance of both realities (physical + digital) and underline the importance of personalized experiences, individual interpretation, value co-creation, and psychological effects. As a consequence and effect, the advances in scientific research, programming, Internet, design and development, and the consequential results accelerated by COVID-19 – governments, commerce, schools, health services, science, and many others have not only (re)adapted to technology but also internalized its undeniable high potential and advantages – are playing today a significant role in the present and future of businesses, education, and culture while extending to domains such as marketing, learning and training, gaming, or tourism (Almeida & Silva, 2020).

I.1.1.1. Phygital Marketing

In the marketing sphere, Belghiti et al. (2018: 61) describe phygital retail as “hybridizing the physical (the point of sale, its products, and others) and digital components (touchscreens, connected mirrors, near-filed communication cards, and others) at the same time and in the same place,” while authors as Teo (2013) and Singh and Singh (2018) argue that it emerges as a concept

that bridges the gap and creates synergistic encounters by connecting e-commerce instruments to physical stores. In addition, Hollebeek et al. (2019) underline that phygital marketing involves crafting a harmonious consumer journey that incorporates physical and digital experiences in a way only possible due to the rise of digital technologies. All in all, digital technologies are generating live in-store promotion in the form of “likes” or other spontaneous interactions.

On the other hand, the rising technologies are, without a doubt, a subset of the Internet of Things that comprises networked "smart devices" equipped with microchips, sensors, and wireless communication capabilities (McLellan, 2013; Thierer, 2015). By combining digital presence and physically immersive reality, digital actions can spark physical reactions or vice versa³. Subsequently, companies, businesses, museums, galleries, and so forth are now merging brands, information, immersive environments, and technology so that the audience approach assumes an increasingly vivid experience – both functional and emotional values are highly considered. Pop-up stores⁴, multimedia kiosks⁵, short sample distribution⁶, augmented reality and virtual reality

³ An interesting example is *McDonalds Pick n'Play*: a billboard game that interacts with customers, generates win-win profit through free food incentive prizes, and word-of-mouth marketing (McDonald's Sverige, 2011).

⁴ According to Zhang, et al. (2019), pop-Up Stores are storefront retail shops open for short periods and designed to offer a direct and experiential consumer-brand experience. In this line of context, *Sonos x Google Brilliant Sound Experience* - created to celebrate the arrival of Google Assistant on Sonos - is an interesting example of good practice (Campaign, 2019).

⁵ Multimedia Kiosks are on site spaces where the user can make reservations or digital purchases as so as access stored or online real-time information (Seo, 2020).

⁶ With Short Sample Distribution companies can combine virtual and real-world environments. Advertising and communication connect objects and devices: physical objects interact with digital platforms (Teo, 2013). An interesting example is the *Granata Pet Snack Check* – a billboard connected to Foursquare – which interacts with customers generating win-win profit while distributing product samples and creating brand awareness (PaperPlane, 2011).

interaction⁷, wearable technologies, or digital payment are some of the formats used to attract and stimulate interaction.

I.1.1.2. Phygital Learning and Training

For the learning and training sector, the potential of the phygital approach arises as a novel design concept that induces a new dimension for learning and practicing experiences. Users interact with physical context and digital information, simultaneously enhancing their levels of competence and learning/practicing domains – cognitive, affective, and psychomotor (Vate-U-Lan et al. 2016; Spitale et al. 2019) – while working in optimized environments: resources, time, and potential are highly attended.

Today, educational modules can be entirely transmitted (learning-teaching-practicing process): by remote means (e-learning), by combining digital methods with face-to-face meetings (b-learning), by using portable devices that allow the user to transport and access information from wherever one is (m-learning), and by using ubiquitous computing (u-learning), (Rocha et al. 2020). Technology and education (learning and training) are currently aiming to improve global reach by providing greater access to quality education/practice, transforming learning into a more personalized experience, and bringing significant improvements to pedagogical practices. As so, phygital learning and

⁷ Augmented Reality or virtual reality interaction provides as overlay of augmented or virtual content adding immersive experiences to the actual environment (Alcañiz et al., 2019). In this line of ideas, the *Audi Quattro Coaster Augmented Reality Experience* allows the user to enjoy the Audi technology by creating and designing personalized experiences (BrinTrin, 2019).

training are being implemented in areas such as phygital libraries⁸, educational toys⁹, learning platforms, classroom environments¹⁰, or phygital simulators¹¹.

I.1.1.3. Phygital Gaming

In the recent decade, phygital has also been playing an important role in the gaming scenario. According to Prattico et al. (2019: 205), the key idea of “phygital play” is that “digital pieces of information mediated throughout physical elements (...) should lead users to more immersive and intense experiences.” Once again, the interaction is achieved by exploiting mixed reality environments, i.e., augmenting physical reality with digital content.

In the words of Lupetti et al. (2015), “both in the scientific and in the consumer world, games are experiencing an evolution oriented [by] the contamination between physical and digital dimensions.” The relevance that human-computer interaction has assumed in the attraction and engagement of users is undeniable.

⁸ The Georgie Tech Library stands as an outstanding example of best practice (PRAXIS3, 2020).

⁹ In 2019, the Lego Group released the Lego Hidden Side. The application extends the play experience by blending traditional physical Lego play with digital augmented reality (Jollyroom Content, 2019; Toyworld, 2019).

¹⁰ The Classroom of the Future is an interactive portal created by Hope Education that explores ways schools can embrace the traits of today’s children as keen adopters of technology. Classrooms can be equipped with programming workspaces, interactive walls and desks, solar windows, or holograms (Paddick, 2016), offering integrated solutions for education providers (Mobilegeeks.de., 2013). An additional example of collaborative style teaching and peer-to-peer learning is the ESCO - Classroom of the Future (GPA: Think Global, Act Global, 2021).

¹¹ To what safety and development concerns it is interesting to focus on the potential that phygital reality represents as a means for practicing real-time pressuring situations, e.g., developing medical practice procedures or exposing drivers to dangerous scenarios (Volvo Cars, 2019).

Playful design¹², playful experience mapping, robotics¹³, video game and nongame context experience combinations, phygital items¹⁴, as many others are now at the core of investment. The aim is to expand the gamers' immersive experience through the combination of physical reality, light, sound, virtual victories, and cloud communities while providing thought-out service, free-to-play monetization advantage, and security by technology (Shlapak, 2019).

I.1.1.4. Phygital Tourism

Regarding the tourism segment, we are also witnessing the rise in the pace of implementing immersive technology (Van Nuenen & Scarles, 2021). Not only is this because Tourism is by nature a highly technology-dependent industry (namely destination management systems, in-room entertainment, self-check-in kiosks, hotel/food and beverage applications, booking programs, and e-commerce kiosk equipment as in Figure 2), but because it is also a consequence of the rapid developments in technology and the Internet of Things (Stankov & Gretzel, 2020).

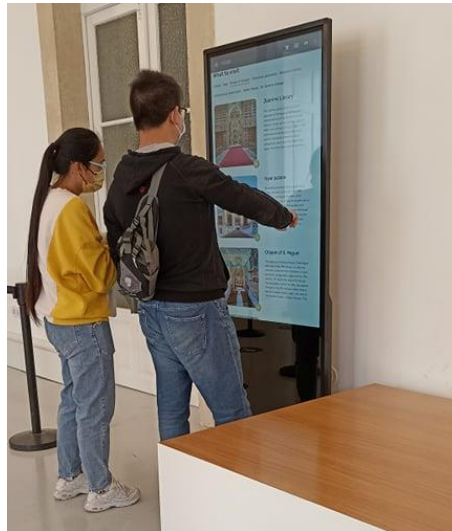
¹² In the work *Active Parks: “Phygital” urban games for sedentary and older people* (Tseklevs et al., 2014) the authors explore how co-design can create playful “phygital” experiences that motivate sedentary and older people into casual physical activity in public urban spaces.

¹³ Lupetti et al. (2018), in their work *Design and Evaluation of a Mixed-Reality Playground for Child-Robot Games*, study a mixed-reality game platform in which children play with or against robots.

¹⁴ Phygital items are physical souvenirs with digital data kept on an internal chip. *Amiibo* by Nintendo, for example, offers a big variety of high-quality popular characters and the possibility to get additional content in games (GAME, 2014).

Figure 2

Interactive Information and E-Commerce Kiosk at the Tourism Ticket Office of the University of Coimbra



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Note. The image was produced by the author of the dissertation (February 2022) and represents a SMART tourism solution that allows visitors to purchase goods, ticket entrances and access to online in-site information.

It is in this context that Tourism 4.0 emerges. Pencarelli (2020) describes it as a new tourism value ecosystem – supported by Industry 4.0¹⁵ – set up on high-tech service production and characterized by interoperability, virtualization, decentralization, service orientation modularity, real-time data gathering, and analysis capability.

Concurrently, researchers and businesses are aiming to understand how to best employ the potential of Phygital Tourism. In reference, **smart tourism**, i.e. the application of information and communication technology – that resorts to ubiquitous technology, such as open data, cloud computation, geographic information system, artificial intelligence, and others (Ballina, 2019) – is

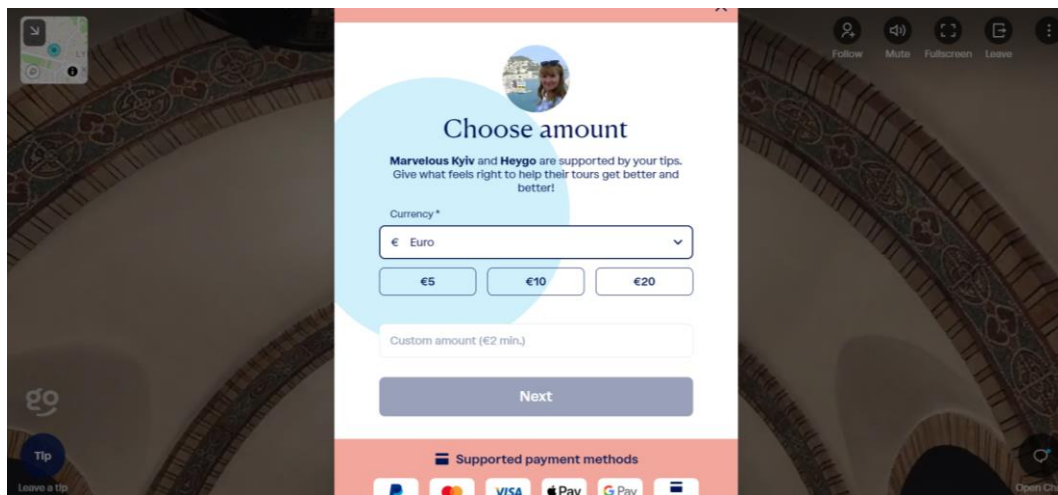
¹⁵ In the work *Industry 4.0: A survey on technologies, applications, and open research issues*, Lu (2017) characterizes Industry 4.0 as the fourth industrial revolution that is composed by (1) cyber physical systems production, (2) heterogeneous data and knowledge integration, (3) automatic data exchange and communication, (4) digitization, optimization, and customization of production, and (5) human-machine interaction. The author also states that Industry 4.0's goals are to achieve higher levels of operational efficiency and productivity and increase the levels of automatization.

overlying physical reality and digital content as well as focusing on promoting sustainable travel practices that combine accessibility, digitalization, as so as cultural heritage, and creativity¹⁶.

In addition to this, not only does phygital tourism wish to personalize and enhance the tourist experience but is also willing to generate novel social experiences, capture new audiences, uplift different evolving and stimulating ecosystems, create innovative means to interact with the past, as so as promote sustainable traveling. Some examples of phygital tourism are virtual tipping codes¹⁷, as in Figure 3, digital menu tables¹⁸, wearable devices that interact with tour guides¹⁹ or information kiosks.

Figure 3

Heygo is a travel-specific live-streaming platform that allows local guides to share the world with virtual tourists



Note. The image was retrieved from Heygo.com (February 2022) and represents the tipping platform. Users can choose the currency, ammount, and payment method.

¹⁶ In 2019, Helsinki was named as the first European Capital of Smart Tourism. It's *Smart Tourism Roadmap Application* combines local co-creation, cultural heritage, and sustainability (EU Growth, 2018)

¹⁷ Vemno is another application that enables the user to accept payments (or tipping) for goods and services (Vemno, n.d.)

¹⁸ Intelligent system management touch tables as Smart Restaurant Table AranTouch (AranTouch Technology, 2016)

¹⁹ Kim et al. (2016), in their work *Development and Evaluation of Mobile Tour Guide Using Wearable and Hand-Held Devices* propose a mobile tour guide system that shares the touring context between hand-held and wearable devices and presents tour information based on the devices capabilities and usage pattern.

I.1.2. Experiencing the Past Through Phygital Heritage

Although heritage is still usually transmitted through traditional forms as written labels, audio guides, or tour guides, the number of institutions – namely monuments, museums, art galleries, and cultural centers – adopting a phygital approach is rapidly growing. Investments of such nature reflect the importance that hybrid environments are having in “the race to “prove” public worth, impact, accountability and relevance” (Kidd, 2014: 2), with education, science, and promotion assuming an ever-growing approach to society.

To this end, many studies on heritage communication, communication design, phygital storytelling, and phygital heritage have understandingly emerged. If many focus on how we can facilitate the communication of heritage or how we can engage the user in richer (visiting) experiences, it is never less accurate that others raise questions on digital object ownership and accessible democracy (Rico, 2017) or digital colonialism (Stobiecka, 2020).

In truth, Eslam Nofal (2019) hypothesizes and studies how interactive phygital prototypes facilitate the communication of built heritage information, how it affects user engagement, and how it functions as a potential communication medium with the broader public. The author defends that phygital environments enable visitors to appreciate heritage more experientially, raise awareness on heritage assets, and promote movement towards the democratization of culture. In order to achieve this, phygital features must combine physical characteristics as physicalization (abstract ideas as numbers or networks encoded into physical form), physical affordance (possibility of action on an object or environment), and situatedness (physical context). Additionally, Nofal et al. (2017: 221) state that “the blending of digital empowerment (...) into heritage, forms an ideal application field to give

meaning to the digital experience, and in turn, the digital medium can truly provide immediate access to dynamic [and] relevant resources.”

By applying **mixed reality**, i.e., “a hybrid reality for producing an innovative visualization and a world where the digital and physical objects interact and co-exist in real time” (Alhakamy & Tuceryan, 2020: 2), users can not only experience highly immersive and interactive environments but also obtain higher understandings on objects and realities. Anywhere between the extrema of the reality-virtuality continuum (Milgram & Kishino, 1994; Milgram & Colquhoun, 1999), mixed reality possesses all the components of other engaging forms of digital entertainment, “while offering (...) additional tools [as] physical props and sets, robotic characters, new types of spaces, and multisensory stimuli” (Nakevska, 2015: 43), meaning that “mixed reality allows the digital world to be extended into the user's real-world (...) [creating] an almost magical environment where virtual animations and graphics are merged with the real world as seamlessly as possible.” (Nakevska, 2015: 51). In this line of reasoning, the Delta Coffee Science Center (Campo Maior, Portugal) presents an excellent example of an intragenerational and interactive experience that combines culture, history, nature, and information technology (Figure 4)²⁰.

²⁰ For a better understanding visit *Centro de Ciência do Café* [Coffee Science Center] (Centro Ciência do Café, n.d.) and *Centro de Ciência do Café em Campo Maior* [Coffee Science Center in Campo Maior] (tubedorui, 2019).

Figure 4

Delta Coffee Science Center – Café Vision Module



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Note. The figure was produced by the author of the dissertation (July 2021) and represents the mixed reality module *Café Vision*. *Café Vision* allows visitors to choose which of Portugal's historical cafés they wish to travel and take a picture. In addition, the feature connects the coffee culture and economy with the Portuguese intellectual culture while promoting other tourist destinations.

As so, it is essential to emphasize digital technology's role in reconstructing, promoting, recording, and preserving historic sites and heritage (Ireland & Bell, 2021). 3D modeling, virtual reality, digital visualization, artificial intelligence-assistance, digital-human reconstruction, game engine visualization, phygital communities, and many other formats are increasing the capacity of preservation as well as creating means that not only aid investigators in the production of new knowledge (Paladini et al., 2013; Lo Turco, 2019) but also able the understanding of lost information or the gaining of insight on past usage and evolution²¹ (Arrighi et al., 2021: 5-6). Moreover, Redweik et al. (2017: 23) argue that 3D models combined with mapping, animation,

²¹ Following a 3D museological digitalization project, the municipality of Montemor-o-Novo (Portugal) created a temporary cycle of exhibitions that combine history, cultural heritage, and technology: archeological objects, holographic reconstructions, and 3D models promote a sensitive and accessible approach (Câmara Municipal de Montemor-o-Novo [Municipal Hall of Montemor-o-Novo], 2021). Furthermore, the 3D castle reconstruction also contributes as a remarkable experience for visitors (public and researchers) to access more profound knowledge (Mor base, 2016; Morbase, n.d.)

holography, or supporting interaction are a highly beneficial means of representation and communication. While Blanco et al. (2016) demonstrate how virtual reality and augmented reality technology mixed with 3D modeling can create accurate, realistic, and immersive environments.

Recently, Moreira et al. (2021: 220) argued that phygital experience is a “novel way of interacting with the world around us,” a world in which we are no longer offline or online, but rather simultaneously in both states at the same time. Viviani (2020), on the other hand, defends that technology must permit immediacy, immersion, and interaction to enjoy an authentic phygital experience. While Van Tichelen (2019: 37-38) considers that phygital experiences must (a) take place in a physical location; (b) trigger emotions and engage the user; (c) combine or use touch technology, mobile technology, object, face, voice recognition, gesture technology, augmented reality, or virtual reality; and (d) personalize the user's experience.

Nevertheless, Lo Turco (2019) highlights that it is crucial to rethink the role of heritage sites, museums, exhibitions, and university structures. In fact, the author affirms that society is witnessing the merge of science and humanities with art and technology: new opportunities can improve the visitor's visual, aesthetic, and intellectual experience by providing information that enriches one's understanding. Even though he discusses if the value of an object in the real world is transferable to phygitalized environments – authenticity, symbolism, and historical development – he, as so as Panciroli et al. (2017), defend that new technologies not only provide cultural enjoyment but also favor the opportunity to benefit from a second heritage, i.e., knowledge, reworking, and participation.

In information and communication technologies interventions on preserving intangible cultural heritage, Permatasaria et al. (2020) argue that digital

environments should be built on the principles of inclusiveness, representation, and community. The authors note that “digital [mediations] should help alleviate the participation of the society by attracting people in producing their own story of the living heritage based on their perspective in the form of written or audiovisual narratives”. In addition, identification, capture, transition, and authenticity follow information and communication technologies’ premises in intangible cultural heritage conservation. Furthermore, Cantoni's (2018: 69-70) approach to information and communication technologies’ role underlines that it preserves cultural heritage and promotes sustainable and responsible tourism.

As so, the European Union's I-Treasures project (2013 – 2017) was an interesting example that reflects an open and extendable online platform – with different sorts of content (text, audio, images, video, or 3D graphics) from different forms of heritage or educational institutions – providing universal access to intangible cultural heritage resources for research and educational purposes. In the words of Alivizatou (2019: 131), I-Treasures²² had the potential to “increase access to cultural heritage by reaching out to diaspora groups and other virtual learners far beyond the geographical contours of locally defined communities.”²³

²² I-Treasures Project introduced innovative methodologies and technologies - as multimodal voice and gesture analysis - to study, preserve, and disseminate Europe’s intangible cultural heritage (i-Treasures, 2013).

²³ The *Memory of the World Programme* is another interesting, interconnected digital network. The project extends universal access to documentary heritage, facilitating the preservation and increasing worldwide awareness of its existence and significance (UNESCO, n.d.). Similarly, the European digital cultural platform *Europeana* encourages worldwide access to Europe's libraries, museums, archives, and audiovisual collections. Most recently, and under the economic hardship flowing COVID-19, it began to support the tourism sector by inspiring people to discover cities, landscapes, and historical places. It’s vast digital collection of artifacts, music, sound files, images of cultural heritage sites, and 3D image collection also promotes

In the Portuguese context, Andrade and Dias' (2020) study on the impact of the augmented reality application designed for Quinta da Regaleira (a Portuguese cultural heritage landmark) defend that applying augmented reality to cultural heritage can address sites and professionals' needs while being attractive to different publics. Nevertheless, they state “although mobile app technology is transitioning from experimental pilot testing to a commercial phase, the technology still has limitations to overcome.” Information overload can be detrimental to efficient software processing, memory capacity, or attractiveness.

Additionally, in Pereira's (2017) work, on the use of augmented reality in the Porto Cathedral, he underlines that the advances in technology and equipment allow users to easily access information in augmented reality applications (people, place, and ease of use). Consequently, the author defends that digital technology embodies useful environments for learning, knowledge transmission, research production and represents a rich multidisciplinary investment that enhances the tourist experience by taking visitors on 3D tours in time and space.

All in all, the impact and influence that phygital environments have on the user experience is easily understood. In the academic and educational field, technology transforms how we obtain knowledge, enlarging in-depth and in width the information accessed while expanding our capacity to preserve and disseminate scientific evidence. For recreational and educational purposes, digital expertise acts not only in higher visitor engagement, allowing the general public to participate, experience actively, and better understand the

responsible, accessible, sustainable, and innovative tourism (European Commission: Shaping Europe's Digital Future, n.d.).

information but also promotes social acceptance, democratic culture access and participation, creative openness, and mind-opening solutions.

Furthermore, from an economic perspective, phygital solutions encourage digital, heritage, and tourist businesses and industries to make revolutionized public approaches. Networks, services, and products offer a wider range of possibilities that enhance tourist attractions and destinations in deeper, personalized, and distinct manners, i.e., a notorious hybridization that characterizes the economy experience: expand personal investments to customized, sustainable, and memorable experiences.

I.1.3. Museums (and Heritage Sites): A New State of Being

Since the beginning of the 20th century, museums have been progressively transmuting from the collection of physical artifacts to photographic and video formats, and most recently, digital forms of creation and transmission. This technological shift is making museums rethink traditional collection-centered models in ways that uplift the visitors' experience and their relation with these institutions. Consequently, museums find themselves producing dynamic real-time dialogues with diverse social circles and audiences: visitors use different media (social media, email, blogs, YouTube, sites, and others) to communicate their thoughts and feelings on visiting experiences, while museums interact, communicate, and collect a broader range of information deepening their (public) understanding and narrative.

In fact, this paradigm transition focuses on the digital-human behavior and how museums can become a central part of digital ecosystems driven by the Internet of Things and (even) the Internet of Life. So much so that Giannini and Bowen (2019) claim digital life and culture are very much rooted in new states of human activities and existence: real, visual, and online intertwine with human behavior, while senses advance into innovative perceptions of existence, awareness, and worldwide dissemination.

According to Bowen and Giannini (2019: 563) “21st-century museums reside in digital culture ecosystems and thus are in search of a new identity as they grapple with audience perceptions of the past and the promise of the future.” As so, museums face new challenges: rapid transformations, physical and virtual interactions, and new states of being are compelling professionals to think on what museums should (be)come. To achieve this goal, museums of the future must promote indoor and outdoor participation, innovation, creativity, question-making, openness, and inter and intra-cultural dialogue.

Thought-provoking is Paul Arthur's study on how collections and communities can engage with technology and interactivity in the museum context. The author concludes that today these institutions "are not only guardians of the past but are also entrepreneurs – linking, facilitating, and marketing collections" – that embrace new modes of digital delivery and display by "blending familiar notions of outreach with publication and dissemination of online content" (Arthur, 2018: 260).

In this line of ideas, it is essential to emphasize the role education and museums play in promoting free and democratic access to knowledge, shared participation, and experiences. As so, it is crucial to consider the part that media and technology perform in democratizing museums, opening them to larger audiences and audience involvement (Kotler et al., 2008; Lo Turco, 2019; Cameron, 2020). If, on the one hand, they build more informed and tolerant societies, on the other, museums provide local, regional, and national economies with a broader range of possibilities and solutions, as so as a closer interconnection with tourism, and by this the economy once again (Carayannis et al., 2018).

In this respect, museums must also provide new answers on how technology can deliver innovative and cooperative ways of interaction: a two-way mediation in favor of sustainable and progressive societies. Nevertheless, and although Flynn (2007: 349) underlines that in an "era of digital technology and connectivity, access to heritage is increasingly mediated through the consumption of signs, electronic images, and simulacra," authenticity and accuracy must be carefully attended in order to reduce disruption.

Under this new framework, museums have become places of encounter and experience and, to some extent, are being converted into *para-museums*²⁴ as well. According to Camps-Ortueta et al. (2021), socialization, ludification, and virtualization are the critical tools of museum transformation. Simultaneously, new technology is offering novel forms of interpretation in ways that the social-historical meaning of museums is transmuting into representational technology. As so, these institutions are configuring mindscapes and landscapes in ways that original traces of discovery and movement, although deriving from tangible existence, give rise to intangible domains of participation (Duelos, 2004).

To this point, it is interesting to comprehend the position that **gaming** is taking in the museum context: cultural heritage, virtual worlds, and phygital games (Lupetti et al., 2015) are ever more growing in value. Video games are now intrinsic to collections and act as informal invitations (Vermeeren et al., 2018) and as part of educational techniques: considering that people (like to) learn in different ways, playing games can represent an effective alternative to traditional approaches.

A compelling example is the Pope's Palace HistoPad (Avignon, France)²⁵. The equipment is an intra-generational user-friendly interactive tablet (included in the entrance ticket price) provided at the beginning of the visit. Using augmented reality, 3D technology, and geolocation mapping, HistoPad takes the public on an eighth-century trip in time. Visitors can obtain detailed

²⁴ Based on the American concept of visitor centers, a *para-museum* is a hybrid concept that binds conventional museums and the cultural equipment of visitor centers. These spaces are like museums but do not obligatorily require a collection and therefore neither a conservator nor regulation (Piñol, 2011).

²⁵ For additional information visit, *HistoPad Palace of the Popes in Avignon* – ENG, the video demonstrates how augmented reality and 3D reconstruction allows visitors to discover the Palace's past ways of life (Histoverly, 2019).

science-based explanations of the palace's history and graphic understanding of wall paintings and ceilings (Figures 5 and 6). In addition, through gamification, children and families are invited on a treasure hunt, searching, and collecting hidden coins.

Figure 5

HistoPad guiding visitors in the Palace of Popes (Avignon, France)



©Germana Torres

Note. The image was produced by the author of the dissertation (July 2019) and represents visitors exploring the Palace of Popes resorting to technology.

Figure 6

Augmented reality technology with HistoPad at the Consistory



Note. The image was granted by the Palace of Popes and represents the Consistory's digital recreation through augmented reality. The software allows tourists to explore their visit resorting to a user-friendly, interactive, educational, and fun device.

In this context, **Game of Learning**²⁶ and **Serious Games**, i.e., games that combine learning strategies and knowledge structures with skills and attitudes,

²⁶ Although Game of Learning and Serious Games are in many cases used as synonyms, Serious Games go beyond Game of Learning given that they intend to alter the players' behavior

are emerging in different areas (Mortara et al., 2014) with the will to promote learning and behavior change (Anderson et al., 2010). By replicating technological, socio-economic, and historical issues of a subject and by using attractive communicative, learning, and training tools, immersive and interactive games are connecting with the public (especially younger generations) as a means of communication that transmits knowledge, culture, and models (Paola et al., 2019).

Engaging is Naskali et al. (2013) study that relates museums growing tendency to incorporate video games as exhibition attractions with the role they play in people's lives and how earlier gaming experiences (tangible and intangible features) influence social relationships, popular culture consumption, and feelings of nostalgia. Nevertheless, and even though heritage institutions²⁷ and video game producers are highly investing in the development of augmented reality and virtual reality gaming techniques, to what intangible cultural heritage gaming concerns, abstraction, and people-orientation must be managed correctly in order to define a clear and unambiguous message (Ma et al., 2018).

Understandingly, **virtual reality** is creating new opportunities for museums to (re)present collections, interact with visitors (Anton et al., 2018), and “overcome lack of space or [object] fragility and their need for special handling” (Lepouras & Vassilakis, 2004: 97). In addition, this technology is being used to not only increase engagement and education (Kang & Yang, 2020) or to reconstruct historical events and heritage sites (Bruno et al., 2010; Cassidy et

through training and are often created to focus on the specific needs of specialized subjects as business, marketing, industry, medicine, or politics (Sawyer & Smith, 2018, as cited in Connolly et al., 2012).

²⁷ According to Ruttkay and Bényei (2018), Galleries, Libraries, Archives, and Museums are also referred to as GLAM institutions.

al., 2019) but also to enhance interpretation and experience (Mohd Noor Shah & Ghazali, 2018) by providing interactive and immersive encounters in museum contexts²⁸ (Pantile et al., 2016). Still, Shehade and Stylianou-Lambert's (2020) leading study on the examination of museum professionals practices, experiences, and perceptions on the use of virtual reality technology – how they perceive advantages and challenges of such technologies, and their vision on the future of technology in museums – indicates that interdisciplinary teams, adequate training, the incorporation of technology topics in museology (university) study programs as well as more profound research on the impact of virtual reality must be attended²⁹.

Similarly, museums are making artworks and contents accessible and preservable to mass audiences by incorporating **holographic displays**, i.e., a stereoscopic virtual reality system that can replicate real showcase behavior by

²⁸ *Mona Lisa: Beyond the Glass* was the first virtual reality experience presented by the Louvre Museum (Paris, France). Available during 2019 and 2020, the museum offered the public eleven headset stations to experience an immersive personal encounter with the artwork and painting process. The technology combined moving images, sound, and interactive design engaging the visitor in an immersive journey into the world of da Vinci, while giving life to years of conservation, research, and data collection. For supplementary information see *Mona Lisa: Beyond the Glass at The Louvre I HTC VIVE ARTS* (HTC VIVE, 2019).

²⁹ An example of effective gamification is the mobile gaming application *MicroRangers*, launched by the American Museum of Natural History in 2015. By downloading the application, players/visitors have access to an augmented reality technology animated ecosystem (like what is used in Pokémon Go) around chosen exhibits. In this line of ideas, the game generates a storyline for the player to follow, where they are the protagonist (sense of agency), and the Museum is the setting (interactive storytelling). *MicroRangers* uses various technologies to geolocate the user, offer augmented animated characters that guide the visitor, and deliver games that bring the dioramas to life. *MicroRangers* is a mobile game for families and children of all ages. The Museum shrinks the user down to microscopic size and sends him/her to combat biodiversity treats. Armed with the mobile application and a free Communicator Coin, augmented characters - both microbes and scientists - will send the visitor on missions (American Museum of Natural History, 2015; Moosha Moosha Mooshme, 2016).

specially arranging an array of projectors and holographic screens and boxes³⁰ (Chessa et al., 2015; Pietroni et al., 2019; Safy El Deen & Hussein, 2020).

To this, USC Shoah Foundation's *Dimensions in Testimony* (Figure 7) represents a remarkable example of advanced holographic technology in the service of humanity. This 3D interactive projection allows visitors to experience virtual conversations with Nazi concentration camp survivors. Users can ask questions that trigger real-time verbal responses, reflecting on the profound and meaningful consequences of the Holocaust. Additionally, it also records and displays memory and oral traditions acting as a valuable archive that preserves the past far into the future (USC Shoah Foundation, 2012).

Figure 7

Holographic technology - Dimensions in Testimony Project



Note. Dimensions in Testimony uses holographic technology to safeguard the dialogue with Holocaust survivors and eyewitnesses. The image represents a Holocaust survivor side by side with his holographic reproduction (Statens Historiska Museer, n.d.)

³⁰For supplementary information see USC Shoah Foundation (2020). In the video USC Shoah Foundation Executive Director Stephen Smith describes the project and why this technology is so impactful to students.

On the other hand, Markov's (2011) approach suggests that museums can use holographic displays due to limited exhibition space, incompleteness of the exposition on a particular theme, poor preservation state of an object, or because they represent a particular advantage for temporary exhibitions. Nevertheless, and although holography is being applied in multiple contexts – such as cartography, education, air traffic control, gaming (Andrade, 2021), or data collection – complexity, high cost, lack of portability, and on-site synchronizations are some of the difficulties that institutions must consider (Wise, 2016; Andrade, 2021).

An equally inspiring virtual arrangement is the **video mapping**³¹ technique. Suroto et al., (2020: 175) describe this technology as “a type of projection technique which is usually used to turn objects [often irregularly shaped], into a display surface for video projection.” In addition, Neuman (2018: 258) explains that “based on virtual images, [video mapped] installations present an array of [projected] visual sequences – figurative and abstract, realistic, and phantasmagorical, commercial and purely artistic – on the physical condition of the facade surface”, while Fedorov (2020: 6) defines the technology as “superimposing static or moving images onto various non-flat surfaces of physical objects”.

The combination of architecture (surface and structures), digital arts (artistic technology), and urban landscape explore innovative approaches that focus on productions centered on special effects and visual appeal (Yoo & Kim, 2014). Additionally, applying video mapping to the inside of buildings or structures – by binding architectural forms with fantastical elements – can provide

³¹ Video mapping is common in Europe, and projection mapping is more prevalent in the United States; nevertheless, both have the same meaning.

immersive and monumental exhibitions, allowing visitors to participate actively.

To this, the *Chartres en Lumières Festival* (France) on a large scale (Figure 8) and the *Uma História de Luz*³² (Figure 9) and *A Luz do Jogo*³³ (Coimbra, Portugal) on a smaller scale are three examples of video mapping used to enhance history and heritage while promoting a tourist destination. Even so, the success of *Carrières des Lumières*³⁴ – an immersive digital exhibition planted in an extinct quarry in the Les Baux-de-Provence (France) – maximizes the demonstration of how cutting-edge projectors and complex computer control produces an outstanding, memorable tourist experience (Figure 10), so much so that the exhibition is one of Provence’s leading tourist attractions and has led to creating “siblings” in Paris, Bordeaux, and South Korea³⁵.

³² A Story of Light. Free translation by the author.

³³ The Light of the Game. Free translation by the author.

³⁴ Quarries of Light. Free translation by the author.

³⁵ Van Sickle (2020) explains the success of the tourist attraction *Carrières de Lumières* and how it has become one of Provence’s leading tourist attractions. For additional information see *Van Gogh, la nuit étoilée aux Carrières de Lumières* (Culturespaces Digital, 2019).

Figure 8

Example Scene of the Chartres en Lumières Festival (France)



©Germana Torres

Note. The image was produced by the author of the dissertation (June 2018) and exemplifies how video mapping technology assists visitors and researchers in the understanding of the past while enjoying art performance

Figure 9

Representative Scene of Uma História de Luz Event (Coimbra, Portugal)



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Torres

Note. The image was produced by the author of the dissertation (July 2015) and represents the video mapping event *Uma História de Luz Event* made for the University of Coimbra's 725th Anniversary Commemoration.

Figure 10

Demonstration Scene of the Carrières des Lumières (Baux-de-Provence, France)



©Germana Torres

Note. The image was produced by the author of the dissertation (July 2019) and demonstrates the *Carrières des Lumières* immersive exhibition that takes visitors on a personal and profound journey, discovering Van Gogh through digital projection.

It is important to attend that although video mapping commonly does not concentrate on the transmission of knowledge, Faria et al. (2020) defend that it can also be used in the art of visual narrative, acting as a participant and enhancer of storytelling and communication of history. To such extent, displays of this nature are now conceptualized as **digital museums**, i.e., museums that “provide visitors an immersed and interactive experience by leveraging multisensory cues” that “capture visitors' imagination activating a sense of surrealism with realism” (Guo et al. 2021: 2 and 14). Moreover, Mirghadr et al. (2018) add that digital museums are technology-driven and hedonism-centered spaces that promote immersive and personalized encounters.

Interesting as well is to consider the importance that **immersive and interactive storytelling** provides. By merging real and virtual worlds to produce new environments, the user is met within an intense and (apparently) real

experience: actively absorbed, the user co-creates the narrative and relates with the space. In Nakevska's (2015: 3) words, “Interactive storytelling is one of the more recent developments in interactive entertainment, allowing people to feel transported into a fictitious world as a story character and to influence the unfolding events of a story.”³⁶

A similar captivating technological approach that is rapidly changing how the public engages with museums is **virtual visits**³⁷. This technology offers a distance real-time connection to museum collections and professionals with active teaching approaches, interactive conversations, demonstrations, and activities (Mitchell, 2019). By connecting the visitor directly to a professional – through a live-video system on a computer or mobile device – the public can engage in similar face-to-face visits seeing and hearing the provider (Hilton et al., 2019), as observable in Figure 11.

³⁶ The *Alice: Curiouser and Curiouser* exhibition at the Victoria & Albert Museum (London, United Kingdom) delves into the evolution of the classical *Adventures of Alice in Wonderland*. The exhibition explores the story’s origins, adaptations, and reinventions evolving towards the global phenomenon of film making, performance, fashion, art, music, and photography (designboom, 2021).

³⁷ To experience virtual museum tours the user will need a phone or desktop screen, a solid internet connection and headphones. The online article *90+ Virtual Museum Tours You Can Enjoy from Your Couch*, for example, presents a list of museums that offer specialized encounters with collections, heritage, and curators (Voges, 2021).

Figure 11

Virtual tour – Nasoni: The Iconic Drinking Fountains of Rome (Italy)



Note. The image was retrieved from Heygo.com (April 2022) and represents a live virtual tour guided by Daniele Meledandri on the Heygo Platform. Virtual tourists can worldwide interact, ask questions to the tour guide, take pictures, and later access the tour by saving screenshots.

Interesting is Lopes' (2020) approach on how the conceptualization of digital dynamic and virtualization now define museums – open to experiences, interactions, and hybridizations – as spaces that do not necessarily relate in time and space even though contemplation and enjoyment occur. Nevertheless, virtual visitors can present usability complications usually due to non-comprehensible or too complicated tour techniques (Latos et al., 2018) and digital disorientation on the count of face navigation problems, loss of overview, and difficulty relocating visited information (Komianos et al., 2015).³⁸

³⁸ In addition, platforms as *Google Arts & Culture* have revolutionized the public's involvement with collections, curators, and institutions, while the COVID-19 pandemic uplifted heritage site investments making objects and information evermore available and accessible. To this, El-Said and Aziz's (2021) study, on to role that virtual tours play in tourism recovery post COVID-19, concludes that besides museums not having another way to maintain visitors' interest during travel restrictions, the intention to adopt virtual visits (Technology Acceptance Model + Protective Action Decision Model) increases a person's tendency to visit the actual site contrary to the idea that virtual visits are competitors or substitutes for actual site visits.

Cultural heritage institutions also propel audiences and share content by integrating **4D cinema**. Consistent with changes in consumer behavior, 4D Cinema's popularity can be deduced from the public's willingness to pay high ticket prices³⁹. Today, museums are referring to immersive entertainment systems that enhance the viewer's experience by including in 2D and 3D films real-time sensory effects (Pine & Gilmore II, 1998; 1999; 2011; 2013), such as physical interactions (ticklers, i.e., leg and back pulsations), shaking (seat movements), fog, water splashing, light, scent discharge (fragrances), wind and mist blasts, and other simulated effects' grounded to either a character in the scene or the camera (Lee et al., 2016; Yecies, 2016; Zhou et al., 2018). According to Yecies (2016: 23), 4D film screenings offer audiences something unique they cannot access on their smartphones or in their homes.

Although this technology in the museum context lacks written analysis that supports its indoor and outdoor better understanding (mainly due to its edge-breaking integration in the museum context) we consider that it aligns with the educational mission of such institutions: it presents and represents complex matters in ways that are both informative and entertaining⁴⁰ (Kersten et al.,

³⁹ By comparing a small sample of tourist attractions that present 4D Cinema features, we can observe that France and the USA present the highest price rates, whereas Russia and Japan have the lowest fees. Interesting, however, is the UK cost when considering their purchasing power. Moreover, this analysis is mainly explanatory, and a deeper analysis is required.

Tourist Attraction	Model	Country	Admission Fee Euros
WWII Museum	Museum	USA	25,20 €
Futuroscope	Theme Park	France	37,00 €
RAF Museum	Museum	UK	05,80 €
Moscow Planetarium	Planetarium	Russia	05,85 €
Jinsha Museum	Museum	China	09,20 €
Miraikan	Museum	Japan	07,25 €
Museum of Egyptian Civilization	Museum	Egypt	10,80 €
		M=	14,44 €

Money Exchange Date: 25.09.2021

Source: Official Websites.

⁴⁰ An interesting example is a 4D journey through the 2nd World War presented by the National WWII Museum (New Orleans, USA). *Beyond All Barriers* is a state-of-the-art,

2017) while attending to the inclusive integration of special needing audiences – 4D theaters are equipped with wheelchair accessibility, assistive listening devices, and sign language interpretation (Museum of Science, n.d.). Yet again, 4D technology demands higher complex human information-processing capacities that are impacting, to some extent, adverse effects towards product placement memorization (Terlutter et al., 2016) as so as the worsening of certain medical conditions due to loud noise, flashing lights, rapid or sudden chair movements, fog effects, and graphic images⁴¹. In any case, tensions between site authenticity and meeting the visitor's needs must be considered as some audiences may not always find it beneficial for the site: elderly populations are more resistant to newer technologies associated with interpretation⁴² (Evans & Gatehouse, 2018).

An additional means of information and communication technology are **multitouch tables** (Figure 12 and 13)⁴³, i.e., a phygital touch-sensitive interface that can read and respond to multiple and simultaneous users (Lehrhaupt, 2015). As such, this technology can consequently deliver greater openness to

digitally enabled multimedia experience that features CGI animation, multilayered environments, special effects, and first-person encounters in the trenches or the Home Front (The National WWII Museum, n.d.).

⁴¹ *4-D Film Planet Earth: Ice Worlds 4-D Experience*, at the Boston Museum of Science, explores the mysterious frozen worlds of the Arctic and Antarctic and the effects of the ice on the autochthonous animals (Museum of Science, n.d.).

⁴² *L'Extraordinaire Voyage* at the Futuroscope Park (Poitiers, France) takes place on a dynamic platform that stands vertically, placing visitors in a 90° axis with their feet in the air, facing the screen and completely immersed in the screen. The immersive journey simulates an aerial world tour inspired by Jules Verne's novel *Around the World in Eighty Days* (Futuroscope, n.d.; Futuroscope, 2020).

⁴³The *Cité du Vin* [City of Wine] is a unique new generation immersive approach to wine and vin history around the world. By offering a renewed and innovative look, the *Cité du Vin*'s mission is to make universally assessable the live heritage of wine culture (La Cité du Vin, 2017). In the same line of context, the *Museu Portugal Romano em Sicó* [Museum Roman Portugal in Sicó] wills to facilitate inclusive knowledge on the Roman cultural heritage in the Sicó territory (Município de Condeixa, 2017).

social sharing by providing several people with simultaneous access to information (Vaz et al., 2018). In addition, Economou (2008) explains that, because multitouch tables are generally not loaded with content that interferes with the exhibition, visitors can select whether or not to access information expanding their sense of free decision-making.

Figure 12

Example Scene of the Modul ‘Six Wine Families’ at the Cité du Vin (Bordeaux, France)



©Germana Torres

Note. The image was produced by the author of the dissertation (December 2019) and represents one of Bordeaux’s *Cité du Vin* fascinating multisensory experience sections that includes several touch table interactive surfaces.

Figure 13

Example Setting of an Interactive Surface at the PO.R.OS Museum (Condeixa, Portugal)



©Germana Torres

Note. The image was produced by the author of the dissertation (August 2021) and demonstrates an interactive surface that provides digital information on the Roman Empire's daily life. Tools of such sort allow visitors to deepen their knowledge visually and by text. The PO.R.OS Museum was prized with the European award *Heritage in Motion*, in 2018.

Though Ma et al., (2015) suggest that multitouch graphical user interfaces foster better user manipulation and encourage visitors with continuous engagement interaction, and Niederer et al., (2017) argue that multitouch technology, in combination with appropriate interaction design concepts, encourages true interactivity between visitors and the exhibition objects; Allen and Gutwill (2004) alert on common hidden problems that museums face when conceiving installations with high levels of interactivity or multiple interactive features⁴⁴.

⁴⁴ The authors describe the following five common pitfalls: (1) multiple interactive options with equal significance make exhibits difficult to follow, (2) features that support simultaneous user interactivity interfere do not promote better learning experiences, (3) some options designed to increase interactivity unknowingly encourage visitors to disrupt what is being displayed, (4)

Lastly, a new frontier in museum information and communication technology is the **robotic platform services**⁴⁵. Robotic applications (interaction, autonomous movement, people, and object recognition) facilitate new forms of cultural heritage innovation, such as remote research exploration, user experience improvement, and attraction accessibility expansion (Germak et al., 2015). Ceccarelli et al. (2018), add that the combination of robotics and cultural heritage (recreation, science, and education) can: ensure the preservation of historical actions (low-impact approach and technical specification); work out efficient and sustainable solutions; offer low-cost answers that increase the use range (miniature components and simplified interfaces); and develop attractive incentives for recreational use in museum contexts (recreation, science, and education). In addition, experimental projects as the Humanoid Pepper Robots can assist museums in learning more about how robotic and artificial intelligence technology, can help solve everyday problems such as attracting people to under-attended galleries, encourage deeper and more customized visitor engagement with artwork and artifacts, and give educators new tools to engage with visitors, as represented in Figure 13.

for visitors lacking prior knowledge features can be difficult to find or understand, and (5) secondary information can make primary features incomprehensible.

⁴⁵ An interesting example is the Smithsonian Museum's employee *Pepper* the humanoid robot. *Pepper* gives museum visitors information and attracts them to under visited exhibits facilitating museum space management (CNN Business, 2018).

Figure 13

Pepper robot service guide at the Smithsonian National Museum of African Art (USA)



Note. The image displays how *Pepper* interacts with visitors translating phrases in the Kiswahili (Swahili) language. ©Edward, M. (Keller, 2018).

In this setting, concurrently, robots are mainly used as guides, mobile video conference routers (telepresence), or installations (Lupetti et al., 2015). Authors as Pang et al., (2017) discuss the advantages they can deliver: mobility, big data processing, adaptability, or interactivity (Burgard et al., 1998), even though autonomous guided robots can still present constrictions such as automatic speech recognition that fails in noisy environments (Iio et al., 2019).

All in all, technology is evolving in ways that the future undoubtedly holds a continuous day-to-day coexistence with artificial means of communication. The digital revolution has crossed all areas of civilization, disrupting the way people work, learn, and socialize, with organizations, businesses, and the economy in general shifting to new forms of production, delivery, and engagement.

Against this background, museums are incorporating new information and communication technologies: if, on the one hand, they strive to attract new visitors, facilitate inclusive audiences, innovate tourist experiences, or improve space management, on the other digital features are providing (big) data

preservation and deeper research assistance while opening access to worldwide audiences.

Chapter I.2 – The Tourist Experience Enhanced by Intangible Cultural Heritage

I.2.1. The Economy Experience: Traveling in the 21st Century

In the 21st Century, Tourism & Travel participate with worldwide development-promoting features⁴⁶. As all nations draw their economies⁴⁷ into this globalized venture and competitive whirl, multiple international investments are directly and indirectly impacting structures created under the experience economy demand: to pursue authentic, meaningful, and experientially oriented encounters where commodities are not just specific products but rather the result of visitor's emotions, impressions, and experiences (Stasiak, 2013) rooted to multisensory feelings of fun and fantasy (Addis & Holbrook, 2006).

In this line of intention, Pine and Gilmore (1998) define the **experience economy** as consumer behavior that emphasizes emotional, aspirational, and participative experiences over functional and rational attributes. To this

⁴⁶ Although in 2020, the share decreased 5.5% due to ongoing restrictions to mobility, in 2019, this sector contributed 10.4% to global GDP (World Tourism & Travel Council, n.d.). International arrivals were estimated at 2.28 billion (The World Bank, n.d.a) and departures in 1.919 billion (The World Bank, n.d.b) generating a total of 1.815 trillion US\$ (The World Bank, n.d.c). Likewise, in the Portuguese panorama, the valued number of non-resident tourists reached 24.6 million, and around 5.4 million residents (53% of the resident population) made at least one trip with a corresponding overnight stay spent outside their usual environment (INE, 2020). Altogether the sector generated a tourist demand equivalent to 15.4% of the Portuguese GDP (GEE, 2019).

⁴⁷ Understanding that all economies define themselves by their predominant offering, in the past 2000 years, it has evolved from commodity, product, and service to the present economic era of experience (Pine II & Gilmore, 2013).

statement, the authors agree that because traditional marketing is inadequate, in order for businesses to be successful, they must add value to their offer by providing unforgettable and satisfying experiences. As so, they defend that affective memories, sensation, and symbolism create holistic and long-lasting personal experiences so much so that the more experiences revolve around entertainment, esthetics, education, and escapism (4 E's), the more they create solid memories and positive behaviors.

In fact, by advancing with the four realms of experience – entertainment, esthetic, education, and escapism⁴⁸ – the position of value occurs according to the customer's degree of involvement and immersion while reflecting from individual and personalized constructions of past and present engagements. To this, in the experience economy, the sense of meaning and meaningfulness will then flow with significant immersion and self-centered performance, dazzling sensations, touching the heart, and stimulating minds (Schmitt, 1999).

In agreement and knowing that the experience economy is an extensive global tendency reaching far across various industries⁴⁹, Pine and Gilmore's model has motivated rich and diverse scientific literature. Universities, businesses, governments, and others are supporting new investigation and upcoming with important advances in knowledge (Boswijk et al., 2006; Gentile et al., 2007; Lorentzen, 2009; Seo, 2013; Kaur & Kaur, 2020). Areas such as psychology, marketing, geography, sociology, or technology blend their perspectives and create innovative solutions that address users, education, culture, creative

⁴⁸ According to Ali et al. (2014), entertainment is developed based on passive absorption (e.g., watching a movie on TV); esthetics consisting of passive participation and immersion (e.g., a beautiful museum exhibition); education referring to active participation in absorption (e.g., participating in folk dance); and escapism occurring when participants perform in a real or virtual world (e.g., interactive and immersive storytelling).

⁴⁹ By 2023, the experience economy is projected to be worth \$12 billion (D'Entremont, 2020).

industries, and many others (Abey Siri & Weerawarna, 2017; Min, 2018; Chang, 2021).

To what the tourism sector comprises, new developments and practices are also being conducted in the travel industry. If, on the one hand, discussions focus on operational needs such as management, market flux, or communication, on the other, they also resort to matters of memorability, authenticity, and proximity. Understandingly, the importance of building emotional tourist products in professional manners is assuming high investment as businesses and cultural heritage institutions search for new forms to recreate spaces and develop new ways to provide original experiences and extreme emotions (Kravtsov, 2019).

As so, Ritchie and Hudson (2009) suggest that tourist companies can affect customers' buying habits by creating intense and real content and emotionally meeting customer expectations. Argenton (2015), on the other hand, adds the idea of experience consumption relying on feelings of arousal and sensory stimulation that meet with the visitor's anticipation of experience. In addition, Paulauskaite et al., (2016) denote the importance of authenticity, while Schlesingera et al. (2020) refer to tourists' assessment of destination attributes and how they perceive loyalty and quality of service experience.

Nevertheless, destination management must consider using empirical measurement scales to provide efficient analyses that validate the practical application and theoretical advancement (Oh et al., 2007). On the other hand, by examining how negative tourism experiences result in undesirable future behaviors (such as unethical business practice, unreasonable pricing, poor service quality, overfull capacity level, and absence of culture value), destination managers can understand what influences negative experiences

(Kim et al., 2020) and how these subtract to the overall assessment of “push and pull factors” (Kassean & Gassita, 2013).

In this line of ideas, destination marketers and planners are also trying to understand the tourism process and how people are engaging with travel (Ketter, 2018). To grasp why people travel, what they expect, and how destinations deliver memorable tourism experiences are top management decision-making guidelines. In accordance with this, understanding that cultural background, social influence, perception, personality, economic situation, and education are (amongst) the most impacting behavioral factors (Gnanapala & Athula, 2012) also generates a sense of uniqueness that opens travel and tourism to infinite and vibrant possibilities.

In a broader range, people travel to attend to either professional needs or satisfy personal desires. Extensive scientific literature has endeavored to understand what influences travel consumption. Authors as Prentice (2004) explain the influences as destination-specific tourism motivators (lifestyle formation paradigm), dividing the purpose of tourism consumption into *romantic tourism* (pre-mass tourism form of consumption with motivations to consume the extraordinary as a means to self-education and spirituality) and *mass tourism* (escape from the everyday tedium of work into an inauthentic, standardized, and commodified dream world).

On the other hand, Camilleri (2018) states that tourism products extend (among others) from urban, educational, and cultural tourism to wine, gastronomy (Santos, 2017), and ecotourism, or health, medical, and religious tourism. All in all, they possess tangible characteristics and are composed of physical attributes (such as attractions, amenities, buildings, and landscapes) that generate into tourists’ intangible perceptions: if tourists’ experiences

remain positive, promotional bodies (formal and informal) will support advertising and reference.

In fact, the understanding of what motivates individuals to travel is widely discussed in the scientific literature (Crompton, 1979; Uysa & Jurowski, 1994; Snepenger et al., 2006; Simková & Jindrich, 2014; Albayraka & Caber, 2018; Zhang et al., 2021). If authors as Li et al. (2013) or Simkova and Holzner (2014) reason the relationship between individuals' traveling patterns and physiological patterns (motivation theory), Yousaf et al. (2018) defend that by understanding people's desires, morals, benefits, and outlooks tourist structures can promote positive (pre and post) travel behavior.

Moreover, and consistent with the above, physiological patterns (Li et al., 2013; Simkova & Holzner, 2014) such as psychosomatic exhaustion, the need to replenish and recharge, or novelty-seeking influence tourists' motivation to travel. In addition, features such as personal factors (personality, self-image, attitudes, motivations, perceptions, lifestyle, age, profession), social factors (culture, family, social class, reference groups), situational factors (time, physical ambiance, social ambiance, state of mind) or the sense of identity (self-actualization), nostalgia, and romance equally contribute to a deeper understanding of travel behavior (Fratu, 2011).

Nevertheless, as technology revolutionizes society, discussions on the quality of life (Morgan et al., 2015; Pyke et al., 2016), life satisfaction (Kroesen & Handy, 2014), personal growth (Camilleri, 2018; Vintean, 2019), inner transformation (Sheldon, 2020), love (Filep & Matteucci, 2020) and fulfillment undertake a more recent assessment.

In this line of reasoning, Chavez et al. (2020) highlight the importance of social media engagement and the impact of learning/discovering travel motivation

stating that both can be reinforced by the consumer's anticipation of travel-related experiences. In addition, Leal et al. (2018) argue that sharing and participating in tourist social platforms (namely crowdsourcing platforms) has impacted tourist behavior even though content overload, application accuracy, privacy, trust, and reputation can be the main weaknesses.

It is interesting to consider how recent literature focusses on the study of technology and how its heavy use while traveling can potentiate negative impacts on the overall tourist experience. To this, Egger et al. (2020) discuss the main factors that motivate digital-free tourism – i.e., escape, personal growth, health & well-being, and relationships – and how their better understanding can help tourism suppliers design products embedded with technology components (e.g., virtual reality; holographic displays; and smart tourism initiatives). Nevertheless, Dean and Webb (2011) have already advanced with some considering solutions to information overload and attention fragmentation. In addition, Tourism is also replying to market demands with offers focusing on slower, sustainable, personalized, and intangible experiences. Altogether economic structures are shifting towards a new economic era of attention economy (Crawford, 2015).

In this plan of action, Jordan (2021) states that traveling trends impact the search for eco and immersive natural experiences, sustainable solutions, and authentic and safeguarded heritage encounters that make a positive impact. In addition, Godfrey (2021) underlines the on growing popularity of staycations – vacations that one can take at home rather than traveling to another place (Gonçalves, 2020); multigenerational trips that reconnect family and friends (choosing to travel with close acquaintances or extended family); rejuvenation (holidays that bring a sense of calm and renewal to the soul); nostalgic settings

(the return to places of past enjoyment and old favorite destinations); and beaten track locations (the inquisitiveness of exploring what is local).

Similarly, Im (2021) emphasizes the upward importance of eco-travel demand, transformational travel (going on a trip to learn, expand minds, have a moment of clarity, or grow from the experience), and tech-centric travel (technology as an integral part of travel - booking flights on your phone, social media, advanced tech in hotel rooms among others) to which Fletcher (2020) underlines the importance of travelers requests for virtual experiences that appeal to convenience (the need to have the same level of convenience at an event as they would at home or at work), self-improvement (spiritual, physical, intellectual, or emotional), status, and delight (be it through education, information, or entertainment).

Interesting as well is the recent research approaches on designing tourism experiences that balance between (in all or part) space and time (Vergopoulos, 2016), as well as tourist sociability and traveler/host interests (Reisinger, 2013; Ashworth, 2015; Singh, 2015). To the same line of progress, investigation on community development (Soulard et al., 2019), environmental sustainability (Dolnicar, 2020; Li et al. 2021), and transformation through consumption (Boswijk et al., 2013) are assuming particular emphasis. Nevertheless, it is important to underline that not all types of tourism and travel (mass and business tourism) can offer travelers transformational experiences (Reisinger, 2013).

All in all, if on the one hand, the sector is shifting to approaches such as slow tourism (Tomić et al. 2018; Zielińska-Szczepkowska, 2020; Hallem et al., 2020), mindfulness (Farkic et al., 2021; Jirojkul et al., 2021), and meaningful consumption (Gruen, 2017; Li et al., 2019) on the other hand technology is also impacting on how and what motivates travel as so as the way tourists,

attractions, and businesses deliver value and create engaging encounters. Keeping this in mind, one can quickly assess that if modern capitalism and postmodern consumption challenge innovative processes and responses to demanding trends, society is also willing to aggregate structures that safeguard, share, and partake communal identity, traditions, and memories.

I.2.2. (Memorable) Tourism Experience: immersion in consumer experience

While it is widely known that Tourism, in the long run, is about converging production into creating and selling experiences, it is also accepted that today's travelers wish to connect to experiences on an emotional, fun, and memorable level. In this line of ideas, marketers, destination managers, cultural institutions, businesses, and many others are increasing investments to not only better understand what people want, but above all, create original and innovative ways that provide enjoyable, experiential, and engaging interactions (Kotler et al., 2017a).⁵⁰

According to Bradley (2014), the concept of **experience** can be distinguished between two primary meanings: the *formative* or *diachronic* sense of experience and the ongoing process of *experiencing* what is happening in the here and the now. Fox (2008), on the other hand, argues that because experiences result from complex interactions (body, sensory input, neurological processing, relationship with the world, and others), they are a phenomenon that individuals make sense of by combining cultural, cognitive, subconscious, and personal interpretations. To this, Hohr (2012) adds the understanding of experiences in terms of feeling (the primary mode of experience where action, emotion, cognition, and communication constitute an original form), “enlivening” (a holistic and relational approach where the aesthetic experience is the lifeworld of a person-in-world experience), and conceiving (the isolation

⁵⁰ Philip Kotler, Herman Kartajaya, and Iwan Setiawan (2017b) define Marketing 4.0 as a marketing approach that combines online and offline interactions (between companies and costumers) with the leverage of machine-to-machine connectivity and artificial intelligence. In addition, the authors also consider the perspectives of horizontality, inclusiveness, connectivity, high-touch interconnection, and loyalty (word of mouth) as fundamental aspects that improve marketing productivity, human-to-human connectivity, and customer engagement.

and abstraction of understanding the world with a greater distance between action, emotion, and cognition) in contrast with Erlich’s (2003) approach to experience as a transformational process where the raw sense of data assumes a psychological meaning of experiential content.

Given the above, experiences are in the overall subjective, intangible, continuous, and highly personal encounters (O’Dell, 2007) that can either refer to moments of lived experience (*erlebnīs*) or moments of evaluated experience (*erfahrung*) (Highmore, 2002). In fact, both of these approaches are central to many tourism experience studies (Boorstin, 1964; MacCannell, 1973; Cohen, 1979; Quan & Wang; 2004; Larsen, 2007; Ryan, 2010; Urry & Larsen, 2011; Perce & Parker, 2013; Neuhofer et al., 2014; Vespestad et al. 2019, and many others) that in the past 60 years have developed into a transversal framework (Table 1) of social scientific methods (anthropology, geography, psychology, and sociology) and economy science understandings (marketing and management).

Table 1
Tourism Experience: literature overview according to the scientific approach

Approach	Study
Anthropology	Graburn (1983); Crick (1995); Selstad (2007); O’Dell (2007)
Geography	Li (2000); Crouch (2005); Ryan (2010)
Marketing & Management	Pine II & Gilmore (1999; 2011); Moutinho (2000); Connell & Meyer (2004); Boswijk et al. (2006); Anderson (2007); Mossberg (2007); Frochot & Batat (2013); Lut & Lazoc (2013); Chandralal & Valenzuela (2013)
Psychology	Larsen (2007); Tung & Ritchie (2011); Pearce & Packer (2013); Filep & Pearce (2013); Čomić & Kalmić (2015)
Sociology	Cohen (1979); Crompton (1979); MacCannell (1999); Wang (1999); Urry (2000); Marujo (2016)

Note. The figure was produced by the author of the dissertation and synthesizes undergone studies attempting to define tourism experience.

In truth, the plurality of scientific approaches confirms its subject's importance and demonstrates its matter's complexity so much so that this multiplicity aligns with the idea of specificity and subjectivity (Jenning, 2006) in addition to the reasoning of multifaceted reality (Selstad, 2007). On the other hand, it also enhances the need to understand how tourism experiences connect with what tourists seek, how destinations offer experiences, and how markets and marketing (can) best engage with current demands. Nevertheless, one must consider that for an experience to be touristic; it is required to link the individual with the world (space and time) in the desire to interact within the framework of a tourist relation (internal and externalization) (Vergopoulos, 2016).

Late approaches to **tourism experience** define it as a multifunctional leisure activity that involves either entertainment or learning (or both) (Ryan, 1997) and as an event where individuals engage on an emotional, physical, spiritual, or intellectual level (Pine II & Gilmore, 1999) while visiting a destination away from their home and learning about its attributes or enjoying its activities (Stamboulis & Skayannis, 2003). In this line of reasoning, tourism experience can be understood on the one hand as a processual subjective evaluation (Tung & Ritchie, 2011) and on the other as an interaction between the actors of experience (tourists) and the site of the experience (destination) (Stamboulis & Skayannis, 2003). In addition, it can also be considered as the overlapping of tourist and destination itself – tourism industries that generate, stage, and consume experiences through the manipulation of place and presentation are also involved (O'Dell, 2007) – in the process of the individual's pursuit of identity and self-realization (Selstad, 2007).

Nevertheless, recent studies evaluate the tourism experience as a multidimensional and holistic phenomenon going beyond the simple contact

with cultures, people, places, or landscapes (Rocha et al., 2016). In fact, tourism experience is now also understood as encounters that promote identity building (Jaurand, 2015), self-transformation (Saunders et al., 2013), happiness (Panchal, 2013), and uniqueness (Rocha et al., 2016). On the other hand, participation in innovative experiences also promotes co-creation with sustainable methodological practices modifying the complete nature (Golja & Paulišić, 2021) of how, when, where, and what the tourism experience is about.

According to this, it is essential to stress the role of information and communication technologies in the construction of the tourism experience understanding. In truth, technology, the Internet, and social media have not only revolutionized how tourists engage with the tourism experiences, but have also changed how researchers understand the phenomenon and how businesses develop tourism products, improve tourism services, and generate tourism marketing (Lan et al., 2021). In this context, the information that tourists produce plays a crucial role in the tourism industry as it influences tourists' behavior in the decision-making process and in the identifying new trends (Leal et al., 2018).

Moreover, technological innovations are also shifting towards an ever more interconnected and phygital tourism industry with high potential to evaluate tourist experiences along the customer journey – pre/during/post-travel (Neuhofer, 2014; Neuhofer & Buhalis, 2014). In fact, **smart tourism**, i.e., the combination of tourism infrastructures with information and communication technology tools to increase destination and business efficiency and tourists' experiences (Gretzel et al., 2016; Femenia-Serra & Neuhofer, 2018), is assessing the tourism experience in ways that: enhance the experience and become more attractive; improve management operations and performance and

attain competitive advantage with a focus on sustainability (Santos, 2015; Shen et al., 2020).

To reach this stage, smart tourism heritage attractions are exploring how technology can rejuvenate tourists' interest in ways that guarantee interactive and cultural experiences (Alletto et al., 2015). In fact, by implementing mobile multimedia guiding applications that engage with tourists in a more interactive and immersive approach (Ceipidor et al., 2013) or by exploiting the Internet of Things technology in ways that make museum objects capable of telling their story (Amato et al., 2013) cultural heritage institutions are working to meet with visitors' requirements making their visiting experience a more attractive, interesting, and memorable encounter (Shen et al., 2020).

In this line of context, by using smart technologies (Internet of Things, cloud computing technology, artificial intelligence, ubiquitous connection, virtual and augmented reality, intelligent robot chat, wearable devices, and others), smart tourists are dynamically co-creating tourism experiences. In truth, they are heavily participating in the experienced reality as they interact with stakeholders and destinations; generate and share information that influences other consumers, and create their own experiences (Neuhofer et al., 2014). In the past three decades, not only have tourists become more independent and skilled, but technology itself has also enhanced the overall tourist experience (Xiang et al., 2015), now aligned with extraordinary (Ritchie & Hudson, 2009) and memorable tourism experience understandings.

Like so, and independent of what comprises travel expenditure and tourism investment, **memorable tourism experiences** are the ultimate experience consumers wish to obtain, and companies/institutions wish to deliver (Tung & Ritchie, 2011). Kim (2010) defines memorable tourism experiences as positively remembered, and recalled encounters travelers refer to after the event

has occurred. In addition, Kim et al. (2012) state that selective construction and individual assessment are equally defining characteristics, while Chandralal and Valenzuela (2013) understand it as a valuable source of (personal) information – originated from the influence of past memory – that is “highly self-centered (...) and stored in long-term memory [and, as so, is] part of autobiographical [existence]” (Kim & Chen, 2019: 639).

Under this framework, recent literature is shifting tourist satisfaction studies to more profound investigation analysis that explains how memory and experience are linked. After Kim et al. (2012) developed a measurement scale – hedonism, refreshment, local culture, meaningfulness, knowledge, involvement, and novelty – that analyses how to assist memorable tourism experience understanding and to effectively improve memorable experience management, other studies have focused on tourist behavior antecedents and outcomes. Coudounaris and Sthapit (2017) examined how antecedent factors can relate to visitors’ behavioral intentions, while Chen et al. (2014) accessed how memorable tourism experiences partake in personal development. In addition, Coelho et al. (2015) address the components of experience and their result in more enriching approaches, rather than considering what makes a particular experience more memorable than another.

Equally interesting is to consider how psychological factors (novelty, dream, emotions, refreshment, and meaningfulness), cultural and environmental factors (local culture, attractions), as well as inter-relational factors (tourist–local agents, tourist–tourist, and tourist–travel companions), determine the memorability of the tourism experience (Coelho & Gosling, 2018). To this, perceptions on local hospitality, value, and on-site activities (Mahdzar et al., 2015) or refreshment, local culture, and involvement (Yu et al., 2019) positively influence visitors’ memory and word-of-mouth intentions.

On the other hand, research on the understanding of the relationships between memorable tourism experience and subjective well-being conclude that destinations offering enjoyment and meaningfulness may add to tourist memorability and satisfaction (Sthapit & Coudounaris, 2018), even though the effect of subjective well-being in individuals who search for meaning and identity does not derive directly from memorable tourism experience (Ayin & Omuris, 2020). As so, and despite emotions of serendipity and meaningfulness not influencing recollection, feelings of involvement, novelty, and social interaction will positively impact the overall memorable tourism experience (Wei et al., 2019).

Present research approaches have also investigated the relationship of visitor engagement, authenticity, and destination image in revisitation and electronic word-of-mouth intention (Rasoolimanesh et al., 2021), emphasizing the importance of memorable experiences. In addition, Lee et al. (2018) state that smart tourism technology generates memorable tourism experiences and tourist happiness even though destinations and individuals' inherent singularities can affect how technology is perceived and used. Nevertheless, Joeng and Shin (2019) encourage the reach of better understanding on how smart tourism technology can improve memorable tourism experience by stating that interactions with the experience will increase the degree of immersion, engagement, and memorability, while Azis et al. (2020) argue that high levels of smart tourism technology infrastructures significantly affect the experience and generate high revisit rate or recommendation intentions.

In this line of reasoning, we can easily understand that the recollection of positive memories performs a competitive advantage in the contemporary tourism market placement (Zhang et al., 2018), so much so that destination managers strive to identify, facilitate, and maintain memorable tourism

experiences (Yu et al., 2019). To this, by accepting that “what remains as memorable impressions come from cognitive perception and emotional response across self, place, other, and time” (Kim & Chen, 2019: 639), memorability will then act as the most appropriated predictor of future behavioral intentions (Hung et al., 2016) with memory participating as the most important source that influences revisitation and recommendation (Sthapit & Coudounaris, 2018; Chen & Rahman, 2018).

Nevertheless, and even though destination image and memorability are proven to be important factors that affect the shaping of memorable tourism experience (Zhang et al., 2018), one must always consider that external information sources can distort how tourists remember their past (Braun-LaTour et al., 2006) or how they perceive their experience. In truth, critical and up-close examination must be carefully applied to access correct knowledge, create effective strategies, and co-create demanded products and services.

I.2.3. Intangible Cultural Heritage: generating tourism experiences

According to the World Tourism Organization, cultural tourism is considered one of the most important and diverse phenomena of modern-age tourism. Alone it accounts for a substantial share of tourism employment by generating 40% of world tourism revenue (UNESCO, 2021) with an estimated growth rate of 4% per annum (World Tourism Organization, 2018: 22). In this line of reasoning, it undoubtedly represents a valuable sub-sector of worldwide investment that supports economic expansion and promotes stakeholder collaboration for sustainable development, heritage safeguarding, and social education and understanding.

To this end, countries all over the world are focusing on the combination of their unique tangible and intangible heritage to create **cultural tourism**, i.e., “a traveling [mode] outside the usual environment for the supply of culture or cultural life, in order to visit or participate in cultural activities” (World Tourism Organization, 2018: 16) that offer tangible and intangible cultural attractions/products in the form of learning, discovering, experiencing, and consumption.

As so, intangible cultural heritage tourism also arises as an enriching feature (Zhang et al., 2018) that promotes the holistic understanding of a (World Heritage) destination’s history, community, and traditions. In fact, in Lixinski’s (2013) reasoning, what stands out in intangible cultural heritage⁵¹ is

⁵¹ By intangible cultural heritage, we understand the practices, expressions, knowledge, and skills that communities, groups, and sometimes individuals recognize as part of their cultural heritage. Intangible cultural heritage is also called living cultural heritage as it is usually expressed in one of the following forms: oral traditions; performing arts; social practices, rituals, and festive events; knowledge and practices concerning nature and the universe; and traditional craftsmanship (UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage, 2003).

not the product itself, but rather the constant and creative engagement with the past (Intangible Cultural Heritage UNESCO, n.d.) and the influence (symbols, meaning, and images) it can withhold in contemporary identities (Alivizatou, 2012).

Understandingly, if tourists' interest in different cultures, performing arts, crafts, rituals, gastronomy, and interpretations grows, then promoting intangible cultural heritage features expands as a fundamental and dynamic tourist motivator (Filipović, 2018). In a likewise manner, as the attention towards intangible cultural heritage increases, so does its position in sustainable economic growth and its importance in the preservation for future generational transmission (Krasojević & Djordjević, 2017).

As so, discussions on the role of **intangible cultural heritage tourism** have promoted interesting understanding regarding sustainable social and economic development (Lenzerini, 2011; Rodzi et al., 2013; Lovrentjev, 2015; Buckley & Graves, 2016; Petronela, 2016; Mendonça & Lopes, 2017), tourism competitiveness, digital practices (Zhang et al., 2018; Giovannini et al., 2021; Xie, 2021), conservation and safeguarding (Esfehani & Albrecht, 2018; Xiaoxing, 2021), authenticity (García-Almeida, 2019; Hu et al., 2019), and many others, favoring its active participation in the building of a better future for tourists and non-tourists alike.

Nevertheless, both positive and negative effects must be considered. Although intangible cultural heritage investments have brought social-economic benefits, George (2010) stresses the importance of copyrights and protection against cultural appropriation (Silverman, 2015). On the other hand, intangible cultural heritage properties must also consider the impact of staged experience (MacCannell, 1989; Pine II & Gilmore, 1998; Chhabra et al., 2003) and commodification (Katelieva, et al., 2020) in the visitors' overall quest for

authentic encounters (Cohen, 2015; Hu et al., 2015; Li et al., 2016; Yan & Chiou, 2021).

In this line of reasoning, late research approaches to **authenticity** define it as products, works of art, cuisine, language, festivals, rituals, architecture, and others made or enacted by local people according to custom or tradition (MacCannell, 1989). Additionally, Sharpley (1999: 189) states that authenticity is “a tangible quality (...) associated with production methods or cultural foundations (...) and a socially constructed, intangible perception (...) form of travel or of overall tourism experience that appears to be pre-modern or traditional”. In comparison, Van Leeuwen (2001) underlines the ideas of “authorship”, “originality”, and “true to essence” as indicators of authentic value.

Furthermore, Wang’s (1999) equation of **authentic experiences** as cognitive encounters assumes contextualized interest. The author redefines the relationship between the subject and the object, referring to travelers’ observation as an active perception of authenticity (objective, constructive, and existential), i.e., epistemological knowledge verifies if what is under consumption is real or genuine. While Ferrelly et al. (2016) find that authentic experiences include physical forms linked to significant and vital cultural and historical aspects that are actively transmitted.

Regardless of the approach to authenticity, the pursuit for authentic experiences is an influential tourist participation motivator (Kolar & Zabkar, 2010; Paulauskaite et al., 2017) that as a result encourages sustainable destination tourism development (Lee et al., 2020). On the other hand, as authenticity acts as an important criterion in the evaluation of business products and services (Gilmore & Pine, 2007) it can also generate place attachment (Ram et al., 2016) and identity that will not only increase the

attractiveness and quality of a destination (Su et al., 2020) but will also highlight its competitive position in the tourism market (Getz & Page, 2016).

In this line of idea, **intangible cultural heritage experiences** allow visitors to embed with the destination's people and lifestyles (Rusalić, 2009; Alahakoon, 2021) through immersive and interactive participation. In fact, by delivering co-creative encounters, intangible cultural heritage properties also encourage understanding, tolerance, and peace (Pietrobruno, 2009; Lenzerini, 2011; Petronela, 2015), even though research suggests that tourists create their meaning of the travel experiences (Alahakoon, 2021).

In the Portuguese context, Mendonça and Lopes' (2017) study provide a significant understanding of the role of intangible cultural heritage experiences (the Cante Alentejano) as authentic and unique cultural exchanges (between visitors and communities) that promote economic development. While Costa & Nossa (2017) address the Fado of Coimbra's cultural value and its relationship with the city's heritage as a sustainable promotor for economic growth in the global tourism market. In a different approach, Pina & Queiroz (2017) assess how the Douro Demarcated Region's intangible cultural heritage can provide sustainable development, the preservation of customs and mores, demographic vitality, and intergenerational exchange. Whereas Nisi et al. (2021) investigates how digital storytelling can explore and enable discussions on intangible cultural heritage interpretations, particularly regarding migrating communities at risk of social exclusion.

From an international perspective, Qiu et al.'s (2019) study support product development, marketing, and post-development evaluations of intangible cultural heritage tourism by analyzing how the relationships between residents' value cognition and emotional attitude can predict the intention of visit and visiting behavior (residents and non-residents). On the other hand, Tahseen &

Aljumaily (2020) stress the significant role open museums play in intangible cultural heritage revival and increasing awareness and interest in non-material values. Additionally, the authors emphasize the museum's contribution to the rise of social and cultural interaction, the development of economic and civilizational progress, and the provision of job opportunities for local communities. While Ferrer-Yulfo (2020) offers a cross-broader understanding of the safeguarding, promotion, and preservation of intangible cultural heritage performing arts in a museum context: Flamenco Dance Museum⁵² in Seville, Spain, and the Fado Museum⁵³ in Lisbon, Portugal. The author defends that both museums have encouraged the safeguarding of intangible cultural heritage (both the inside and the outside of the museum have encouraged a museographic formula that preserves and transmits its unique heritage) and have made significant contributions to the economic sustainability of its intangible cultural heritage community.

Nevertheless – and although intangible cultural heritage tourism experiences assume undoubtable importance in the maintenance of cultural authenticity, integrity, and diversity in a globalized world – the recent literature review has recognized the lack of investigation in what regards the sense of “awe” – the emotional reaction of the individual’s sensory system after being stimulated and challenged by the outside world (Su et al., 2020) and the non-tourist perspective to intangible cultural heritage as a tourism resource (Su et al. 2020).

In this regard, we propose that future research on phygital affordance, co-creative intangible cultural heritage museographic understandings, community involvement, and young generational valuation be seen as vital research fields

⁵² *Museo del Baile Flamenco*. Free translation by the author.

⁵³ *Museu do Fado*. Free translation by the author.

to better assess how authentic and innovative encounters can generate and enhance tourists (and non-tourists) overall visiting experience.

PART II
CASE STUDY
WORLD HERITAGE AND
UNIVERSITY



In Chapter II.1, by dividing political treaty examination into three diplomatic groups – International (UNESCO), European (Council of Europe) and Nacional (Portugal) – the case study starts by acknowledging the conceptualization of heritage and its evolution. Furthermore, by linking the same three diplomatic contexts we conducted a comparative analysis introducing a triangle relation of cultural heritage, tangible cultural heritage, and intangible cultural heritage. In addition, graphical representation of tangible and intangible cultural heritage enlistment allows the reader to comprehend the international and Portuguese asset enrollment over the last four decades.

In Chapter II.2, the research narrows its attention towards World Heritage University properties, by first focusing on the conceptualization of scientific and technologic heritage as so as university heritage, and secondly by analyzing the evolution of academic heritage and universities promotion, namely the European University Heritage Network, the International Council of Museums Committee of University Museums and Collections, the Alcalá Declaration on the Protection, Preservation, and Dissemination of UNESCO World University Heritage, and the Mexico Declaration. In this line of context, we next assert on (university) World Heritage properties according to cluster association, and in last depict a brief World Heritage University case description of the initial four enlisted properties: Monticello and University of Virginia in Charlottesville, University and Historic Precinct of Alcalá de Henares, City University of Caracas, and Campus Central de la Ciudad Universitaria de la UNAM.

In Chapter II.3, we concentrate on the main subject of the study: the fifth and last World Heritage University – the *University of Coimbra – Alta and Sofia*. As so, the understanding of the Coimbra World Heritage property enlistment process (1981 – 2019) assumes a crucial starting point of analysis. After, we conduct remarks on criteria, authenticity, integrity, and overall outstanding universal value, while lastly, the property description – tangible and intangible cultural heritage – leads the reader to a better understanding on the *University of Coimbra – Alta and Sofia*, not only as World Heritage per se, but also as the main UNESCO tourist attraction in the Central Region of Portugal.

In Chapter II. 4, we start by directing the analytical study by addressing the period of the Academic Museum's "pre-historical" existence. Historical documents such as academic, local, and national press, kept at the Academic Museum of the University of Coimbra's Historical Archive, prove the longing that UC Students had to create an Academic Museum. Subsequently, we examine the Academic Museum of the University of Coimbra's evolution by dividing it into four phases of existence and localization.

Chapter II.1. Cultural Heritage: Policy Making

II.1.1. The International Context and UNESCO

Discussions on (world) **Heritage** have been on the international cultural and political agenda since the second half of the 20th century (Jokilehto, 2011; Albert & Ringbeck, 2015; Selicato, 2016). Primarily linked with preservation and conservational concerns, its conceptualization has undergone a significant theoretical legislative evolution in the United Nations Educational, Scientific, and Cultural Organization (UNESCO) conventions. Many studies have approached diverse perspectives of Heritage – from management (Aplin, 2002; Leask & Fyall, 2006), sociology and anthropology (Low, 2002; Papazoglou, 2019), to law or international relations (Ryniejska, 2009; Schreiber, 2017) – all underlining the complexity of its definition (Fortuna, 2012) and the importance of its preservation.

Most recently, Josefsson and Aronsson (2016: 2091) argue that the "present heritage concept would benefit from introducing the concept of life-values (...) to enrich and take heritage into the 21st century." As so, today, the *pater* (father) and *munus* (duty) discussions result as a remedy for the cultural homogenization produced by globalization (Kirshenblatt-Gimblett, 2006). In addition, the tourism industry's threats may also induce apprehension to contemporary society (development of tourism-related facilities, physical and environmental effects, social impacts as exploitation of local populations, tourism mass consumption, and inappropriate presentation of related works). Nevertheless, according to Marmoin (2012), non-expert views of Heritage and

its multiple meanings must be considered to better comprehend its conceptualization.

Although shifting its central target, the focus always lies on the importance of identity building for the future in a changed (Borowiecki et al., 2016) and globalized world as conferred by Comer et al. (2015). To this, Harisson (2013, p. 4-5) shows concern with the “various ways in which humans and non-humans are linked (...) and work together to keep the past alive in the present for the future”. Nevertheless, and although Heritage is a very political subject (Aplin, 2002) – representing the connection of groups or nations to the past – it reproduces and affirms history (Smith 2006; Harvey 2008; Harrison 2013) through legacy passed down in time.

In this line of reasoning, the 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage resulted as a fundamental document that approached basilar definitions to heritage. In fact, not only did it address the understanding of **safeguarding** as “measures aimed at ensuring the viability (...) as well as the revitalization of the various aspects of heritage” (Article 2), but it would also focus on defining one of the humanities main political and historical concerns regarding heritage for future generations: to identify what is Natural Heritage and Cultural Heritage.

To this, **Natural Heritage** understands natural sites, geological, and physiographical formations as so as natural features of outstanding universal value from the aesthetic, scientific, or conversational point of view (Article 2); and **Cultural Heritage** concerns monuments, groups of buildings, and sites (defined as “works of man or the combined works of nature and man”) of outstanding universal value from the historical, aesthetic, artistic, scientific, ethnological, or anthropological perspective (Article 1). Under this umbrella,

tangible (movable, immovable, and underwater) and intangible heritage were also distinguished.

While **Tangible Cultural Heritage**, defined in the World Heritage Convention (1972), refers to physical artifacts produced, maintained, and transmitted intergenerationally – artistic creations, built heritage (buildings and monuments), and other physical products of human creativity invested with cultural significance in a society – **Intangible Cultural Heritage** would only be addressed, in 2003, during the Convention for the Safeguarding of the Intangible Cultural Heritage (Alivizatou, 2012; Salvatore & Lizama, 2018). In this convention, intangible cultural heritage would be designated as practices, representations, expressions, knowledge, and skills that communities, groups, and individuals identify as part of their cultural heritage.

In 1972, during the International Convention for the Protection of the World's Cultural and Natural Heritage, **cultural landscape** was also defined. The convention presented it as the “combined works of nature and humankind, that express a long and intimate relationship between people and the natural environment.” These settings illustrate the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and successive social, economic, and cultural forces, both external and internal.

In this line of reasoning, we must also address the concept of **outstanding universal value**. Thought-provoking is to consider that even if it is only part of the proposal for inscription forms since 2005, the justification of every nomination has been based upon this criterion since the beginning (Labadi, 2013). In truth, all conventions have sustained that there are heritages worldly recognized of exceptional value, and because of this, they must be protected by humankind in general (Ugarte, 2012). To this extent, all world heritage will

reflect the criteria(on) that justify(ies) the inscription of a site (Jokilehto, 2006; 2008) for its value tied to authenticity and integrity, as stipulated in 1972.

Nevertheless, and as the “world heritage list contributes to promoting the diversity of cultures on the planet, and by extension [the] strengthening [of] social cohesion” (Labadi, 2013: 150), it is essential to underline the influence that the Universal Declaration on Cultural Diversity (2001) and the Convention on the Protection and Promotion of the Diversity of Cultural Expressions (2005) have on the recognition of cultural multiplicity as a common heritage of humanity and a fundamental aspect of its heritage (Article 1).

Additionally, the Valletta Principles for the Safeguarding and Management of Historic Cities, Towns, and Urban Areas (2011) demonstrates an increasing awareness of heritage as an essential resource part of the urban ecosystem. In fact, the document's primary purpose is to suggest rules and strategies suitable to all interventions in historical urban areas. In this line of reasoning, the principles are intended to safeguard the tangible and intangible values of historic towns and their settings, sustaining their inclusion into the social, cultural, and economic life of the present times.

Furthermore, and recently, **museums** have intensified the debate regarding the adequacy of the existing legal instruments to protect and promote museums and collections. This has led to the extension of standards and principles to museums' places and their related roles and responsibilities with the Recommendation concerning the Protection and Promotion of Museums and Collections (2015). As so, the document establishes as its first principle that museological institutions share several missions, namely the dissemination of culture and education, the involvement of working towards justice, freedom, and peace, and the edification of moral and intellectual solidarity among

people, ensuring equal access to education for all. Moreover, the Recommendation defines the term *collection* as “an assemblage of natural and cultural properties, tangible and intangible, past and present”, whereas *heritage* is understood as a “set of tangible and intangible values, and expressions that people select and identify (...) as a reflection and expression of their identities, beliefs, knowledge, traditions, and living environments deserving protection (...) by contemporary generations and transmission to future generations”.

II.1.2. The European Context and the Council of Europe

To this degree, the European Union and the Council of Europe have closely connected cultural heritage promoting European identity and values (Calligaro, 2014). From the 1960s into the 21st century, these agents have debated a meaningful field of reference on the conceptualization of cultural heritage and the development of transnational conservation standards (Soldano et al., 2017).

Following the post-Second World War, the Council of Europe is the first international organization to use the term “cultural heritage” in an official document (European Cultural Convention, 1954), introducing three main structural domains: material, intangible, and political (Calligaro, 2014). In the subsequent years, various Council of Europe charters, conventions, and recommendations were presented, strengthening the protection of cultural and natural heritage (at a national level).

The Convention for the Protection of the Architectural Heritage of Europe, in 1985 (Granada Convention), established the principles of “European coordination of conservation policies” (Articles 19-21) that would not only reinforce the preservation of Europe's heritage (Articles 10-13) but would also promote it. According to this Convention, the concept of **Architectural Heritage** would comprise monuments, groups of buildings, and sites with conspicuous historical, archaeological, artistic, scientific, social, or technical interest (Article 1).

In 1992, the European Convention on the Protection of the Archaeological Heritage (Valletta Convention) – revising a previous Convention signed in 1969 – underlined the conservation and enhancement of archaeological heritage on a regional level, stressing the importance of cooperation (Article 2-

4) and systematic exchange of experience and experts among States (Article 12). For so, it would set the guidelines for excavation (Article 6), research work, and publishing (Article 3, 7, and 8) as so as monitorization while dealing with public access, public awareness, and educational actions (Article 9).

In this Convention, **Archaeological Heritage** was conceptualized as all remains and objects and any other traces of humankind from past epochs, which include structures, constructions, groups of buildings, developed sites, moveable objects, monuments of other kinds as well as their context, whether situated on land or underwater (Article 1).

Several years later, the European Convention for the Protection of the Audiovisual Heritage was signed (2001). This Convention introduced systematic storage of audiovisual works in film archives (Articles 6 and 9) with the latest conservation and restoration technology. As **Audiovisual Heritage** was understood as television productions, depository body, and broadcaster (Article 1), the convention would also center around the principles of legal depository (Article 5 and 6) and public availability (Article 12) of all moving-image material produced or coproduced by each signatory State.

Equally important is to refer to the Recommendation on Crafts and Cultural Heritage Conservation Skills (2008) and how the document underlined the importance of conservation projects for the local and regional crafts industry and economy. In addition, the 2011 Council of Europe Framework Convention on the Value of Cultural Heritage for Society⁵⁴ (Faro Convention) reinforced citizen's right to participate in cultural life (Article 4).

⁵⁴ The document signed by the European Union and non-member States ratifies the convention agreed in 2005.

In this line of evolution, heritage is now presented as a resource for human and economic development (Article 8-13), cultural diversity, and a means for intercultural dialogue (Article 7). This last Convention defined **Cultural Heritage** as resources inherited from the past, which people identify as the reflection and expression of their values, beliefs, knowledge, and traditions that result from the interaction between people and places through time; and **Heritage Community** as people who value specific aspects of cultural heritage and as so wish to sustain and transmit them to future generations.

Lastly, it is crucial to refer to the Convention on Offences Relating to Cultural Property (2017). This document aims the prevention and combat against illicit trafficking and destruction of cultural property in line of action with the Council's framework in the fight against terrorism and organized crime.

II.1.3. The Portuguese Context and Laws

The 1976 Constitution of the Portuguese Republic underlines the State's role in protecting and promoting cultural and natural heritage (Article 9). In the following years, basilar documents such as the Institute of Cultural Heritage (Decree-Law 59/80), the Portuguese Cultural Heritage Law (Decree-Law 13/85), and the Environment Basic Law (Law 11/87) would add and create important policy structures⁵⁵.

Still, the Portuguese Cultural Heritage Law (Decree-Law 13/85) established the political basis, the protection regime, and the promotional standards that regulate the line of action to defend, safeguard, and promote cultural and historical heritage. In 2001, the National Legislation on Cultural Heritage (Law 107/2001) replaces Decree-Law 13/85. In this last document, **Cultural Heritage** was described as “all properties that are witnesses of the relevant civilizational or cultural value of interest and should be subject to special protection, and enrichment” (Article 2).

It is important to underline that the National Legislation on Cultural Heritage aimed “to guarantee the survival of social groups and cultural heritage that are structuring for the Portuguese identity and collective memory.” As so, it is understood that the State, Autonomous Regions, and Local Authorities must preserve, defend, protect, and value Portuguese cultural heritage (Article 2).

In addition, the diploma would also describe protection categories for **movable** (archeological, documental, and audiovisual heritage) **and immovable property**

⁵⁵ In this context, cultural heritage is vertically normalized through the Portuguese Constitution, European laws and orientations, and international and administrative laws, while horizontally diverse public instructions safeguard cultural properties (Ferreira, 2011).

(monuments, groups of buildings, or sites), as so as **intangible heritage** considered as oral expressions of cultural transmission and traditional ways of making (Article 2).

Years later, in 2008, Portugal ratified the 2003 UNESCO Convention for the Safeguarding of Intangible Cultural Heritage and, in 2009, Decree-Law 139/2009 established the legal framework for safeguarding **intangible cultural heritage**, defining it as oral traditions and expressions that include (a) language as part of intangible cultural heritage; (b) artistic and performative expressions; (c) social practices, rituals, and festive events; (d) knowledge and practices related to nature and the universe; (e) traditional technical skills and processes (Article 1).

Lastly, in 2015, the 2009 diploma was ratified once more. Decree-Law 149/2015 added popular or erudite culture that communities, groups, and individuals recognize as part of their cultural heritage recreated by communities and groups, instilling a sense of collective identity (Article 1) as equally defining features.

II.1.4. International and Portuguese Heritage Enlistment

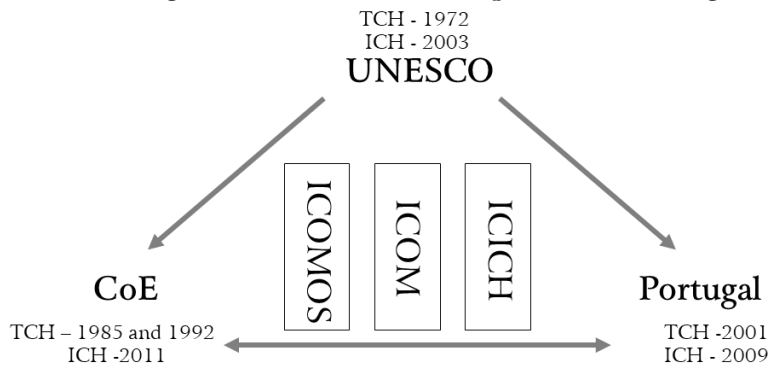
By combining the three diplomatic contexts presented (UNESCO, Council of Europe, and Portugal), we can summarize in Figure 17 the fundamental diplomas that formally conceptualize tangible and intangible cultural heritage⁵⁶ and how they relate in time. On the other hand, we can also understand the dynamic relationship between the international organisms.

As so, while UNESCO launches the formalities introducing them to the European and Portuguese contexts, it will be the international non-governmental organisms – as the International Council on Monuments and Sites (ICOMOS), the International Council of Museums (ICOM), and the International Scientific Committee for Intangible Cultural Heritage (ICICH) – that will surveil how heritage policy is nationally applied. In addition, the Council of Europe will emerge as a diplomatic institution that moderates cooperation and understanding between state members as it promotes “diversity and dialogue through access to heritage to foster a sense of identity, collective memory, and mutual understanding” (Vícha, 2014: 27).

⁵⁶ In the international context, the Convention Concerning the Protection of the World Cultural and Natural Heritage (1972) and the Convention for the Safeguarding of the Intangible Cultural Heritage (2003). In the European context, the Convention for the Protection of the Architectural Heritage of Europe (1985), the Convention on the Protection of the Archaeological Heritage (1992), and the Council of Europe Framework Convention on the Value of Cultural Heritage for Society (2011). In the Portuguese context, the Portuguese Cultural Heritage Law 107/2001 (2001) and Decree-Law 139/2009 (2009).

Figure 17

The triangle relation of Cultural Heritage, Tangible Cultural Heritage, and Intangible Cultural Heritage in International, European, and Portuguese diplomacy



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Note. The figure was produced by the author of the dissertation and relates UNESCO’s, Council of Europe’s (CoE), and Portugal’s fundamental Tangible Cultural Heritage (TCH) and Intangible Cultural Heritage (ICH) diplomatic production assisted by ICOMOS, ICOM, and ICICH.

It is equally interesting to understand the international law-making forms justification for international cooperation. In truth, the policy has drafted from “an ‘iconic’ and ‘wonders of the world’ approach towards the idea of cultural heritage that is ‘representative of the best’ in a particular cultural area, region, theme, or historical period” (Blake, 2015: 13).

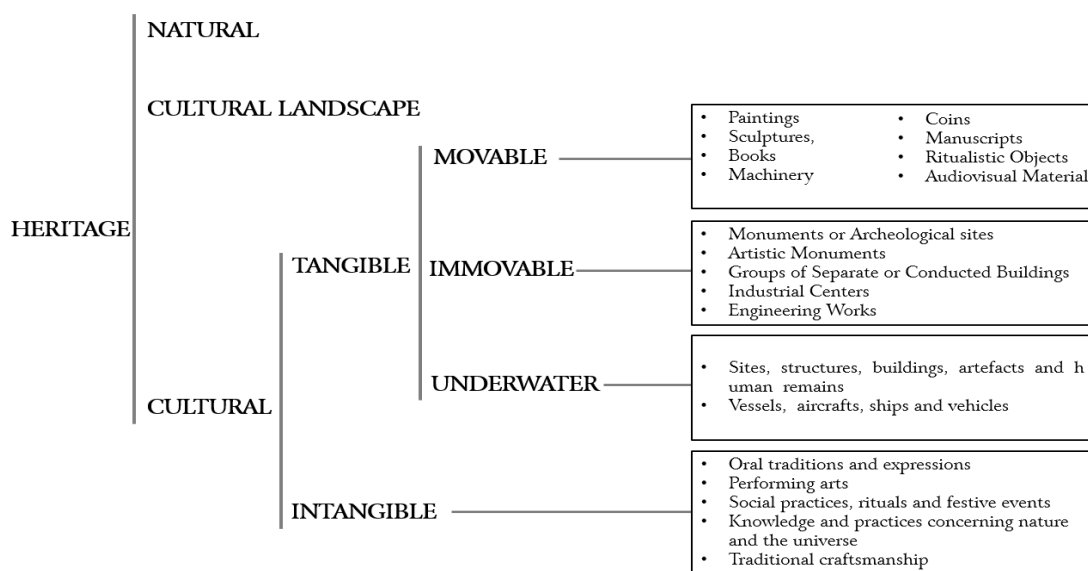
Though-provoking is to acknowledge how the concepts presented in II.1.1. and II.1.2. prove international commitment and relations. In fact, (extra)governmental organisms have transversally underlined the importance of protecting and preserving the heritage of humankind, state treasures, or legacy that refers to value, uniqueness, and identity.

Nevertheless, and even though the Council of Europe and Portugal are presented establishing bilateral relations (while UNESCO appears unilaterally), this does not stand as an international imposition, but rather as an organization that globally orientates and chronologically sets the action guidelines so that States can operationalize at their scales. Together, all

organisms focus on safeguarding, promoting, and granting full access to cultural heritage as an open and democratic right (Logan, 2012; Calligaro, 2014; Blake, 2015).

Under this line of reasoning, the concept(s) of heritage(s) displayed in Figure 18 serve(s) as an orientational guideline.

Figure 18
Schematic Diagram of Cultural Heritage according to UNESCO



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Note. The figure was produced by the author of the dissertation and presents the main heritage conceptualizations under the UNESCO orientation.

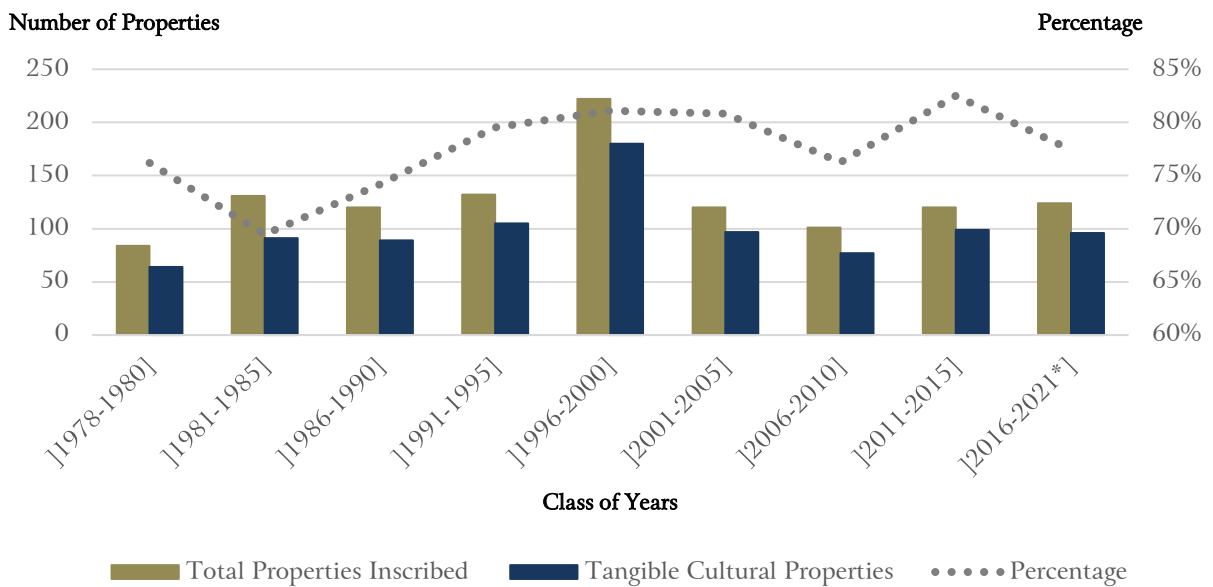
On the other hand, by addressing the fundamental diplomatic production enlisted in Table 2 in combination with Figure 19 and Figure 20, it is possible to recognize that although property enlistment (cultural, natural, and mixed heritage) does not immediately occur, the diplomatic production inflicts on States Parties actions, measure taking, and promotion of national and universal heritage.

Table 2
Fundamental Diplomatic Production address by UNESCO

Year	Category	Name of Document
1972	Convention	Convention Concerning the Protection of the World Cultural and Natural Heritage
1976	Charter	Cultural Tourism Charter
1976	Recommendation	Recommendation Concerning the Safeguarding and Contemporary Role of Historic Areas
1989	Recommendation	Recommendation on the Safeguarding of Traditional Culture and Folklore
1992	Charter	Charter for the Conservation of Places of Cultural Heritage Value
1994	Resolution	The Nara Document on Authenticity
1999	Charter	International Cultural Tourism Charter: Managing Tourism at Places of Heritage Significance
2001	Convention	Convention on the Protection of Underwater Cultural Heritage
2001	Declaration	UNESCO Universal Declaration on Cultural Diversity
2001	Proclamation Program	Proclamation of the Masterpieces of the Oral and Intangible Heritage of Humanity
2003	Convention	Convention for the Safeguarding of the Intangible Cultural Heritage
2003	Declaration	UNESCO Declaration concerning the Intentional Destruction of Cultural Heritage
2005	Convention	Convention on the Protection and Promotion of the Diversity of Cultural Expressions
2008	Charter	ICOMOS Charter on Cultural Routes
2008	Charter	ICOMOS Charter on the Interpretation and Presentation of Cultural Heritage Sites
2011	Principles	Valletta Principles for the Safeguarding and Management of Historic Cities, Towns and Urban Areas
2015	Recommendation	Recommendation concerning the Protection and Promotion of Museums and Collections
2017	Convention	Convention on Offences Relating to Cultural Property

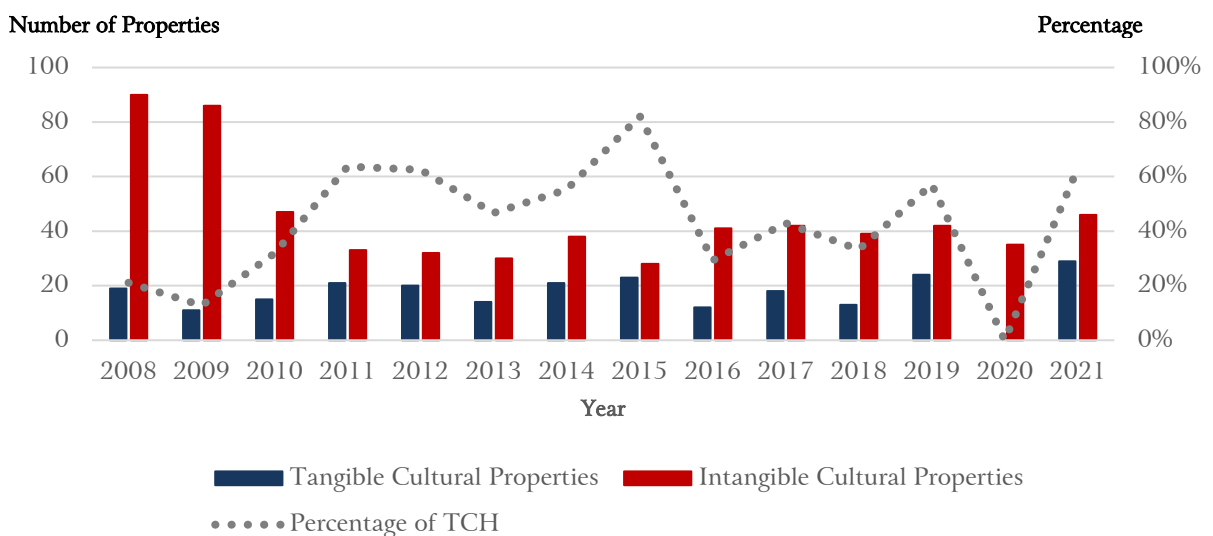
Note. The table was produced by the author of the dissertation and enlists the fundamental diplomas on the safeguarding of cultural heritage.

Figure 19
Cultural World Heritage Properties Enlisted 1978 – 2021



Note. The figure was produced by the author of the dissertation (April 2022) and represents the enlistment of cultural heritage properties from 1978 until 2021. These have been grouped in a five-year period for better analysis. Nevertheless, in the year of 2020* no entries were inscribed. Source: UNESCO

Figure 20
Tangible Cultural Heritage and Intangible Cultural Heritage Properties Enlisted 2008 – 2021

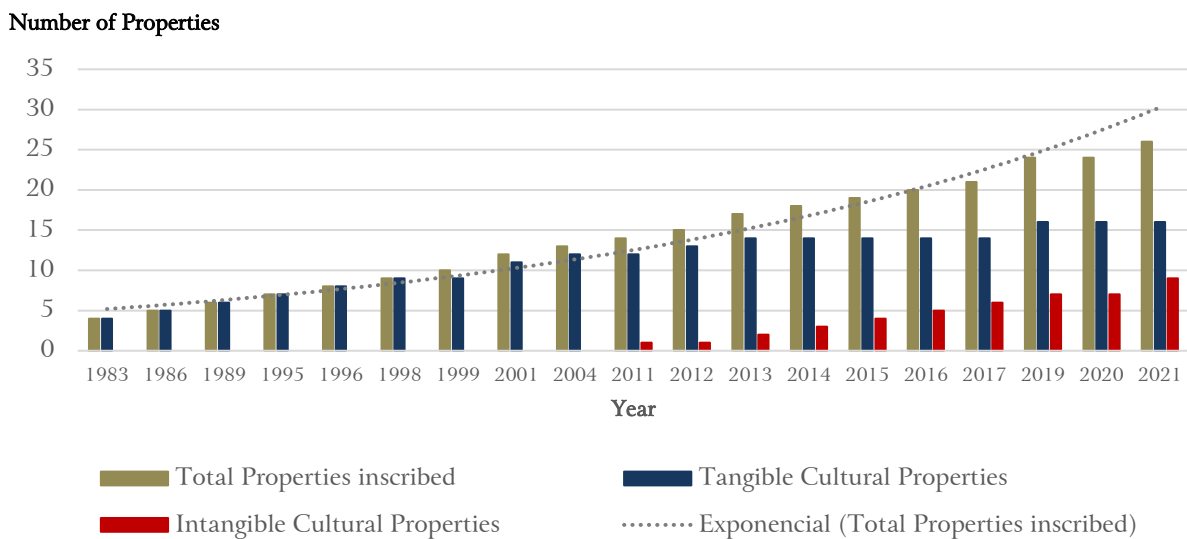


Note. The figure was produced by the author of the dissertation (April 2022) and represents the yearly enlistment of tangible cultural heritage and intangible cultural heritage properties from 2008 until 2021. Source: UNESCO

Interesting as well is to comprehend that international intangible cultural heritage surpasses tangible cultural heritage (Figure 20) with an average enlistment of 46 intangible properties per year, even though the first two years appear as irregular, maybe because of property enlistment accumulation from the year 2003.

Focusing on the enlistment developments in the Portuguese context, one can obtain that even though tangible cultural heritage properties are predominant (24 cultural heritage properties), intangible cultural heritage registers are at a rising situation (8 intangible cultural heritage assets with two listed as intangible cultural heritage in need of urgent safeguarding) as shown in Figure 21. This reality also expresses how the Portuguese context complies with international lineups.

Figure 21
Portuguese Tangible Cultural Heritage and Intangible Cultural Heritage Property Enlistment



Note. The figure was produced by the author of the dissertation (April 2022) and represents the Portuguese property enlistment from the year 1983 until 2020, the year of the last inscription. Source: UNESCO

All in all, it is unquestionable to say that the World Heritage Committee is the most visible and universal attainment in terms of conserving cultural heritage. Since then, international collaboration has dramatically intensified the universal approach to cultural diversity and concepts of value (The Operational Guidelines for the Implementation of the World Heritage Convention, 2021), so much so that “cultural value is what makes a thing become cultural heritage” (Perez & Oubiña, 2011).

Nevertheless, concerns with “heritagization” (Walsh, 1992) will, in time, transfer into Apaydin’s (2015) ideas of heritage site valuing under the need to shift from a top-bottom colonial approach to a local-people-in-practice approach. In fact, the Eurocentric (Aa, 2005) or Western-centered position will give into a global context where heritage safeguard is understood holistically and democratically. As so, the initial issues of heritage per se (architectural conservation) will in due time expand to immaterial manifestations even though Bertacchini et al. (2016) discuss if Committee membership, size of national delegations, and the country’s political and economic power influence enlistment, or if Von Droste (2011) identifies the risk of diplomat career domination in the World Heritage Committee rather than the investment in heritage specialists.

Chapter II.2. – Universities as Guardians of World Heritage

II.2.1. Discussions on University Heritage

Universities operate under a complex correlation between science, culture, education, and economy for humankind's growth. In this multiple reality, they also exist as organisms that create and perpetuate their identity as a sense in which time contributes to their definition (Kazem, 1981). To this, and conscient of their task as guardians of a past, universities display their cultural performance (Smith, 2017) and cultural heritage (Capela de Campos & Murtinho, 2018) in ways that show their current asset for future generating value.

It is interesting to understand how University Heritage has gained importance in the international field⁵⁷. At the turning of the 21st Century, several initiatives have addressed scientific, technological, or university heritage that is willing to preserve and promote cooperation and international exchange of science and knowledge (Oliveira, 2019).

In this line of reasoning, if initially interests, approaches, and documental production conceptualized **Scientific and Technologic Heritage** (Novaes, 2018; Lourenço & Wilson, 2019) as objects collected by private owners or University depositories; in time, the concept gave into the definition of **University**

⁵⁷ The first reference to the preservation of scientific discoveries dates to the Charter of Athens (1933), and today assets of scientific nature are still invoked as cultural heritage.

Heritage incorporating the tangible and intangible knowledge that they uphold (Oliveira, 2019).

As so, in 2000, the **European Academic Heritage Network (UNIVERSEUM)** was created to promote Academic Heritage and Universities. European party members agreed to share knowledge and experience and undertake joint projects to enhance access to collections at all levels (UNIVERSEUM Charter, Article 2). In the following year, the **International Council of Museums Committee of University Museums and Collections (UMAC)** was formed and globally operating to underline the importance and the outstanding universal value of university properties enlisted in UNESCO's World Heritage.

In 2005, the Council of Europe Committee approved the **Recommendation Rec(2005)13**. This document aimed to set good practice guidelines for European university heritage governance and management while underlining how they outstand in uniqueness and autonomy. Additionally, the **Salamanca Declaration on Universities Historical and Cultural Heritage (2008)** highlighted the need to produce legal and institutional coverage for correct heritage management and promotion.

In 2013, the World Heritage Universities signed the **Declaration of Alcalá on the Protection Conservation and Promotion of University Heritage**, and two years later, the **Mexico Declaration (Declaration of Mexico on the Protection, Conservation and Promotion of University Heritage, University Collections, and Museums)** would ratify the preceding document adding its concern with the preservation and conservation of university museums, collections, and intangible heritage. Both documents resulted from international symposiums, promoted by the World Heritage Universities representatives, to discuss promoting, conservation, and cooperation between institutions.

Altogether, the discussions reveal the significant and active role that universities play and the challenges they face with preservation, conservation (Lemos & Tissot, 2020), research, diffusion, and cooperation of heritage, science, and technology (Nyst et al., 2014). In addition, they comply with universities' contribution to economic growth, local sustainability, international visibility, honor, and prestige (Vigneron, 2016; Capela de Campos & Murtinho, 2018; Moreira et al., 2020) while generating relevance to contemporary life (Frey & Steiner, 2011).

Nonetheless, the status of World Heritage generally does not guarantee per se the most exemplary preservation efforts nor the best heritage selection (Cameron, 2020). Its conservancy depends mainly upon national and local actors' ability to tactfully link international help, media attention, and worldwide visitors for the same purpose (Aa, 2005; Lochrie, 2016).

For so, it is essential to establish partnerships between key stakeholders that multilaterally play and adjust to a continuous investment focused on the assets and how they can generate extended turnover. The motto must always consider efforts that preserve an identified heritage, surrounded by the content of protection and conservation and never the possibility of losing it, for as Goodwin (2010: 298) states, “if a site loses its outstanding universal value, it is no longer heritage.”

II.2.2. Universities as World Heritage

Regardless that the first university in a world heritage city center dates from 1978, it is accurate to consider that a direct World Heritage University enlistment was only registered in 1987. To this, Capela de Campos and Murtinho (2018: 60-61) stress the underrepresentation of these properties, stating that “in the last 40 years only 5 are world heritage university properties”. In addition, the authors also divided the 26 universities in world heritage city centers⁵⁸ into categories and subcategories.

On the other hand, Oliveira (2019: 43-51) sectioned the 5 World Heritage University properties into two categories: *pre-modern*, stating built heritage developed with greater diversity throughout its history, and *modern*, referring to campuses that were planned and performed in a short period, during the 20th Century.

In the present investigation, the properties have been divided into three clusters considering the arguments presented in their nomination files:

1. **Universities in World Heritage City Centers (UWHCC)**, incorporated in historical centers or historic cities and therefore are indirectly enlisted.
2. **University-Scientific Contributors to World Heritage (U-SCWH)** which are assets that have scientifically contributed to the increase of knowledge in university environments.
3. **World Heritage Universities (WHU)** properties directly enlisted for their outstanding universal value in the scientific, humanistic, and university context.

⁵⁸ From the 26 identified universities in World Heritage Sites, Capela de Campos & Murtinho identified 21 that are inscribed under the following categories: historical center (8), historical city (6), colonial city (1), historical complex (1), religious complex (1), monumental setting (1), archeological site (1), monument (1) and botanic garden (1).

Thus, in this study, the first cluster – UWHCC – is composed of 27 properties. In fact, although authors as Capela de Campos and Murtinho (2018) state 26 assets, we considered a total of 27. In addition, we created a second group – U-SCWH – which highlights the properties world contribution as a singular structure. In this group, two properties were integrated due to their outstanding universal value for modernity. By this means, we also differed from the list presented in the International Council of Museums Committee for University Museums and Collections website⁵⁹ where these two properties are categorized as World Heritage University assets. As so, Tables 3 and 4 demonstrate how the properties are organized in clusters.

⁵⁹ International Council of Museums Committee for University Museums and Collections – UMAC. (n.d.).

Table 3
UWHCC - Universities in World Heritage City Centers Properties 1978 - 2012

Years	Universities	Country	Criteria
1978	Historic Centre of Kraków	Poland	(iv)
1980	Federal University of Bahia, Federal University of Ouro Preto	Brazil	(i) (iii)
1980	Historic Centre of Rome, the Properties of the Holy See in that City Enjoying Extraterritorial Rights and San Paolo Fuori le Mura	Italy	(i) (ii) (iii) (iv) (vi)
1980	Historic Centre of Warsaw	Poland	(ii) (iv)
1982	Historic Centre of Florence	Italy	(i) (ii) (iii) (iv) (vi)
1985	Historic Centre of Salvador de Bahia	Brazil	(iv) (vi)
1985	Santiago de Compostela (Old Town)	Spain	(i) (ii) (vi)
1986	Historic Centre of Évora	Portugal	(ii) (iv)
1987	Venice and its Lagoon	Italy	(i) (ii) (iii) (iv) (v) (vi)
1987	Cathedral, Alcázar and Archivo de Indias in Seville	Spain	(i) (ii) (iii) (vi)
1987	City of Bath	UK	(i) (ii) (iv)
1987	Historic Centre of Puebla	Mexico	(ii) (iv)
1988	Strasbourg, Grande-Île and Neustadt	France	(ii) (iv)
1988	Old City of Salamanca	Spain	(i) (ii) (iv)
1990	Historic Centre of Saint Petersburg and Related Groups of Monuments	Russia	(i) (ii) (iv) (vi)
1991	Historic Centre of Lima	Peru	(iv)
1994	Vilnius Historic Centre	Lithuania	(ii) (iv)
1995	Ferrara, City of the Renaissance, and its Po Delta	Italy	(ii) (iii) (iv) (v) (vi)
1995	Historic Centre of Siena	Italy	(i) (ii) (iv)
1995	Historic Centre of Naples	Italy	(ii) (iv)
1995	Old and New Towns of Edinburgh	UK	(ii) (iv)
1996	Historic Centre of Oporto, Luiz I Bridge, Monastery of Serra do Pilar	Portugal	(iv)
1997	Historic Centre of Riga	Latvia	(i) (ii)
1998	Historic Centre of Urbino	Italy	(ii) (iv)
2005	Historic Centre of Macao	China	(ii) (iii) (iv) (vi)
2010	Seventeenth-Century Canal Ring Area of Amsterdam inside the Singelgracht	Netherlands	(i) (ii) (iv)
2012	Rabat, Modern Capital and Historic City: a Shared Heritage	Morocco	(ii) (iv)

Note. The table was produced by the author of the dissertation and represents the list of indirect university properties. Source: UNESCO and UMAC.

Table 4

U-SCWH - University-Scientific Contributors to World Heritage Real Estate 1997 – 2005

Year	University-Scientific Contributors	Country	Criteria
1997	Botanical Garden (Orto Botanico), Padua	Italy	(ii) (iii)
2005	Struve Geodetic Arc	Belarus; Estonia, Finland, Latvia; Lithuania; Norway, Republic of Moldavia; Russian Federation; Sweden and Ukraine	(ii) (iv) (vi)

Note. The table was produced by the author of the dissertation and represents the University-Contributors to World Heritage properties enlisted in 1997 and 2005. Source: UNESCO and UMAC.

To what concerns the third cluster **World Heritage Universities** observable in Table 5 all have directly submitted their universities as great contributors to human, scientific, and artistic examples. To this, it is crucial to understand them as exceptional contributions to humanity and their purposes as depositories of world heritage. At the same time, it is vital to perceive the preservation and conservation works that occurred before and after the nomination process. This chapter will focus, on a minor level, on the first four properties enlisted – from III.2.2.1. until III.2.2.4. In III.3., the *University of Coimbra – Alta and Sofia* will be expounded in more detail.

Table 5

World Heritage Universities Real Estate 1987 – 2013

Year	University World Heritage	Country	Criteria
1987	Monticello and University of Virginia in Charlottesville	USA	(i) (iv) (vi)
1998	University and Historic Precinct of Alcalá de Henares	Spain	(ii) (iv) (vi)
2000	Ciudad Universitaria de Caracas	Venezuela	(i) (iv)
2007	Central University City Campus of the Universidad Nacional Autónoma de México (UNAM)	Mexico	(i) (ii) (iv)
2013	University of Coimbra – Alta and Sofia	Portugal	(ii) (iv) (vi)

Note. The table was produced by the author of the dissertation and represents the properties directly enlisted as University World Heritage real estate. Source: UNESCO and UMAC.

II.2.2.1. Monticello and University of Virginia in Charlottesville

The first property enlisted was the **Monticello and University of Virginia in Charlottesville** on December 29th, 1987 (ICOMOS Nomination File of the Monticello and the University of Virginia in Charlottesville, 1986). This asset was drawn and founded by Thomas Jefferson and extended throughout 460 hectares of land. It represents a marvelous testimony of the 18th Century neoclassic architecture, reflecting the assessment of man, society, and the endless opportunities a new nation offers. The property symbolizes man's universal ambitions for freedom, self-determination, and self-fulfillment, being the University (academical village) an important instrument for achieving the nation's requests. In addition, Monticello represents the only presidential and private home on the UNESCO World Heritage List.

Preservation works gained intensity after the residence and grounds were purchased by the Thomas Jefferson Memorial Foundation, Inc., in 1923. Extensive archeological investigations that date back to the promoter's time restored its infrastructures. At the same time, the Voluntary Guidelines for Development within Monticello's Viewshed focused on protecting the landscape. On the other hand, the Foundation and the preservation works have been operating with sources that result from admission fees and gift-shop sales. In return, the Foundation makes yearly academic grants to the University of Virginia, supporting diverse scientific work and initiatives related to the properties and their founder.

Indeed, the asset arises as a living example of scientific, educational, historical, and architectural depository having been distinguished due to its cultural heritage importance regarding criteria (i); (iv); and (vi)⁶⁰.

⁶⁰ For detailed information, consult ICOMOS Nomination File of the Monticello and the University of Virginia in Charlottesville (1986). (i) The integration of buildings into the natural landscape, the originality of the plan and design, and the refined proportions and décor are an example of neo-classic work of art; (iv) An outstanding example of a significant educational institution from the Age of the Enlightenment; (vi) Directly associated with the ideals of Thomas Jefferson, the works of perfection (passage from Utopia to reality) are harmoniously achieved. These works were directly inspired by the same principles that led to the Declaration of Independence and his project to abolish slavery.

II.2.2.2. University and Historic Precinct of Alcalá de Henares

On December 5th, 1998, a second property was added – the **University and Historic Precinct of Alcalá de Henares** (ICOMOS Nomination File of the University and Historic Precinct of Alcalá de Henares, 1998). This asset – consisting of Main and Lesser Colleges – represents the first university city of the Modern Age (79 hectares). It was founded in 1499 and designed by Cardenal Ximénez de Cisneros in the early 16th Century. A magnificent group of secular and religious buildings would serve the Spanish kingdom's higher educational purposes. At the same time, they settled as an exemplary university model for Europe and America, exporting studies, academic degrees, internal rules, and operational structures under the Humanistic philosophy while projecting the Spanish language world widely.

In 1968, the restoration works began after the General Directorate of Fine Arts designated it as important Historical Group of Buildings. Years after, the Covenant of 1985 aimed at new renovation plans. The Spanish Historical Heritage Act and its regulatory laws established the improvement program (later reinforced by the Special Plan of Protection of the Historical Center, 1997). The nominated area was protected under Law 16/1985 on the Spanish Historic Heritage that shields historic groups of buildings declared Assets of Cultural Interest. In 1991 the Master Town Plan for Alcalá de Henares reinforced provisions for safeguarding the historic quality of the city. In time, many other laws and documents were firmed, and today various preservation works continue.

This property is a model of urban planning designed to create the first university city in Europe. The model includes buildings and a layout still preserved today under criteria (ii); (iv); and (vi)⁶¹.

⁶¹ For detailed information consult ICOMOS Nomination File of the University and Historic Precinct of Alcalá de Henares (1998). (ii) It was the first city to be designed and built solely as the seat of a university and would serve as the model for others in Europe and the Americas. (iv) The concept of the ideal city, the City of God (*Civitas Dei*), was first materially expressed in Alcalá de Henares. (vi) The contribution to the intellectual development of humankind sustained in the *Civitas Dei*; in the advances in linguistics; the definition of the Spanish language through the work of Miguel de Cervantes and his masterpiece “Don Quixote”.

II.2.2.3. City University of Caracas

The City University of Caracas (ICOMOS Ciudad Universitaria de Caracas, 2000) was the third property enlisted on December 2nd, 2000. Built according to the architect Carlos Raúl Villanueva's design, between the 1940s and the 1960s, it was declared an outstanding example of the Modern Movement in architecture. The synthesis of state-of-the-art architectural work combined with plastic arts represented the reinterpretation of Venezuelan colonial architecture by the Modernist Movement. Simultaneously it complies with his theory on city planning (Cinesa Channel, n.d.), covering an area of 164,203 hectares.

This complex was designated a National Historic Monument, in 1994, by the National Protection and Conservation Board on Historical and Artistic Heritage. In 1999, the University Council approved the construction, conservation, and open areas in the University City. When the property was enlisted, the Institute of Cultural Heritage managed the protection and conservation of the university campus on a national level. On an institutional level, the responsibility fell upon the Commission of Conservation, the Planning Department, and the General Services Department of the University. After integrating the World Heritage List in 2001, the Venezuelan Central University Preservation and Development Council was created, and studies were developed willing to provide its integral protection. Periodic reports were presented, and its structures of maintenance were reorganized. Nevertheless, sadly one of the structures, the Concrete Passageway, collapsed during June 2020 (Sota, 2020), adding to the state of decay that the property has been suffering.

The City University of Caracas represents a work of art that constitutes a masterpiece of human creative genius in its most transcendental value and is

recognized and incorporated in the World Heritage List under criteria (i); and (iv)⁶².

⁶² For detailed information consult ICOMOS Ciudad Universitaria de Caracas (2000). (i) It is a masterpiece of modern city planning, architecture, and art, created by the Venezuelan architect Carlos Raúl Villanueva and a group of distinguished avant-garde artists. (iv) It represents an outstanding example of the coherent realization of the urban, architectural, and artistic ideals of the early 20th century while being an ingenious interpretation of concepts and spaces of colonial traditions as so as an example of an open and ventilated solution, appropriate for its tropical environment.

II.2.2.4. Campus Central de la Ciudad Universitaria de la UNAM

In 2007, June 29th, the Campus Central de la Ciudad Universitaria de la UNAM (ICOMOS Central University City Campus of the Universidad Nacional Autónoma de México, 2007) joined the University of World Heritage list. Built between 1949 and 1952 with the purpose to not only concentrate all university schools and facilities – up to then dispersed in Mexico City’s historical center – but also improve the university community’s quality of life. Important 20th Century lineaments of architectural thinking are here represented (International Modern Architecture, Mexican Historicist Regionalism, and the Plastic Integration). Today it resides as a unique example that exhibits the integration of urbanism, architecture, engineering, landscape design, and fine arts combined with references to local traditions in a total area of 176.5 hectares.

At the time of the nomination, the property was considered very well preserved in authenticity and integrity (Nomination File. Section 3). Nevertheless, reports from corrective and preventive maintenance programs were made (Nomination File, Section 4), although its autonomy is protected at federal jurisdiction by the presidential decree that classifies it as a National Artistic Monument. On the other hand, it complies in protecting the maintenance of the campus through the Works and Preservation General Office, the Special Projects Office, and the General Services Office. Additionally, the University Management Plan coordinated the campus management, monitored the Plan, and agreed with federal agencies and relevant University offices.

This property is considered a complex that exhibits in original means the universal scope of the 20th Century modernism and was nominated based on criteria (ii); (iv); and (vi)⁶³.

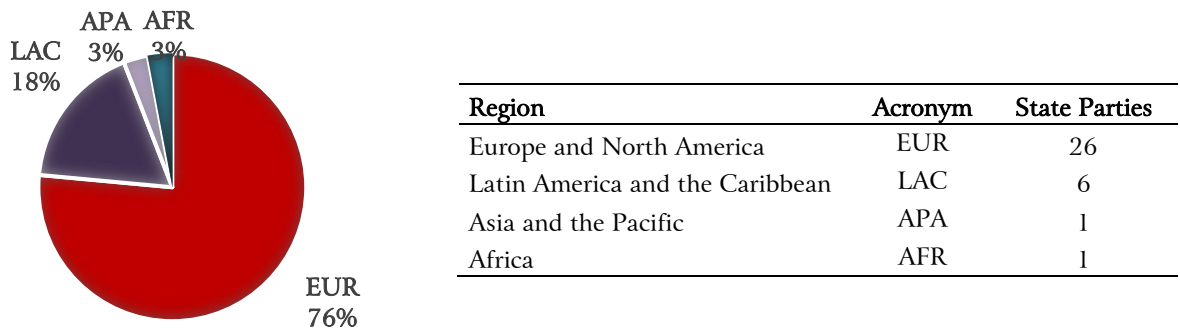
⁶³ For detailed information consult ICOMOS Central University City Campus of the Universidad Nacional Autónoma de México (2007). (i) The property is a unique example in the 20th century where more than sixty professionals worked together to create an urban architectural ensemble that bears testimony to social and cultural values of universal significance; (ii) The most important trends of the architectural thinking from the 20th century converge in the Central University City Campus of UNAM; and (iv) The University is one of the few models around the world where the principles proposed by the Modern Architecture and Urbanism were applied having the ultimate purpose in offering man a notable improvement in the quality of life.

II.2.3. University Heritage Properties – case analysis

All World Heritage Sites result from description and justification under the criteria – based on authenticity and integrity – presented in the World Heritage Committee and Operational Guidelines. The claim of value – which is so exceptional that it transcends national boundaries – must be supported with wide-ranging research that covers the protected area and the subject of protection. To this, all World Heritage Sites must be above and beyond regional, national, political, religious, or economic substance as they represent what is of exceptional importance for all civilizations.

Still, and notwithstanding the efforts and initiatives of Global Strategy (Meskell et al., 2015; Vigneron, 2016), Europe and North America (76%) have been the most dominant regions in terms of site inscription. In a likewise manner, the same extends to university-like properties and the collections that they hold. By observing Figure 22, we can infer how the assets are regionally distributed in percentage, while in Figures 23 and 24 we can visualize their geographic location. As so, Europe and North America withhold 76% of properties from the 3 clusters (Universities in World Heritage City Centers; University-Scientific Contributors to World Heritage; and World Heritage Universities), Latin America and the Caribbean possess 18%; and Africa and Asia and the Pacific withstand an equal 3% both.

Figure 22
Percentage of Universities with World Heritage by Region



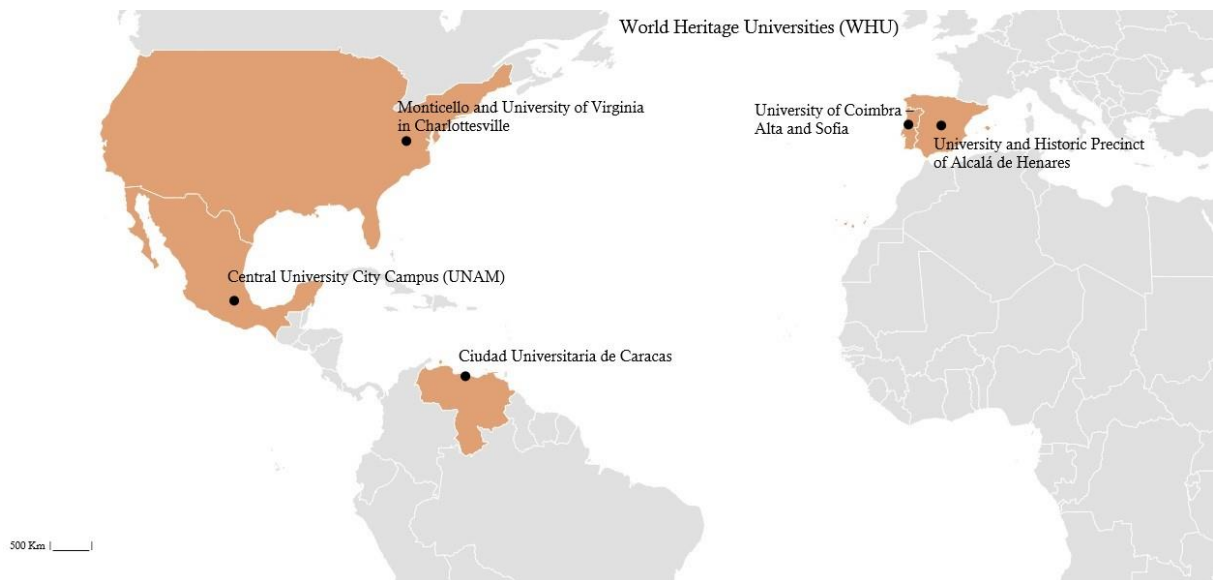
Note. The figure was produced by the author of the dissertation and represents the distribution of universities with world heritage by region. Source: UNESCO.

Figure 23
World Distribution of Universities in World Heritage Historic Centers



Note. The figure was produced by the author of the dissertation and represents the distribution of universities in World Heritage Historic Centers. Source: UNESCO.

Figure 24
Geographic distribution of World Heritage University



Note. The figure was produced by the author of the dissertation and represents the geographic distribution of World Heritage University. Source: UNESCO.

By observing Figure 23, we can infer how the sites are geographically located, with the darker gradient of color indicating which countries possess the most assets in the category analyzed. As so, the most representative are: Italy with 7 Universities in World Heritage City Centers and 1 University-Scientific Contributors to World Heritage, totalizing eight properties; Spain, owner of 3 Universities in World Heritage City Centers and 1 World Heritage University property, totalizing four assets; and Portugal, with 2 Universities in World Heritage City Centers and 1 World Heritage University property, giving a total amount of 3 properties.

To this extent, the European and North American regions (Figure 23 and 24) visually stand out with the most university-like properties, attesting once again the Westernization of site inscription. In contrast, the African and Asian continents are the less represented with a total of 1 property per continent.

On the other hand, by observing Figure 24, it is true to say that the American continent (north, central, and south America) excels at 3 World Heritage University assets. By analyzing the nomination files, it is similarly true that they represent the first universities in their countries. In addition, they stand as testimonies of structural and organizational philosophies of their time and arise from the need to build and support new societies while sustaining the purpose of preserving and defunding knowledge for the service of humankind.

Regarding the two World Heritage University sites in Europe, they share the same criteria and are historically very similar. Thought-provoking is that the Portuguese and Spanish universities will serve as models replicated in the Latin American imperial territories. This reality is transversal in the History of Mexican, Venezuelan, and Brazilian Universities (Micó, 1998; Mendonça, 2000; Rojas, 2005; Marsiske, 2006; Barreto & Filgueiras, 2007; Paiva & Bernardes, 2012).

Lastly, it is important to outline the international extension of the Struve Geodetic Arc, the only property whose singular existence results from a transnational conception. Ten countries⁶⁴ stretching from Hammerfest in Norway to the Black Sea, over 2,820 km, align to form an only property of outstanding universal value.

Indeed, World Heritage has evolved and adapted to new approaches. The combination of people, countries, expertise, skills, and knowledge has generated a continuous revalorization of cultures and identities, so much so that if sharing the sense of belonging shapes individuals while promoting

⁶⁴ The countries that belong to this property are Belarus, Estonia, Finland, Latvia, Lithuania, Norway, Republic of Moldova, Russian Federation, Sweden, and Ukraine. See Struve Geodetic Arc (UNESCO Struve Geodetic Arc, n.d.).

cultural diversity, then creating networks enriches and inspires innovative cohesion, peace, and dialogue between nations.

Chapter II.3. – University of Coimbra – Alta and Sofia

II.3.1. Launching a Nomination File

In March 2013, ICOMOS approved the *University of Coimbra – Alta and Sofia's* (UC-AS) application file. The property was added during the 37th Convention on the Protection of World Heritage, held in Phnom Penh, Cambodia. From then forward, it stands as the fifth World Heritage University asset.

Nonetheless, the enlistment process started, in 1982, with a very different approach. To what underwent as the will to enlist the old perimeter of the city of Coimbra would derive into the University of Coimbra (UC) as property of outstanding universal value.

Thought-provoking is to understand that Portugal ratified the World Heritage Committee in 1979 (Decree-Law 49/79), and three years later, it presented seven cultural properties to the World Heritage Tentative List (1982). In this attempt, the Monumental Area of Coimbra⁶⁵ was declined, and in time the application would be matured.

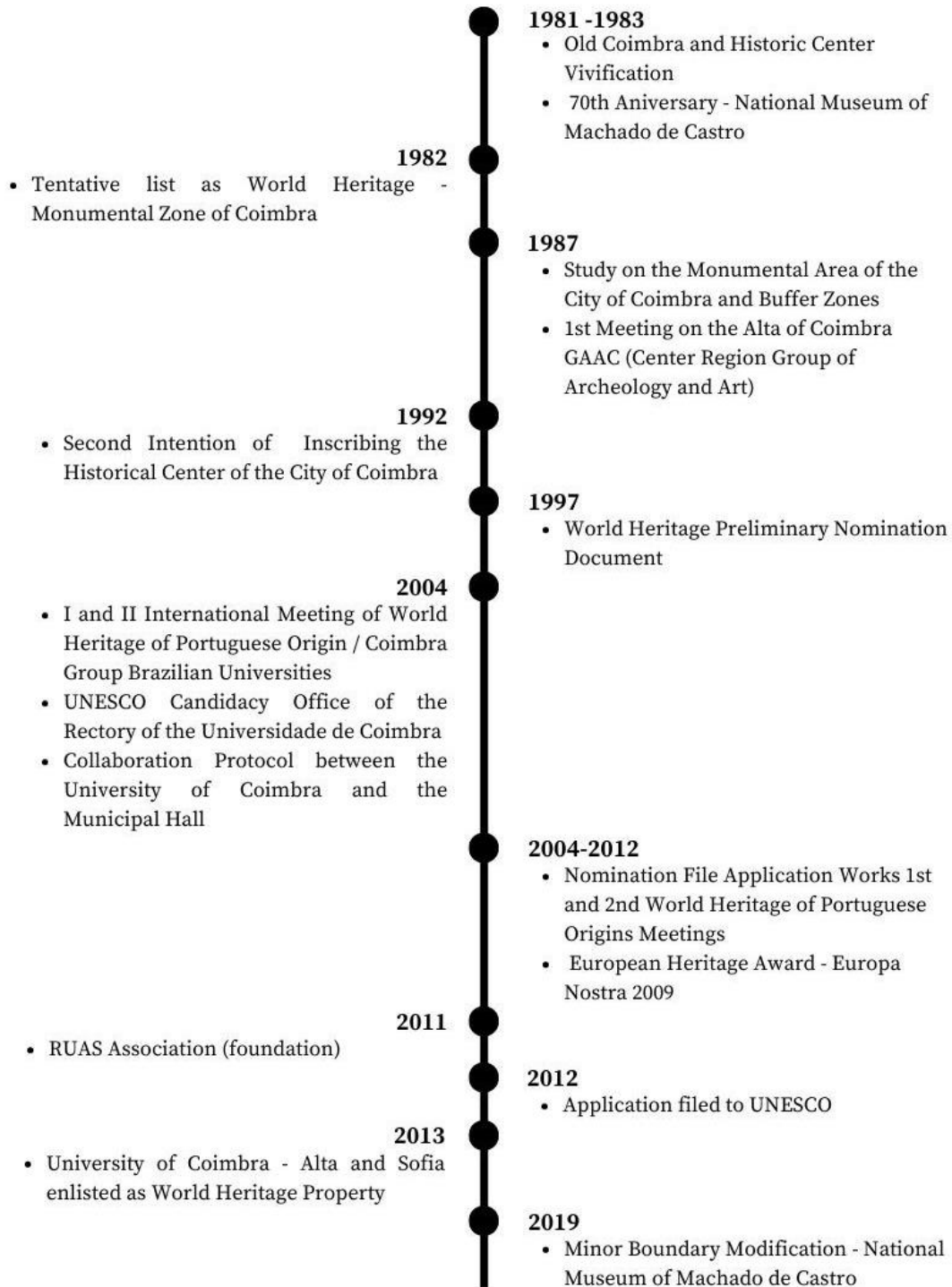
To this, Capela de Campos (2018: 103-134) divided Coimbra's nomination process into three interrelated phases – Phase I (1982-1998); Phase II (1998-2003); and Phase III (2004-2013) – linking the historical evolution of the nomination file with the roles of urbanism, municipal policies, and the University of Coimbra. In addition, she presented the international panorama

⁶⁵*Área Monumental da Cidade de Coimbra*. Free translation by the author.

of World Heritage University inscriptions as time caption references,
perceiving it under a diachronic and synchronic understanding.

Figure 25

The Coimbra World Heritage Property Enlistment Process 1981 – 2019 – Timeline



Note. The figure was produced by the author of the dissertation and underlines the most important moments of the property's inscription process.

As so, and by observing Figure 25, we can visualize how the process developed and how different organisms were created during the proceeding⁶⁶. In fact, Coimbra's aim to be part of the World Heritage universe can be traced to the beginning of the 1980s. The National Museum of Machado de Castro with the will of commemorating the 70th inaugural anniversary (1911), promoted several incentives under the theme Old Coimbra and Historical Center Vivification⁶⁷. In this context, in 1982, the attempt of enlisting the Monumental Zone of Coimbra⁶⁸ as world heritage⁶⁹ occurred. Nevertheless, this inscription will be denied.

Some years later, in 1987, the Coimbra Municipal Hall requested the classification of the Monumental Area (the Alta) and buffer zones⁷⁰ as Public Interest Buildings by the Portuguese Institute of Cultural Heritage⁷¹. In this same year, the Center Region Group of Archeology and Art⁷² promoted the 1st Meeting on the Alta of Coimbra⁷³. Both initiatives strengthen the importance of the Alta as World Heritage and a second intention of inscribing the Historical Center of the City of Coimbra (1992). However, this would not be presented to the world heritage commission.

⁶⁶ The organisms presented in Figure 9 were selected for their significance as milestones in the overall process. For a detailed examination, see Capela de Campos (2018).

⁶⁷ *Coimbra Antiga e a Vivificação de Centros Históricos*. Free translation by the author.

⁶⁸ *Zona Monumental de Coimbra*. Free translation by the author.

⁶⁹ According to Matilde de Sousa Franco, the Secretary of State for Culture gave good order, but the Portuguese Institute of Cultural Heritage would invalidate it. (Franco, 1983: 11; 1984: 134).

⁷⁰ *Área Monumental (a Alta) e zonas de proteção*. Free translation by the author.

⁷¹ *Instituto Português do Património Cultural*. Free translation by the author.

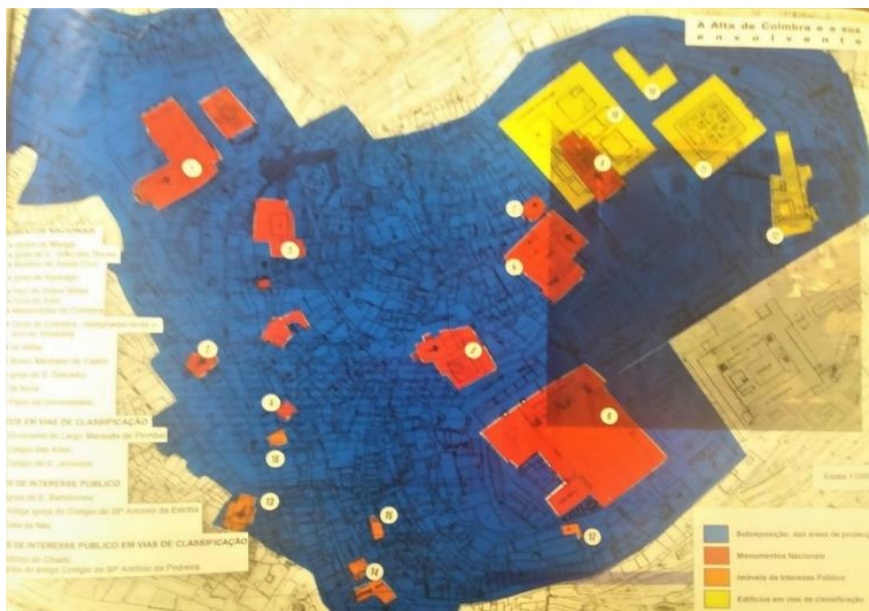
⁷² *Grupo de Arqueologia e Arte do Centro*. Free translation by the author.

⁷³ *1º Encontro sobre a Alta de Coimbra*. Free translation by the author.

Although a World Heritage Preliminary Nomination Document⁷⁴ was devised⁷⁵ in 1997 (Figure 22), the period between 1998 and 2003 marks the Municipal Hall's offstage work and the University of Coimbra's scientific production. In fact, while the first created and promoted legal instruments and technical teams that drafted the methodological approach and plotted the areas to be classified, the latter, in straight collaboration with the Department of Architecture, fostered studies, conferences, colloquiums, and symposiums focusing on the old heritage of Coimbra as so as the New State architecture.

Figure 26

World Heritage Preliminary Nomination Document – Classification Area and Buffer Zones



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Note. The figure was produced by the author of the dissertation (November 2020) and graphically represents the candidacy areas. Map legend: Blue – Buffer zone; Red – National

⁷⁴ *Documento Preliminar de Candidatura a Património Mundial*. Free translation by the author.

⁷⁵ Martins (2013: 99), in her master's dissertation, notes that in the years 2000, UNESCO issued an informal report on the idea that applying Coimbra's Historic City Center did not correspond to the criteria established by World Heritage due to the lack of originality and significant modifications occurred during the New State works. Capela de Campos (2018: 115), on the other hand, analyzed the application process and formalized the information affirmed by Martins documenting it: the UNESCO National Committee (UNC) replied to the Municipality on January 10, 2001.

Monuments; Orange – Public Interest Buildings; Yellow – Buildings in Process of Classification (World Heritage Preliminary Nomination Document, 1997).

In this line of procedure, in 2003, the University of Coimbra officially presented its purpose of inscribing the University as World Heritage. This marked a shift of action from the Municipal Hall to the University of Coimbra, although they would celebrate a collaboration protocol next year.

As so, between 2004 and 2013, the Nomination File was formally designed. The UNESCO Candidacy Office of the Rectory of the University of Coimbra,⁷⁶ a multidisciplinary team created in 2004, developed important structural studies, projects, and conservation works to support the submission. On the other hand, international initiatives such as the I and II International Meeting of World Heritage of Portuguese Origin and the celebration of the Coimbra Group Brazilian Universities took place. In addition, the RUAS Recreate University – Alta and Sofia (2011) was formed to safeguard, promote, and manage the property and buffer zone and simultaneously produce scientific, cultural, and social activities.⁷⁷

To what concerns urban and conservation works, it is important to refer that although the Municipal Hall's efforts, with programs as RECRUA⁷⁸ and REHABITA,⁷⁹ important and intensive restoring interventions will only take place in the mid-years of the first decade of 2000. In this line of action, the University of Coimbra will be involved in rehabilitating and preserving its

⁷⁶ *Gabinete de Candidatura a UNESCO da Universidade de Coimbra.*

⁷⁷ For detailed information see Associação RUAS (n.d.).

⁷⁸ *Regime Especial de Participação na Recuperação de Imóveis Arrendados* [Especial Regime for Co-funding the Rehabilitation of Rented Properties]. Free translation by the author.

⁷⁹ *Regime de Apoio à Recuperação Habitacional em Áreas Urbanas Antigas* [Support Regime for Housing Rehabilitation in Old Urban Areas]. Free translation by the author.

buildings, namely the Via Latina⁸⁰, the Tower of the University, and the Chapel of Saint Michael, reinforcing its commitment to promoting and safeguarding cultural heritage.

All in all, in 2013, after officially delivering the Nomination File, ICOMOS considered the *University of Coimbra – Alta and Sofia* an outstanding universal example of tangible (and intangible) culture⁸¹. With this recognition, a new chapter in history was added, with past legacy strengthened as an economic, social, and political instrument for upcoming generations.

⁸⁰ In 2009, the restoration works on the Via Latina were recognized with the European Heritage Award *Europa Nostra*.

⁸¹ In 2019, the boundaries of the core zone of the UC-AS will include the National Museum of Machado de Castro, due to its remarkable architectural complex located in the upper part of the city (Alta), and integrated in an urban network with medieval details, Roman reminiscences of the Forum of *Aeminuim*, a Christian temple (eleventh century), an Episcopal palace (twelfth century) and today a national museum. *Nomination 1387bis (inscribe minor boundary modification)*.

II.3.2. The University of Coimbra – Alta and Sofia as a World Heritage University

The *University of Coimbra – Alta and Sofia* (ICOMOS Nomination File of the University of Coimbra – Alta and Sofia, 2013) was inscribed under criterion:

(ii) planning, construction, and maintenance of the University as the heart of the production and transmission of knowledge evolving while simultaneously being of influence to the lusophone world;

(iv) exceptional architectural set that testifies different significant periods of the history of Portuguese universities, the Country, and Western Human past; and

(vi) direct association to cultural development transmitting important aesthetic, scientific, philosophical, political, and social contributions mainly in the domains of Literature (promotion and constitution of the Portuguese Language) and Law (education of the elite forces of resistance to power).

Concerning the authenticity of the asset, the University of Coimbra is one of the most long-lasting institutions in the history of Europe and the world. Not only has the property's usage been the same since its beginning, as it has never given rise to any other school, despite its initial itineracy between Lisbon and Coimbra.

In cultural standings, its traditions, festivities, cycles of student life, garbing, and the Fado of Coimbra are examples of practices that survived almost unaltered throughout time⁸². In architectural and material terms, each building

⁸² The slight changes – due to the need to adapt to new historical moments show their ability – to endure and maintain their significance.

represents the historical, artistic, and ideological times in which it was built, setting as models of representation and construction. Most recently, the interventions on protection and rehabilitation have also revealed an international example of safeguarding the integrity of its edified heritage.

In terms of its integrity, the property remains as one of the most important institutions in the lusophone world and perpetuates its role as a promoter of ideas and outlines (Nomination File: 186-187). As tangible cultural heritage, the edifices represent the cultural genesis and scientific improvement, reflecting the more important reformation stages in university studies⁸³. On the other hand, the traditions associated with live practices and academic festivities demonstrate intangible continuity. In truth, the *University of Coimbra – Alta and Sofia* is the epicenter of singular academic and social practices: a rich set of original traditions, signs of recognition, and rituals that assure cultural unity and sustain a community with unique defining characteristics.

⁸³ From the Middle Age Scholastic and the Renaissance Humanism to the Rational Enlightenment and today's pedagogical and scientific ideals.

Figure 27

University of Coimbra – Alta and Sofia: Nominated Property and Buffer Zone Plan



Note. The original figure was taken from Universidade de Coimbra - Gabinete de Candidatura à UNESCO (2012, vol.1, pp. 20)

In the overall, the property has an applicant area of 35.5 hectares – 29 correspond to the Alta and 6.5 to Sofia⁸⁴ – and an additional 81.5 hectares referring to buffer zone in the surrounding areas (Figure 27). Altogether the asset comprises 32 buildings⁸⁵ and many intangible traditions to which the nomination file application aimed to highlight the outstanding universal value under a holistic approach. To this the property has inclusively enlarged its structure by adding the National Museum of Machado de Castro, in 2019, to the list of buildings that comprise the *University of Coimbra – Alta and Sofia’s* world heritage asset.

II.3.3. University of Coimbra – Alta and Sofia: The Property

Both tangible and intangible assets supported the University of Coimbra's candidacy value. If the first referred to the university's architectural, historical, and artistic heritage, the latter comprehended that its history and humanistic traditions were given to language, literature, and culture (Universidade de Coimbra, Património Mundial, 2003). To this, the *University of Coimbra – Alta and Sofia* (UC – AS) would interconnect its tangible and intangible legacy articulating architecture, university heritage, and urban spaces with knowledge, science, art, and cultural environments in the lusophone world.

It is interesting to understand that the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage will set an innovative argument framework for the *University of Coimbra – Alta and Sofia's* application process. As so, the purpose of adding the immaterial aspects of the community's intangible history emerged as a new focal point of criteria analysis and justification (Capela de Campos, 2020).

To this, the nomination process – that took place between 2003 and 2012 – was composed of a wide range of historical buildings and a variable set of singular traditions, experiences, and community identity practices believed to have outstanding universal value. Nevertheless, and even though criteria (iii)⁸⁶ was not considered by the ICOMOS⁸⁷ (WHC-13/37.COM/8B; WHC-13/37.COM/20), it is correct to affirm that the University of Coimbra's

⁸⁶ Criterion (iii) to bear unique and exceptional testimony to a cultural tradition or a living civilization that has disappeared.

⁸⁷ ICOMOS considered that “The vitality and the creative potential of these academic traditions, and Coimbra as a fundamental center of influence lies in the fact that other university communities have recreated these traditions.” (Universidade de Coimbra - Gabinete de Candidatura à UNESCO, Executive Summary, 2012: 10).

ceremonial and cultural traditions stand as the cradle of influence to other lusophone intuitions.

In reality, the *University of Coimbra – Alta and Sofia* has kept alive an exceptional ensemble of symbolic practices and traditions associated with the academic year and socio-cultural festivities (Table 6). To this, the ritualist traditions are both identity marks at an institutional academic level – namely in the ceremony of the Rector’s Investiture, the Solemn Opening of the Academic Year, the Ph.D. Public Examinations, and *Honoris Causa* ceremonies – and at the level of the students’ living culture – with Welcome Festives, the Serenades, or the Fado of Coimbra⁸⁸. In addition, the University’s cultural identity is also composed of Fraternity House living experiences (*Repúblicas*), *Tertulias*, Academic Tunas, the Charamela, University Archers and Bells, and the Academic Garb and *Praxe*.

⁸⁸ These ceremonies and festivities expand the imagination of the University of Coimbra belonging to all of those that have participated in these events (students’ parents, friends, or students from other national and international universities).

Table 6

List of the UC – AS’s Tangible and Intangible Cultural Heritage.

Tangible Cultural Heritage		Intangible Cultural Heritage
Old Cathedral	Chemical Laboratory	Fraternity Houses (<i>Repúblicas</i>)
St. Cross Monastery	University Press	Academic Festivities
Royal College of Arts	Botanical Garden	Serenades
St. Jerome College	Melo’s House	Fado of Coimbra
St. Benedict College	The Boiler House	Academic Tuna (university choir)
St. Rita College	Faculty of Arts and Humanities	Charamela (group of woodwind musicians)
Old College of Arts (Inquisition)	General Library	Solemn Opening of the Academic Year
Holy Ghost College	University Archive	Ph.D. Public Examinations
Our Lady of Carmel College	Faculty of Medicine	Rector’s Investiture
Our Lady of Grace College	Physics and Chemistry Department	<i>Honoris Causa</i> Doctorate Ceremony
St. Peter of the Third Order College	Mathematics Department	University Archers/Halbarders
St. Thomas College	Academic Association of Coimbra/	University Bells
St. Bonaventure College	Coimbra Student Union	Academic <i>Praxe</i>
St. Augustine College	Sub-Ripas Palace	Academic Garb
	<i>Studium Generale</i> / University Palace	<i>Tertulias</i> (social gatherings)
	National Museum of Machado de Castro ⁸⁹	<i>Cultural and Sportive Sections/Autonomous Organisms</i>

Note. The table was produced by the author of the dissertation and aggregates the property’s tangible and intangible assets.

On the other hand, Table 6 also lists the thirty-two buildings that compose and support the Nomination File document regarding the property’s tangible heritage. Altogether, the assets can be gathered in Pre-University Education Centers (2); Colleges (13); University Press (1); Botanical Garden (1); Coimbra University City building ensemble (7); University Palace (1); Museum / Archeological Site (2); and Other Dependencies (3).

⁸⁹ In 2019, the Nacional Museum Machado Castro was added redrawing the area inscribed (Capela de Campos & Murtinho, 2020).

It is equally important to underline that if, on the one hand, the ritualist culture can be observed daily at the University, on the other, it can also be contemplated by visiting the **Academic Museum of the University of Coimbra**. Thought-provoking is to understand that this Museum is the only cultural institution in Portugal to safeguard a collection and documental archive (written, graphic, musical, and audiovisual) regarding the academic experiences of all the academic community (students, alumni, professors, personnel, and people in general with deep connections to the history of the University) (Lopes, 2012). In truth, the museographic collection is composed of items that the University once used; former students donated belongings; and historical academic objects of singular value.

As so, and even though a more profound approach is required to best comprehend the University of Coimbra's intangible cultural heritage significances, it is important to emphasize some of the Museum's displayed objects and themes⁹⁰:

(1). The **Academic Garb** (Figure 28) is the most representative element of the University of Coimbra student. This black garment – generally understood as a student uniform – originates from the ecclesiastic influence (Figure 29) of the beginning of the University's existence (Lamy, 1990). It is interesting to consider that the garb is not only a distinguishing reference with association to the university life, but it is also an important unifying social-economical element for the academic community.

⁹⁰ A closer examination of the *University of Coimbra – Alta and Sofia's* tangible cultural heritage is not under this dissertation's analysis.

Figure 28

Academic Garb of the University of Coimbra



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Note. The figure was produced by the author of the dissertation (April 2022) and represents the male and female academic garments.

Figure 29

Alumnus of the University of Coimbra, 18th century



Note. The image intitled “Estudante de Coimbra” belongs to the Estampas Coimbrãs. IX Centenário da Reconquista Cristão de Coimbra, 2nd Vol., kept at the Academic Museum of the University of Coimbra Historical Archive. The Christian priest cleric's black cassock with white collar is an undoubtable ecclesiastic reference to the Church's influence.

(2). In a likewise manner, the *Academic Praxe* similarly represents, unifies, and regulates the student community so much so that it assumes primary historical (Lopes & Sebastião, 2017) and identity purposes. In truth, the *Praxe*⁹¹ is a regulated set of uses and customs traditionally existing among the University of Coimbra students (Figure 30). Additionally, the *Academic Praxe*, decreed by the Veteran's Council of the University of Coimbra, also defines community hierarchy, academic procedures (namely the Academic Garb), and the different moments that mark the school year (Cruzeiro, 1979; Lamy, 1990; Prata, 1993; Código da Praxe, 2007).

Figure 30
Coimbra's Academic Praxe Code, 1957



©Germana Torres

Note. The image was made by the author of the dissertation (July 2021) and represents a Coimbra's Academic Praxe Code of 1957 exhibited at the Academic Museum of the University of Coimbra once located (until March 2022) at the Saint Jerome College.

⁹¹ According to Frias (2000), the *Praxe* covers a multiplicity of realities that extend from ceremonial practices and processions to academic community language and anthems, or temporal rhythms and sound signals.

(3). With similar academic community singularity are the **Fraternity Houses** (*Repúblicas*) as in Figure 31. While the origins of student housing in Coimbra can be traced back to the 13th Century, the current model evolved from 19th Century accommodation and feeding needs (Ribeiro, 2004; Carreiro, 2004). Interesting is to consider that Fraternity Houses are communal homes based on principles of cohabitation, group interaction, cooperation, self-management, and friendly companionship that generate reciprocal bonds, trusting ethics, a sense of belonging, and intra and inter-generational unity as represented in Figure 32 (Frias, 2003).

Figure 31

Facade of the Fraternity Houses “Marias do Loureiro” and “Baco”.



©Germana Torres

Note. The image was produced by the author of this dissertation (April 2022) and represents unique aspects of Coimbra’s Fraternity Houses, such as irreverent handings and drapery.

Figure 32

Intergenerational companionship at a Fraternity House in the 1960s.



Note. The figure represents the connection existing between Alumni and UC Students. Such commemorative gatherings still occur today. In the image we can observe the Portuguese poet, writer, and physician Miguel Torga (second person in the background on the left) in the image. The document is kept at the Academic Museum of the University Historical Archive.

(4). In addition, the unique musical ensembles composed, sung, and played by Coimbra male students are also connected to social and socializing needs. In fact, the **Fado of Coimbra** (Figure 33), the **Serenades** (Figure 34), the **Academic Tunas** (Figure 35 and 36), the **Charamela** (Figure 37 and 38), and other formats are not only means of unique artistic expression but also function as instruments of community representation (Correia, 2014; Coelho et al., 2011; Homem, 2006; Pereira, 2020) promoting emotional expression, community gathering, and academic celebration. Daily, it is possible to witness musicality's presence in and for the University of Coimbra.

Figure 33

*Fado of Coimbra in the movie *As Capas Negras* [The Black Capes], 1947*



©Germana Torres

Note. The figure was produced by the author of the dissertation (July 2021) and represents the movie poster from *As Capas Negras* [The Black Caps] exhibited at the Academic Museum of the University of Coimbra when located at the Saint Jerome College. It was a cinematographic hit of its time, even though the Coimbra Academy did not accept it with enthusiasm.

Figure 34

Love Serenade dedicated by a male student



Note. The image was retrieved from the promotional video *Serenata a Coimbra*, (Turismo UC, 2019), and represents a male student courting his loved one with the help of his musician companions.

Figure 35

The Academic Tuna Estudantina [Studantina] in 1894



©Germana Torres

Note. The image represents the reminiscences of today's Academic Tunas. The Estudantina [Studantina] was founded following the Tuna of Santiago de Compostela's visit in 1888. The iconographic document is kept at the Academic Museum of the University of Coimbra's Historical Archive.

Figure 36

Performance of the Estudantina of the University of Coimbra at the XXX Festuna⁹²



Note. The image represents the Estudantine performing during the XXX Festuna⁹³ at the Convent of Saint Francis, Coimbra, on the March 12, 2022. ©Lília Parisseaux

Figure 37

The Charamela performing at an Insignia Imposition Ceremony at the beginning of the 20th Century



Note. The image is a picture postcard from Papelaria Borges. In the front we can observe the Charamela and in the background the Astronomical Observatory ordered by the Marquis of Pombal following the University Reforms of 1772.

⁹³ *Festival Internacional de Tunas de Coimbra [Coimbra International Tunas Festival]. Free translation by the author.*

Figure 38

The Charamela at the Joanine Library



Note. The image was granted by Conductor Francisco Pereira and represents the Charamela of the University of Coimbra in full costume. ©Paulo Amaral

(5). In this line of reasoning, the **Academic Festivities** (Figure 39) represent likewise value. The commemorative events that take place in October and May are marked by ritualizing practices and symbols that give a more profound significance to the imagined and collectively idealized community identity (Esteves, 2008). Both festivities – the Can Festival (October) and the Burning of the Ribbons⁹⁴ (May) – figure as passing ritualization and cultural integration in the University community.

⁹⁴ Translations adopted in Câmara Municipal de Coimbra [Coimbra City Hall] (n.d.). Can Festival. Retrieved October 12, 2021. <https://www.cm-coimbra.pt/en/areas/visit/ver-e-fazer/festas-feiras-e-romarias/festa-das-latas>; and Câmara Municipal de Coimbra [Coimbra City Hall] (n.d.). Burning of the Ribbons. Retrieved October 12, 2021. <https://www.cm-coimbra.pt/en/areas/visit/ver-e-fazer/festas-feiras-e-romarias/queima-das-fitas>

Figure 39

The Academic Festivity of Queima das Fitas in 1929



©Germana Torres

Note. The figure was produced by the author of the dissertation (July 2021) and represents part of the art nouveau illustration exhibited at the Academic Museum of the University of Coimbra when located at the College of Saint Jerone (until March 2022). With detail, one can observe the popular female figure of Coimbra the *Tricana*, Students, female figures of that era, as so as the University with its iconic Tower.

(6). Additionally, the **University Bells** (Figure 40) and the **University Archers** (Figure 41) are also central figurative elements that regulate the institution. If the first refer to the regulating object – bells as time-marking pieces – (Lamy, 1990 quotes Ortigão et al., 1944; Araújo, 1991), the latter regards the regulating subject – guardians that guard and preserve order and tradition (Lamy, 1990) – and both are symbolic elements that connect the University with its secular existence.

Figure 40
Original University Bell dated from 1741



©Germana Torres

Note. The figure was produced by the author of the dissertation (July 2021) and exposes the University Bell placed after the construction of the current University Tower, built between 1728 and 1733. The bell was cast in 1741 by Joannes Ferreira Lima.

Figure 41
University Archers in Full Costume



Note. The figure represents the University Archers dressed in full costume and halberds: dark blue military coat with cricket brim and closed in the front with golden buttons. The ensemble also presents collaring ornaments, cuff sleeves, a white ceremonial vest, shirt, and plastron. In addition, dark blue shorts fastened below the knee with a buckle and black formal shoes equally equipped with silver buckles finish the dress code. ©Rui Lopes

(7). The **Solemn Opening of the Academic Year** (Figure 42) and the **University of Coimbra's Day Celebration**⁹⁵ are equally essential ceremonies that mark the annual academic calendar. While the first formally marks the beginning of the academic year, the last commemorates the University's foundation (March 1, 1290). On the other hand, the **Rector's Investiture**⁹⁶ is a somewhat similar significant ceremony. Following every directive election, the new Rector is publicly invested on the University of Coimbra's Day (Pereira, 2020). All events are guided by strict University protocol.

Figure 42

Sapientia lesson of the Solemn Opening of the Academic Year 2019/2020



©Germana Torres

Note. The figure was produced by the author of the dissertation (September 2019) and represents the *Sapientia* lesson given by Professor Ana Paula Relvas from the Faculty of Psychology and Education Sciences. On the left-hand wing, one can observe Professors in full costume.

⁹⁵ For a better understanding see Universidade de Coimbra. (n.d.a).

⁹⁶ For a better understanding see Universidade de Coimbra. (n.d.b).

(8). Similarly driven by protocol procedure are the **Ph.D. Public Examinations** and *Honoris Causa* Doctorate Ceremony⁹⁷ as in Figure 43. Although these events exist in other universities worldwide, the Coimbra ritualization confers the practices with proper meaning. Both ceremonies contribute to the educational and scientific dissemination in the most diverse Humanities, Sciences, and Art domains (Pereira, 2020).

Figure 43

Honoris Causa Doctorate Ceremony



©Germana Torres

Note. The figure was produced by the author of the dissertation and registers the *Honoris Causa* Doctorate Ceremony granted by the Faculty of Medicine to Doctor Luis Martí-Bonmatí on May 26th, 2019. During these ceremonies, one can observe hanging in the middle of the front wall the drape with the color of the proposing Faculty.

(9). Additional identity elements are the **professor's garb** (black vestment also relating to the primarily ecclesiastic influence) and their **insignias** (Figure 44 and 45), i.e., the *borla* (headpiece symboling knowledge) and the hood (cover representing science) in the color that represents their faculty (Torgal, 1993; Santos, n.d.). These traditional elements witness the University's ancestral existence (Cruz & Filgueiras, 2013).

⁹⁷ For a better understanding see FEUC - Faculdade de Economia da UC (2016).

Figure 44

Full Professor's Borla and Hood



©Germana Torres

Note. The figure was produced by the author of the dissertation (July 2021) and represents the Borla and Hood used by Doctor Amândio Augusto Coxito former Professor of the Faculty of Arts and Humanities. These objects belong to the Academic Museum of the University of Coimbra's vast museological collection.

Figure 45

19th Century Professor in Full Costume



Note. The figure displays Theology Professor António Bernardino de Menezes. The iconographic document is kept at the Academic Museum of the University of Coimbra's Historical Archive.

(10). Lastly, but nevertheless with utter importance, is the **Academic Association of Coimbra** (Coimbra Student Union) and the **Autonomous Organisms** or the **Cultural and the Sports Sections** (Figure 46) emerge within the University's history. In fact, the Association's founding is deeply rooted in the significance that culture and sports assume in the academic life experience. On the other hand, all mentioned structures are essential references in initiating political participation, sportive practice and preparation, and complimentary skill and expertise earning.

Figure 46

The Academic Association of Coimbra Headquarters



©Germana Torres

Note. The figure was produced by the author of the dissertation (April 2022) and displays the Association's main entrance. Throughout its history, the Academic Association of Coimbra has had five different addresses: College of Saint Paul the Apostle, Trinity College, Paulista's College (Rua Larga), Palace of Grilos, and today it is located at the Padre António Vieira Street.

All in all, by combining the application process and the intangible cultural heritage summarily presented, we can attain that it reveals the academic communities' complex and structured relations and demonstrates the ethnographic singularity of its people. In fact, to experience the academic community and participate in its living intangible cultural heritage is an omnipresent reality of impossible dissociation. Both living and visiting experiences in the *University of Coimbra – Alta and Sofia* are automatic

witnesses of cultural connection, so much so that its intangible cultural heritage stands as a cultural aggregator to all Portuguese universities. i.e., the only *Alma Mater* in Portugal (until 1911) and the lusophone world (1808)⁹⁸, while standing as the oldest World Heritage University property in a worldwide context (723 years old at the time of nomination).

⁹⁸ Faculty of Medicine of Bahia, Brazil (Neves et al., 2005).

Chapter II.4. The Academic Museum of the University of Coimbra

II.4.1. From Antiquity Museum and Museum of the History of the University to the idealization of the Academic Museum

The first reference to an exhibition related to the academic livelihood remotes to April 29th, 1902. The short article intituled “Antiquity’s Museum”⁹⁹ (Figure 47) informs the academic community about an exhibition on the “relics” of the Centennial of the Sebenta¹⁰⁰(1899) held in the Academic Association of Coimbra, perhaps located at the time in the Trinity College¹⁰¹.

Figure 47

Article on the Antiquity’s Museum



Museu d'antiquidades

Nas salas da Associação Académica acham-se hoje expostas todas as reliquias existentes do glorioso e inolvidável Centenário da Sebenta, celebrado com grande pompa pela mocidade académica de 1899.

Note. Evidence of the first reference to an "Antiquity's Museum" in the following of an exhibition on the Centennial of the Sebenta of 1899. Article found in pp. 2, of the Centenário da Sebenta [Centennial of the Sebenta], 1902. The academic press document is kept at the Academic Museum of the University of Coimbra's Historical Archive.

⁹⁹ *Museu d'Antiquidades*. Free translation by the author.

¹⁰⁰ *Centenário da Sebenta*. Free translation by the author.

¹⁰¹ The Academic Association of Coimbra's initial headquarters were settled in the College of Saint Paul the Apostle. [At the begging of the 20th Century] it would occupy several buildings emphasizing the accommodation at the Trinity College. In 1913, the Academic Association relocated to the Paulista's College, Rua Larga, by instruction of the University Senate. (A Velha Alta Desaparecida, 1984: 29). Free translation by the author.

Two decades later, in 1922, there is evidence in the press highlighting "ACADEMIC MUSEUM. An academy museum will be organized and housed in the Academic Association"¹⁰² (Gazeta de Coimbra, 1922: 1). The Academic Museum was at the time already installed at the Paulista's College (Rua Larga), as observable in Figure 48.

Figure 48

The Paulista's College: Headquarters of the Academic Association of Coimbra, 1913– 1949



©Germana Torres

Note. The figure was produced by the author of the dissertation (July 2021) and displays a postcard representation of the Academic Association of Coimbra exhibited at the Academic Museum of the University of Coimbra when located at the Saint Jerone College (until March 2022).

An additional two decades passed when, in 1943, the national press *Diário de Notícias* [Daily News] drew attention to the Academic Museum with the article "Coimbra: School Center Par Excellence does not have an Academic Museum: It must be founded!". In this news, one can attain reference to accommodations and possible collections "(...) the Academic Museum should be installed on the 2nd Floor of the Generales [Faculty of Law] and display [objects related to] the student garb, uniforms and armaments of all academic battalions, a library,

¹⁰² "MUSEU ACADÉMICO. Vai organizar-se um museu da academia que ficará instalado na Associação Académica". Free translation by the author.

iconographic documentation, sebatas [apostiles], cartoons, allegories to the Enterro do Grau [Grade Burial], and (...) the Queima das Fitas [Burning of the Ribbons] (...).”

II.4.2. First Phase: The Academic Museum of Coimbra – 1951– ca.1960 – Palace of Grilos

Furthermore, on May 21, 1951, with the Academic Museum's preparatory exhibition, the Museum will be officially inaugurated by the University's Rector Maximino José de Moraes Correia. The Museum's accommodations were installed at the Academic Association of Coimbra's headquarters at the Palace of Grilos (Figures 51 and 52). The opening ceremony was held with several academic, civil, military, and religious authorities. Nevertheless, it is crucial to point out that, one year before, in May 1950, the General Board of the Academic Association of Coimbra requested the foundation of the Academic Museum of Coimbra, to which the Rector and the Senate replied in favor by including it in a Museum of the History of the University (Protocolo de Instalação do Museu Académico de Coimbra, 1990).

Figure 49

The Palace of Grilos – The Forth Headquarter of the Academic Association of Coimbra and The First of the Academic Museum of Coimbra



©Germana Torres

Note. The figure was produced by the author of the dissertation (April 2022) and displays the building where the Academic Association of Coimbra (1949/50 – ca.1960) and the Academic Museum of Coimbra once functioned (1951 – ca.1960). Currently, it houses the Students Archive of the Academic Management Services of the University of Coimbra.

Figure 50

Academic Museum of Coimbra exhibition room



Note. The image displays part of the collection visitors could observe at the Academic Museum of Coimbra when located at the Palace of Grilos. The iconographic document is kept at the Academic Museum of the University of Coimbra's Historical Archive.

It is interesting to comprehend that since the beginning of the 20th Century, the conscience of promoting and safeguarding academic traditions has been associated with the idea of creating an Antiquity Museum, Academic Museum, or Museum of the History of the University. However, it is intriguing to consider Lopes' (2012) contextualized analysis that combined the need to preserve the past, its people, and their memories with the academic response to the demolition of the Old Alta. In fact, the author states that the Academic Museum was created by individuals who were opposed to the Old Academy and the political regime of the time.

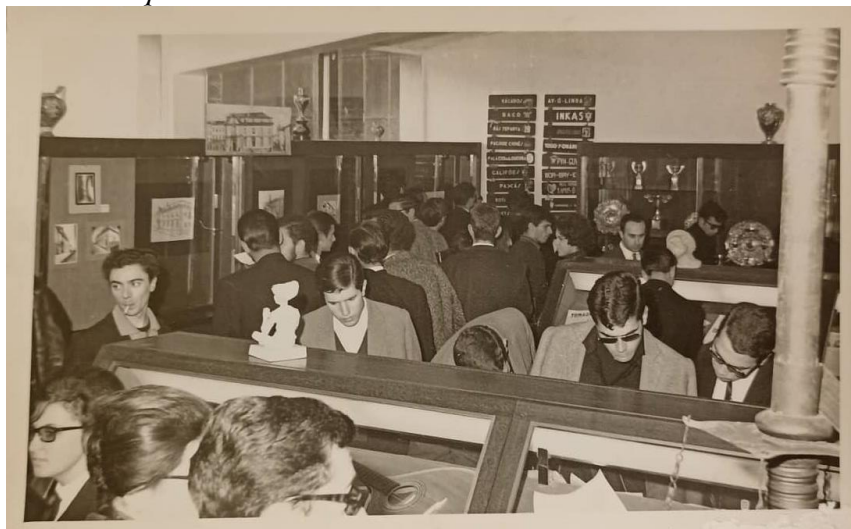
II. 4. 3. Second Phase: The Academic Museum of Coimbra – 1964–1987 – Academic Association of Coimbra Headquarters

Considering the success of the Academic Museum in 1958, it was transformed into a subdivision of the Academic Association of Coimbra¹⁰³. At the beginning of the 1960s, the Academic Museum was transferred to the new installations of the Academic Association of Coimbra (Figure 53) on Padre António Vieira Street, continuing the extensive exhibit activity that characterized this Museum until the end of the 20th Century.

In addition, it is important to refer that the Academic Museum, during the first decade of existence, had its revenues either from ticket and merchandising sales or from Rectory subsidizing and Queima das Fitas Commission participations, so much so that the Queima das Fitas Commission participated in the directives of the Academic Museum since its beginning.

Figure 51

Inauguration of the Academic Museum of Coimbra at the Academic Association of Coimbra's new headquarters



Note. The figure presents UC Students and other visitors at the inauguration of the Academic Museum of Coimbra on May 11, 1964, now located at the Academic Association of Coimbra headquarters. The iconographic document is kept at the Academic Museum of the University of Coimbra's Historical Archive.

¹⁰³ *Secção da Associação Académica de Coimbra.* Free translation by the author.

II. 4. 4. Third Phase: The Academic Museum of Coimbra – 1987–2022 - College of Saint Jerone

In 1987, the Academic Museum – lodged in the basement of the Academic Association of Coimbra for some time and, as a result, having its collection suffering from degradation – will harness from the dislocation of the Old Hospital of the University of Coimbra situated at the College of Saint Jerome (Figure 53). On December 11, 1987, the President of the Portuguese Republic, Dr. Mário Soares, officially inaugurated the installations.

Figure 52

The Facade of Saint Jerome College where the Academic Museum of the University was located



©Germana Torres

Note. The figure was produced by the author of the dissertation (April 2022) and displays the building where the Academic Museum of the University of Coimbra functioned until March 2022.

After renovation works, on December 20, 1990, the Academic Museum of Coimbra Installation Protocol was signed by the Academic Association of Coimbra, the Rectory of the University of Coimbra, the Former Students Association, and the Directorates of the Academic Association of Coimbra Autonomous Organisms. The Academic Museum of Coimbra would, from now

on, have a Museum Director. Nevertheless, after the death of the first director, from 1996 onward, this has never again occurred.

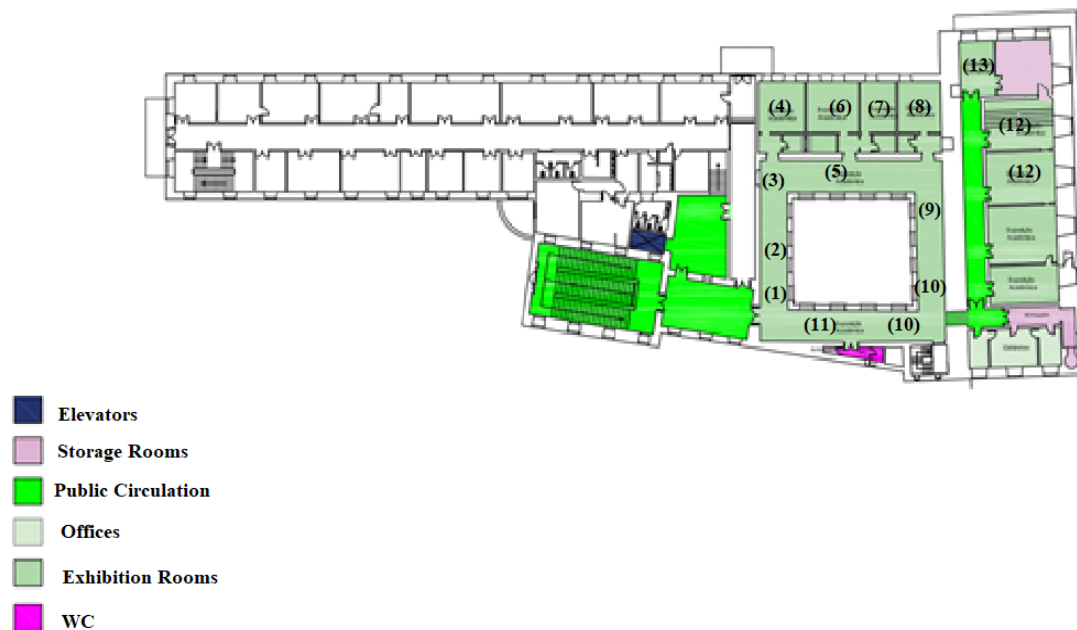
Once in the 21st Century, if in 2011, the Academic Museum had a coordinator, a tour guide, an administrative employee, and occasional trainees; in 2015, it showed significant signs of abandonment and disinvestment. Its designation changed to “Academic Gallery of the Science Museum” due to superior political management decisions. This position revealed the desire to optimize spending and a high disinterest in the Academic Museum of Coimbra.

Nevertheless, Regulation n. 675/2020 would regulate the existence of the Academic Museum of the University of Coimbra, under the Director of the Museums of the University of Coimbra, i.e., the Natural History and Science Museum and the Academic Museum.

Visitors of the Academic Museum of the University of Coimbra would encounter a museum thematically divided into thirteen Nuclei, namely (1) Student Garb and the Sebentas [apostiles] Nucleus; (2) The University Bell of 1741; (3) Fraternity Houses Nucleus; (4) Camonian Nucleus; (5) Academic Association of Coimbra Nucleus; (6) Fado Nucleus; (7) Queima das Fitas Nucleus; (8) Professors Garb Nucleus; (9) Enterro do Grau and Centenário da Sebenta Nucleus; (10) The Academic Briefcase, Honors Briefcase and Graduation Diplomas Nucleus; (11) Alumni Associations and Alumni Gatherings Nucleus; (12) Sportive Sections Trophies and Prize Winnings Nucleus; and (13) Praxe and Tertulias Nucleus (Figure 53).

Figure 53

Academic Museum of the University of Coimbra Building Floorplan – College of Saint Jerome



Note. The figure was granted by the Information and Communication Systems and Infrastructure Management Service of the University of Coimbra¹⁰⁴.

Additionally, the Academic Museum of the University of Coimbra has an essential and vast documental archive¹⁰⁵ and specialized narrative and scientific literature on the field. On the other hand, it holds an important iconographic and phonographic collection of unique musical compositions. All researchers wishing to use the Academic Museum of the University of Coimbra's Documental Archive must contact via email (museuacademico@uc.pt) explaining what is required, and a visitation date is settled. The museum

¹⁰⁴ *Serviço de Gestão de Sistemas e Infraestruturas de Informação e Comunicação.* Free translation by the author.

¹⁰⁵ The Academic Museum of the university of Coimbra's Historical Archive has documents from correspondence, newspaper clippings, magazines, written statements, music scores, posters, and many others.

believes this method is efficient and time-saving for personnel and researcher alike.

Until March 2022, those who wished to visit the Academic Museum of the University of Coimbra could do so from 9 AM to 1 PM and 2 PM to 5 PM through Monday to Friday but had to pre-book, verifying availability by email (geral@museudaciencia.org). Pre-booking was likewise required for ticket issuing by the Tourism Ticket Office. The reservation email would prove the existence of pre-reservation, guaranteeing a tour guide or an escorted visit.

Regarding ticket pricing, until March 2022, all UC Community (students, professors, personnel, and alumni associates) providing valid documentation was free of charge. The same was applied to ICOM¹⁰⁶, APOM¹⁰⁷, MC²P¹⁰⁸, and ALPHA CENTAURI¹⁰⁹ associates. Concerning the general public (individuals and groups), the entrance cost two euros.

¹⁰⁶ International Council of Museums.

¹⁰⁷ *Associação Portuguesa de Museologia* [Portuguese Museology Association]. Free translation by the author.

¹⁰⁸ *Associação de Museus e Centros de Ciência de Portugal* [Portuguese Association of Museums and Science Centers]. Free translation by the author.

¹⁰⁹ *Associação de Astronomia* [Astronomy Association]. Free translation by the author.

II. 4. 5. Forth Phase: The Academic Museum of the University of Coimbra – 2022 and onward – College of Jesus

The Office and Historical Archive of the Academic Museum of the University of Coimbra is now located at the College of Jesus (Marquis de Pombal Square), next to the UC Tourism Tick Office (Figure 54). To what personnel concerns, at the present moment, the Museum is composed of a Superior College Technician performing the roles of museum curator of the academic collection and archivist of the historical documentation; an administrative assistant that assists the Superior College Technician, and a Trainee in Museology by the Faculty of Arts and Humanities of the University of Coimbra performing technical preparation in museum management and product/content communication.

Figure 54

The College of Jesus Facade - Headquarters to the Museums of the University of Coimbra



©Germana Torres

Note. The headquarters of the Office and Historical Archive of the Academic Museum of the University of Coimbra as so as the location of the new performative Academic Museum.

Presently, the Academic Museum of the University of Coimbra is closed due to construction work on the new museological approach aligned with what the UC Strategic Plan 2019–2023 aims for heritage, Museum, and tourism investment. Nevertheless, it is publicly known that the (new) Academic Museum of the University of Coimbra¹¹⁰ will be relocated to the College of Jesus¹¹¹ and will meet a contemporary museological performance¹¹² venturing a University of Coimbra (–Alta and Sofia) for the 21st Century.

¹¹⁰ Director of the Museums of the University of Coimbra, Professor Paulo Trincão, states that “the Academic Museum is working hard on a new Museum. (...) A partnership that will be deepened with the Coimbra City Hall and which can open during 2022” (Simões, 2021).

¹¹¹ The Rector of the University of Coimbra, Amílcar Falcão, affirmed that the Academic Museum should be relocated to the College of Jesus and focuses on traditions and the history of the academy and its students (Público, 2022).

¹¹² The new Prefiguration of the Academic Museum is on the agenda for June/July 2022. The director of the Science Museum, Paulo Trincão, confirms that the Academic Museum has already been transferred to the College of Jesus (Simões, 2021).

PART III
METHODOLOGY



METHODOLOGY

Chapter III.1 starts by referring to the theoretical beliefs and methodological background (models, scales, and techniques) that support the investigative research question and conceptual map. Later, we remark on the sample, academic traditions, and on-site experience for better contextualization. Altogether, the reader can initially acknowledge the empirical framework that endorses the study project.

Following Chapter III. 2, more profound reflections on the paradigm, method, and survey research are reported. Discussion on methodological pros and cons and ethnicity provide the basis for a pondered research design, development, and further application of the online survey inquiry, throughout all operational phases of conceptualization. Towards the end, explanations on the nonparametric testes set the necessary contextualization.

Once in Chapter III. 3, the study provides descriptive information on sociodemographic and academic traditions and presents the tested statistical hypothesis and additional results provided by the survey application.

Lastly, Chapter III. 4 presents the result analysis and discussion, with interpretations and the theoretical body that supports the investigative outcomes. Moreover, inquires on study limitations and future adaptations finish the methodological and empirical component of Part III.

Chapter III.1. – Theoretical Assumptions and Research Question

This master's dissertation is mainly guided by Eslam Nofal's (2019) Ph.D. investigation, to which his research questions provided analytical support for the probed hypothesis: *phygital heritage facilitates the communication of heritage information*¹¹³. From his viewpoint, the author believes that phygital approaches deliver access to rich and vast forms of information in personalized and immersive formats. To this end, and even though Nofal directs and presents research on architectural prototypes (Amended Phygital Heritage Model), he hypothesizes that phygital heritage structures prospective means that engage the public in meaningful and significant communication, raising their awareness on heritage property through experiential participation.

In this line of reasoning and in order to recognize a valid explanation on consumption behavior in computer-facilitated environments (Marangunić & Granić, 2015)¹¹⁴, this master's research analyzed the inquired community's **Attitude Towards Digital Information Technologies**. In addition, the relation between UC Students' attitude towards digital technologies and the apprehended technological intention of use (the way consumer behavior

¹¹³ The fundamental hypothesis of his research is that the approach of phygital heritage can become an engaging and meaningful communication medium of the tangible and intangible information of built heritage. The main research question that the investigation addresses is: *How can "phygital heritage," the integration of digital technology into physical reality, facilitate the communication of built heritage information to museum visitors?* Nofal (2019).

¹¹⁴ In fact, the Technology Acceptance Model has been tested in domains that extend from the World Wide Web and mobile services (Gao et al., 2011; Tsourela & Nerantzaki, 2020; Lin et al., 2020), to e-commerce (Fedorko et al., 2018), e-learning (Ibili et al., 2019; Granić & Marangunić, 2019) or e-tourism (Huang et al., 2015; Pourfakhimi et al., 2018, 2019; Kuo et al., 2019; Alkhatib & Bayouq, 2021).

perceives usefulness and ease of use) demonstrated how expectably phygital environments are attractive and promote tourist experience enhancement.

From this perspective, by applying the **Technology Acceptance Model** (Davis, 1989), we agree that the acceptance of information technology results in the theoretical assumption that *usefulness* and *ease of use* will predict the *usage intention* of a person towards information technology. Thus, *perceived ease of use* is understood as “the degree to which a person believes that using a particular system will be free of effort”, while *perceived usefulness* is defined as “the degree to which a person believes that using a particular system will enhance his or her job performance” (Davis, 1989: 320). In this context, *usage intention* will then “define the degree to which an individual is willing to engage in a particular behavior” (Lin et al., 2020: 5), i.e., the stronger the intention, the higher the probability of engaging.

Nevertheless, and even though authors as Hai and Kazmi (2015) reason on the weakness of the Technology Acceptance Model to explain the user’s online shopping intention to buy, reject, or accept the use of technology; Pourfakhimi et al. (2018) studied the impacts of ease of use and usefulness empirical testing repetitiveness; and Chandio et al. (2017) examined its robustness to predict the adoption of new technology in the e-government context; we believe that the classical approach¹¹⁵ best correlates with the study conducted. In the far reach, to best understand how the Tourism Department and the Academic Museum of the University of Coimbra can enhance the visitors experience to

¹¹⁵ The theoretical model of the TAM (Davis, 1989) is formulated based on the Theory of Reasoned Action (Fishbein & Ajzen, 1975) and the Theory of Planned Behavior (Ajzen, 1985). Davis changed the TRA model by dropping the subjective norms and adding two belief variables: perceived usefulness and perceived ease of use, to predict the user’s attitude towards a system. The model has been used and extended with some modifications: Technology Acceptance Model 2 (Venkatesh & Davis, 2000), the Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003), and the Technology Acceptance Model 3 (Venkatesh & Bala, 2008) (cited by Aziz & Kamaruddin, 2020, in Habidin, et al., 2020).

the *University of Coimbra – Alta and Sofia* this research undertook the UC Student's perspective to (a) understand the academic community's perception on phygital heritage; (b) assert the Academic Museums role with and for the local and academic community; (c) comprehend how information and communication technologies can improve and create (memorable) tourism experiences that generate market placement, word of mouth promotion, and revisitation.

To what concerns the **Attitude Towards Digital Information Technologies** analysis this study addresses the cognitive component of **attitude**, i.e., “beliefs, thoughts, and attributes associated with an object” (Haddock & Maio, 2008: 116), and accepts that the concept of attitude towards digital information technologies is an “enduring, unidimensional summary evaluation of the [means] that presumably energizes behavior” (Spears & Singh, 2004: 55).

To this end, and key to most definitions, “attitude” reflects the reaction of an individual to an object assessing it (abstract, concrete, self, or social groups) on a dimension that stretches from negative to positive (Fabrigar et al., 2005; Haddock & Maio, 2008). Additionally, “attitude” can be evaluative (bad/good; insecure/secure, and others), resulting from a relatively continuous internal state; and vary in *valence* (negative/positive) and *strength* (feel less strongly/very strongly) (Eagly & Chaiken, 1993)¹¹⁶. Nevertheless, it is important to stress that, in this research, attitude is assessed regarding the intention of use and does not necessarily correlate with an actual behavioral position (Guyer & Fabri, 2015).

¹¹⁶ *The Psychology of Attitudes* is arguably the most comprehensive volume on the attitude concept. The authors defined “attitude” as “a psychological tendency expressed by evaluating a particular entity with some degree of favor or disfavor.” (p. 1).

In this line of ideas, knowing that marketing researchers engage attitude measurement towards real and imagined consumer products and services, we analyzed UC Students' Attitude Towards Information Digital Technologies by applying a **Semantic Differential Scale**¹¹⁷. This response scale consists of antonym adjective pair anchors on a 5-point rating scale. The adjective pairs are listed with negative adjectives on the left and positive adjectives on the right. Participants must select the point on each scale to indicate their object evaluation (Stoklasa et al., 2019; Won Shin et al., 2020).

All in all, the Semantic Differential Scale technique reveals the participants' overall assessment of the object, their perception of concepts (Divilová, 2016) and the understanding of the participants' semantic profile (Paradis et al., 2015). Furthermore, the Semantic Differential Scale is easy to manage and enables relatively quick evaluation. In fact, for online surveys, it assumes great importance because not only is it less time-consuming for the participant, but it also gives an objective and easier understanding of the overall picture analysis (Al-Hindawe, 1996; Mudd, 2005; Chráskaa & Chrásková, 2016). On the other hand, it is of simple production for the interviewer and of higher rate correctness. Overall, the technique allows very reliable and valid output information collection (DeVellis, 2016), even though Everett (1973) suggests that the semantic differential is unsuitable for personality assessment due to expenses in measurement precision format.

On the matter of the **Likert-Type Psychometric Technique** it is employed to measure the student community's pragmatic opinion on the University of Coimbra's intangible cultural heritage, the importance of the Academic

¹¹⁷ During the questionnaire structure this scale and others presented were considered. See pages 149-150.

Museum of the University of Coimbra, and new technologies in the museum context.

In truth, Likert Scales present a unidimensional measurement ratio with multiple categories used by researchers to collect respondents' attitudes or feelings about a particular issue (Kriksciuniene et al., 2020). Therefore, "participants are asked to show their level of agreement (namely from strongly disagree to strongly agree) with the given statement on a metric scale" (Joshi et al., 2015: 398). In this study, a 5-point symmetric scale is applied to offer a valid spectrum of choice and provide the participant with independent and balanced responses – the position of neutrality lies in between the extremes of strongly disagree and strongly agree, for example (Dolnicar et al., 2011; Taherdoost, 2019).

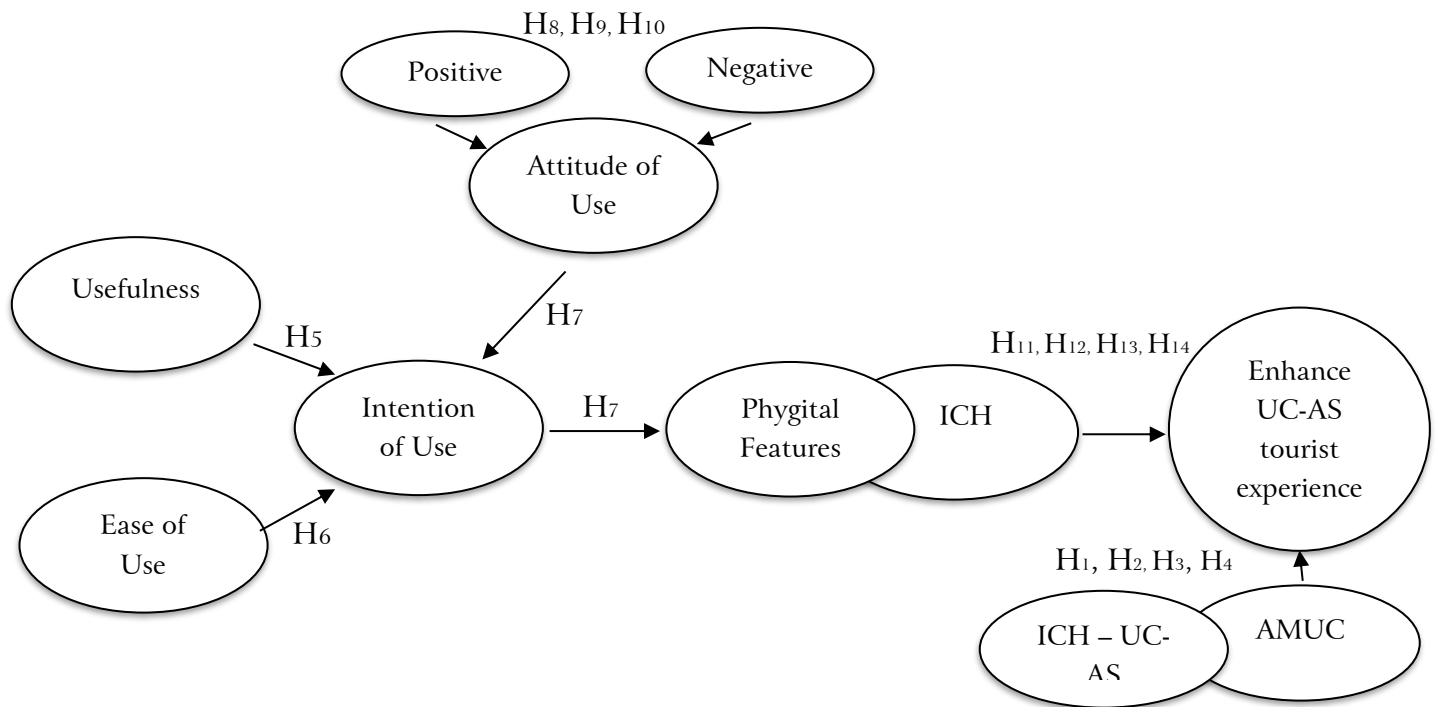
Although limitations to Likert Scales demonstrate that (a) the category description most certainly affects the responses (b) artificial classifications or groupings might not be sufficiently descriptive for complex, continuous, and subjective phenomenon's (Vickers, 1999), or (c) 'too many response categories may lead to difficulties in choosing [or loss of information], and too few may not provide enough choice or sensitivity, forcing the respondent to choose an answer that does not represent the person's true intent' (Hasson & Arnetz, 2005: 2), Likert-scale questionnaires present indeed many advantages.

As so, some of the advantages are (a) a relatively quick gathering of data from large numbers of respondents, (b) the provision of highly reliable personal estimates, and (c) the data obtained can be successfully compared, contrasted, and combined with other data-gathering techniques, such as open-ended questions and on-site observation (Nemoto & Beglar, 2014: 2).

On the other hand, combining the itemized rating scales will enable the understanding of how the student community internally relates with the intention of use, while the Technology Acceptance Model will acknowledge the existing external relations. In addition, **nominal, ordinal and interval measure scales** will characterize the UC students and **ordinal measure scales** will acknowledge the understanding of matters such as opinions or agreements. In fact, by observing Figure 55, we can understand how the conceptual map unfolds and in which way they interrelate with the hypotheses led by the research question:

Can the intangible cultural heritage of the University of Coimbra and phygital technology enhance the tourist experience?

Figure 55
The Conceptual Map



Note. The figure was produced by the author and represents the conceptual plan of the study.

Figure Caption:

- H1** The valorization of academic traditions varies according to the campus where the UC students' courses are given.
- H2** Visits to the Academic Museum vary according to the campus where the UC students' courses are given.
- H3** The level of importance assigned by the UC students to the Academic Museum varies according to age.
- H4** UC students that visited the Academic Museum know more academic traditions than those who have not.
- H5** If UC students perceive technology usefulness, then intention to use is directly affected.
- H6** If UC students perceive technology ease of use, then intention to use is directly affected.
- H7** UC students believe that attitude towards technology and intention of use will directly affect the behavioral experience.
- H8** UC students' attitude towards technology relates to age.
- H9** UC students' attitude towards technology relates to sex.
- H10** UC students' attitude towards technology relates to campus.
- H11** The type of immersive experience UC students most value varies in relation to age.
- H12** The type of immersive experience UC students most value varies in relation to sex.
- H13** The type of immersive experience UC students most value varies in relation to course.
- H14** UC students believe that the Academic Museum can significantly enhance the tourist experience if phygital features are added in the museum context.

By accepting Nofal's theory, 'Phygital heritage facilitates the communication of heritage information' we relate the key concepts that support the empirical study (Figure 1)¹¹⁸, and by addressing the tested hypotheses (Figure 55), we connect and promote the construction of knowledge regarding:

- (a) technology in tourist attractions and museum contexts as tourism experience enhancers;
- (b) phygital features applied to the *University of Coimbra – Alta and Sofia* and the Academic Museum of the University of Coimbra museological context;
- (c) UC students' intention of use and attitude towards technology; and
- (d) UC student's opinion on the University of Coimbra's intangible cultural heritage and the Academic Museum of the University of Coimbra role to and for the community;

In this line of understanding, if, on the one hand, we descriptively examine the inquired student community's most significant intangible cultural heritage and which technologies they believe will enhance the tourist destination experience at the *University of Coimbra – Alta and Sofia*, on the other we characterize and understand how the sample relates to intangible cultural heritage and information and communication technologies.

Consequently, the intangible legacy appointed results from direct observation of the Academic Museum of the University of Coimbra collection exhibition; the analysis of primary sources of historical information (written documents, pictures, posters, music albums, and yearbooks) held in the Academic Museum

¹¹⁸ See page 5 of the Master's Dissertation.

of the University of Coimbra's Historical Archive; secondary and tertiary source literature review; personal living experience as a University of Coimbra student; and professional knowledge as personnel of the cited museum as so as a former worker of the University of Coimbra Tourism Department.

To what concerns the Academic Museum of the University of Coimbra's collection it is thematically organized and directly relates to the intangible cultural heritage presented: students' and professors' garbs, University bells and University Archers, Fraternity Houses (*Repúblicas*), Cultural and Sports Sections, Autonomous Organisms, Academic Association of Coimbra (Student Union), Coimbra Fado, Academic Festivities, Tertúlias (social gatherings), Charamela (group of woodwind musicians), and Student Rituals, Customs and Symbols (*Praxe* and *Insignias*).

In relation to the Internet of Things, and augmented and virtual reality technology the considered means were chosen according to the *University of Coimbra – Alta and Sofia's*' destination characteristics and potential as so as on personal past on-site experiences, namely at: *A Story of Light*¹¹⁹ (Coimbra, Portugal); Carlos Relvas House-Studio (Golegã, Portugal); Cathedral de Sevilla Audio Guide App (Sevilla, Spain); Chartres Cathedral and Light Festival (Chartres, France); City of Wine¹²⁰ (Bordeaux, France); Delta Center of Coffee Science (Campo Maior, Portugal); Discoveries Museum (Belmonte, Portugal); Douro Museum (Peso da Régua, Portugal); Futuroscope Theme Park (Poitiers, France); Interpretive Center of the Battle of Aljubarrota (Aljubarrota, Portugal); Island of Nantes (Nantes, France); Lisbon Story Center (Lisbon, Portugal); Money Museum (Lisbon, Portugal); Montemor-o-Novo Interpretative Center (Montemor-o-Novo, Portugal); Municipal Museum of

¹¹⁹ *Uma História de Luz*. Free translation by the author.

¹²⁰ *Cité du Vin*. Free translation by the author.

Vila Franca de Xira (Vila Franca de Xira, Portugal); Museum of Architecture, Art and Technology (Lisbon, Portugal); Pope's Palace (Avignon, France), PO.RO.S¹²¹ (Conimbriga, Portugal); Porto Legends (Porto, Portugal); *Quarries of Light*¹²² (Les Baux-de-Provence, France); Romanity Museum (Nimes, France); *Serralves in Light*¹²³ (Porto, Portugal); Temporary Exhibition *No Plan for Japan* at the Oriente Museum (Lisbon, Portugal); and Zêzere Ecomuseum, (Belmonte, Portugal).

All this considered, if, on the one hand, we wish to comprehend in which ways the tourist experience can be enhanced, on the other, we aim to discover how the student community relates with the use of technology in the museum context. Consequently, this study will also allow understanding of how (a) the inquired sample perceives the intangible cultural heritage of the University of Coimbra as a means of identity; (b) the Academic Museum of the University of Coimbra is viewed as a promoter and guardian of communal identity; (c) the Intangible Cultural Heritage and the Academic Museum is understood as an agent of the UC image and UC brand; and (d) acknowledge how the Intangible Cultural Heritage and the Academic Museum can promote better tourist experiences. Altogether, by establishing associations between variables the study aims to not only diagnose the samples perception on the Intangible Cultural Heritage of The *University of Coimbra – Alta and Sofia*, but also construct decision-making knowledge that will support museum and tourist management as well as communicational and promotional strategies.

¹²¹ *Portugal Roman Museum in Sicó*. Free translation by the author.

¹²² *Carrières de Lumières*. Free translation by the author.

¹²³ *Serralves em Luz*. Free translation by the author.

Chapter III.2. – Research Method and Investigation Procedures

III.2.1. Paradigm, Method, and Technique

Accepting that – apart from the theoretical review – all researchers attempting to formulate conclusions from an investigation rely on verifiable evidence measured or proven using observational methods; it is readily accepted that in an empirical investigation, the researcher attains conclusions by testing data obtained through scientific methods determined by the nature of the study.

As so, in this inquiry, we are guided by the **post-positivist paradigm** approach, i.e., the philosophical assumptions and the intellectual structure that leads the study's proceedings (Krauss, 2005; Cannella & Lincoln, 2017; Rezaei, 2019) is determined by critical realism, while the hypotheses and consistent data are supported by the quantitative method and deductive reasoning.

Understandingly, the study's guidelines wish to “establish [provisional] facts or laws” (Veal, 2018: 39), suggesting that truth even though non-probabilistic results from a pragmatic approach and as so the outcomes can “advance scientific knowledge or provide practical benefits and solutions to problems” (Henderson, 2011: 342). Still, it is essential to consider that post-positivism understands research as a succession of logically related procedures and resorts to knowledge based on objectivity, standardization, and control within the investigation process (Creswell, 2013; Creswell & Creswell, 2018; Kaushik & Walsh, 2019; Stockemer, 2019).

In this line of reasoning, the applied **exploratory quantitative method** analysis results in a study carefully designed using reconstructed logic (Neuman, 2014). The sets of variables – that gather data formed by numbers and statistics, organized in tables and figures – are structurally organized by objective measurements and examination procedures (Sue & Ritter, 2007; Edmonds & Kennedy, 2017). In the long run, the generated outputs produce a replicable research study due to its high stability and clearly defined research question to which responses were sought (Babbie, 2016), even if unbiased only to some extent (Trochim, n.d.).

III.2.1.1. Survey by Questionnaire

The **survey research** appears as a fundamental data collection technique to empirically and scientifically study and provide knowledge on opinions, attitudes, and behaviors (Ballou, 2008; Neuman, 2014). Mathiyazhagan and Nandan (2010: 34) state that it is a “method of descriptive research used for collecting primary data based on verbal or written communication” while Check and Schutt (2012: 160) define it as “the collection of information from a sample of individuals through their responses to questions”.

In this line of reasoning, the survey research usually involves conducting a **questionnaire**, i.e., a tool that collects information (Ruel et al., 2016) through question making and acts as the “medium of communication between the researcher and the subject” (Brace, 2008: 4).

The popularity of this technique widely employed in social sciences (e.g., economy, psychology, marketing, geography, tourism, or anthropology) is due to its versatility, efficiency, and generalizability. It is efficient in a way that

many variables can be assessed without significantly increasing the study's cost, time, or accessibility (Schonlau et al., 2002; Ruel et al., 2016). On the other hand, the data can be collected from large populations (Vannette & Krosnick, 2018) – probability sampling and generalizability – offering the means for developing an illustrative picture of the examined population's attitudes and characteristics (Creswell, 2013; Stockemer, 2019).

According to Schonlau et al. (2002), online surveys should be considered when: (a) conducted with a convenience sample; (b) in an organization that has a list of e-mail addresses for the target population; (c) the sample size is moderately large; and (d) the survey has multimedia or contains interactive elements.

In fact, **online survey research** presents many advantages when considering (Singh, 2006; Denscombe, 2010; Vaske, 2011; Dahikar et al., 2014; Nayak & Narayan, 2019) automation and immediate access; low time consumption; easy to send e-mail participation reminders; contact efficiency with people that have common interests or characteristics; participation convenience and easiness; respondent openness to share (more) information; participant anonymity; and design flexibility or survey software programming and personalization.

Nevertheless, it is essential to consider that this survey method does produce lesser response rates; is not appropriate for low literacy audiences; requires internet access; participants can experience technological problems; the questionnaire e-mail request can be viewed as spam mail or virus and be deleted; some respondents will choose answers before reading the questions; others can face survey fatigue or undergo cooperation problems; and the interviewer can witness limited sampling or respondent input due to probing inability (Evans & Mathur, 2005; Glasow, 2005; Sue & Ritter, 2007; Rice, et al., 2017; Vannette & Krosnick, 2018).

To this extent, and to avoid adverse experiences during the survey research process, Vannette (2018) proposes an extensive series of recommendations for best practices¹²⁴. The combination between his work and the resources he refers to is a valuable tool that opens awareness throughout the scientific survey design and offers solutions and referenced guidance. Equally essential is the importance of survey ethics (Fundação da Ciência e Tecnologia, 2014), voluntary participation (Gilman, 2008), and informed consent (Valerio & Mainieri, 2008)¹²⁵, considering the intrusiveness of the model and that it involves human subjects.

In the overall, it is essential to consider a balanced combination of logical structure, lack of ambiguity, and transparent and ethical purpose along all phases of online questionnaire development. In truth, when carefully treated, the appointed factors will highly influence the credibility and output information while, in the aftermath, they interestingly reflect a quasi-perfect combination of science, art, and technology.

¹²⁴ Vannette (2018: 331 – 343) presents a list of best practices to matters as response rates; question design and presentation; visual display and survey navigation; coding and website usability; measurement tools, data and paradata collection modes; transparency and credibility; as so as confidentiality and anonymity.

¹²⁵ The intention of informed consent is to guarantee that participants understand (a) the nature and intention of the survey; (b) what is expected of them; (c) the necessary length of time to complete the survey; (d) how the data will be used; (e) and the research participants rights and responsibilities (Valerio & Mainieri, 2008)

III.2.2. Research Design, Development, and Application

III.2.2.1. Research Question

The meaning and importance of the **research question** is widely discussed in the scientific literature. Wood and Ross-Kerr (2010: 2) describe it as “an explicit query about a problem or issue that can be challenged, examined and analyzed, and that will yield useful new information”. On the other hand, Mattick et al. (2018: 105) state that it will “send the researcher on a quest to identify or collect data that can be analyzed and interpreted, such that it provides new insights”. While Sue and Ritter (2007: 18) argue that the research question will help keep in mind the general objectives that clarify the study and determine who will be surveyed and what will be asked.

Given so, when starting an investigation study, it is crucial to define the research question that will guide the purpose of the inquiry. According to Moreira (2013: 326), “the research question should be transformed into specific investigation questions [that are] clear and precise, operational, and testable, [and] allow empirical validation through a survey questionnaire.”

In this line of reasoning, when applying descriptive research, specific investigation questions are formed as **hypotheses** (Veal, 2018), i.e., testable predictions deducted from a theory or arisen from a tentative solution to a problem (Dayanand, 2018), that guide the investigation concerning data collection, organization, and analysis method selection (Kabir, 2016).

Given the expound, in this study, the **research question** that directs the investigation process and the general objectives that we wish to achieve is:

*Can the intangible cultural heritage of the University of Coimbra and
phygital technology enhance the tourist experience?*

III.2.2.2. General Objectives

In addition, the **general objectives** (GO), i.e., the “specific statements indicating the key issues to be focused on in a research project” (Thomas & Hodges, 2010: 39) that this study expects to achieve in general terms and that shape the investigation (design of study and sample size) are:

GO₁ Determine which intangible cultural heritage UC students most relate to.

GO₂ Identify which immersive technologies UC students prefer to experience in the University of Coimbra museum context.

GO₃ Understand UC students' attitude towards technology in the museum context.

GO₄ Perceive the UC students' degree of technology intention of use.

GO₅ Attain UC students' opinion on phygital (intangible cultural) heritage as a tourist attraction to the University of Coimbra and the tourist destination of Coimbra city.

GO₆ Apprehend UC students' opinion on the importance of the Academic Museum's role for the Academic Community and the University itself.

III.2.2.3. Tested Hypotheses

While the defined and **tested hypotheses** (H) are:

H₁ The valorization of academic traditions varies according to the campus where the UC students' courses are given.

H2 Visits to the Academic Museum vary according to the campus where the UC students' courses are given.

H3 The level of importance assigned by the UC students to the Academic Museum varies according to age.

H4 UC students that visited the Academic Museum know more academic traditions than those who have not.

H5 If UC students perceive technology usefulness, then intention to use is directly affected.

H6 If UC students perceive technology ease of use, then intention to use is directly affected.

H7 UC students believe that attitude towards technology and intention of use will directly affect the behavioral experience.

H8 UC students' attitude towards technology relates to age.

H9 UC students' attitude towards technology relates to sex.

H10 UC students' attitude towards technology relates to campus.

H11 The type of immersive experience UC students most value varies in relation to age.

H12 The type of immersive experience UC students most value varies in relation to sex.

H13 The type of immersive experience UC students most value varies in relation to course.

H14 UC students believe that the Academic Museum can significantly enhance the tourist experience if phygital features are added in the museum context.

Thought-provoking is to emphasize the importance of the hypotheses that shape the selection of questions applied. According to Kabir (2016: 56) “hypotheses are the ‘guiding light’ and the link between the theory and practice, connecting related facts and information organized as wholes” or in the words of Moreira (2013: 326) “the hypothesis is a logical architecture of causal relationships preconceived between variables that result from the theoretical interpretation of the reality that is the object of study.”

In fact, the formulated hypotheses function as the main determiners that structured the online questionnaire. Simultaneously, they merge within the investigation’s general objectives and act as the definer of responses to the research question that tested the devised assumptions.

Nevertheless, the questionnaire’s design and structure resulted from a broader combination of research components, namely: (a) scientific and methodological literature review on the subjects; (b) online questionnaire observation and examination; and (c) past personal and scientific knowledge.

III.2.2.4. Questionnaire Structure

The developed online questionnaire (Annex) *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space* is organized in four parts that, although independent, will sequentially articulate with one another (Table 9).

The first part – *The Intangible Cultural Heritage of the University of Coimbra* – focusses on understanding the inquired population’s knowledge on the University of Coimbra’s Intangible Cultural Heritage and the significance it personally assumes; the relation UC students have with the Academic Museum

of the University of Coimbra; and the importance that the Academic Museum assumes for the student community, the University, the tourist attraction, and the Coimbra destination. (*what?* and *how?*).

In the second part – *The University of Coimbra Tourist Attraction, Museology, and Innovation* – the questions wish to comprehend the participants' technological preferences and which technologies they find desirable to incorporate in the *University of Coimbra – Alta and Sofia's* museum context (*what?*).

The third part – *Immersive Technologies: Acceptance and Attitudes* – evaluates technology acceptance – usability and ease of use – relating to past experiences; wills to understand the participants' attitude towards technology and analyze how the combination of these can predict the intention of use and immersive experience demand (*what?* and *how?*).

In the last part – *Personal Characterization* – the questionnaire aims to obtain a sociodemographic description of the inquired population (*who?*); while the last question is open, allowing personal contribution to those that wish to leave an opinion on the role and the location of the Academic Museum as so as the importance (or not) that it can assume for the tourist experience (*what? where?* and *why?*).

Altogether, the online questionnaire specifically designed for this study intended the development of an unambiguous, diverse, versatile, and intuitive questioning model. In fact, and even though each question was subjected to mandatory reply, the last was open answered allowing the participant to express his or her opinion. In the overall, we resorted to applying a plurality of response

scales¹²⁶ such as Likert-scale, semantic differential scale, ordinal, nominal and interval scale, as so as ranking scale¹²⁷.

¹²⁶ See pages 138 – 139 of the Master's Dissertation.

¹²⁷ Ranking Scale allows participants to rank their answers/options according to their preferences (Question Type – Ranking, n.d.).

Table 7
The Questionnaire Structure, Survey Contents, and the Relation with Research Specific Objectives

	Survey Content	Research Specific Goals
0. Mission and Framework	<ul style="list-style-type: none"> • Institutional framework • Overall goals • Component parts 	<ul style="list-style-type: none"> • Provide the survey with transparency and credibility • Set the data policy
1. The University of Coimbra's Intangible Cultural Heritage <i>(what? and how?)</i>	<ul style="list-style-type: none"> • ICH • Academic Museum – visit and knowledge existence • Significance of the Academic Museum for the Academic Community and the University of Coimbra • Touristic Importance of the Academic Museum 	<ul style="list-style-type: none"> • Understand the knowledge and significance on the University of Coimbra's ICH • Comprehend what relation exists with the Academic Museum • Obtain opinions on the role of academic museums • Understand how the Academic Museum can positively influence the community and the tourism experience
2. The UC Tourist Attraction, Museology, and Innovation <i>(what?)</i>	<ul style="list-style-type: none"> • Immersive Technologies 	<ul style="list-style-type: none"> • Evaluate technological preferences • Identify which technologies are desirable in the UC-AS context
3. Immersive Technologies: Attitudes and Acceptance <i>(what? and how?)</i>	<ul style="list-style-type: none"> • Usability • Ease of Use • Intention of Use • Attitude towards Technology 	<ul style="list-style-type: none"> • Evaluate usability and ease of use in relation with past experiences • Comprehend how usability and ease of use contribute to intention of use • Understand the inquired attitude towards technology • Understand the importance that technologies play
4. Personal Characterization <i>(who?, what?, where?, and why?)</i>	<ul style="list-style-type: none"> • Sample profile, geographic and demographic data 	<ul style="list-style-type: none"> • Characterize the inquired population • Personal contribution on the location, the role and opinion on what an Academic Museum means

Note. Adapted from Moreira (2013).

III.2.2.5. Questionnaire Operational Conceptualization

All things considered, the study's survey research process is divided into three main phases (as summarized in Figure 56)¹²⁸:

In the first phase – (1) **survey construction** – we start by determining the purpose of this investigation: to gather the University of Coimbra's student community's opinions, preferences, personal meanings, and beliefs to what concerns the academy's intangible cultural heritage and immersive technologies in the museum context. On the other hand, we wish to understand how the combination of these variables can enhance the *University of Coimbra – Alta and Sofia's* tourist experience.

To this extent, and in order to formulate the object of investigation (general objectives and statistical hypotheses), this study project initially gathers information from prior primary, secondary, and tertiary source analysis and literature review. Additionally, we also participated in different online survey studies of similar nature.

The combination of all factors resulted in the design of seventeen questions, some aided by images and hyperlinks to better understand the intended investigation. Furthermore, it is essential to point out that all content was subjected to careful analysis so misspellings, omissions, and any informatic program limitations could be eliminated.

In the second stage – (2) **survey conduction** – we decided upon the population and sample design. We directed the study to all UC Students of Courses that Grant an Academic Degree (UC – CGAD). In fact, the foundation of the Academic Museum of the University of Coimbra rose, in 1951, as a student's

¹²⁸ For Figure 56 see page 139 of this Master's Dissertation.

project, so much so that it is the first and only worldwide museological structure concerning academic traditions created by an academic community. As so, we believe that the UC Students stand as the proper kick off population to inquire.

To apply the online survey, we contacted the UC Academic Management Services¹²⁹ to obtain the exact number of students that attend Courses Granting an Academic Degree per faculty and per cycle of study¹³⁰. The solicited was directed to the Planning, Management, and Development Unit that then provided the requested information. Initially, we aimed to apply the stratified sampling method, but during the investigation this methodological procedure had to be abandoned.

As so, we decided to employ the **convenience sample** to collect the required data. It is important to point out that although the convenience sample is a **non-probabilistic method** and does not produce a statistically representative description of the population – guaranteeing that the outputs present the exact characteristics of the dimension size – we resorted to this sampling method attending to the pandemic scenario.

In fact, and although it is crucial to apply careful analysis to a convenience sampling method, the convenience sample allows the research data to result from an accessible pool of respondents (Abreu, 2006). On the other hand, this sampling method also relates to a less available budget, implies lower time consumption, and according to Veal (2018: 430), it resorts the “use of conveniently located persons or organizations”.

¹²⁹ *Serviços de Gestão Académica da Universidade de Coimbra*. Free translation by the author.

¹³⁰ Due to data processing this study had to consider information regarding the academic year of 2019/2020.

As so, we must point out that we obtained a relationship between the population and the sample size of 95% with a standard deviation of 0.1. In this line of reasoning, we can confirm that the output is valuable to identify overall hypotheses and upcoming challenges in an exploratory research context.

It is equally important to underline that, in this phase, a pretest was conducted before applying the final survey. In truth, in the survey development process, pretesting¹³¹ is an essential step that will help increase the viability and reliability of the testimonial survey evidence and improve the survey experience (Singer, 2018). Consequently, in this study, we lead a five-day pretesting exercise (from the 24th to the 29th of May 2021) with the participation of ten volunteers. The observations appointed allowed the following questionnaire refinements: question reduction and reformulation, software error correction, and accurate definition of how long the survey participation would last.

All things considered, the online questionnaire – created resorting to the LimeSurvey tool – was applied between July 7th and October 14th, 2021 (99 days). According to Abreu (2006) a well-defined questionnaire application collection period adds value to the research and increases the information reliability. As so, the collection period was carefully chosen to not only reach the senior students of 2020/2021, but also attain the new-coming students of 2021/2022.

To this point, the participants were accessed by email and social media following two electronic disclosure requests sent to all UC services, divisions,

¹³¹ According to Singer (2018), when performing pretest questionnaires, researchers focus on how respondents reply, which doubts do participants experience, how they interpret questions, perform tasks, and react, in which order do they reply, and if lapses are detected. To this, Sue and Ritter (2007: 13) add that “pretesting the questionnaire will provide feedback about the ease of navigation, and an understanding of the target population will aid in including interesting and relevant items to the respondents.”

departments, faculties, student nuclei, cultural and sports sections, autonomous organisms, and the Coimbra Academic Association¹³², resulting in the subsequent distribution (Table 8): the months that registered the most participants were July (61%), October (21%), and September (14%). These months correspond to the two moments of disclosure request and represent a regular academic year activity. Contrarily, the month of August (4%) is the less representative and naturally corresponds to the academic year vacation period.

Table 8
Participant Distribution by Months

Time Period	Absolute Value	%
July (7th - 31st)	280	61%
August (1st - 31st)	20	4%
September (1st - 30th)	64	14%
October (1st - 14th)	97	21%
Total 99 days	461	100%

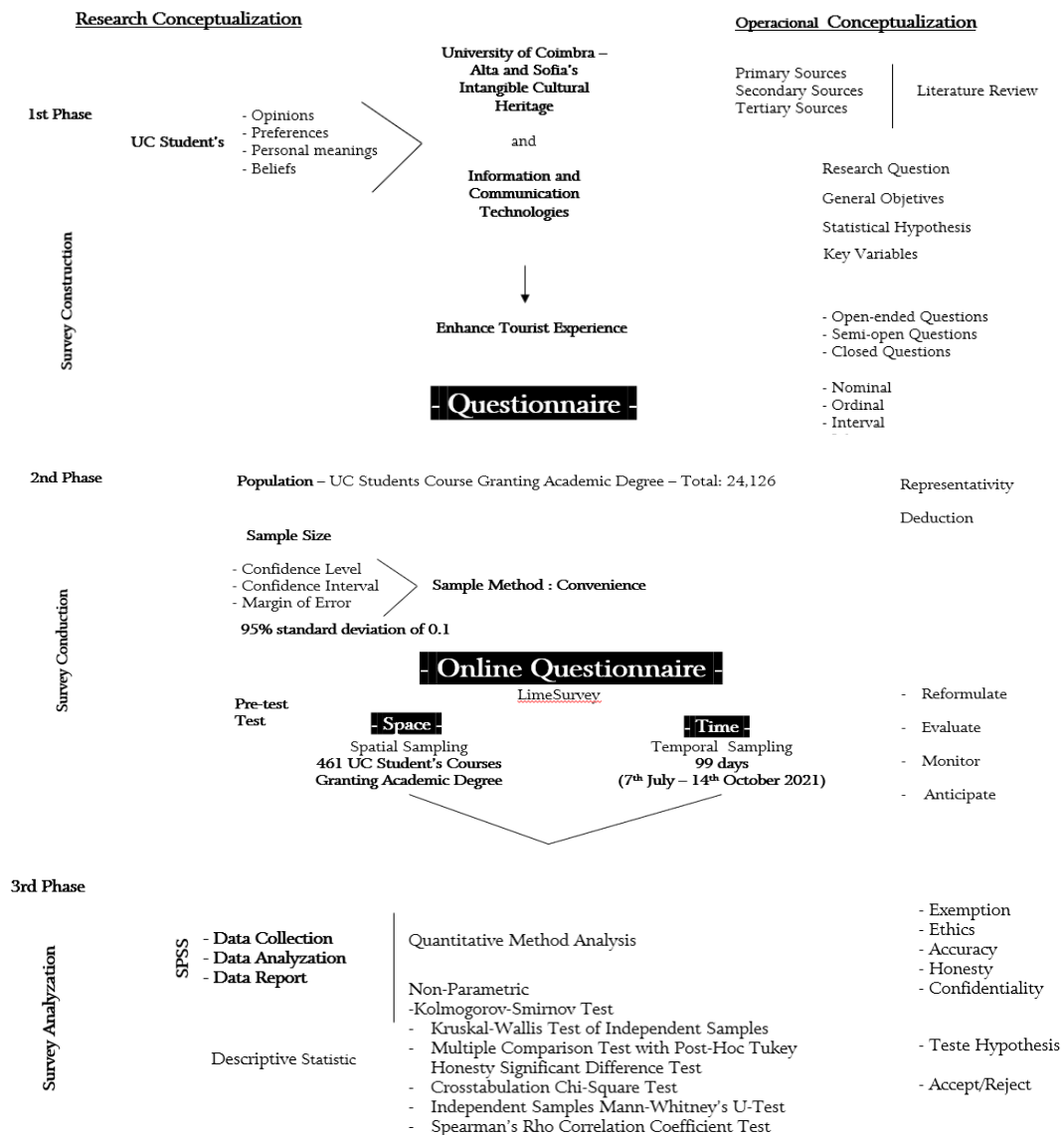
Note. The table was produced by the author and demonstrates the questionnaire participation distribution in absolute values and percentages.

The last and final phase – (3) **survey analysis** – data analysis, reported results, and discussion outcomes (Chapter III.3.3.) exposes which tested hypotheses can be accepted, how the information collected replies to the research question, and what study paradigm can be drawn. By reporting to the software Statistical Package for the Social Sciences (SPSS), we initiated by visualizing the sample characterization: sociodemographic and academic distribution; then we followed by analyzing the tested hypotheses and other analysis results; and

¹³² The first request was sent in July 2021 and a second solicitation in October 2021. During both contacts, all student nuclei, cultural and sports sections, autonomous organisms, and the Coimbra Academic Association was reinforced by Facebook chat.

lastly, we presented and discussed the results appointing further understanding on tourist experience enhancement at the asset *University of Coimbra – Alta and Sofia*.

Figure 56
 Questionnaire Research and Operational Conceptualization – 1st, 2nd, and 3rd Research Phases



Note. The figure was produced by the author of the dissertation and synthesizes the conceptual and operational research phases of the undergone quantative method study.

Furthermore, it is important to state that due to the sample size, it's abnormal distribution of variables, and the low or lack of variance homogeneity we conducted **nonparametric tests**, namely:

- **Kolmogorov-Smirnov Test**¹³³, that examines if scores were likely to follow some distribution in some population;
- **Kruskal-Wallis Test of Independent Samples**¹³⁴, to test if the rank-based nonparametric test determines statistically significant differences between two or more groups of an independent variable on a continuous or ordinal dependent variable, and verifies the nature of the statistical populations' relative frequency distribution;
- **Multiple Comparison Test with Post-Hoc Tukey Honestly Significant Difference Test**¹³⁵, a post-hoc test based on range distribution. Although an ANOVA test can tell if the results have overall significant representation, it will not demonstrate where the differences lie. As so, after running an ANOVA test and finding meaningful results, one can also run Tukey's Honestly Significant Difference Test – considering that the test compares all possible pairs of means – to understand which specific groups means are different;
- **Crosstabulation Chi-Square Test**¹³⁶, is a nonparametric test that determines whether there is an association between categorical variables (i.e., whether the variables are independent or related);

¹³³ *SPSS Tutorials* (n.d.)

¹³⁴ Lærd Statistics (n.d.a)

¹³⁵ Brillinger, D. (1984). *The Collected Works of John W. Tukey: Time Series 1949-1964*. (Vol. I). Chapman and Hall

¹³⁶ Kent State University (n.d.).

- **Independent Samples Mann-Whitney's U Test**¹³⁷, used to compare differences between two independent groups when the dependent variable is either ordinal or continuous, but not normally distributed. As so, the test uses two independent simple random samples to determine whether the relative frequency distributions of two statistical populations of continuous values are identical or different from one another; and
- **Spearman's Rho Correlation Coefficient Test**¹³⁸ applied to measure the strength of association between two variables, where the value $r = 1$ means a perfect positive correlation and the value $r = -1$ means a perfect negative correlation. This test measures the degree of association between two variables for which only rank-order data is available.

In the overall, and even though nonparametric tests have somewhat less power than the parametric tests, Kohler (2020) states that nonparametric tests can generate safe and rigorous outcome, even if little is known about the population from which the sample data is being drawn. However, and conscient that nonparametric tests are less capable of representing significant effects even if real effect exists (Morgan, et al. 2020) the results of this exploratory research assured successful, accurate, and significant outcomes.

¹³⁷ Lærd Statistics (n.d.b)

¹³⁸ Social Science Statistics (n.d.).

Chapter III.3. – Results, Analysis, and Discussion

III.3.1. Sample Characterization: Sociodemographic and Academic Distribution

To best understand the results of any quantitative method study, it is essential to start by addressing how the sample is characterized. The importance of its clear understanding is held not only for a correct contextualization of the research framework but assumes the relevant significance for best inference on the results obtained. For so, we began by describing how gender, age, residential location, year of study, study cycle, faculty, and Campus location was represented. In addition, a sample and population comparison were made, namely to what faculty representation concerns, to best understand if we could draw equivalences in scale.

In fact, and although the student population size of Courses Granting an Academic Degree in 2019/2020 was composed of 24 126 students¹³⁹, the

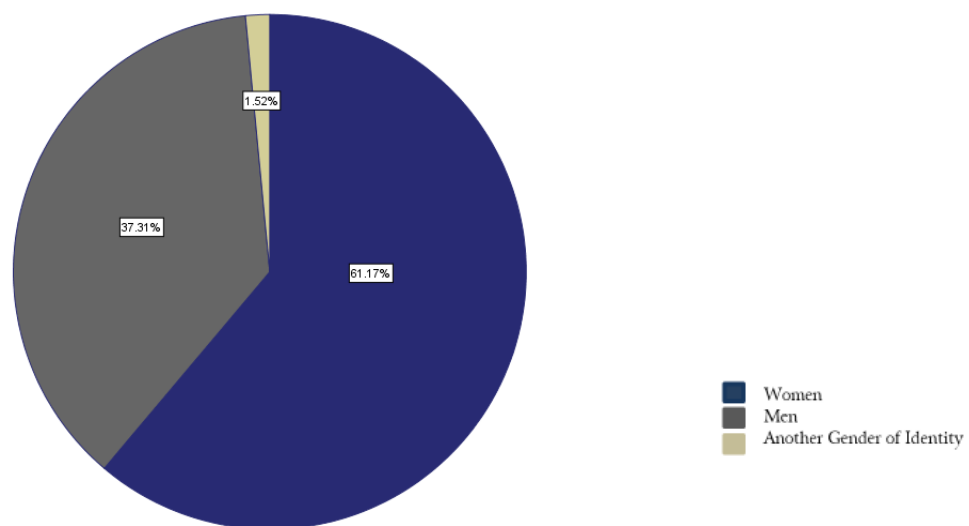
¹³⁹ Student distribution representation by Course Granting an Academic Degree per Faculty – Academic Year 2019/2020*

Faculty Study Cycle	FAH-UC	FL-UC	FM-UC	FST-UC	FPh-UC	FE-UC	FPES-UC	FSSFE-UC	III	AC	Total
1st Cycle - Bachelor's Degree	2296	2588	0	2400	187	1573	417	517	0	0	9978
%	66%	73%	0%	32%	13%	61%	23%	66%	0%	0%	41%
1st and 2nd Cycle - Integrated Study	0	0	2243	3083	1017	0	926	0	0	0	7269
%	0%	0%	9%	41%	68%	0%	51%	0%	0%	0%	30%
2nd Cycle - Master's Degree	670	583	193	1108	199	600	239	200	0	16	3808
%	19%	16%	%	15%	13%	23%	13%	25%	0%	19%	16%
3rd Cycle - Ph.D. Degree	515	394	195	862	91	392	241	68	246	67	3071
%	15%	11%	7%	12%	6%	15%	13%	9%	100%	81%	13%
Total	3481	3565	2 631	7453	1494	2565	1823	785	246	83	24126
%	14.43%	14.78%	10.91%	30.89%	6.19%	10.63%	7.56%	3.25%	1.02%	0,34%	100%

*Data provided by the Planning, Management, and Development Unit of the University of Coimbra, on 18-05-2021.

present research was conducted on a sample of 461 participants with a gender representation of 61.2% (n = 282) women, 37.3% (n = 172) men, and 1.5% (n= 7) of another gender identity (1.5%) (Figure 57), ranging from ages of 17 to 69 and a mean of 27.31 years of age with a standard deviation of approximately 10.27 (Table 9).

Figure 57
Descriptive Statistics Frequency – Gender – Pie Chart



Note. The figure represents the questionnaire participation by gender identity. Sold blue represents women (61.17%); grey men (37.31%); and beige another gender of identity (1.52%).

Table 9
Descriptive Statistics Age by Mean

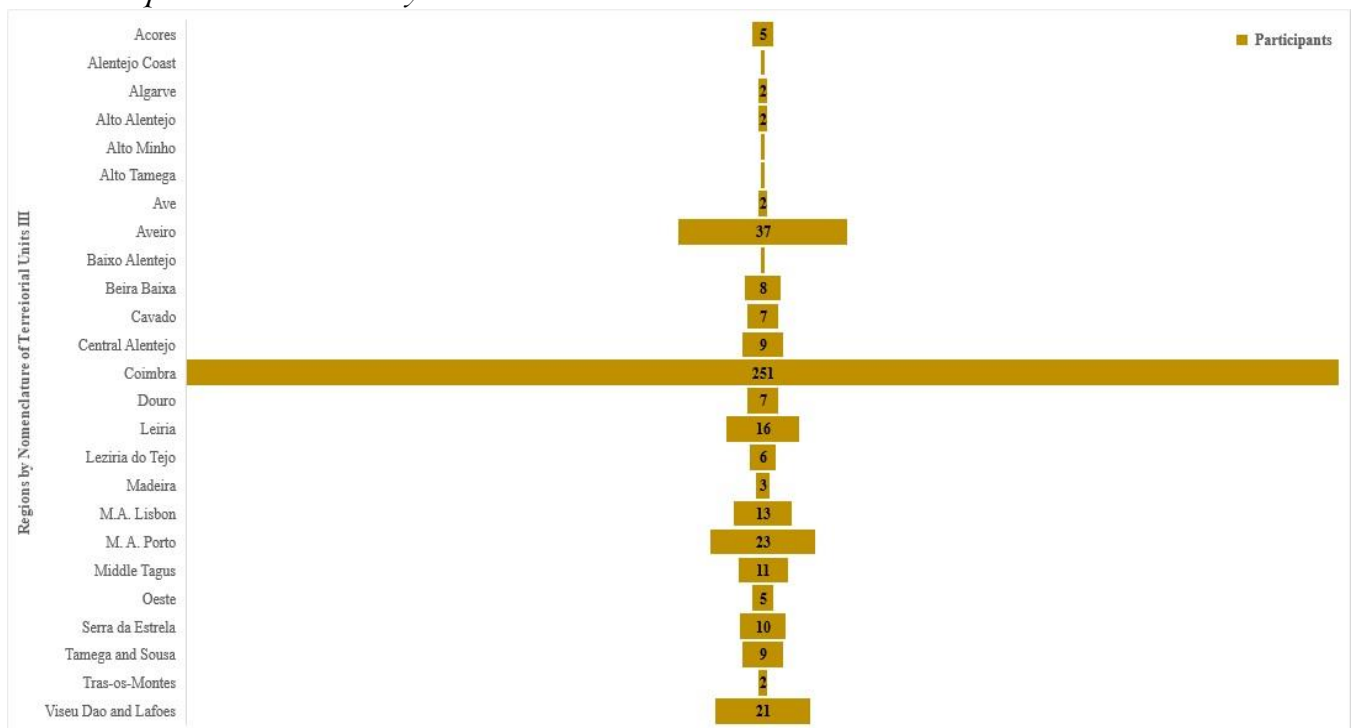
	N	Mean	Std. Deviation
Age	461	27.31	10.269
Valid N (listwise)	461		

Note. The table demonstrates the average age participation with a standard deviation of 10.269.

Interesting is to understand how UC Students residential location was distributed. However, beforehand it is important to point out that the answers given were reorganized and gathered by Nomenclatures of Territorial Units (NTUs) level III regions. By addressing the results, we were able to understand that the Coimbra region was the most represented (251 participants) followed by the Aveiro region (37 participants) and the Metropolitan Area of Porto (23 participants) (Figure 58) Nevertheless, eight participants indicated to be living in Brazil¹⁴⁰, therefor for a better representative analysis we gathered their replies by state.

Figure 58

Sample Distribution by Nomenclature of Territorial Units III



Note. The figure was produced by the author of the dissertation and demonstrates the sample's distribution by NTUs III. The Coimbra region stands out with 251 participants.

¹⁴⁰ Eight participants live in Brazil in the states of São Paulo (2), Alagoas (1), Santa Catarina (1), Rio de Janeiro (3), and Rio Grande do Sul (1).

To what Academic characteristics comprises, this study was mainly composed of 1st Cycle Study – Bachelor’s Degree students, 49.9% (n = 230), and 2nd Cycle Study – Master’s Degree students representing 24.1% (n = 111). On the other hand, 1st and 2nd Cycle – Integrated Study’s 14.1% (n = 65), and 3rd Cycle Study – Ph.D. Degree 11.9% (n = 55) showed to be the less representative (Table 10).

Table 10
Descriptive Statistics Frequency – Study Cycle

	Frequency	Percent	Valid Percent	Cumulative Percent
1st Cycle - Bachelor's Degree	230	49.9	49.9	49.9
1st& 2nd Cycle - Integrated Study	65	14.1	14.1	64.0
2nd Cycle - Master's Degree	111	24.1	24.1	88.1
3rd Cycle - Ph.D. Degree	55	11.9	11.9	100.0
Total	461	100.0	100.0	

Note. The table displays student participation by study cycle. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

It is interesting to consider that to what concerns UC Students population the 1st Cycle Study, 41.36% (n= 9978), and the 3rd Cycle Study, 12.73% (n = 3071), registered an approximate percentage significance when compared with the study sample. Nevertheless, the same is not verifiable with the other two study cycles: 1st and 2nd Cycle - Integrated Studies, 30.13% (n = 7269), and 2nd Cycle - Master’s Degree, 15.78% (n = 3808)¹⁴¹.

To this extent, it is important to operate a closer analysis. As so, when applying a Crosstabulation Test we examined that the study sample distribution per year

¹⁴¹ See footnote 139, in page 157 of the Master’s Dissertation.

of study and cycle study showed a decreasing representation of students according to the year in attendance. As a result, 1st year students stood for 31% (n = 143), 2nd year students 28.2% (n = 130), 3rd year students 24.3% (n = 112), 4th year students 13% (n = 60), and 5th year students 3.5% (n = 16). (Table 11)

Table 11
Crosstabulation Test Year of Study and Study Cycle

		Study Cycle				Total
		1st Cycle - Bachelor's Degree	1st& 2nd Cycle - Integrated Study	2nd Cycle - Master's Degree	3rd Cycle - Ph.D. Degree	
Year of Study	1st	75	8	51	9	143
	2nd	46	11	60	13	130
	3rd	87	10	0	15	112
	4th	22	20	0	18	60
	5th	0	16	0	0	16
Total		230	65	111	55	461

Note. The table reveals the sample distribution by year of study throughout the study cycle. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

On the other hand, the same test allowed us to understand that 1st Cycle – Bachelor’s Degree students were mainly represented by 3rd-year students 18.9% (n = 87) and 1st-year students 16.3% (n = 75), while 2nd Cycle – Master’s Degree students were closely distributed with 2nd-year students expressing 13% (n = 60) and 1st-year students 11.1% (n = 51).

In addition, 1st and 2nd Cycle – Integrated Study students were exemplified by 1.7% (n =8) allocating to the 1st year of study, 2.4% (n = 11) to the 2nd year, 2.2% (n = 10) to the 3rd year, 4.3% (n = 20) to the 4th year, and 3.5% (n = 16) to the 5th year. Lastly, 3rd Cycle – Ph.D. Degree students 11.9% (n = 55) were the less significant with 2% (n = 9) attending the 1st year, 2.8% (n = 13) the 2nd year, 3.3% (n = 15) the 3rd year, and 3.9% (n = 18) the 4th year.

To what respects UC Student’s per Faculty sample, we could not establish a close relationship with the UC student population due to the exploratory characteristics of this study. Nevertheless, by applying a Descriptive Statistics Frequency test the study sample indicated that the Faculty of Law, 25.2% (n = 116), the Faculty of Sciences and Technology, 22.6% (n = 104), and the Faculty of Arts and Humanities, 17.6% (n = 81), were the most represented, while the Faculty of Sport Sciences and Physical Education, 1.1% (n = 5), and Faculty of Medicine, 0.9% (n = 4), were the less signified (Table 12).

Table 12
Descriptive Statistics Frequency – Faculty

	Frequency	Percent	Valid Percent	Cumulative Percent
Faculty of Arts and Humanities	81	17.6	17.6	17.6
Faculty of Law	116	25.2	25.2	42.7
Faculty of Medicine	4	.9	.9	43.6
Faculty of Sciences and Technology	104	22.6	22.6	66.2
Faculty of Pharmacy	72	15.6	15.6	81.8
Faculty of Economy	67	14.5	14.5	96.3
Faculty of Psychology and Education Sciences	12	2.6	2.6	98.9
Faculty of Sport Sciences and Physical Education	5	1.1	1.1	100.0
Total	461	100.0	100.0	

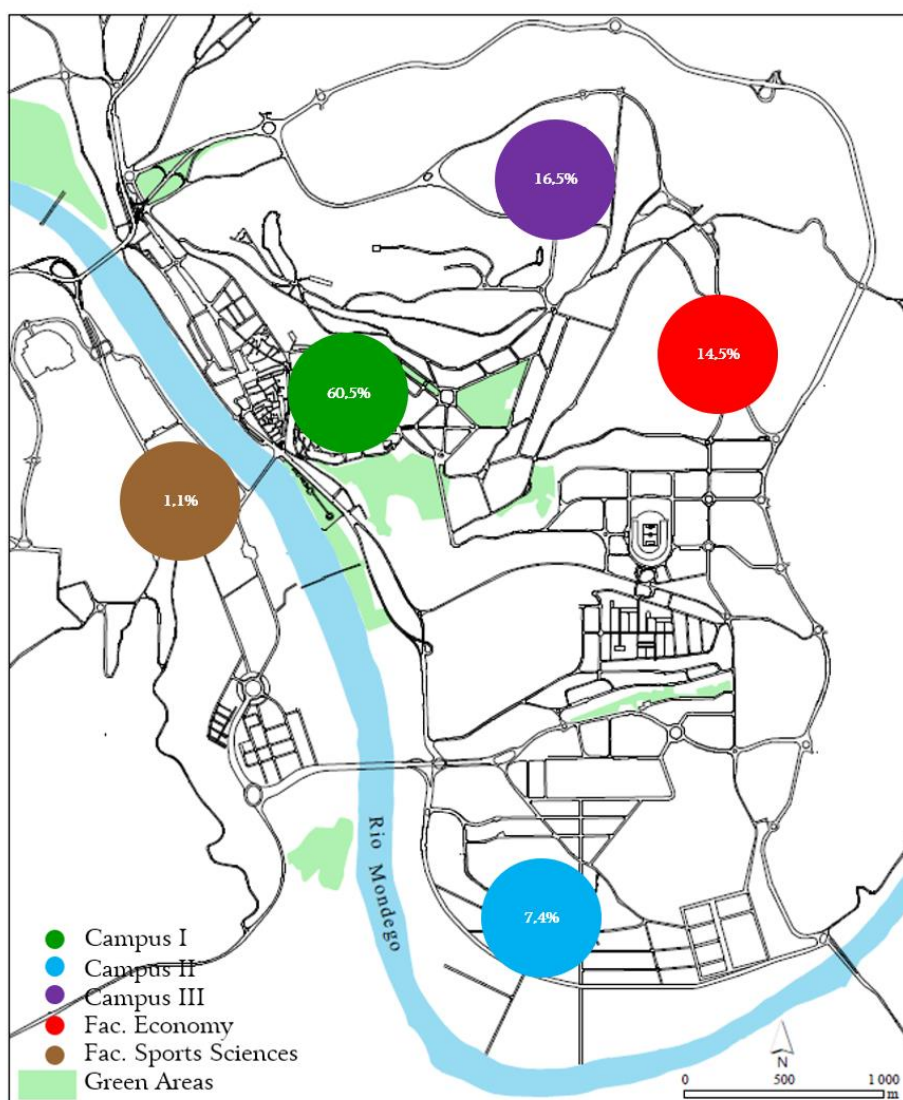
Note. The table represents the sample distribution by faculty. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

In terms of Campus territorial distribution, the sample had its courses departments headquartered¹⁴² with the following distribution: 60.5% (n =

¹⁴² It is important to underline that some courses are held in more than one campus. As so, in this study we considered a course’s main campus in accordance with the department to which it belongs.

279) in Campus I, 7.4% (n = 34) in Campus II, 16.5% (n = 76) in Campus III, 14.5% (n = 67) study in the Faculty of Economy, and 1.1% (n = 5) attend the Faculty of Sport Sciences and Physical Education. Both Faculties are not integrated into any of the three UC Campus and as so must be understood as faculty location per se.

Figure 59
Sample Distribution by Campus



Note. The figure was produced by the author of the dissertation and displays the sample distribution by Campus location mapped according to the Coimbra city. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

III.3.2. Statistical Hypothesis Testing

By employing correct statistical tests, not only did we test the hypothesis that led this study, but we also attained interesting information that supported the research question and the general objectives that guided this research project. In fact, if in this study we wished to understand what UC Students consider regarding the intangible cultural heritage of the University of Coimbra and phygital technology as means that enhance the tourist experience, on the other hand, we also aimed to comprehend which academic traditions were most valued and which immersive technologies were most desirable for the intended enhancement.

In this line of reasoning, we started by accepting a significance value of 0.05 to all Statistical Testes. Thereupon, and before testing all hypotheses, we conducted normality tests to understand if the sample values had a normal distribution. To this extent, and considering our sample size, we employed the Kolmogorov-Smirnov Test that indicated a p-value inferior to 0.05. This teste showed that the variables were not normally distributed and as so nonparametric testing was required.

Sequentially, we tested all the hypothesis and applied additional testing for a deeper output understanding. Important is to refer, that supplementary analysis was conducted in order to attain further understanding that enriched this exploratory research.

• **Research Hypothesis H₁**

The valorization of academic traditions varies according to the Campus where UC Students' courses are given.

To test this hypothesis, we used the Kruskal-Wallis Test of Independent Samples. The outputted value to variables Autonomous Organisms ($p = 0.002$), Fraternity Houses ($p < 0.0005$), Ph.D. Public Examinations ($p < 0.0005$), and Rector's Investiture ($p = 0.048$) are not the same across all categories of the variable Campus (Table 13). This result supports the acceptance of the hypothesis.

Table 13
Kruskal-Wallis Test of Independent Samples – Research Hypothesis 1
Hypothesis Test Summary

Null Hypothesis: The distribution of Academic Traditions is the same across categories of Campus.		
	Sig.	Decision
Welcome Festivities	.081	Retain
Fraternity Houses	.000	Reject
Serenades	.584	Retain
Coimbra Fado	.770	Retain
Academic Tunas	.280	Retain
Student Garb	.427	Retain
Tertulias and Praxe	.294	Retain
Autonomus Organisms	.002	Reject
Cultural Sections	.221	Retain
Sports Sections	.222	Retain
Solemn Opening Academic Year	.981	Retain
Ph.D. Public Examinations	.000	Reject
Rector's Investiture	.048	Reject
<i>Honoris Causa</i> Doctorate	.054	Retain
Doctoral Insignia Imposition	.127	Retain
Borla and Hood	.501	Retain
University Bells	.921	Retain
University Archers	.073	Retain
Charamela	.702	Retain

*Asymptotic significances are displayed. The significance level is .05.

Note. The table reveals how the Campus location impacts the valorization of Academic Traditions. Null Hypothesis rejection is marked in solid brown. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

Still, it is interesting to observe the significance level presented by the Hypothesis Test Summary, where we could easily acknowledge that Solemn Opening Academic Year ($p = 0.981$), University Bells ($p = 0.921$), Coimbra Fado ($p = 0.770$), and Charamela ($p = 0.702$) were the variables that presented the best homogenous distribution across all categories of Campus.

We believe that if, on the one hand, some academic traditions are driven by the city location of the Campus, i.e., certain traditions are physically connected to Campus I, which implies the need for dislocation to benefit or actively participate in such academic rituals. On the other hand, ritualist practices such as Coimbra Fado, Serenades, Academic Tunas, and the Student Garb exist on all Campus' and attending to the University's urban distribution, they do not depend on predetermined spaces, as the Grand Hall of Acts, for example.

Still, for a deeper understanding, we additionally applied a Multiple Comparison Test with Post-Hoc Tukey Honestly Significant Difference Test (Table 14).

Table 14

Multiple Comparison Test with Post-Hoc Tukey Honestly Significant Difference Test

Dependent Variable	(I) Campus	(J) Campus	Std. Error	Sig.
Fraternity Houses	Campus I	Campus II	.308	.000
		Campus III	.220	.000
		Fac. Economy	.231	.897
		Fac. Sport Sciences	.766	.418
	Campus II	Campus I	.308	.000
		Campus III	.350	.297
		Fac. Economy	.358	.000
		Fac. Sport Sciences	.813	.997
	Campus III	Campus I	.220	.000
		Campus II	.350	.297
		Fac. Economy	.285	.001
		Fac. Sport Sciences	.784	.987
	Fac. Economy	Campus I	.231	.897
		Campus II	.358	.000
		Campus III	.285	.001
		Fac. Sport Sciences	.787	.295
	Fac. Sport Sciences	Campus I	.766	.418
		Campus II	.813	.997
		Campus III	.784	.987
		Fac. Economy	.787	.295
Autonomus Organisms	Campus I	Campus II	.368	1.000
		Campus III	.262	.019
		Fac. Economy	.275	.999
		Fac. Sport Sciences	.913	.322
	Campus II	Campus I	.368	1.000
		Campus III	.418	.290
		Fac. Economy	.426	1.000
		Fac. Sport Sciences	.970	.392
	Campus III	Campus I	.262	.019
		Campus II	.418	.290
		Fac. Economy	.339	.076
		Fac. Sport Sciences	.935	.054
	Fac. Economy	Campus I	.275	.999
		Campus II	.426	1.000
		Campus III	.339	.076
		Fac. Sport Sciences	.938	.393
	Fac. Sport Sciences	Campus I	.913	.322
		Campus II	.970	.392
		Campus III	.935	.054
		Fac. Economy	.938	.393
Ph.D. Public Examinations	Campus I	Campus II	.327	.928
		Campus III	.233	.000
		Fac. Economy	.245	.240
		Fac. Sport Sciences	.812	.779
	Campus II	Campus I	.327	.928
		Campus III	.371	.002
		Fac. Economy	.379	.254
		Fac. Sport Sciences	.862	.937
	Campus III	Campus I	.233	.000
		Campus II	.371	.002
		Fac. Economy	.301	.267
		Fac. Sport Sciences	.831	.102

		Campus I	.245	.240
		Campus II	.379	.254
		Campus III	.301	.267
		Fac. Sport Sciences	.834	.420
		Campus I	.812	.779
		Campus II	.862	.937
		Campus III	.831	.102
		Fac. Economy	.834	.420
		Campus II	.334	.999
		Campus III	.238	.325
		Fac. Economy	.250	.510
		Fac. Sport Sciences	.829	.396
		Campus I	.334	.999
		Campus III	.379	.622
		Fac. Economy	.387	.727
		Fac. Sport Sciences	.880	.521
		Campus I	.238	.325
		Campus II	.379	.622
		Fac. Economy	.308	1.000
		Fac. Sport Sciences	.848	.162
		Campus I	.250	.510
		Campus II	.387	.727
		Campus III	.308	1.000
		Fac. Sport Sciences	.852	.189
		Campus I	.829	.396
		Campus II	.880	.521
		Campus III	.848	.162
		Fac. Economy	.852	.189

*. The mean difference is significant at the 0.05 level.

Note. The table demonstrates the relationship between the variables rejected in Table 13 (dependent variable) “Academic Traditions” and the Campus location (independent variable). Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

We observed that for variable Fraternity Houses we obtained a significative difference between Campus I and Campus II and Campus III ($p < 0.0005$), as so as between Faculty of Economy and Campus II and Campus III ($p < 0.0005$ and $p = 0.001$ respectively). To what Autonomous Organisms concerns the test registered a significative difference between Campus I and Campus III ($p = 0.019$), while for variable Ph.D. Public Examinations the significative difference was registered between Campus I and Campus III ($p < 0.0005$), and Campus II and Campus III ($p = 0.002$).

Nevertheless, to what concerns the variable Rector’s Investiture we did not register a significant difference. This outcome did not come to a surprise

considering that with the Kruskal-Wallis Test (Table 13) the variable registered $p = 0.048$.

Once again, both tests sustain the explanation previously advanced: Campus location influences the valorization of academic traditions either due to in-site presence or physical and ritualistic exchange.

- **Research Hypothesis H₂**

Visits to the Academic Museum vary according to the Campus where UC Students' courses are given.

In the following, we wanted to understand if we could establish a relation between visitations to the Academic Museum and the location of the UC Students Campus of study. For so, we applied a Pearson Chi-Square Test (Table 15).

Table 15

Pearson Chi-Square Test – Research Hypothesis 2

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	11.568 ^a	4	.021
N of Valid Cases	461		

a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 1.21.

Note. The table shows the relation between visitations to the Academic Museum and Campus location. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

By having obtained a p-value of 0.021, our statistical decision was to accept the hypothesis: the number of UC Students that visited the Academic Museum of the University of Coimbra varies according to the Campus location where students study.

In fact, by after applying a Crosstabulation Chi-Square Test we understood that Campus I, 16.5% (n = 76), was the most represented when analyzing it within the variable percentage visitation “Yes”. Nevertheless, and although Campus II registers a lower number of participants (n = 34), in relative terms the percentage of participants that had visited the Academic Museum was the highest, 2.8% (n = 13). To what concerns Campus III, 2.2% (n = 10), and

Faculty of Economy, 2.6% (n = 12), both represent low values of visitation. Lastly, we considered that the representation of the Faculty of Sport Sciences was not significant due to the sample size (Table 16).

Table 16
Crosstabulation Chi-Square Test – Research Hypothesis 2

			Campus I	Campus II	Campus III	Fac. Economy	Fac. Sport Sciences	Total
Academic Museum Visitation	No	Count	203	21	66	55	4	349
		% of Total	44.0%	4.6%	14.3%	11.9%	0.9%	75.7%
	Yes	Count	76	13	10	12	1	112
		% of Total	16.5%	2.8%	2.2%	2.6%	0.2%	24.3%
Total	Count	279	34	76	67	5	461	
	% of Total	60.5%	7.4%	16.5%	14.5%	1.1%	100.0%	

Note. The table shows UC Student distribution according to Academic Museum visitation and non-visitation. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

In fact, Campus I and II share the highest result in Academic Museum visitation. Naturally, Campus I due to in-site location and Campus II due to classes taken simultaneously in Campus I and II. On the other hand, the need for some students to attend two Campuses promotes the exchange and livelihood of academic traditions. In addition, improved municipal transportation service encourages student mobility and cross-cultural academic tradition. In a likewise manner, the wide usage of the internet and mobile devices creates live streaming relations and expands exchanges to the next level: phyigital reality.

- **Research Hypothesis H₃**

The level of importance assigned by the UC Students to the Academic Museum varies according to age.

We also wished to test if the UC Students age influences the importance assigned to the Academic Museum. For this matter, we applied Spearman's Ordinal Correlation Test (Table 17).

Table 17
Spearman's Ordinal Correlation Test – Research Hypothesis 3

	AMUC UC Students	AMUC UC Alumni	AMUC Collective Memory	AMUC UC Academic Identity	AMUC UC Image	AMUC UC Brand	AMUC Tourist Experience Enhancement	AMUC Authenticity	AMUC Coimbra City Destination
Correlation Coefficient	.112*	.164**	.162**	.169**	.163**	.099*	.096*	.070	.353**
Age Sig. (2-tailed)	.017	.000	.000	.000	.000	.034	.039	.133	.203
N	461	461	461	461	461	461	461	461	461

** . Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Note. The table displays the sample's position by Age regarding the importance given to the Academic Museum of the University of Coimbra. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

The test indicated a significative relation in all variables except for Authenticity ($p = 0.133$) and Coimbra City Destination ($p = 0.203$). Interesting as well is to understand which correlations are the strongest, as so for variables UC Alumni, Collective Memory, Academic Identity, and UC Image p -value was < 0.0005 .

Considering the results obtained, we rejected the hypothesis and concluded that Age was not a relevant factor influencing the score. In fact, the Academic Museum is shown to be an important aggregator and promotor of the Coimbra Academy Identity across all generations, mainly due to the Academic Museums' primary role: to safeguard the memory of the past and interact as a social and

intergenerational community that congregates unity and cohesion amongst all the University of Coimbra.

- **Research Hypothesis H₄**

UC Students that visited the Academic Museum know more academic traditions than those who have not.

Interesting was to assess if a previous visitation to the Academic Museum can influence the knowledge on academic traditions. For such, we applied the Independent Samples Mann-Whitney’s U Test (Table 18).

Table 18
Independent Samples Mann-Whitney’s U Test - Research Hypothesis 4

Hypothesis Test Summary		
Null Hypothesis:		
The distribution of Academic Traditions are the same across categories of Academic Museum Visitation.		
	Sig.	Decision
Welcome Festivities	.539	Retain
Fraternity Houses	.618	Retain
Serenades	.363	Retain
Coimbra Fado	.609	Retain
Academic Tunas	.890	Retain
Student Garb	.284	Retain
Tertulias and Praxe	.130	Retain
Autonomus Organisms	.004	Reject
Cultural Sections	.001	Reject
Sports Sections	.002	Reject
Solemn Opening Academic Year	.046	Reject
Ph.D. Public Examinations	.001	Reject
Rector’s Investiture	.028	Reject
Honoris Causa Doctorate	.010	Reject
Doctoral Insignia Imposition	.008	Reject
Borla and Hood	.000	Reject
University Bells	.064	Retain
University Archers	.000	Reject
Charamela	.000	Reject

*Asymptotic significances are displayed. The significance level is .05.

Note. The table demonstrates the relationship between Academic Tradition knowledge and previous AMUC visitation. Results with a significance level below 0.05 are marked in solid

brown and represent the Null Hypothesis rejection. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

The outputs indicated that we rejected the assumption that the distribution of the academic tradition represented a statistical significant difference across the category of Academic Museum visitation for eleven variables: Autonomous Organisms ($p = 0.004$), Cultural Sections ($p = 0.001$), Sports Sections ($p = 0.002$), Solemn Opening of the Academic Year ($p = 0.046$), Ph.D. Public Examination ($p = 0.001$), Rector Investiture ($p = 0.028$), *Honoris Causa* Doctorate ($p = 0.010$), Doctoral Insignia Imposition ($p = 0.008$), Borla and Hood ($p < 0.0005$), University Archers ($p < 0.0005$), and Charamela ($p < 0.0005$).

Nevertheless, we accepted the hypothesis for seven variables: Welcome Festivities ($p = 0.539$), Fraternity Houses ($p = 0.618$), Serenades ($p = 0.363$), Coimbra Fado ($p = 0.609$), Academic Tunas ($p = 0.890$), Student Garb ($p = 0.284$), Tertulias and *Praxe* ($p = 0.130$), as so as University Bells ($p = 0.064$).

Altogether, we observed a homogenous distribution between variables, indicating no significant correlation between visitation and Academic Tradition knowledge. For so, we can consider that not many students have visited the Academic Museum, and even if so, this does not signify more knowledge of academic traditions. Knowingly, academic traditions are orally passed on and many times inaccurately. To reverse this tendency, it is vital to promote strategic initiatives such as guided itinerary exhibitions on all Campus' and closer working relations between the Academic Museum and the Academic Association of Coimbra, the Veretans Council, different Student Nuclei, and the Coimbra Alumni Association in ways that encourage information action plans, as so as cultural and sports initiatives. Moreover, we believe that adequately conducted guided tours and the creation of structured museological

narratives in addition to phygital realities is crucial to perpetuate knowledge of the Academy's traditions, meanings, and identity and clarify students and visitors on incorrect information.

- **Research Hypothesis H₅**

If UC Students perceive technology usefulness, then intention to use is directly affected.

- **Research Hypothesis H₆**

If UC Students perceive technology ease of use, then intention to use is directly affected.

To what the Technology Acceptance Model concerns, we wanted to understand if the perception of Usefulness and the perception of Ease of Use influenced UC Students decision on Intention of Use. Considering that the understanding of intention of use results from the analysis of both hypotheses' outcomes, we tested H₅ and H₆ simultaneously. In this sequence, after creating a new variable for all features that reflected the mean of each technology considering Usefulness and Ease of Use, we applied the Spearman's Rho Correlation Coefficient Test. Since the p-value for all immersive technologies was inferior to 0.05 we concluded that the mean of Usefulness and the mean of Ease of Use were positively correlated as demonstrated by the coefficients of correlation obtained: Virtual Reality Glasses, $p = 0.962$ (Table 19); Automated Storytelling and Gamification, $p = 0.923$ (Table 20); Interactive Surface, $p = 0.713$ (Table 21); and Immersive 360° Cinema, $p = 0.882$ (Table 22).

Table 19

Spearman's Rho Correlation Coefficient Test – Virtual Reality Glasses and Intention of Use

		Media_EaseofUse_VRG
	Correlation Coefficient	.962**
Media_Usefulness_VRG	Sig. (2-tailed)	.000
	N	461

** . Correlation is significant at the 0.01 level (2-tailed).

Table 20

Spearman's Rho Correlation Coefficient Test – Automated Storytelling & Gamification and Intention of Use

		Media_EaseofUse_ASgaming
	Correlation Coefficient	.923**
Media_Usefulness_ASgaming	Sig. (2-tailed)	.000
	N	461

** . Correlation is significant at the 0.01 level (2-tailed).

Table 21

Spearman's Rho Correlation Coefficient Test – Interactive Surface and Intention of Use

		Mean_EaseofUse_InteractiveSurface
	Correlation Coefficient	.713**
Mean_Usefulness_InteractiveSurface	Sig. (2-tailed)	.000
	N	461

** . Correlation is significant at the 0.01 level (2-tailed).

Table 22

Spearman’s Rho Correlation Coefficient Test – Immersive 360° Cinema and Intention of Use

		Mean_EaseofUse_360°Cinema
	Correlation Coefficient	.882**
Mean_Usefulness_360°Cinema	Sig. (2-tailed)	.000
	N	461

** . Correlation is significant at the 0.01 level (2-tailed).

Note. Tables 22 to 24 represent UC Student’s Intention of Use towards technology acceptance by correlating the effect of Usefulness (mean value) and Ease of Use (mean value). Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

In this line of reasoning, we could recognize that both Usefulness and Ease of Use influence Intention of Use and allow the acceptance of both hypotheses. In fact, if a user recognizes that a particular technology is simultaneously useful and easy to use, then logically, the intention to use will automatically be positively influenced. The relevance of such investigation was the direct acceptance applicability to which the Student Community connects.

• **Research Hypothesis H₇**

UC Students believe that attitude towards technology and intention of use will directly affect the behavioral experience.

Thought-provoking was to attain if UC Students Attitude Towards Digital Information Technology and Intention of Use could affect the behavioral experience. Beforehand, it is essential to refer that to determine UC Students Attitude Towards Digital Information Technology, we first computed a new variable that resulted from the mean of the Semantic Differential Scale’s mean. In the following we employed the Spearman’s Rho Correlation Coefficient Test (Table 23) to which we addressed that Attitude Towards Digital Information Technologies and Intention of Use were positively correlated, even though the degree of correlation between variables was not very high, varying between 0.203 and 0.353, as suggested by Callegari-Jacques (2009).

Table 23
Spearman’s Rho Correlation Coefficient Test – Research Hypothesis 7

		Mean Usefulness VRG	Mean EaseofUse VRG	Mean Usefulness ASGaming	Mean EaseofUse ASGaming	Mean Usefulness Interactive Surface	Mean EaseofUse Interactive Surface	Mean Usefulness 360°Cinema	Mean EaseofUse 360°Cinema
Mean Attitude	Correlation Coefficient	.230**	.208**	.276**	.233**	.353**	.245**	.243**	.203**
	Sig. (2- tailed)	.000	.000	.000	.000	.000	.000	.000	.000
	N	461	461	461	461	461	461	461	461

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Note. The table demonstrates the correlation between UC Students Attitude Towards Technology Digital Information Technology and Intention of Use as a behavioral experience predictor. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

All in all, we accepted the tested hypothesis assessing that the behavioral experience was affected by the Attitude Towards Digital Information Technology and Intention of Use.

- **Research Hypothesis H₈**

UC Students' attitude towards technology relates to age;

- **Research Hypothesis H₉**

UC Students' attitude towards technology relates to gender;

- **Research Hypothesis H₁₀**

UC Students' attitude towards technology relates to campus.

In addition, it was interesting to understand if UC Students Attitude Towards Technology was related to Age, Gender, and Campus. For this matter, and to what H₈ concerns after conducting the Spearman's Ordinal Correlation Test, we rejected the hypothesis as the p-value was 0.857, and as so higher than 0.05. (Table 24).

Table 24
Spearman's Ordinal Correlation Test – Hypothesis 8

		Age
Mean Attitude	Correlation Coefficient	.008
	Sig. (2-tailed)	.857
	N	461

Note. The table represents the relation between independent variable Age and dependent variable Attitude. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

To what H₉ and H₁₀ respects, we applied the Kruskal-Wallis 1-way ANOVA Test of Independent Samples and the results demonstrated that we could similarly reject both hypothesis Gender (p-value = 0.085) (Table 25) and Campus (p-value = 0.228) (Table 26), as they presented p-values above 0.05.

Table 25

Kruskal-Wallis 1-way ANOVA Test of Independent Samples – Research Hypothesis 9

Null Hypothesis:

The distribution of Mean Attitude is the same across categories of Gender.

	Sig.	Decision
Gender	.085	Retain

Note. The table reveals the relationships between independent variable Gender and dependent variable Attitude. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

Table 26

Kruskal-Wallis 1-way ANOVA Test of Independent Samples – Research Hypothesis 10

Null Hypothesis:

The distribution of Mean Attitude is the same across categories of Campus.

	Sig.	Decision
Campus	.228	Retain

*Asymptotic significances are displayed. The significance level is .05.

Note. The table displays the relationships between independent variable Campus and dependent variable Attitude. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

As so, and in conclusion, neither variables Age, Gender, or Campus had a statistically significant relation to UC students' attitudes towards technology. On the other hand, one can relate to the democratization of education and culture, as so as technology usage and accessibility.

• **Research Hypothesis H₁₁**

The type of immersive experience UC Students most value varies in relation to age.

In the following, we wished to test if the type of immersive experiences valued was related to Age. For this reason, after applying a Kolmogorov-Smirnov Normality Test and verifying once again that the variables did not follow normality, we used the Spearman’s Rho Correlation Coefficient Test (Table 27).

Table 27
Spearman’s Rho Correlation Coefficient Test – Research Hypothesis 11

	Guided Tour Smart Device	Auto. Story telling	Holog. Concig.	Expert Online Visits	Gamif. Moduls	Interac. Gesture Control	Mixed Format	Virtual Reality Format	Augmented Reality Format	Immer. 360° Cinema	4D Cinema
Correlation Coefficient	0,018	0,017	-0,085	0,017	-.113*	0,048	-0,007	-0,028	-0,018	-0,082	0,043
Age Sig. (2-tailed)	0,696	0,722	0,067	0,711	0,016	0,308	0,888	0,548	0,7	0,077	0,361
N	461	461	461	461	461	461	461	461	461	461	461

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Note. The table represents the relation between Age and Phygital Features. Variables under the significance level of 0.05 are rejected. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

As a result, we could only accept the hypothesis for Gamification Modules ($p = 0.016$) as it was under the significance level of 0.05, even though it was rejected for all the other variables. In addition, it is interesting to underline that variables Gamification Modules and Age were negatively corelated even if presenting a weak correlation ($r = - 0.113$)

Next, we applied a Crosstabulation Chi-Square Test by Age Category (Table 28).

Table 28
Crosstabulation Chi-Square Test by Birth Year in Classes of 10

		Age Category						Total
		Age	1950-1959 (71-62)	1960-1969 (61-52)	1970-1979 (51-42)	1980-1989 (41-32)	1990-1999 (31-22)	
Gamification Modules	No Opinion	0	0	0	0	7	6	13
	Not At All Desirable	0	2	0	1	1	1	5
	Slightly Desirable	0	3	2	5	4	5	19
	Moderately Desirable	0	3	8	4	30	11	56
	Desirable	1	3	12	11	67	47	141
	Strongly Desirable	2	7	14	27	87	90	227
Total		3	18	36	48	196	160	461

Note. The table represents the relation between variable Gamification Modules and Age by Category. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

The results showed that Generations Y and Z¹⁴³ were the participants that most preferred Gamification Modules, possibly due to online gaming communities in which many Students might be involved. Nevertheless, Gamification Modules registered an increase in participant interest across all age categories, signifying the will and (even) curiosity to incorporate ludic modules in the museum context. Such complies according to authors such as Lupetti et al. (2015) and Vermeeren et al. (2018).

¹⁴³ Zemke et al. (2013) analyzed four generational groups drawing research conclusions to understand better the dynamics of multigenerational relations; in addition, Bencsik et al. (2016) drew specific observational study to Generations Y and Z at the workplace, whereas Slivar et al. (2019) researched travel trends, motivations and behaviors of Gen Y and Z.

- **Research Hypothesis H₁₂**

The type of immersive experience UC Students most value varies in relation to gender.

To examine this hypothesis we also applied the Kruskal-Wallis 1-way ANOVA Test of Independent Samples (Table 29).

Table 29

Kruskal-Wallis 1-way ANOVA Test of Independent Samples – Research Hypothesis 12

Null Hypothesis:

The distribution of Immersive Technologies are the same across categories of Gender.

	Sig.	Decision
Guided Smart Devices	.044	Reject
Automated Storytelling	.265	Retain
Hologram Concierge	.172	Retain
Expert Online Visits	.086	Retain
Gamification Moduls	.109	Retain
Interactive Gesture Control	.816	Retain
Mixed Format	.911	Retain
Virtual Reality Format	.178	Retain
Augmented Reality Format	.887	Retain
Immersive 360° Cinema	.288	Retain
4D Cinema	.630	Retain

*Asymptotic significances are displayed. The significance level is .05.

Note. The table displays the correlation between independent variable Gender and dependent variables phygital features. The rejected variable is presented in solid brown. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

Considering that Guided Tour Smart Services was the only variable that registered a p-value of 0.044 we could only reject the hypothesis for this feature. This indicated that all genders demonstrated an interest in the inquired immersive technologies. Thought-provoking is to attain that Mixed Formats (p-value 0.911), Augmented Reality Format (p-value 0.887), Interactive Gesture Control (p-value 0.816), and 4D Cinema (p-value 0.630) presented

the highest scores indicating that even though further results will demonstrate low experience with these technologies the curiosity in engaging with new and immersive environments is high.

Nevertheless, since Guided Tour Smart Services according to Gender was the rejected variable, for a deeper understanding we conducted a Descriptive Analysis (Table 30).

Table 30

Descriptive Analysis for Guided Tour Smart Services according to Gender

		Guided Tour Smart Device	Woman	Man	Another Gender Identity
N	Valid	282	282	172	7
	Missing	0	0	0	0
Mean		4.17	1.00	2.00	3.00
Std. Deviation		1.036	.000	.000	.000

Note. The table demonstrates the relation between dependent variable Guided Tour Smart Device and independent variables Woman, Man, and Another Gender Identity. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

The test indicated that women were represented by 282 participants, men by 172, and Another Gender of Identity with 7¹⁴⁴. A possible explanation for these results can be related to the fact that these are widely present in most museums and monuments. In some cases, they are included in the ticket price making their usage more accessible or commonly known. Nevertheless, for a deeper gender understanding a new and broader inquiry on gender and phygital technologies should be conducted.

¹⁴⁴ The outcome is explained when considering that Another Gender of Identity was represented by 7 participants, i.e., 1.5% of the total sample size.

- **Research Hypothesis H₁₃**

The type of immersive experience UC Students most value varies in relation to Campus

To understand if we could accept or reject the hypothesis, we used Kruskal-Wallis 1-way ANOVA Test of Independent Samples (Table 31).

Table 31

Kruskal-Wallis 1-way ANOVA Test of Independent Samples – Research Hypothesis 13

Null Hypothesis:

The distribution of Immersive Technologies are the same across categories of Campus.

	Sig.	Decision
Guided Smart Devices	.039	Reject
Automated Storytelling	.210	Retain
Hologram Concierge	.404	Retain
Expert Online Visits	.025	Reject
Gamification Moduls	.535	Retain
Interactive Gesture Control	.498	Retain
Mixed Format	.539	Retain
Virtual Reality Format	.064	Retain
Augmented Reality Format	.078	Retain
Immersive 360° Cinema	.422	Retain
4D Cinema	.606	Retain

*Asymptotic significances are displayed. The significance level is .05.

Note. The table demonstrates the association between variable Campus and the phyigital features variables. The rejected variables are presented in solid brown. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

Considering the outputs, we accepted the hypothesis for variable Guided Tour Smart Device ($p = 0.039$) and Expert Online Visits ($p = 0.025$) and rejected it for all the other variables. Interesting is the relation one can establish for 4D Cinema (p -value 0.606), Mixed Formats (p -value 0.539), and Interactive Gesture Control (p -value 0.498) when asserting to the relation with the variable Gender previously tested, although we rejected Guided Tour Smart Devices. Interpretations of the outcomes demonstrate that even though more

profound research is needed, we can assert coherent valorization and interest in immersive technologies (Gender and Campus).

For a deeper analysis, we conducted a Descriptive Analysis and assessed that for Guided Tour Smart Device, Campus III presented the lowest mean (4.11) and Faculty of Sports Sciences the highest (4.80) (Table 32a and 32b). To what Expert Online Visits concerns Campus III presented the lowest mean (3.50) and Faculty of Sports Sciences the highest (4.80)¹⁴⁵ (Table 33a and 33b).

Table 32a

Descriptive Analysis – Guided Tour Smart Devices by Campus – Campus III

	N	Mean	Std. Deviation
Gamification Moduls	76	4.11	1.228
Campus III	76	3.00	.000
Valid N (listwise)	76		

Table 32b

Descriptive Analysis – Guided Tour Smart Devices by Campus – Fac. Sport Sciences

	N	Mean	Std. Deviation
Gamification Moduls	5	4.80	.447
Fac. Sport Sciences	5	5.00	.000
Valid N (listwise)	5		

Table 33a

Descriptive Analysis – Expert Online Visits by Campus – Campus III

	N	Mean	Std. Deviation
Expert Online Visits	34	3.50	1.542
Campus III	34	2.00	.000
Valid N (listwise)	34		

¹⁴⁵ Nevertheless, it is important to consider that the percentage of participants concerning the Faculty of Sports Sciences location represents 1.1% explaining the outcome presented.

Table 33b

Descriptive Analysis – Expert Online Visits by Campus – Fac. Sport Sciences

	N	Mean	Std. Deviation
Expert Online Visits	5	4.80	.447
Fac. Sport Sciences	5	5.00	.000
Valid N (listwise)	5		

Note. Tables 32a to 33b demonstrate the rejected results of the test applied in Table 31. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

In conclusion, by combining H_{11} , H_{12} , and H_{13} we could comprehend that the type of immersive experience UC students most value varied according to: Gamification and Age; Expert Online Visits and Campus; and Guided Tour Smart Services and Gender and Campus. The analysis demonstrated mild valorizations considering, once again, the need for a deeper and more extensive study.

- **Research Hypothesis H₁₄**

UC Students believe that the Academic Museum can significantly enhance the tourist experience if phygital features are added in the museum context.

Last of all, we wanted to test Students' belief on tourist experience enhancement when phygital features are added to the Academic Museum context. For so, we applied Spearman's Ordinal Correlation Test (Table 34). The results showed that we could accept the research hypothesis for dependent variables Tourist Experience, Authenticity, and Coimbra Tourist Destination, excluding (p-value > 0.05) 4D Cinema for all dependent variables, probably due to a more ludic understanding of this immersive technology. Nevertheless, it is essential to reflect on the significant results that all technologies except 4D Cinema presented. In fact, to what Tourism concerns, the inquired community defended that applying immersive technology would enhance the tourism experience at the Academic Museum and create differentiated and authentic offers, attracting visitation interest to the University as a tourist attraction and the Coimbra city destination in a broader sense. Subsequently, an investment of such nature would accentuate the University's tourist competitive position.

On the other hand, the output also indicated that the Attitude Towards Digital Information Technology and the Intention of Use would positively affect the overall museological behavior, which in addition to Nofal's theory (2019) – i.e., phygital heritage facilitates the communication of heritage information – would generate overall importance for the University of Coimbra's Collective Memory, the Academic Identity, the University of Coimbra's Image, UC Alumni, and the UC Brand as a promotor of the past for the Academic Community and for all visitors that wish to embrace informed and authentic experiences.

Lastly, we accepted the sample's urge for new experiences and a modernized museological tourist attraction due to their knowledge (even if not experimented with) of such features in the national and international context.

Table 34
Spearman's Ordinal Correlation Test – Research Hypothesis 14

		AMUC Tourist Experience Enhancement	AMUC Authenticity	AMUC Coimbra Destination
Guided Tour Smart Device	Correlation Coefficient	.261**	.233**	.198**
	Sig. (2-tailed)	0	0	0
	N	461	461	461
Automated Storytelling	Correlation Coefficient	.233**	.274**	.219**
	Sig. (2-tailed)	0	0	0
	N	461	461	461
Hologram Concierge	Correlation Coefficient	.211**	.245**	.237**
	Sig. (2-tailed)	0	0	0
	N	461	461	461
Expert Online Visits	Correlation Coefficient	.148**	.226**	.269**
	Sig. (2-tailed)	0,001	0	0
	N	461	461	461
Gamification Moduls	Correlation Coefficient	.230**	.255**	.279**
	Sig. (2-tailed)	0	0	0
	N	461	461	461
Interactive Gesture Control	Correlation Coefficient	.245**	.265**	.221**
	Sig. (2-tailed)	0	0	0
	N	461	461	461
Mixed Format	Correlation Coefficient	.227**	.208**	.156**
	Sig. (2-tailed)	0	0	0,001
	N	461	461	461
Virtual Reality Format	Correlation Coefficient	.204**	.204**	.176**
	Sig. (2-tailed)	0	0	0
	N	461	461	461
Augmented Reality Format	Correlation Coefficient	.224**	.187**	.211**
	Sig. (2-tailed)	0	0	0
	N	461	461	461

Immersive 360° Cinema	Correlation Coefficient	.141**	.131**	0,069
	Sig. (2-tailed)	0,002	0,005	0,142
	N	461	461	461
4D Cinema	Correlation Coefficient	-0,003	0,011	-0,002
	Sig. (2-tailed)	0,941	0,82	0,967
	N	461	461	461

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Note. The table displays the correlation between phygital features and Tourism experience variables. Correlations below 0.05 are rejected. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

III.3.3. Other Results

- **UC Student’s Preferred Phygital Approaches: Automated Storytelling & Gamification, Immersive 360° Cinema, Interactive Surface, and Virtual Reality Glasses**

Furthermore, we also wished to understand through the conducted questionnaire which technologies UC Students most preferred. By applying the Borda’s Method¹⁴⁶ we concluded that the preferred technology was the Immersive 360° Cinema. In fact, this phygital feature emerged with 1437 votes, followed by Interactive Surface (n = 1072), and Automated Storytelling & Gamification (n = 1059). In a lesser position stood Virtual Reality Glasses (n = 1042).

Overall, it is interesting to consider that the desire to integrate such technology (Immersive 360° Cinema) is a means to enhance the tourism experience and provide the inquired community with additional museological practice and interest.

¹⁴⁶ The Borda’s Method enables a full ranking of voter preferences while determining the outcoming winners. According to Fraenkel & Grofman (2014: 187) the “Borda’s method takes into account all voter preferences, allotting a value to each, and establishes victors by a simple tallying of the total each candidate obtains.” In this line of reasoning, by applying this method each participant registered the phygital feature in order and in accordance with their individual preference. Moreover, to each phygital feature we awarded scores according to the position given by the participant: to the most preferred we gave 4 points, the second 3 points, and so forth. The sum of each individual scores presented the final outcomes.

- UC Student’s most related *University of Coimbra – Alta and Sofia’s* Intangible Cultural Heritage

On the other hand, by creating a Frequency Test Analysis by Mean to access which Intangible Cultural Heritage UC Students most related to (Table 35a – 35e).

Table 35a
Frequency Test Analysis by Mean – Student Garb

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	7	1.5	1.5	1.5
Not At All Valued	9	2.0	2.0	3.5
Moderately Valued	39	8.5	8.5	11.9
Valued	95	20.6	20.6	32.5
Strongly Valued	311	67.5	67.5	100.0
Total	461	100.0	100.0	

Table 35b
Frequency Test Analysis by Mean – Coimbra Fado

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	8	1.7	1.7	1.7
Not At All Valued	3	.7	.7	2.4
Slightly Valued	11	2.4	2.4	4.8
Moderately Valued	29	6.3	6.3	11.1
Valued	106	23.0	23.0	34.1
Strongly Valued	304	65.9	65.9	100.0
Total	461	100.0	100.0	

Table 35c
Frequency Test Analysis by Mean – Serenades

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	12	2.6	2.6	2.6
Not At All Valued	3	.7	.7	3.3
Slightly Valued	18	3.9	3.9	7.2
Moderately Valued	32	6.9	6.9	14.1
Valued	106	23.0	23.0	37.1
Strongly Valued	290	62.9	62.9	100.0
Total	461	100.0	100.0	

Table 35d

Frequency Test Analysis by Mean – University Bells

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	27	5.9	5.9	5.9
Not At All Valued	4	.9	.9	6.7
Slightly Valued	18	3.9	3.9	10.6
Moderately Valued	41	8.9	8.9	19.5
Valued	121	26.2	26.2	45.8
Strongly Valued	250	54.2	54.2	100.0
Total	461	100.0	100.0	

Table 35e

Frequency Test Analysis by Mean – Academic Tunas

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	11	2.4	2.4	2.4
Not At All Valued	5	1.1	1.1	3.5
Slightly Valued	16	3.5	3.5	6.9
Moderately Valued	53	11.5	11.5	18.4
Valued	138	29.9	29.9	48.4
Strongly Valued	238	51.6	51.6	100.0
Total	461	100.0	100.0	

Table 35f

Frequency Test Analysis by Mean – Welcome Festivity

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	21	4.6	4.6	4.6
Not At All Valued	11	2.4	2.4	6.9
Slightly Valued	26	5.6	5.6	12.6
Moderately Valued	54	11.7	11.7	24.3
Valued	118	25.6	25.6	49.9
Strongly Valued	231	50.1	50.1	100.0
Total	461	100.0	100.0	

Note. Tables 37a through 37e represent the Academic Traditions that the sample most relates to. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

The results demonstrated that the Student Garb 67.5% (n = 311), the Coimbra Fado 65.9% (n = 304), the Serenades 62.9% (n = 290), the University Bells 54.2% (n = 250), the Academic Tunas 51.6% (n = 238), and the Welcome Festivity 50.1% (n = 231) were the most valued. All values were considered regarding the percentage of students that replied, “Strongly Valued” and to which responses represented more than 50% of the global answers.

Though-provoking is to comprehend that these traditions are not only part of students’ daily lives but they also represent means of escapism, ludic encounters among them, and academic representativeness. To this, the traditional academic element that most identifies and embodies the Academy’s distinctiveness was the Student Garb, not only because it visually characterizes a Coimbra Student, but because it is very much associated with many ritualist practices throughout all levels of accomplishments. In addition, to what the University Bells concerns, this component is easily understood due to the Tower of the University being a milestone in the Coimbra city landscape, extending its significance throughout all Campus’.

- Immersive Technologies mostly desired by UC Student’s in the *University of Coimbra – Alta and Sofia* Museological Context

To comprehend which immersive technologies Students most desired to have in the *University of Coimbra – Alta and Sofia* museological context, we applied the same logic of statistical testing (Table 36a – 36d).

Table 36a
Frequency Test Analysis by Mean – Immersive 360° Cinema

	Frequency	Percent	Valid Percent	Cumulative Percent
No Opinion	17	3.7	3.7	3.7
Not At All Desirable	4	.9	.9	4.6
Slightly Desirable	12	2.6	2.6	7.2
Moderately Desirable	31	6.7	6.7	13.9
Desirable	110	23.9	23.9	37.7
Strongly Desirable	287	62.3	62.3	100.0
Total	461	100.0	100.0	

Table 36b
Frequency Test Analysis by Mean – Mixed Format

	Frequency	Percent	Valid Percent	Cumulative Percent
No Opinion	21	4.6	4.6	4.6
Not At All Desirable	1	.2	.2	4.8
Slightly Desirable	12	2.6	2.6	7.4
Moderately Desirable	37	8.0	8.0	15.4
Desirable	135	29.3	29.3	44.7
Strongly Desirable	255	55.3	55.3	100.0
Total	461	100.0	100.0	

Table 36c
Frequency Test Analysis by Mean – Augmented Reality Format

	Frequency	Percent	Valid Percent	Cumulative Percent
No Opinion	19	4.1	4.1	4.1
Not At All Desirable	5	1.1	1.1	5.2
Slightly Desirable	16	3.5	3.5	8.7
Moderately Desirable	43	9.3	9.3	18.0
Desirable	150	32.5	32.5	50.5
Strongly Desirable	228	49.5	49.5	100.0
Total	461	100.0	100.0	

Table 36d
Frequency Test Analysis by Mean – Gamification Modules

	Frequency	Percent	Valid Percent	Cumulative Percent
No Opinion	13	2.8	2.8	2.8
Not At All Desirable	5	1.1	1.1	3.9
Slightly Desirable	19	4.1	4.1	8.0
Moderately Desirable	56	12.1	12.1	20.2
Desirable	141	30.6	30.6	50.8
Strongly Desirable	227	49.2	49.2	100.0
Total	461	100.0	100.0	

Note. Table 38a to 38d demonstrate the sample’s preference on phygital features in the AMUC context. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

As so, Immersive 360° Cinema showed that 62.3% (n = 287) UC Students believe it was “Strongly Desirable” and 55.3% (n = 255) also replied the same to Mixed Format. Nevertheless, and although inferior to 50%, we would also like to point out that Augmented Reality Format was understood as “Strongly Desirable” by 49.5% (n = 228) and Gamification Modules were quoted by

49.2% (n = 227). Once again, the results aligned with Hypothesis 11, 12, and 13 reinforcing the results obtained. We believe that this demonstrates the valorization that the inquired sample showed in information and communication technologies and their will to experience new museological formats. On the other hand, we also accept that introducing such features will strengthen and widen the community’s interest in History and the significance of academic tradition that presented low significance and unfamiliarity. In addition, we comprehend that a new museological approach will generate more visitation from the local, national, and international public with an elucidated understanding of the *University of Coimbra – Alta and Sofia* post-visit.

- **UC Student’s Opinion on the Importance of the Academic Museum for the Academic Community and the University of Coimbra**

In the following, important as well was to apprehend the UC Student’s opinion on the importance of the Academic Museum’s role for the Academic Community and the University itself. For so, we applied a Frequencies Test Analysis by Mean (Table 37a - 37h).

Table 37a

Frequencies Test Analysis by Mean – AMUC and Collective Memory

	Frequency	Percent	Valid Percent	Cumulative Percent
Not At All Important	3	.7	.7	.7
Low Importance	2	.4	.4	1.1
Moderately Important	14	3.0	3.0	4.1
Important	131	28.4	28.4	32.5
Very Important	311	67.5	67.5	100.0
Total	461	100.0	100.0	

Table 37b

Frequencies Test Analysis by Mean – AMUC and Academic Identity

	Frequency	Percent	Valid Percent	Cumulative Percent
Not At All Important	3	.7	.7	.7
Low Importance	4	.9	.9	1.5
Moderately Important	21	4.6	4.6	6.1
Important	149	32.3	32.3	38.4
Very Important	284	61.6	61.6	100.0
Total	461	100.0	100.0	

Table 37c

Frequencies Test Analysis by Mean – AMUC and UC Image

	Frequency	Percent	Valid Percent	Cumulative Percent
Not At All Important	4	.9	.9	.9
Low Importance	13	2.8	2.8	3.7
Moderately Important	44	9.5	9.5	13.2
Important	150	32.5	32.5	45.8
Very Important	250	54.2	54.2	100.0
Total	461	100.0	100.0	

Table 37d

Frequencies Test Analysis by Mean – AMUC and Tourist Experience Enhancer

	Frequency	Percent	Valid Percent	Cumulative Percent
Not At All Important	4	.9	.9	.9
Low Importance	9	2.0	2.0	2.8
Moderately Important	41	8.9	8.9	11.7
Important	157	34.1	34.1	45.8
Very Important	250	54.2	54.2	100.0
Total	461	100.0	100.0	

Table 37e

Frequencies Test Analysis by Mean – AMUC and UC Brand

	Frequency	Percent	Valid Percent	Cumulative Percent
Not At All Important	6	1.3	1.3	1.3
Low Importance	22	4.8	4.8	6.1
Moderately Important	61	13.2	13.2	19.3
Important	156	33.8	33.8	53.1
Very Important	216	46.9	46.9	100.0
Total	461	100.0	100.0	

Table 37f

Frequencies Test Analysis by Mean – AMUC and Authenticity

	Frequency	Percent	Valid Percent	Cumulative Percent
Not At All Important	6	1.3	1.3	1.3
Low Importance	12	2.6	2.6	3.9
Moderately Important	58	12.6	12.6	16.5
Important	172	37.3	37.3	53.8
Very Important	213	46.2	46.2	100.0
Total	461	100.0	100.0	

Table 37g

Frequencies Test Analysis by Mean – AMUC and UC Alumni

	Frequency	Percent	Valid Percent	Cumulative Percent
Not At All Important	3	.7	.7	.7
Low Importance	17	3.7	3.7	4.3
Moderately Important	53	11.5	11.5	15.8
Important	178	38.6	38.6	54.4
Very Important	210	45.6	45.6	100.0
Total	461	100.0	100.0	

Table 37h

Frequencies Test Analysis by Mean – AMUC and Coimbra Destination

	Frequency	Percent	Valid Percent	Cumulative Percent
Not At All Important	6	1.3	1.3	1.3
Low Importance	91	19.7	19.7	21.0
Important	156	33.8	33.8	54.9
Very Important	208	45.1	45.1	100.0
Total	461	100.0	100.0	

Note. Tables 37a to 37h represent the level of importance given to the different AMUC's contexts. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

Thought-provoking was to conclude that the sample held that the Academic Museum plays a “Very Important” role for the University of Coimbra’s Collective Memory 67.5% (n = 311); the Academic Identity 61.6% (n = 284); the University of Coimbra’s Image 54.2% (n = 250). Additionally, it was understood as a “Very Important” Tourist Experience Enhancer 54.2% (n = 250). Nevertheless, if we wished to include an observation towards the responses above 45% then we could also involve the high importance it plays for the UC Brand 46.9% (n = 216), the Tourist Experience Authenticity 46.2% (n = 213), UC Alumni 45.6% (n = 210), and the Coimbra Destination 45.1% (n = 208). We undoubtedly accepted that the Academic Museum holds an essential role across all variables. Such results demonstrated the strong identity of the Academy and the uniqueness that this Museum occupies. On the other hand, it fulfills a needed social and historical safeguarding of a collective past and can function as an important professional network between Alumni and current students. Subsequently, the results demonstrated that the Academic Museum plays an unquestionable role in promoting and valorizing the *University of Coimbra – Alta and Sofia* tourist attraction, as well as the Coimbra city destination. In fact, previous results showed that the participants

do not separate the Alta (up hile) from the Sofia (downtown) but understand them holistically.

Furthermore, thought-provoking is to consider that while Cantoni (2018) understands information and communication technologies as means that preserve cultural heritage and promote sustainable and responsible tourism; our results showed that phygital features associated with the Academic Museum function as a reinforcer of communal identity, a perpetrator of collective memory, an instrument of national and international placement, and a promotor of unique and differentiated experiences that can strategically attract stakeholders and players altogether.

• UC Student Academic Museum Visitation

To this extent, it is interesting to acknowledge that by conducting, once more, a Frequencies Test Analysis by Mean the sample revealed that although 59.4% (n = 274) knew that the Academic Museum of the University of Coimbra existed (Table 38), only 24.3% (n = 112) of UC Students had visited it (Table 39).

Table 38

Frequencies Test Analysis by Mean – Students that have Knowledge of its Existence

	Frequency	Percent	Valid Percent	Cumulative Percent
No	187	40.6	40.6	40.6
Yes	274	59.4	59.4	100.0
Total	461	100.0	100.0	

Note. The table demonstrates the sample’s knowledge on the AMUC existence. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

Table 39

Frequencies Test Analysis by Mean – Students that have Visited the Academic Museum of the University of Coimbra

	Frequency	Percent	Valid Percent	Cumulative Percent
No	349	75.7	75.7	75.7
Yes	112	24.3	24.3	100.0
Total	461	100.0	100.0	

Note. The table displays the sample’s AMUC visitation in absolute and relative values. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

We interpret such results not as sparse interest of the Academy but as an unfortunate consequence of past low political investment; insufficient and poorly prepared personnel; stagnated museological practices; absence of information: digital, signposting, and high academic impact studies; inexistence of a marketing and communication strategic promotion; difficult information attainment on location and ticket pricing, as so as scarce on-site information for visitors that do manage to find and visit the Museum.

- **UC Students Knowledge on Academic Traditions**

In the same line of analysis, and to what understanding on Academic Traditions concerns, answers registering “Not Known” above 20% were: the Charamela 58.8% (n = 271); the University Archers 41.1% (n = 194); Borla and Hood 35.4% (n = 163); the Autonomous Organisms 31.2% (n = 144); the Doctoral Insignia Impositions 25.2% (n = 116); the *Honoris Causa* Doctorate 24.3% (n 112), and the Rector’s Investiture 24.1% (n = 111) (Table 40a – 40g).

Table 40a

Frequencies Test Analysis by Mean – Knowledge on Academic Traditions - Chamarela

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	271	58.8	58.8	58.8
Not At All Valued	10	2.2	2.2	61.0
Slightly Valued	23	5.0	5.0	65.9
Moderately Valued	46	10.0	10.0	75.9
Valued	41	8.9	8.9	84.8
Strongly Valued	70	15.2	15.2	100.0
Total	461	100.0	100.0	

Table 40b

Frequencies Test Analysis by Mean – Knowledge on Academic Traditions – University Archers

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	194	42.1	42.1	42.1
Not At All Valued	13	2.8	2.8	44.9
Slightly Valued	15	3.3	3.3	48.2
Moderately Valued	55	11.9	11.9	60.1
Valued	79	17.1	17.1	77.2
Strongly Valued	105	22.8	22.8	100.0
Total	461	100.0	100.0	

Table 40c

Frequencies Test Analysis by Mean – Knowledge on Academic Traditions – Borla and Hood

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	163	35.4	35.4	35.4
Not At All Valued	19	4.1	4.1	39.5
Slightly Valued	33	7.2	7.2	46.6
Moderately Valued	69	15.0	15.0	61.6
Valued	68	14.8	14.8	76.4
Strongly Valued	109	23.6	23.6	100.0
Total	461	100.0	100.0	

Table 40d

Frequencies Test Analysis by Mean – Knowledge on Academic Traditions – Autonomous Organisms

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	144	31.2	31.2	31.2
Not At All Valued	9	2.0	2.0	33.2
Slightly Valued	17	3.7	3.7	36.9
Moderately Valued	53	11.5	11.5	48.4
Valued	116	25.2	25.2	73.5
Strongly Valued	122	26.5	26.5	100.0
Total	461	100.0	100.0	

Table 40e

Frequencies Test Analysis by Mean – Knowledge on Academic Traditions – Doctoral Insignia Imposition

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	116	25.2	25.2	25.2
Not At All Valued	21	4.6	4.6	29.7
Slightly Valued	40	8.7	8.7	38.4
Moderately Valued	69	15.0	15.0	53.4
Valued	100	21.7	21.7	75.1
Strongly Valued	115	24.9	24.9	100.0
Total	461	100.0	100.0	

Table 40f

Frequencies Test Analysis by Mean – Knowledge on Academic Traditions – Honoris Causa Doctorate

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	112	24.3	24.3	24.3
Not At All Valued	24	5.2	5.2	29.5
Slightly Valued	36	7.8	7.8	37.3
Moderately Valued	84	18.2	18.2	55.5
Valued	103	22.3	22.3	77.9
Strongly Valued	102	22.1	22.1	100.0
Total	461	100.0	100.0	

Table 40g

Frequencies Test Analysis by Mean – Knowledge on Academic Traditions – Rector’s Investiture

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	111	24.1	24.1	24.1
Not At All Valued	33	7.2	7.2	31.2
Slightly Valued	49	10.6	10.6	41.9
Moderately Valued	79	17.1	17.1	59.0
Valued	101	21.9	21.9	80.9
Strongly Valued	88	19.1	19.1	100.0
Total	461	100.0	100.0	

Note. Tables 40a to 40g demonstrate the sample’s knowledge on Academic Traditions. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

In our understanding, on the one hand, we assigned the results to Age and Cycle Study interest – older students such as those attending Masters and Ph.D. Degrees are more likely to know and identify references with traditions such as Ph.D. Public Defense or Doctoral Insignia Imposition. On the other hand, we also believe that academic rituals such as Rector's Investiture, *Honoris Causa* Doctorate, Borla and Hood, Charamela, and University Archers are less known because of little hierarchy and protocol interest, as so as Age and Campus location. In fact, sociological and anthropological contextualizing studies on UC Students' interests and identification models would bring light to deeper understanding.

Lastly, to what Autonomous Organisms are concerned, we comprehend that UC Students do not present knowledge on them due to the diversity of cultural and sportive offerings and a preferred interest in festivities and escapism activities.

- UC Student’s Museological Immersive Technology Previous Experimentation

Furthermore, it is equally relevant to mention that to what immersive technologies in museological context refers the conducted Frequency Test by Mean (Table 41a – 41d) revealed that 59.4% (n = 274) of the participants had never experimented with Virtual Reality Glasses, 46.4% (n = 214) had never tried Automated Storytelling and Gamification, 12.6% (n = 58) had never used Interactive Surfaces, and 38.2% (n = 176) UC Students had never experienced Immersive 360° Cinema.

Table 41a

Frequencies Test Analysis by Mean – Knowledge on Virtual Reality Glasses

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	274	59.4	59.4	59.4
None	12	2.6	2.6	62.0
Slightly	32	6.9	6.9	69.0
Moderately	38	8.2	8.2	77.2
Very	59	12.8	12.8	90.0
Extremely	46	10.0	10.0	100.0
Total	461	100.0	100.0	

Table 41b

Frequencies Test Analysis by Mean – Knowledge on Automated Storytelling and Gamification

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	214	46.4	46.4	46.4
None	8	1.7	1.7	48.2
Slightly	24	5.2	5.2	53.4
Moderately	58	12.6	12.6	65.9
Very	82	17.8	17.8	83.7
Extremely	75	16.3	16.3	100.0
Total	461	100.0	100.0	

Table 41c

Frequencies Test Analysis by Mean – Knowledge on Interactive Surfaces

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	58	12.6	12.6	12.6
None	8	1.7	1.7	14.3
Slightly	27	5.9	5.9	20.2
Moderately	102	22.1	22.1	42.3
Very	153	33.2	33.2	75.5
Extremely	113	24.5	24.5	100.0
Total	461	100.0	100.0	

Table 41d

Frequencies Test Analysis by Mean – Knowledge on Immersive 360° Cinema

	Frequency	Percent	Valid Percent	Cumulative Percent
Not Known	176	38.2	38.2	38.2
Slightly	6	1.3	1.3	39.5
Moderately	37	8.0	8.0	47.5
Very	90	19.5	19.5	67.0
Extremely	152	33.0	33.0	100.0
Total	461	100.0	100.0	

Note. Tables 41a to 41d display the sample’s knowledge on the inquired phygital features. Source: *Tradition and Innovation: the Academic Museum of the University of Coimbra as a Collective Memory Space*, 2021.

In our opinion, the results demonstrated sparse contact with phygital realities because of the high expenses that the average Portuguese families face: family income, high taxes, inflation, bank loans, demanding careers, long working hours, and even the average level of schooling negatively impact the interest, availability, and access to museological and cultural activities.

To this, the Calouste Gulbenkian Foundation conducted a study on social inequalities in access to culture (Martinho, 2020)¹⁴⁷, revealing that 11% of visitors that visited monuments, museums, or art galleries, in 2019, had a level of education up to the 3rd Cycle (9th Grade). When inquired what the reasons for not visiting a heritage site more often, the respondents, presented “lack of time” (39%), “lack of interest or preference for other activities” (38%), and the “high price” (21%) as significant barriers. Additionally, we believe that cultural spaces are (still) perceived as erudite, elitist, dull (or not ludic), and undemocratic environments.

To this extent, it is equally interesting to acknowledge that while previous research focused on technology promoting democratic access to knowledge (Kotler et al., 2008; Lo Turco, 2019; Cameron, 2020), our study demonstrated that the promotion of phygital features for the UC Student community is vital when considering that an average of 50% of the participants had never experimented immersive technologies. As so, the incorporation of such technologies is critical when willing to grant democratic access to (diverse) knowledge, (different) experimentation, and (mind-opening) perspectives.

- **Open-ended Questions**

Lastly, it is important to refer to the data obtained from the last question of the online survey that reflected on UC Student’s opinion regarding: (a) what is an academic museum and what should it reflect? (b) where would UC

¹⁴⁷ The survey includes data from 2,000 participants, collected through direct personal interviews at the respondents’ homes – aged 15 or older – between the 12th of September and the 28th of December 2020.

Student's wish to have an academic museum located? (c) and why (or why not) is it important as a tourist experience enhancement?

Considering that this question was open-ended and was not of mandatory reply, the data was organized by gathering the responses of a total of 59 participants.

Sub-Question (a): In general, the 26 participants that replied to this question agreed that an Academic Museum should represent the past and the present of the University of Coimbra, by safeguarding student's and professor's academic traditions and memories. In fact, the idea of an Academic Museum was transversally understood as a perpetuator of collective memory and an identity unifier so much so that it was considered as an essential promotional asset of the University's national and international prestige. On the other hand, it is interesting to reflect on the suggestions of an Academic Museum as a location of academic and intergenerational exchange and as a space that can attract future students for the University.

In addition, it is vital to mention that the interests on museological conservation and preservation; educational programming and service; and scientific production were likewise understood as essential matters of an Academic Museum.

Sub-Question (b): By analyzing the next sub-question, a total of 31 participants indicated Campus I as the best location for the Academic Museum of the University of Coimbra. From these responses 6 specified the "Science Museum", 4 the "College of Jesus", 1 the "Old Faculty of Medicine", and 1 the "Botanical Garden". Interesting as well is to underline that accessibility (physical and transportation) and over tourism concerns were also appointed as important assessments to consider when choosing a location.

Sub-Question (C): Lastly, and to what concerns the importance that an Academic Museum has as a tourist experience enhancer, 24 participants recognized that the museum is a very important tourist asset. In fact, interests on University and Coimbra city national and international promotion, revenue opportunity and sponsorship, employment comeback, authentic tourist experience fostering, differentiated tourist attraction, and accurate historical information and contextualization were pointed out as valuable resources.

In the overall, if the present research clearly demonstrated the UC Student's position on the importance of the Academic Museum as a guardian of the University's unique past and promoter of living heritage made of and for people (students, professors, personnel, Alumni, visitors in general); we undoubtedly defend that future investment will guarantee an unprecedented international approach to tourism, heritage, museology, and sustainability, upraising the Institution and the World Heritage Property to a *Faster – Stronger – Higher* position in the national and international scientific, academic, and tourist scenario.

CONCLUSIONS



CONCLUSIONS

This part displays the exploratory study by summarizing the key investigative outcomes concerning the theoretical section and the empirical research aims and questions. Furthermore, we present action measures in relation to the study, the investigative limitations encountered, and future research recommendations. As so, we discuss how value and contributions result in theoretical subsidies to the research field and how practitioners can act from the investigation. On the other hand, by weaving on revisions to the study's limitations in conjunction with encountered research gaps we draw new recommended opportunities for future experimental directions and management decisions.

1. Concluding Remarks

The present research findings allow us to develop exciting conclusions on understandings concerning phygital heritage, intangible cultural heritage tourism, (memorable) tourism experience requirements, and museological involvement expectations. In fact, the central assumptions appoint to ever-shifting and continuous investments in communication and information technologies, so much so that phygital reality is undoubtedly here to stay and will endure changes in how people live, safe care, work, travel, and satisfy recreational momentums.

In this line of reasoning, and to what tourism, travel, and leisure comprise remainders to hybrid technology existing across all stages of the marketing mix strategies have increased their digital venture. In a likewise manner, e-formats play a vital role in educational and content production, creative industry development, and ludic (re)creation never before experienced.

To this extent, academic studies have demonstrated the significant part that hybrid solutions, (real-time) social media interactions, geolocation positioning, big data management, artificial intelligence, and others are partaking in the follow-up and transformation of the 21st Century. In fact, technological developments are revolutionizing the way visitors and researchers perceive, understand, access, and process heritage, monuments, and museums so much so that it has allowed us to expand not only the information one can obtain but also the uniqueness that the experience and experimentation can provide.

Thought-provoking is to ponder that we are beholding an Era where science and humanities are merging with technology and art, creating new possibilities for intellectual and technological enlightenment that, if applied responsibly, can provide humanity with enriching information towards a better world. Consequently, human existence, interests, and activities face rapid transformations where online entangle with the sense of being, responsiveness, and planetary expansion.

To this degree, museums are concurrently not just classical promoters and safe guardians of the past but are active representatives that entrepreneur cultural institutions, displaying modern, blended, and innovative collections. Hence, the social-historical meaning of museums is unquestionably transfiguring into representational tools of socialization, ludification, and virtualization. In this sense, immersive communication and information technologies such as holographic displays, video mapping, interactive storytelling, and augmented

and virtual reality are not only increasing the visitor's engagement and range of interpretation but are transforming the overall visiting experience. Additionally, such tools are assisting museums in everyday challenges such as lack of space, object fragility, or absence of an artifact when facing temporary collection lending.

On the other hand, cultural institutions and businesses by shifting towards the experience economy have added value to their offer by creating memorable and satisfying experiences that combine entertainment, aesthetics, education, and escapism. To this degree, visitors and customers are personally involved and immersed as a result of their past and present engagements. Consequently, new advances in knowledge have been combining areas such as psychology, sociology, anthropology, history, art, marketing, management, and technology to create new solutions that reply to contemporary demands.

The realm between experience economy and experience consumption, feelings of arousal and sensory stimulation, as so as authenticity and quality of service result in attitudes of loyalty, memorability, recommendation, and revisitation. Nevertheless, the desire to experiment with intense and technology-driven tourist engagements does not necessarily comply with all audiences; in fact, the need for digital-free tourism, attention economy solutions, and transformation through consumption is highly sought.

In this line of ideas, intangible cultural heritage tourism that focuses on the visitor's interest in different cultures, performing arts, crafts, rituals, gastronomy, and interpretations has grown as a dynamic tourist motivator. Simultaneously, the importance of sustainable economic growth and the prominence of preservation for future generations sustains an ever more tourism demand.

To this, the pursuit for authentic experiences that promotes active participation also acts as an influential tourist motivator that drives place attachment, attractiveness, and destination quality assurance generating tourism market competitiveness. On the other hand, authentic intangible cultural heritage experiences encourage understanding, tolerance, and peace, even though scientific literature suggest that tourists create their own meaning of experience.

In this line of reasoning, the present theoretical study shows that the combination of phygital reality and intangible cultural heritage tourism preforms a positive recollection of memorable tourism experiences so much so that memorability can predict future behavioural intentions: revisitation and word of mouth recommendation. Nevertheless, accurate, critical, and up-close examination must be applied across all phases of knowledge production, strategic marketing and communication line-up, and co-creational products and services making.

To what the empirical research comprises, this Master's Dissertation indicates that UC Students of Courses Granting an Academic Degree consider the University of Coimbra's Intangible Cultural Heritage and the Academic Museum of the University of Coimbra as very important and unique assets that the University must actively coordinate in museological and tourism terms.

Furthermore, and although the inquired participants show low phygital experience in the museum context, the results direct a clear preference in combining Immersive 360° Cinema with the *University of Coimbra – Alta and Sofia's* Intangible Cultural Heritage. Such indicates the wish to experiment with new encounters that not only transform the museological interpretation but also provide immersive elucidation of the Academy's history and communal past to visitors in general.

In fact, the outcomes openly suggest that the combination of phygital communication and cultural heritage (phygital heritage) positively replies to the research question: *Can Phygital Technology and the Intangible Cultural Heritage of the University of Coimbra enhance the Tourist Experience to the University of Coimbra – Alta and Sofia Property?* when comprising the Academic Museum of the University of Coimbra. In fact, the outcomes clearly suggest positive influence and high valorization of the asset for the Academic Community, the University of Coimbra, and the tourist attraction in the national and international panorama.

As such, this study reinforces the need to carefully articulate tourism and museum management, so much so that the first does not surpass the last. To this, it is essential to stress the fundamental purposes of museums: create, promote, and disseminate democratic access to scientific knowledge. In addition, it is also essential to underline the importance of balanced fun and feature in the museum context to captive and embrace public of all sorts.

For such, the results indicate that UC Students greatly support new technological approaches to the Academic Museum of the University of Coimbra and positively relate to features of such kind. On the other hand, the inquired community asserts its significance for the tourism experience enrichment – on the exception of 4D Cinema – as all phygital features scored highly regarding their role as resources of authentic tourism experiences and tourism experience enhancers.

On the other hand, the present study contributes to understanding which academic traditions UC Students most relate to and how they are directly connected to Students' daily academic experiences at the University of Coimbra. To this extent, daily livelihood traditions confirm student's identity with the University's unique and symbolic materiality (Student Garb); their

interest in social gatherings, and their desire for escapism through festivities and musicality (Welcome Festivities, Academic Tunas, Serenades, and the Coimbra Fado); and a cross-campus identification with the University Bells as an Academic aggregator and representative of the University and the City of Coimbra. Moreover, we can equally assess which traditions are lesser valued and which practices are not known. To the last, the study reveals scores that are commendable of analysis and serious reflection as they indicate concluding remarks on former political directions that have not taken minded investment in the congregation of intergenerational alliances, student union and council participation, as so as active promotion and enrollment of the Academic Museum of the University of Coimbra.

In this line of reasoning, this investigation provides primordial knowledge on which traditions communication improvement is needed, so tradition and heritage are not forgotten. In fact, the study also suggests that the Academic Museum of the University of Coimbra is vital in safeguarding the Coimbra World Heritage Property, particularly to what Intangible Cultural Heritage concerns.

Moreover, it is important to refer to Nofal's (2019) theory on interactive phygital prototypes as facilitators of heritage communication. In fact, the scores of this exploratory dissertation highly relate to the author's suggestions on hybrid technology as a mediator and influencer on public engagement. On the other hand, we can also accept that UC Students assume digital technologies to enable users to appreciate heritage more experientially.

Nevertheless, additional investigation is needed to understand Nofal's theory on phygital technology as a promoter of heritage awareness and advocate towards the democratization of culture. In fact, due to research limitations on

account of pandemic restrictions and sample size collection, we suggest that further investigation must be conducted.

Still in Nofal's theoretical line of reasoning, we obtained thought-provoking insight on the inquired sample's phygital involvement in the museological context. Even though participants were 27 years of age on average, the outcome showed insufficient knowledge and digital experience to what Virtual Reality Glasses, Automated Storytelling and Gamification, and Immersive 360° Cinema comprises. To this, it is essential to underline that involvement in museological context was not required, implying that experience in gaming, online websites, applications, or leisure events were accepted as past personal experiences to recall.

All in all, the study subsidizes a theoretical and empirical understanding of what and how tradition and innovation can contribute to an Academic Museum of the University of Coimbra for the 21st Century. Nonetheless, the following measures of action wish to contribute with viable methodological tactics that can facilitate a contemporary approach to the museological conceptualization and practice of the University of Coimbra while positively impacting the tourist offering.

2. Action Measures

For a tourism and museological heaving of the operational action plan, we advocate, in the first place, that more profound research on UC Student's knowledge concerning academic traditions and their meanings be conducted. So much so that as a World Heritage University, we consider it vital to safeguard the tangible heritage that subsists and actively protect, collect, and

disseminate the *University of Coimbra – Alta and Sofia's* unique intangible cultural traditions.

For such, we recommend that if, on the one hand, the Academic Museum of the University of Coimbra should emphasize the property's important national and international legacy, it, on the other hand, must imperatively function as a cultural institution that promotes knowledge, interchange of ideas and experiences, and the University of Coimbra as a rich, unique, and lifelong impacting academic and scientific institution. The promotion of itinerary exhibitions and international testimonial feedback can brightly enhance the Museum's social placement. In addition, the creation of robust online participation: official website, UC Global lettering (newsletter), podcast channel presence, active social media, multilingual virtual tour offerings (as practiced by the Monticello and the University of Virginia World Heritage Site), and short online thematical visits will reinforce the Intangible Cultural Heritage that the Museum holds for the Academy and visitors alike. Online information will also assist visiting preparation, so much so that it can be interconnected with the online ticket platform (visit.uc.pt – "Prepare your visit") of the University of Coimbra's Tourism Department.

In this line of action, we defend the need for the Institution to promote active alliances between Portuguese organizations such as the Portuguese Museum's Network¹⁴⁸ and international political bodies such as the European University Heritage Network and the International Council of Museums Committee of University Museums and Collections. Such collaboration can establish protocol frameworks and financing opportunities with Non-Profit Organizations, like the La Caixa or the Millenium BCP Foundation, and renowned enterprises that promote social responsibility as EDP (Energies of Portugal) or ONI (Oni

¹⁴⁸ *Rede Portuguesa de Museus*. Free translation by the author.

Telecommunications). Additionally, we claim that the Academic Museum and the University of Coimbra's uniqueness can easily attract national and international investment for temporary exhibition itinerancy with World Heritage Universities, Universities in World Heritage City Centers, and University Scientific Contributors to World Heritage while generating co-creational project investments that can work on solutions in domains such as scientific museology, human-computer interaction, online virtual communicational systems, and tourist demand understanding.

Further, we advocate that the Academic Association of Coimbra, the Veterans Council, all different UC Student Nuclei, and Former Student Associations in Portugal and in international territories should work side by side for the better promotion of the *University of Coimbra – Alta and Sofia's* Intangible Cultural Heritage. As so, such multilateral participation will provide excellent networking opportunities for the Academy while simultaneously functioning as a marketing and communication promotor, attracting tourists in general, as so as students, researchers, and professors taking the tourism segment venture to another level: University Tourism.

Cumulatively, the introduction of phygital reality will, on the one hand, perpetuate the University and its community's heritage through namely, digital archives and libraries, 3D prototyping, digital restoration, and recreation, and on the other will captivate the community's interest and regular attendance. In addition, and regarding that the University is situated in five different city locations, we defend that the Academic Museum should sponsor smaller cross-campus on-site thematic exhibitions, strengthening its existence, Academy involvement, and content communication while encouraging the physically belonging to all Campus' and collecting a more participative museum collection.

In addition, we believe that a 21st Century Academic Museum of the University of Coimbra must not only resort to phygital technology but also consider its academic community's fundamental needs. In fact, community studies show that investments in temporary exhibitions and spatial expansion must reflect the necessities of its co-users, while ponderations on *what* and *how* the Museum must engage with and for the public should result from co-collaborative production.

In this line of reasoning, we also support that to what tourism enhancement concerns, a modernized Academic Museum of the University of Coimbra should endorse a better and more authentic experience to all tourist segments. In fact, immersive technologies will allow visitors to understand, feel, and fantasy-live the tourist attraction *University of Coimbra – Alta and Sofia*, creating a memorable tourism experience that impacts (re)visitation. At the same time, the contact with clarified intangible cultural heritage will engender strong marketing product placement. Online apps included in the ticket purchase will distribute correct information and function as a souvenir to generate home reliving and personal word of mouth promotion to family, friends, and co-workers or online blog posting on travel experiences.

To this extent, it is equally important to refer that introducing phygital approaches will strengthen the relationship with active national and international players (namely, tour operators, international trade fairs, or hoteliers) and attract new tourist and tourism providers. A new and technological Academic Museum of the University of Coimbra will reinforce the *University of Coimbra – Alta and Sofia*, beyond the Joanine Library or the Palace of Schools, expanding the University of Coimbra's tourist circuit areas and the University of Coimbra's Tourism Department product offering (Plano

Estratégico da Universidade de Coimbra 2019-2023)¹⁴⁹ while the University's museological safeguarding mission (Plano de Ação: Unidades de Extensão Cultural e de Apoio à Formação, 2019)¹⁵⁰ and its World University Heritage preservation responsibility are also attained.

In the overall, the action measures presented allow us to comprehend that phygital heritage is highly recommended for scientific and academic matters, the impact of the University of Coimbra on the national and international panorama, and the enhancement of the overall tourism experience: generating greater visitation flux, high word of mouth marketing, profit for tourism revenue income, and in the long-run benefits for the University's different income returns.

3. Research Limitations and Fragilities

Before completing this dissertation, it is essential to focus on the three main research limitations and fragilities encountered during the investigation:

(1). The present Master's Dissertation was mainly conducted during the COVID-19 pandemic – January 2020 to April 2022 – so on-site interactions were precluded due to lockdown impositions and restrictions concerning paper-based inquiry handouts. On the other hand, the pandemic impositions did not allow us to conduct on-site visits to classes of different courses on different Campuses. Both situations explain why we could not conduct a probabilistic understanding of the population. Consequently, resorting to the online survey

¹⁴⁹ As intended by the University of Coimbra's Strategic Plan 2019-2023 (Plano Estratégico da Universidade de Coimbra 2019-2023, 2019: 45).

¹⁵⁰ *Cultural Extension and Educational Support Units Action Plan 2019-2023* (Plano de Ação: Unidades de Extensão Cultural e de Apoio à Formação, Museu da Ciência, 2019: 1-3)

technique was the best procedure for applying a quantitative method investigation.

(2). In order to contact UC Students of Courses Granting an Academic Degree, we had to resort to the University of Coimbra's and Student Nuclei's social media accounts, as so as directors, professors, and researchers' mailing lists. Although many colleagues and professors fostered this study, a considerate amount of email requests were not attended. Such likewise explains why we presented an exploratory research.

(3). The inexistence of a research support team that can assist UC Students devoting academic work to the University of Coimbra reveals a fragility in the research practice of the University of Coimbra and unexploited research potential that can provide the Institution with additional on-site knowledge free of charge.

Considering the presented, we believe that if, in the future, all Academic structures actively participate, we can transform fragilities into strengthened practices and overcome limitations by building a better utilitarian study for the University, the Academy, the Academic Museum, and the UC Tourism Department altogether. Such, will surely demonstrate the living legacy of communal spirit and membership identity so historically characteristic of the Coimbra Academy.

4. Future Research Directions

Even so, future research must be conducted to better understand tourism experience at the *University of Coimbra – Alta and Sofia*; experience economy demand and supply; and University of Coimbra competition marketing position.

In such manner, towards the end of this study, we appoint the need to develop further investigation on digital information and communication in the museum context; tourism economy at the University of Coimbra; marketing strategy for the *University of Coimbra – Alta and Sofia*; and most importantly quality and innovation in the *University of Coimbra – Alta and Sofia* hospitality and tourism market.

Understanding how the Intangible Cultural Heritage of the *University of Coimbra – Alta and Sofia* can attract tourist interest, generate demand, and increase tourism revenue, seems a vital research subject to undertake. In fact, investment in such intangible context can enhance authenticity and authentic experiences and encourage social and financial development that focuses on sustainable economic ventures.

Similarly significant is to expand knowledge on museological and tourist projects that safeguard and promote intangible cultural heritage experiences. It is vital to increase understanding on how intangible cultural heritage and creative industries can facilitate new responses to societal challenges. How can schools, special needs institutions, nursing homes, hospitals, and other organizations actively participate, promote authentic experiences, and safeguard intangible cultural heritage? Such projects, knowledge, and financial investments will undoubtedly bring many social and economic advantages.

To what the tourism economy at the University of Coimbra concerns, it is vital to develop research on stakeholder interest: What challenges exist? How is intangible cultural heritage tourism and travel internationally developing? Which trends are arising? and Who are the next demanders? Understanding the players' interests and position is vital in a competitive market placement.

As so, academic work on new marketing strategies for the *University of Coimbra – Alta and Sofia* appear very much important. To this, venturing capital and transversal scientific approaches on phygital environments and equipment's; free and high-speed internet coverage platforms; synchronized spatial management through geographic information system programming; and communicational strategies that induce spontaneous social media participation and real-time word of mouth marketing will benefit quality and innovation to what comprises UC Quality¹⁵¹ goals.

Furthermore, we believe that investigating the relationship between the Intangible Cultural Heritage of the *University of Coimbra – Alta and Sofia* and cultural authenticity, integrity, and diversity will foster new perspectives and help develop the UC Image and UC Brand. For such, investments in phygital heritage will enhance the tourist experience itself and bring light on novel approaches to promotion, placement, product, and value for money (price).

In addition, we recommend conducting a broader study to access a representative sample size that can generate a solid understanding of immersive museological activities, marketing strategies, and co-creational product design aligned with economy experience approaches. For so, we advocate the need to inquire UC Professors and UC Personnel through paper-based questionnaires.

¹⁵¹ As intended by the Quality Plan. University of Coimbra's Strategic Plan 2019-2023. (Plano de Qualidade. Plano Estartégico da Universidade de Coimbra 2019-2023, 2019)

Subsequently, and due to the population size of the University of Coimbra's Alumni, we believe it is important to apply semi-structured interviews to assess their concerns and expectations.

Lastly, we consider it essential to understand the visitor's contextual perspective, their previous knowledge of the University of Coimbra's academic traditions, and what expectations towards the *University of Coimbra – Alta and Sofia* exist. As so, we suggest that multilingual on-site digital questionnaires resorting to tablets should be applied while visitors are queuing at the ticket office or waiting for their turn to enter the Joanine Library. Once again, it is crucial to have trained personnel who can assist participants with any doubts concerning the questions posed.

All in all, and in the long run, investing in the intangible asset of a community – its people, traditions, and intergenerational relationships – is the accurate, tangible representation of respect for humanity and its communal History. In fact, safeguarding heritage that cannot be seen but is felt in a collective group's mundane life, heart, and mind is the utter demonstration of a prudent and realistic strategy decision-making practice. To this, and as an ending conjecture, this dissertation reveals that applying phygital features to the Intangible Cultural Heritage of the *University of Coimbra – Alta and Sofia* will not only enhance the tourist experience itself but will above all heighten the UC Community and the UC Identity to a more fortified, sustainable, and people-oriented horizon.

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ANNEX

Tradição e Inovação

O Museu Académico da UC como Espaço de Memória Coletiva

Caro/a Participante,

Este questionário integra-se num estudo de âmbito científico, no contexto do Mestrado em Turismo, Território e Patrimónios, que visa aferir qual o **património cultural imaterial** que os/as estudantes da Universidade de Coimbra mais valorizam, o modo como percecionam as **experiências imersivas** e como consideram que estas poderão **enriquecer a experiência turística** no bem **Universidade de Coimbra - Alta e Sofia**.

O seu propósito é servir como instrumento de recolha de opinião e tem como intuito orientar estratégias de decisão para uma gestão e comunicação inovadora do património cultural imaterial da Universidade de Coimbra.

Só podem participar os/as estudantes da Universidade de Coimbra que frequentem um curso conferente de grau. A participação neste estudo tem uma duração aproximada de 10 minutos.

Todas as respostas são anónimas e os dados serão usados exclusivamente para fins de investigação, mantendo a sua privacidade. Os dados recolhidos serão guardados em segurança, de forma codificada e anónima, numa base de suporte de dados da Universidade de Coimbra por um período de 5 anos e sujeitos ao dever de confidencialidade e ao Regulamento Geral de Proteção de dados (RGPD).

A sua disponibilidade para participar neste estudo contribuirá muito para compreendermos o modo como o património imaterial é percecionado e permitirá valorizar as tradições académicas, bem como inovar e enriquecer a experiência turística na Universidade de Coimbra.

Para mais informações contacte a mestranda **Germana Torres** através do seguinte endereço eletrónico: **torres.c.germana@gmail.com**

Grupo I - O Património Cultural Imaterial da Universidade de Coimbra

Neste grupo encontra um conjunto de 3 questões onde se procura conhecer a sua opinião acerca do Património Cultural Imaterial da Universidade de Coimbra.

Por “**património cultural imaterial**” entende-se

(a) tradições e expressões orais, incluindo a língua como vetor do património cultural imaterial;

(b) artes do espetáculo;

(c) práticas sociais, rituais e atos festivos;

(d) conhecimentos e usos relacionados com a natureza e o universo;

(e) técnicas artesanais tradicionais (...) transmitidas de geração em geração e recriadas pelas comunidades (...) conferindo-lhes um sentido de identidade e de continuidade, assim como a promoção do respeito pela diversidade cultural e pela criatividade humana.

In Artigo 2 - Convenção para a Salvaguarda do Património Cultural Imaterial, UNESCO, 2003.

I) 2. Relativamente ao Museu Académico da Universidade de Coimbra, como responde aos seguintes itens? *

	Sim	Não
Conhece a sua existência	<input type="radio"/>	<input type="radio"/>
Já o visitou	<input type="radio"/>	<input type="radio"/>

I) 3. Para as seguintes realidades, que grau de importância considera que um museu académico assume? *

Por favor, selecione a posição apropriada para cada elemento:

	Nada Importante	Pouco Importante	Razoavelmente Importante	Importante	Muito Importante
Os Estudantes da UC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Os Antigos Alunos da UC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A Construção da Memória Coletiva	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A Identidade da Comunidade Académica	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A Imagem da UC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A Marca UC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A Valorização da Experiência Turística na UC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A Fruição de uma Experiência Turística mais Autêntica	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
O Destino Turístico Cidade de Coimbra	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Grupo II - A Atração Turística Universidade de Coimbra,
Museologia e Inovação

Neste grupo de 2 questões pretende-se conhecer a sua opinião relativamente à utilização de tecnologias imersivas em núcleos museológicos e como considera que podem ser aplicadas ao bem *Universidade de Coimbra - Alta e Sofia*.

<p>Interação Informativa por Gesto Controlado</p> <p><i>(O/A visitante controla o exposto ou a informação via gestual sem ter de tocar na superfície)</i></p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Formato Misto</p> <p><i>(Combinação do analógico e digital, fazendo uso do mundo real e virtual. Os objetos físicos e virtuais encontram-se lado a lado)</i></p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Formato Realidade Virtual</p> <p><i>(Ambiente tridimensional acedido por Óculos RV que reagem aos movimentos do/da utilizador/a e permitem que interaja com a realidade virtual)</i></p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Formato Realidade Aumentada</p> <p><i>(A exposição é enriquecida com conteúdos virtuais como imagens, vídeos e objetos que são sobrepostos à perceção real)</i></p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Cinema Imersivo 360º</p> <p><i>(O/A visitante acede à informação através de um filme em 360º, podendo deambular pelo espaço enquanto o visualiza)</i></p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Cinema 4D</p> <p><i>(Uma experiência imersiva que combina o cinema e os sentidos através de cheiros, vento, calor/frio, água, trepidar das cadeiras, etc.)</i></p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Grupo III - Tecnologias Imersivas: Aceitação e Atitudes

Neste grupo de 4 questões pretende-se compreender como se posiciona relativamente às tecnologias imersivas no contexto da experiência turística.

III) 1. Recorde a sua experiência pessoal com as seguintes tecnologias, como classifica a sua utilização quanto à **Utilidade?** *



Por utilidade entende-se a forma como considera que determinada tecnologia vai beneficiar ou não a sua experiência turística.

Selecione a opção que melhor representa a sua opinião de acordo com a legenda que se apresenta em baixo.

- 0 - Não Conheça
- 1 - Nada
- 2 - Pouco
- 3 - Moderadamente
- 4 - Muito
- 5 - Bastante

Caso nunca tenha experimentado uma destas tecnologias faça uso do valor

"0 - Não Conheço"

	Melhorou a experiência turística	Facilitou o acesso à informação	O seu uso facilitou a compreensão do espaço	Foi útil para a experiência turística
<p>Óculos de Realidade Virtual</p> 	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<p>Tablet Realidade Aumentada e Gamification</p> 	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Superfície Interativa



Cinema Imersivo 360°



III) 2. Recorde a sua experiência pessoal com as seguintes tecnologias, como classifica a sua utilização quanto à **Facilidade de Uso?**

*



Por facilidade de uso entende-se o esforço de uso que determinada tecnologia requer.

Selecione a opção que melhor representa a sua opinião de acordo com a legenda que se apresenta em baixo.

- 0 - Não Conheça
- 1 - Nada
- 2 - Pouco
- 3 - Moderadamente
- 4 - Muito
- 5 - Bastante

Caso nunca tenha experimentado uma destas tecnologias faça uso do valor

"0 - Não Conheço"

	Deixou-me confuso	Orientou-me no espaço	Foi de fácil utilização	Requereu baixo esforço mental
<p>Óculos de Realidade Virtual</p> 	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<p>Tablet Realidade Aumentada e Gamification</p> 	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Superficie Interativa



Cinema Imersivo 360°



Grupo IV - Caracterização Pessoal

Neste último grupo, composto por 7 questões, pretende-se conhecer as características do participante.

IV) 1. Em que faculdade estuda? *

Por favor, selecione **apenas uma** das seguintes opções:

IV) 2. Qual é o curso que está a frequentar? *

Por favor, escreva aqui a sua resposta:

IV) 3. Qual é o seu ciclo de estudos? *

Por favor, escreva aqui a sua resposta:

IV) 4. Em que ano está a estudar? *

Por favor, selecione **apenas uma** das seguintes opções:

IV) 5. Qual é o seu ano de nascimento? *

Por favor, selecione **apenas uma** das seguintes opções:

IV) 6. Como se identifica? *

Por favor, selecione **apenas uma** das seguintes opções:

IV) 7. Em que município reside? *

Por favor, escreva aqui a sua resposta:

IV) 8. Faça uso desde espaço se quiser deixar a sua opinião sobre: (a) o que é para si um museu acadêmico e o que este espaço deve refletir; (b) onde gostaria de o ver localizado; (c) porque é (ou não) importante para a valorização da experiência turística.

Por favor, escreva aqui a sua resposta:

Muito obrigada pela sua participação!