D3.4: eCHOing methodology for the implementation of Open Innovation Collaborations

Authors:	**Alexandra Angeletaki, Paula Rice -NTNU**
Editor	**Christina Kanellou-OSYGY**
Version Status	**Final**

Dissemination Level		PU

Deliverable Factsheet

Project Number:	**2021-1-NO01-KA220-HED-000031986**
Project Acronym:	**eCHOIng**
Project Title:	**Recovery of cultural heritage through higher education-driven open innovation**
Title of Document:	**PR3A5: eCHOing Methodology for the implementation of OI collaborations.**
Editor(s):	**Christina Kanellou - OSYGY**
Contributor(s):	**NTNU, OSYGY,**
Reviewer(s):	**Milena Dobreva**
Approved by:	**All Partners**
Abstract:	**Guidelines on the organisation of OI projects: roles of organisers, quality assessment framework and tools, quality control, practicalities, etc.**
Copyright	**Creative Commons License 4.0 International**
Please cite as	**Angeletaki A., Rice P. 2024. PR3A5 : eCHOing Methodology.**

Consortium

The consortium governing the project is adequately representing a wide range of expertise, as 4 Higher Education Institutions and 1 university library (NTNU, Scuola Superiore Sant'Anna, Sofia University ST Kliment Ohridski, University of Tartu) join hands with a web education specialist (Web2Learn) and an NGO of 16 cultural associations: OSYGY. This mix of knowledge, skills, experiences and networks guarantees a layered approach toward a diverse range of stakeholders.

	Name	Short Name	Country
1	**Norwegian University of Sciences and Technology**	NTNU	Norway
2	**Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna, Pisa**	SA	Italy
3	**Web2Learn**	W2L	Greece
4	**Sofia University St Kliment Ohridski**	SU	Bulgaria
5	**University of Tartu**	UT	Estonia

| 6 | **Federation of Women Association "Kores of Cyclades"** | OSYGY | Greece |

Revision History

Version	Date	Revised by	Reason
V0.1	**11/01/2024**	Alexandra Angeletaki	Editing from draft methodology
V0.2	**17/01/2024**	Paula Rice	Editing
V0.3	**22/01/2024**	Milena Dobreva, Paula Rice & Alexandra Angeletaki	Final proofreading

Statement of originality:

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

Disclaimer:

This project has been funded with support from the European Commission. This deliverable reflects the views only of the author and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Table of Contents

List of Figures: Fig 1: five stage model visualisation

Abbreviations:

Aps: Associated Partners

CHOs: Cultural Heritage Organisations

CCS Cultural and Creative Sector

HEIS: Higher Education Organisations

LTTA: Learning Teaching Week

MEs: Multiplier events

MMG: Mapping and Matching Guide

OI: Open Innovation

OIP: Open Innovation Project

OII: Open Innovation Initiatives

R&D: Research and Development

Executive Summary

The eCHOing project has developed this Methodology to enable the effective replicability of Open Innovation Project (OIP) initiatives driven by Higher Education Institutes (HEIs) for the benefit of Cultural Heritage Organisations (CHOs). The need for such a Methodology stems from a lack of systematic knowledge on how HEIs can collaborate with CHOs through Open Innovation (OI) tools to address the challenges CHOs face. It addresses all target groups of the eCHOing project: primarily staff at all levels and students of HEIs as the main beneficiaries and also stakeholders in the cultural and creative sector and small and medium-sized cultural organisations. This Methodology was produced as a draft within the Project Result 3, and was presented and implemented through a Learning Teaching week (LTTA) in April 2023 to all eCHOing members, associated partners and students. It has then been implemented by the eCHOing partners in 28 different OIPs organised and performed by all associated partners as planned during the Project Result four (PR4) period. Each OIP group has used the proposed methodology to define action plans containing the criteria and the modalities that the Methodology has recommended. After these were completed, the Methodology has been revised and finalised so that it is easily replicable for the benefit of other academia-society cooperations using Open Innovation as a frame for interdisciplinary and inter-generational collaborations between academic staff and students as well as stakeholders of the cultural and creative sector. Each partner has showcased the Methodology during the final project phase through events (MEs) for partners and local communities (MEs). The consortium produced learning modules, reports, conducted surveys, and ultimately created a policy brief and a recommendation for academic curricula, based on lessons learned and participant feedback, collected during the fourth and fifth project period (PR4 and PR5). The project's goal was to create a framework for open, interdisciplinary environments where participants can discuss challenges and co-create solutions. The result was strengthened collaborations between HEIs and CHOs using Open Innovation Initiatives (OII) that are easy to adopt and replicate for the benefit of the European cultural and creative sector.

1. Introduction: Over the past two years (2022-2024), the Erasmus+ partnership "Recovery of cultural heritage through higher education-driven open innovation" (eCHOing) has worked with open innovation practices for collaborations between heritage professionals, students and citizens across five countries, focusing on small capacity building and new skills transfer. The coronavirus crisis was seen as an opportunity to revitalise the connection between Higher Education (HE) and society and enable them to assume even more energetically, their role and responsibilities towards European citizens. The project aimed to realise the potential of universities to contribute to the recovery of a sector that has been most severely hit, the cultural and creative sector (CCS), specifically small and medium-sized CHOs. The term 'open innovation' refers to a situation where an organisation doesn't just rely on internal knowledge, sources, and resources (such as its own staff or R&D) but also uses external sources (such as customer feedback, published patents, competitors, external agencies, the public) to drive innovation.

In the cultural heritage sector, it means initiatives or activities where institutions co-create or co-develop project ideas in collaboration with citizens, students and institutions from other sectors or industries. These activities can take many forms: for example, citizen science, crowdsourcing, actions for grassroot communities, hackathons, etc.(see our open innovation guide). One of the objective challenges for designing a methodology for OIPs is how to choose a flexible structure which supports these very different kinds of potential activities. The approach implemented by eCHOing was to focus on the stages which capture the innovative nature of the intervention rather than pick any technology-driven intricacies which would require branching into different opportunities. The observations on the implementation of the OIPs confirmed that this was a sound approach as the methodology provided a framework to advance the activities as useful structuring placeholders rather than being unnecessarily prescriptive on details which might not have always been adequate depending on the nature of the innovation.

The eCHOing project sees OI as a collaborative effort between academia, the cultural heritage sector, and members of the public, with the aim of creating an open space for the exchange of knowledge and creativity.

2. Tools Developed by eCHOing

eCHOing has identified the need for such a Methodology due to the lack of systematic knowledge on how the collaboration between HEIs and CHOs can benefit from OI tools to address specific sectoral challenges.

Three tools were developed by eCHOing to familiarise its partners and APs on how OI can be used and to create a common understanding among participants on the general framework of the projects to be implemented:

1. Online Modules & Learning Objectives of OI Training to establish a common training platform.
2. A Mapping & Matching Guide to explain OI and present several concrete examples of similar projects.
3. An Interview Guide to facilitate the dialogue between partners

4. A series of eCHOing webinars and videos on various subjects related to tools and methodologies applied in the CCS and Academia for collaborative projects.

These are directed at all target groups of the eCHOing project: primarily staff at all levels and students of HEIs as the main beneficiaries and also stakeholders in the cultural and creative sector and small and medium-sized CHOs.
The series of the youtube videos showcases the work done by the students that have participated in the implementation of OIPs.

2.1 Online Modules & Learning Objectives of OI Training

eCHOing also delivered a set of carefully selected modules aimed at empowering the CHO staff and HEI participants, students in particular.

Module 1: Open innovation in academia-society cooperation: examples of cultural heritage preservation in a crisis situation

Module 2: Datafication of Collections: Opportunities for Innovation in the novel European Data Space for Cultural Heritage

Module 3: Development of an Open Innovation approach through the co-creation of Immersive Virtual Heritage applications

Module 4: Craft as an empowering tool for community and cultural heritage

Module 5: Diversity, Inclusivity and the Gender Perspective: Women and Cultural Heritage, a how-to crash course

Module 6: Co-designing projects for the cultural sector. Discover the important processes, tools, and skills needed

These modules were designed to train CHO staff as well as Higher Education staff and students to use OI methods and practices. The modules range from basic to advanced topics and are designed to inspire and equip CHOs with the tools and resources needed to effectively conceive, develop, and manage OI collaborations. Through internal and external reviews, the six online modules

were finalised and run in four different university courses during the spring semester of 2023. Evaluation feedback was also collected from 20 students at the piloting stage of the modules.

The modules were embedded in four different courses with 120 students. The main outcomes of the modules are summarised here:

1. An online library was established containing scholarly articles, videos, and other media content related to OI and academia-society collaborations to be used as resources.

2. Engaging interactive modules were designed and delivered, featuring case studies and lessons learned, highlighting innovative ways in which such crises have been addressed by other HEIs and CHOs.

3. Some of the tools used to facilitate collaboration between HEIs and CHOs and to promote OI comprehension were virtual events (E1 and E2), as well as student visits where museum staff were interviewed.

4. OIP ideas were collected from the courses and delivered to the CHOs participating as collaborators for review and evaluation. This was to decide on the final OII to be implemented by the PR4 phase and evaluated by the 5th Project Result (PR5) phase of the eCHOing project in 2023 and 2024.

2.2 Mapping & Matching Guide (MMG)

In addition to the free online learning modules run by the four partner universities of eCHOing, several other tools were developed to help small cultural organisations without any revenue to establish an understanding of OI as a tool for collaboration, for their own benefit and in collaboration with students. Additionally, eCHOing created an OI Mapping and Matching Guide in

order to explain the types of OI that could be used during the developmental phase of project collaborations

The eCHOing MMG summarises key forms of OI and provides the CHO partners with an overview of the characteristics of different forms of OI as well as some inspirational examples. It also allows an appropriate matching with associated partners, depending on the size, scope, selected audience etc. of the institutions. The guide outlines several categories of OI and gives descriptions of practical examples and case studies to provide the reader with a better understanding of the characteristics of each category. Additionally, the guide provides an analysis of the best OI practices and how they were used to create synergies between universities and the cultural sector. The guide furthers the understanding of how OI processes can be implemented in different contexts, considering the specific needs and strategies of the stakeholders involved. Using the MMG as a foundation for further interaction, partners can identify at a glance the possible type of OI in which they are interested.

3. The methodology is also supplemented by the webinars and videos produced by the consortium on the revival of the European cultural sector through Higher-education-driven open innovation.

4. Ten videos were also produced by students that have been working with a concrete collaborative project during the implementation period and have shared their experiences as agents of change with us.

2.3 Policy Framework as a Tool for Collaborations

The following Policy framework was proposed by all partners to be communicated to stakeholders (CHOs) through OI contracts signed by the collaborators during the PR4 implementation period.

During this implementation period, the proposed eCHOing action Methodology was adjusted to the specific environment and needs of each CHO that was implemented and evaluated through the proposed project. Each partner hosted a HEI student at their premises and worked closely with them, following the guidelines outlined in the collaboration objectives below.

The main collaboration objectives are:

1. **Establish objectives**: Identify stakeholders and define project objectives, outcomes, and timelines. Identify the purpose of the collaboration and the competencies each partner brings to the project.

2. **Develop a strategic plan**: Outline the objectives in detail, create a project timeline, develop a plan to coordinate partners, and include plans for resources.

3. **Identify legal issues**: Establish the legal framework and identify any laws or regulations that need to be followed.

4. **Identify resources:** Secure available resources, staff, technology, and partnerships.

5. **Design methodologies**: Design innovative processes to enhance learning, gather data and share information between both organisations.

6. **Develop an implementation plan**: Break down the project into manageable checklists with a timeline; identify any risks and challenges.

7. **Monitor and evaluate:** Create a quality control process to ensure project goals are met; review and evaluate processes regularly.

8. **Create a communication plan**: Create a plan for communication between partners and stakeholders for the duration of the project.

9. **Disseminate results**: Promote the project results (PRs) and outcomes to tell relevant audiences about OI initiatives.

10. **Replicate and scale up possibilities:** Develop plans to replicate successful OI projects and scale up initiatives in the future.

3   The 5-Stage Organization of an OI Project

The 5-stage structure aims to provide a proposed action plan for the initiation, and implementation of a project collaboration framework. It consists of the following phases:
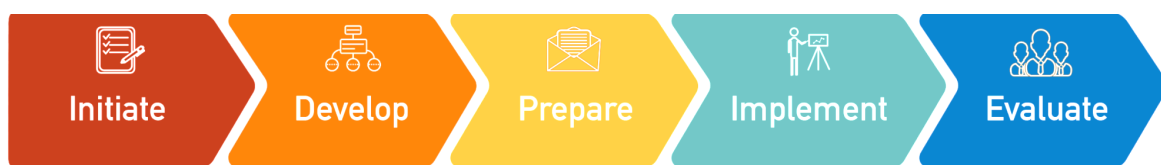

Image 1

1. INITIATE - A strategic alliance between a university and a CHO to explore the OI design models suited to the needs of the partners and to promoting their goals.

2. DEVELOP - Establishing project working groups composed of staff and students from the HEI and CHO's staff to develop working plans and choose the OI initiatives they want to work on.

3. PREPARE - Agree on an implementation plan and a timeline, the dates, the target groups of the proposed project and on methods of engagement for the target groups.

4. IMPLEMENT - Implement the project, with the cultural organisation leading the project work, which is adjusted to their needs and challenges. The collaborating HEI   explores and plans solutions as well as providing support through skill-mentoring of the participants to ensure quality of experience (digital or analogue).

5. EVALUATE - Review the entire project and complete a report that covers every aspect of project production, evaluating its outcome through partners and user

experience surveys and interviews. This last stage will provide the participants with valuable feedback.

3.1 A 10-step implementation general guide for Open Innovation Initiatives (OII)

The implementation guide for OI and the action plan for project collaborations between HEIs and CHOs using the Echoing collaboration framework on OII is summarised here in 11 action steps:

INITIATE

1. Establish a group composed of the collaborating partners and map the competencies they bring to the process allowing interdisciplinary and intercultural approaches.
2. Set shared objectives: define a clear set of common objectives and establish a mutual understanding of the aims and objectives of the collaboration.
3. Research: understand previous and existing OI-project collaborations and identify a target type through eCHOing MMG.

DEVELOP

4. Develop a project plan and timeplan: decide on an approach and create an action plan to implement your OIP, share resources and create content.
5. Agree on the target groups of the proposed project and on methods of engagement for the target groups.
6. Establish communication channels and marketing strategies to interact effectively with target audiences.

PREPARE

7. Establish desired outcomes and produce solutions that are implemented in a way that yields tangible results, for the effective replicability of OI driven by HEIs for the benefit of CHOs for whom the solutions are tailored.

IMPLEMENT

8. Agree on criteria for successful implementation and methods of evaluation.
9. Monitor progress: monitor the project, establish a timeplan and make adjustments as necessary.

EVALUATE

10. Measure impact: evaluate results through surveys, interviews and participatory webinars or workshops with stakeholders based on the established criteria and determine how to move forward and establish further implementation.
11. Establish a systematic evaluation suite to assess the success of the collaboration. This could involve setting specific metrics that parties can use in order to measure the achievements of the collaboration.

"

4. Impact Assessment Methodology

The potential benefits of OI collaborations in the cultural sector are numerous (see benefit criteria checklist from Mavroudi, A., Angeletaki, A. 2022,pgs 16 to 19). Open Innovation (OI) collaborations are seen here as a way to help museums, libraries, archives, and other institutions to increase their visibility, attract new audiences, and improve visitor experiences. Additionally, these collaborations foster creativity and collaboration between different actors in the cultural sector, allowing for interdisciplinary and intercultural approaches that can lead to new and innovative forms of knowledge. In addition, innovation in libraries, museums and archives can help to crystallise and consolidate much-needed use cases for the development of new large-scale data ecosystems such as the common European data space for cultural heritage, or the European collaborative cloud for cultural heritage (Dobreva et al., 2022). Finally, OI collaborations give institutions the opportunity to share resources and to create content that can be accessed by a wider audience, thus allowing for a more equitable distribution of knowledge (Errichiello, 2018).

It is widely acknowledged among academic researchers that digital transformation processes have become increasingly necessary for the successful engagement of stakeholders in CHOs and other sectors (Kraus 2021). The need for frameworks of collaboration between CHOs, HEIs and other relevant partners is very important.

In order to understand modern relationships between archives, libraries, and museums, previous research has focused on examining trends in collaboration in the cultural heritage sector (Allen and Bishoff 2001; Gibson, Morris, and Cleeve 2007). The successful implementation of OIPs requires that certain criteria are met, both during and after the project. To measure the impact of such projects, it is essential to understand the perspectives of stakeholders involved in the project. Thus, the relationship between stakeholders needs to be adjusted

according to some of the new technologies being applied in archives, libraries, and museums but they also need to be adjusted to their public and potential audiences.

4.1 Qualitative Criteria for Evaluating the Impact of OI Cooperative Projects

In order to establish successful collaborations between educational programs and cultural organisations, it is important for both to assess their respective needs and capabilities in terms of resources, expertise, and existing networks. For example, the educational programs may need to assess the specific objectives of their courses and identify specific types of knowledge and skills that they would like to gain from a collaboration. Meanwhile, cultural organisations should assess their current resources and how they could be applied towards the collaboration in order to increase its potential for success.

Furthermore, in order to ensure the success of the collaboration, the educational programs and cultural organisations should seek to maintain open dialogue and communication. For instance, they should establish a mutual understanding of the aims and objectives of the collaboration. This can help both parties to create a shared vision and create an environment that is conducive to creative thinking and collaboration.

Moreover, it is important to establish a systematic approach to assess the success of the collaboration. This could involve setting specific metrics that both parties can use in order to measure the achievements of the collaboration. Such metrics could include the number of visitors to the cultural organisation, the number of resources shared, or the number of partnerships that are established as a result of the collaboration. By setting and monitoring these metrics, both parties can evaluate the success of the collaboration and assess what future steps need to be taken to ensure its continuing success.

4.2 Social Impact Criteria by eCHOing

The benefits of the eCHOing OI collaborations have been measured through interviews, surveys, and observation of participatory workshops during the project period.

The eCHOing Project has thus set up a survey toolkit and an [interview guide](#) to help the collaborating partners during the implementation of the OII during the PR3 and PR4 phase of the project. To assess the gain of an OII, partners need to establish measurable criteria for successful outcomes.

To be able to achieve realistic collaborative working practices all partners were asked to establish the following criteria framework:

- Clear working practices between CHO and HEI.
- Objectives that are achieved in a timely and efficient manner.
- Project outcomes that are implemented in a way that yields tangible results.
- Long-term collaboration and implementation risks assessment criteria.

Such criteria can be summarised as benefits that are clearly outlined and measurable, during and after the project:

Assessment of Gain:
➔ Risks are identified and assessed prior to the start of the project.
➔ Performance is reviewed after completion of the project to assess success or failure.

Finally, PR4 evaluated the success of the implementation of the pilot projects and proceeded to assess the impact of the projects through a SWOT performance analysis. In addition to that, PR5 surveys have provided a checklist of benefits, indicative of the performance of the project outcomes measured by three phased surveys.

Surveys were conducted in three periods, before the OIPs implementation post-surveys after the OIP implementation and six months post-OIP surveys. These provided us with success evaluations among HE staff, students and CH staff.

A selection of important documents delivered to the CHOs after the implementation of the projects were produced to supplement the policy framework which was translated in all the languages of the consortium. This policy as well as the impact reports can be used for further collaborations between academia and CCS.

All the reports and deliverables of the methodology are published as open access through the Erasmus plus platform and [eCHOIngs website](#)

[PR4-D4.1: Design Framework for The Implementation of OIPs](#)
[PR4A11: Policy Brief: eCHOING: Recovery of cultural heritage through higher education-driven open innovation: Academia-driven open innovation for the revival of small and medium cultural heritage organisations (CHOs)](#)
Translations in different languages: [Bulgarian](#) | [Estonian](#) | [Greek](#) | [Italian](#) | [Norwegian](#)
[D5.4 Impact report of eCHOing project. The final report based on the data analysis of the collected participant surveys](#)

4.3 Survey Toolkit

The survey tool kit is developed to assist all stakeholders to measure the impact of the OII projects during the PR4 phase of eCHOing collaborations with selected CHOs.

Some general guidelines to consider when one creates data surveys in order to collect ideas and feedback from users/visitors/participants are shown below:

1. Ensure a clear definition of the purpose of the survey before creating it. What do you hope to learn from it?

2. Develop survey questions that are clear and concise, as well as applicable to the cultural experience.

3. Include open-ended questions that encourage respondents to provide more detailed feedback.

4. Provide space for respondents to add their own suggestions and/or comments.

5. Tailor questions to various demographics such as age, gender, or ethnicity to better understand how specific groups might experience the cultural event.

6. Ask respondents to indicate what could be done differently or improved when it comes to the cultural experience.

7. Keep the survey short and to the point; the fewer questions, the better.

8. Offer incentives to complete the survey and boost response rates.

9. Allow respondents to answer anonymously, if possible.

10. Follow up with respondents after they complete the survey as necessary.

4.4. Lessons Learned

The aims of the tools, modules and all documents that have been shared among partners during the preparation of the third and fourth phases of the implementation period (PR3-PR4) allowed us to:

- Formulate strategies for local sustainable development through collaborative OIPs for social benefit.
- Identify best practices to encourage civic engagement and intergenerational participation in cultural heritage through OI.
- Identify skills and resources for digital transformation based on informative case studies.
- Apply strategies related to cultural heritage and address broader social challenges through collaborative work.
- Apply co-creative strategies to appeal to broader audiences and make their work relevant to them.
- Use examples of teaching and learning practices that can be tailored to their own organisations as part of flexible educational models.

The methodology was applied to working groups of CHOs Staff and Students in order to proceed to the actualisation of the OI projects. The final results have been collected as answers to the three-phase surveys during the PR4 and PR5 period. Throughout the project period students have been characterised as the key contributors to the success of the projects. As identified by the report of PR4,D4.5 Lessons Learned "HE-driven open innovation to sustain CHO's in Europe" Open Innovation requires initiative, engagement and willingness to

volunteer from the participants (p.29). Lack of these factors in the process might lead to challenges with overdue deadlines and difficulties for completion of project results. eCHOing had to organise several extra webinars and workshops to create engagement among the various participants, students, museum staff and educators. Small and medium-sized CHO members also made significant contributions, offering valuable practical knowledge and professional insights. The students who have allocated time and effort as interns and mediators of the proposed methodology have been very important for the success of the implemented OIPs. They mediated the information from and to the partners in all the working periods of the project.

The assumption of a lingua franca as a communication tool throughout the project period for all participants of the 5 different countries, proved to be more of a wish than a reality. Especially the small NGOs from Greece, Bulgaria, and Estonia. They have had a number of members that were not able to benefit as much through the lack of translation infrastructure during meetings, webinars and conferences.

Therefore, we suggest that in such endeavours and prior to the implementation of such a collaborating methodology, the representatives of the NGOs should have a "train the trainer" webinar in their own language. This was actually added by all partners in different periods to address this challenge and help the flow of information and resulted in extra working efforts for all members organising meetings and webinars in the respective languages.

The overall aim was to re-establish their societal role of HEIs to act as catalysts for the revival for sectors strongly hit by the pandemic and use open innovation as a transformative approach to academia-society continuum for more inclusive societies and the digital transformation of HEIs.

The eCHOing consortium has delivered a comprehensive Methodology designed to promote new forms of knowledge creation and circulation outside traditional HEI settings, involving both students and staff.

The methodology developed was the result of a hands-on collaborative approach in order to establish a common ground on how to approach the challenges and create solutions. This final version of the eCHOing methodology achieves the aim of finding ways in which cultural heritage can benefit from working with HEIs. It managed to identify citizen-enhanced open innovation methodologies as well collect best practices and inspire collaborations. Finally, this collaboration framework has managed to foster innovation, laying out a blueprint for future interdisciplinary initiatives between HEIs and CHOs contributing to the revival of the cultural and creative sectors in Europe.

References

Allen, N., & Bishoff, L. (2001). Academic library/museum collaboration: I'm ok, you're ok.

Cappa, F., Rosso, F., & Capaldo, A. (2020). Visitor-sensing: Involving the crowd in cultural heritage organizations. *Sustainability*, *12*(4), 1445.

Dobreva, M., Stefanov, K., & Ivanova, K. (2022). Data spaces for cultural heritage: Insights from GLAM innovation labs. In *International Conference on Asian Digital Libraries* (pp. 492-500). Cham: Springer International Publishing.

Errichiello, L., & Micera, R. (2018). Leveraging smart open innovation for achieving cultural sustainability: Learning from a new city museum project. *Sustainability*, *10*(6), 1964.

Fraisl, D., Hager, G., Bedessem, B., Gold, M., Hsing, P. Y., Danielsen, F., ... & Haklay, M. (2022). Citizen science in environmental and ecological sciences. *Nature Reviews Methods Primers*, *2*(1), 64.

Flus, M., & Hurst, A. (2021). Design at hackathons: new opportunities for design research. *Design Science*, *7*, e4.

Gibson, H., Morris, A., & Cleeve, M. (2007). Links between libraries and museums: investigating museum-library collaboration in England and the USA.

Hetland, P., Pierroux, P., & Esborg, L. (2020). *A history of participation in museums and archives: Traversing citizen science and citizen humanities* (p. 310). Taylor & Francis.

Hylland, O. M. (2017). Even better than the real thing? Digital copies and digital museums in a digital cultural policy. *Culture unbound*, *9*(1), 62-84.

Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., & Roig-Tierno, N. (2021). Digital Transformation: An Overview of the Current State of the Art of Research. Sage Open, 11(3). https://doi.org/10.1177/21582440211047576 Meehan, N. (2022). Digital museum objects and memory: postdigital materiality, aura and value. *Curator: The Museum Journal*, *65*(2), 417-434.

Mason, M. (2022). The Contribution of Design Thinking to Museum Digital Transformation in Post-Pandemic Times. *Multimodal Technologies and Interaction*, *6*(9), 79.

Mihelj, S., Leguina, N., & Downey, A. (2019). Digital cultural heritage: Challenges for academia and cultural institutions. Cultural heritage and digital attribution: Between surveying and documentation, 5-17.

Mavroudi, A., Angeletaki, A. 2022, PR1A5: Practices in the revival of European cultural heritage organisations through university-driven open innovation

Kolb, B. M. (2013). *Marketing for cultural organisations: New strategies for attracting audiences*. Routledge.

Klein, V. B., & Todesco, J. L. (2021). COVID‑19 crisis and SMEs responses: The role of digital transformation. *Knowledge and Process Management*, *28*(2), 117-133.

Nolte, A., Pe-Than, E. P. P., Affia, A. A. O., Chaihirunkarn, C., Filippova, A., Kalyanasundaram, A., ... & Herbsleb, J. D. (2020). How to organize a hackathon--A planning kit. *arXiv preprint arXiv:2008.08025*.

Tjora. (2019). Qualitative research as stepwise-deductive induction (Vol. 26). Routledge.

UNESCO (2003). Declaration on digital heritage: http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/declaration_digital_heritage.pdf

Oktaberliana, D. W., Pramesti, A. C. A., Ridha, A. A., & Harjunowibowo, D. (2022). The Effect of Gamification on Student's Learning Motivation: A Mini Review. *Specialusis Ugdymas*, *1*(43), 7938-7954.

Haddara, M. (2022). An experimental study on the effects of gamification on task performance. https://doi.org/https://doi.org/10.1016/j.procs.2021.12.102

Champion, E. (2021). Assassin's Creed in the Classroom Book Project. (personal blog). https://erikchampion.wordpress.com/2021/02/11/assassins-creed-in-the-classroom-book-project/