inclusive memory
INCLUSIVE MUSEUMS FOR WELL-BEING AND HEALTH THROUGH THE CREATION OF A NEW SHARED MEMORY

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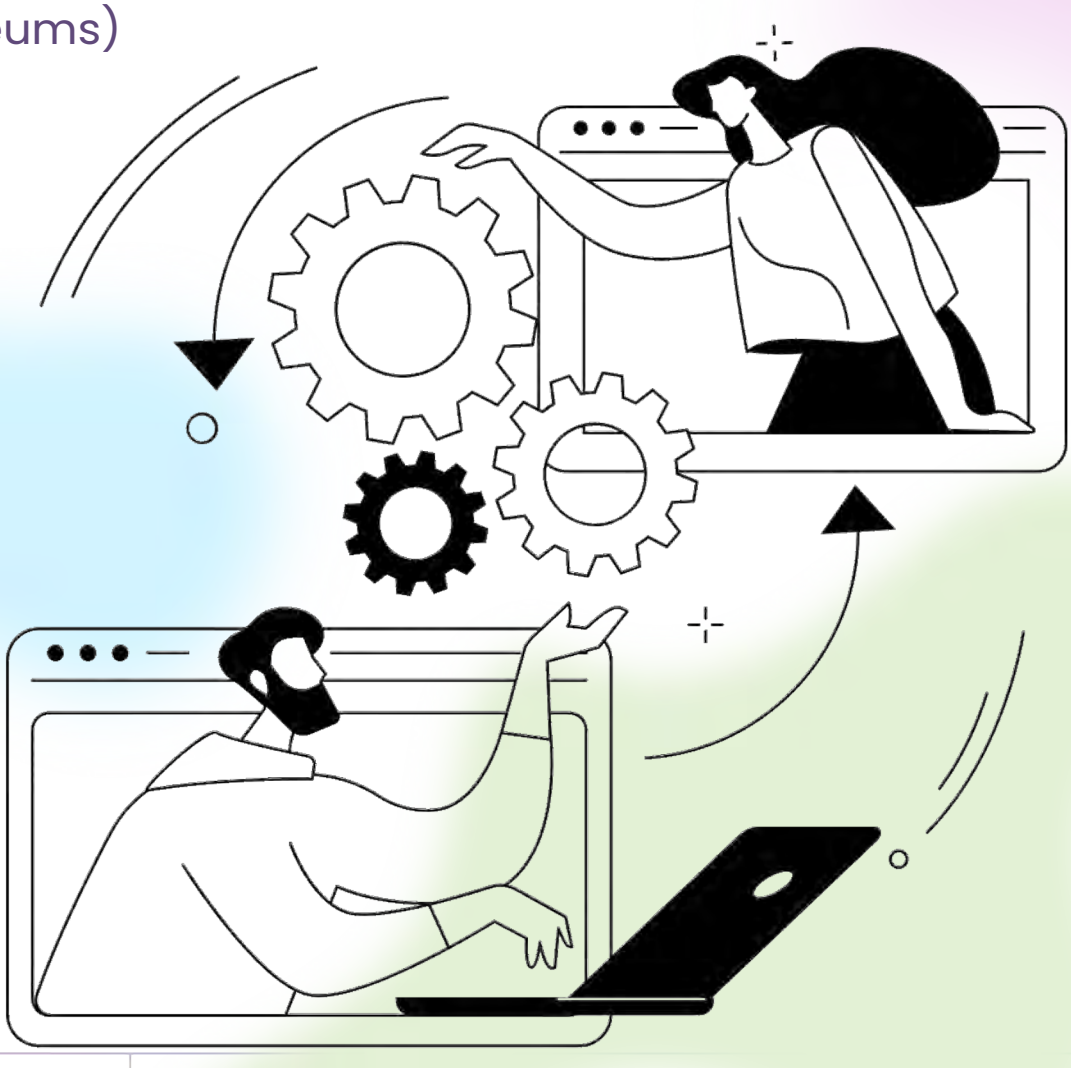
PR4.A4

Enhanced electronic handbook for the replicability of the experience (both training at HE and workshops/labs at the Museums)



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INCLUSIVE MUSEUMS FOR WELL-BEING AND HEALTH THROUGH THE CREATION OF A NEW SHARED MEMORY

Inclusive Memory

PR4.A4 – "Development of a media applied methodology enhanced electronic handbook for the replicability of the experience (both training at HE and workshops/labs at the Museums)"

Results 4 | Activity four	
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Introduction

1. Goals and objectives

This document aims to provide museum professionals, social caregivers, school teachers and healthcare personnel a guide for the development, on the one hand, of a shared vision of museums as inclusive spaces enhancing human wellbeing for everyone and, on the other hand, an introduction to the use of digital technologies to support the development of museums visitor's cross-sectional skills and wellbeing inductive experiences.

This guide is based on the HE resources developed by the European+ Inclusive Memory project (MOOC), and the results of its Investigations on the analysis of best practices in the use of technologies for museum accessibility and a summary of the evaluation and assessment of museum-based activities for health and wellbeing development through technology.

2. Partners involved in the activity

The Inclusive Memory partners involved in the design and creation of the "Enhanced electronic handbook for the replicability of the experience (both training at HE and workshops/labs at the Museums)" were the following:

- Universidad Nacional de Educación a Distancia, leader of the activity.
- Zètema Progetto Cultura co-leader of the activity.
- Haskoli Islands.

3. Structure of the document

This document includes:

- The uses of the handbook
- State of the art of museums as inclusive spaces
- Inclusive activity design
- Innovative technologies to make museums more inclusive
- Training for inclusive museums

1 The uses of the handbook for museum professionals, educators, art, humanistic, and health professionals

1.1 *Usefulness*

This Handbook is based on the results of the IM project results including all the PRs. Partners of the Inclusive Memory project selected among the previous PRs and study cases practices and repertoires potentially useful and as much as possible applicable in training and work contexts about museums as places of inclusion for well-being. This catalogue is conceived as a practical tool for professionals who intend to design, implement and evaluate inclusive activities, also through the potential of new technologies.

This handbook is based on selected projects and study cases practices and repertoires potentially useful and as much as possible applicable in training and work contexts concerning museums as places of inclusion for well-being. The handbook is conceived as a practical tool for professionals who intend to design, implement and evaluate inclusive activities, also through the potential of new technologies.

1.2 *Main purpose*

This Handbook would provide practical references for those who foresee the museum space as a space to think, share with and listen to others, and want to Rethink the museum concept as a bridge for communication and dialogue. This Handbook is conceived for General use as the project considered several different stakeholders (teachers, students, museum professionals, caregivers, services providers, associations, and people with protected characteristics), and provides guidelines on how to build up a dialogue and trust relationships as a path to inclusion; to understand /build empathy for protected characteristic groups, museums as spaces for wellbeing, dissemination of information to develop inclusive activities in museums based on the social model of disability and the design 4all approach. Everyone has an equal right to culture and the right to benefit to the fullest from a visit to the museum for an inclusive experience and contribute to one's well-being

2. State of the art on museums as inclusive spaces for wellbeing

2.1 Desk research methodology

The Desk research on the use of Museums as Inclusive Spaces and Learning contexts for Health and Wellbeing development has been published as PR1.A1 report[1]. It aims at sharing research materials and reflections on the realisation of specific learning experiences within heritage contexts aimed at social inclusion promotion. Seven institutions from five different countries (Italy, Spain, Portugal, Greece and Iceland) worked together to identify pending research questions on museums as inclusive spaces and to draft an overview of the state of the art of research in health and wellbeing promotion through cultural heritage.

In drawing up the desk research, particular attention is given to the social model of disability, considered by some to be an effective model to deal with this theme. The social model gave rise to new perspectives on disability, as well as new interesting questions on such human condition — and how to deal with it. Moreover, it may also highlight important criticalities about how society — mainly unconsciously — looks at disabled people.

The main conclusions that have been pointed out after the analysis are that professionals should be trained and familiar with the main characteristics of the mental and physical barriers. In that way, they can respond creatively and direct the attention to the strengths of each one, instead of focusing on weaknesses; Also, it is important to promote commitment by museum managers. In this sense, it is crucial the cooperation among museums and care centres and services, schools, and families. Moreover, the organisation of spaces and the structure of the museum sites, the contents of the collections and the museum environment are relevant. Finally, another thing to consider is that although one of the main difficulties reported was the lack of scientific documents and papers, gradually more resources have been published.

2.2 Good practices examples

The results of the desk research show a diversified European landscape in terms of promoting heritage education experiences for health, well-being and social inclusion, but also some common features. In general, the good practices under analysis highlight the need to implement forms of collaboration between museums, heritage sites, schools and universities, as well as research institutes. These actions are crucial for the realisation of true participation of the entire community in the local artistic and cultural heritage, as well as correct and wide dissemination of the results, with the possibility of replicating the educational experiences also in different contexts. Well-being and social inclusion are only achieved where dialogue with heritage is intercultural and inclusive, where accessibility is guaranteed in all terms and where scientific evidence demonstrates the effectiveness of educational interventions. The engagement of all social targets, especially those most at risk of cultural exclusion, drives the participative and shared creation of new meanings of tangible and intangible heritage.

A list of examples of best practices found by each partner are listed below.

[1] https://www.inclusivememory.unimore.it/pr1-state-of-the-art-on-museums-as-inclusive-spaces-for-health-and-wellbeing-promotion/

2.2.1 Art as Therapy, Museums and Alzheimer

Partner institution	HASKOLI ISLANDS
Title of the experience	Art as Therapy, Museums and Alzheimer's. Sigríður Örvarsdóttir. 2018. Söfn, list sem meðferð og alzheimer. (English title: Museums, Art as Therapy and Alzheimer's.) University of Iceland.
Type of museum involved	Art Museum
Type of experiences	Social inclusion and stimulation for people with Alzheimer's
Brief presentation of the activity	The study highlights the specially designed program for people with Alzheimer's and their caregivers, "Hittumst á Listasafninu ("Meet me at the Museum") at the National Gallery of Iceland. Furthermore, it evaluates the results of surveys, conducted with Alzheimer's patients and their caregivers, in eight organized visits during the first 17 months of the project, i.e. from November 2015 to June 2017. Visual art played a key role as a tool for stimulating emotions and memories, as well as for increasing the well-being of participants.
Teaching/learning methodologies/strategies used	Both qualitative and quantitative methods were used in the research, and results are presented in statistical form by describing personal responses of survey participants.
Learning results (are the aims reached?)	The project was successful, with participants and caregivers reporting positive experiences, particularly through exploring artwork, which evoked emotions, memories, and meaningful conversations. Visits to the National Gallery fostered group trust and an inclusive environment where participants felt valued and safe to share their perspectives without fear of judgment, enhancing their self-confidence. A welcoming atmosphere facilitated personal storytelling linked to the artwork, which boosted engagement and mental well-being. Collaboration with social service institutions, such as the National Hospital Dementia Unit and Day Centres, was crucial, promoting well-being, social inclusion, and combating societal prejudice, while positive experiences served as valuable feedback for project evaluation.
Reported difficulties	No reported difficulties are reported. However, the knowledge and skills of museum professionals, social caregivers, schoolteachers and/or healthcare personnel are different in themselves which must be considered when proposing activities to vulnerable groups in society or those with Alzheimer's. To meet unexpected situations, due to the nature of the groups, these professionals should be trained and familiar with the main characteristics of the mental and physical barriers. In that way, they can respond in a creative way and direct attention to the strengths of each one, instead of focusing on weaknesses. Intellectual and physical barriers are not always evident and thus they must be flexible and ready to use the skills of adaptability and problem-solving without hesitation and prejudice. This knowledge benefits the professionals and provides them with self-confidence.

2.2.2 Women of Cultural Diversity and Complex Post Traumatic Stress Disorder: Group Intervention with STAIR Model

Partner institution	Institut Català de la Salut (ICS)
Title of the experience	Women of Cultural Diversity and Complex Post Traumatic Stress Disorder: Group Intervention with STAIR Model (Skills Training in Affective and Interpersonal Regulation). Fidel_Kinori, SG; Palomar_Martínez, G; Ramos_Sayalero, C; Garcia_Gea, E: Daigre_Blanco, C; Serra Villalba, P; Fullana_Ferré, G; Ramos_Quiroga, JA. Women of cultural diversity and Complex PTSD: group intervention with STAIR model. [not published]
Type of museum involved	Art Museum (Museu Nacional d'Art de Catalunya - MNAC)
Type of experiences	Pilot Study adapting the STAIR modular program to Spanish for women of cultural diversity and applying it in a group format in two different settings: a General Hospital and an Arts Museum. Parametric statistical analysis for repeated measures was used.
Brief presentation of the activity	26 culturally diverse women were randomized into two groups, offering the STAIR program in 10 consecutive weekly sessions, with a pre-and post-evaluation, and a follow-up during the first year. A non-parametric statistical analysis for repeated measures was used.
Teaching/learning methodologies/strategies used	Psychological intervention, STAIR program and Visual Thinking Strategies (VTS)
Learning results (are the aims reached?)	All the participants showed significant improvement ($p<0.001$) in anxiety, depressive and post-traumatic stress symptoms, and quality of life. Overall symptomatic improvement was identified in the participants, even though satisfaction with the treatment was lower in the Museum group setting with Art in Health approaches. All in all, the article concludes that the cross-cultural adaptation of the STAIR Model has been useful in the symptomatic improvement of the participants, but it is necessary to get better with the Arts in Health perspective.
Reported difficulties	Regarding the difficulties in focusing on the therapeutic meaning of the proposal, some elements, from museum interventions, like the spaces used, were not sufficient and needed to be accompanied by more previous visits and adaptation to a new framework. The museum was not previously known to the women and, despite having been accompanied in a preparatory session, it was a new space and perhaps not entirely safe, as a hospital could be, from their perception. In this pilot study, the adaptation of the STAIR was effective for this symptomatic improvement, with satisfaction with the therapeutic proposal, but it would be important to be able to carry out more studies, with similar populations and with other clinical and sociodemographic characteristics, to validate the therapeutic model. Furthermore, the inclusion of the Arts in Health strategies in the museum should be reviewed and improved, as their effectiveness has also been proven in other studies.

2.2.3 Making mosaics with bricks and colours - Rooftile and Brickworks Museum N. & S. Tsalapatas (Greece)

Partner institution	INTER ALIA
Title of the experience	"Making mosaics with bricks and colours" Kanari, Ch., Souliotou A.Z. (2020), "Education of Children with Disabilities in Non-Formal Learning Environments: A Cross- Disciplinary Approach of STEAM Education in a Technological Museum in Greece", European Journal of Alternative Education Studies, 5 (2), pp. 1-34.
Type of museum involved	Technological Museum
Type of experiences	Inclusion of school children with disabilities (intellectual disabilities, autism spectrum disorders and deaf children).
Brief presentation of the activity	Preliminary preparations for the museum program involved collaboration with school Special Education Teachers (SETs) to understand the needs of participating children, a museum visit to plan the route and exhibits, and the creation of materials for art activities. The educational goals focused on helping students recognize material transformations (like clay to bricks), identify production machinery, describe brick features, create artworks with brick miniatures, and engage collaboratively. The program was implemented in three stages: first, children participated in introductory activities in the museum yard, familiarizing themselves with outdoor machinery; second, they took a guided tour inside the museum with simplified explanations, encouraging observation and discussion; and third, they engaged in sensory-rich activities in an educational room, exploring clay and bricks and creating their own artwork with miniature bricks.
Teaching/learning methodologies/strategies used	Storytelling; Object analysis; Learning by doing; Multisensory activities; Experiential learning; Individual and group activities. The design of the educational program was based on the STEAM approach and the principles of Differentiated Instruction (DI) and Universal Design for Learning (UDL). It is also important to mention the specific facilitations available in the museum: the animated model for the construction process of bricks and tiles, the availability of authentic bricks and materials (e.g., bricks, clay soil), as well as the miniatures of factory machines provided unique opportunities for the design and the implementation of the program.
Learning results (are the aims reached?)	Observations and evaluations indicate that the educational program successfully engaged children, allowing them to create aesthetically interesting artwork while encouraging interaction with peers and adults. Children required varying levels of support, but this did not limit their creativity or initiative. Special Education Teachers (SETs), who were new to the STEAM approach, expressed a strong interest in learning more about it for their students' benefit, noting that the program enhanced communication, collaboration, social skills, and creativity.
Reported difficulties	Children's support by teachers and instructors: This is of particular importance for children with diverse needs and abilities and concerning different educational and developmental domains. During the implementation of this educational program, children needed varied levels of support and guidance but without setting limits to their choices, initiatives and creativity.

2.2.4 Measuring the Inclusion of Migrants in the Van Gogh Museum

Partner institution	UAb
Title of the experience	Vermeulen, M., Vermeylen, F., Maas, K. De Vet; M. & Van Engel, M. (2019). Measuring Inclusion in Museums: A Case Study on Cultural Engagement with Young People with a Migrant Background in Amsterdam. The International Journal of the Inclusive Museum 12(2), 1-26.
Type of museum involved	Art museum - Van Gogh Museum in Amsterdam
Type of experiences	Faced with the growing wave of migrants arriving in Europe, museums are paying increasing attention to the need to include these populations. The Van Gogh Museum (VGM) wants to understand what is required in terms of governance to make relevance and inclusion sustainable. The museum is aware that enhancing the participation of young adults with a migrant background will require a multi-year approach and an adjustment of internal awareness.
Brief presentation of the activity	The Van Gogh Museum (VGM) recognized that it was not effectively engaging Amsterdam residents with migrant backgrounds, particularly young adults from Surinamese, Turkish, Antillean, and Moroccan communities (STAM). To address this, VGM launched the Van Gogh Connects program in April 2017, a four-year initiative aimed at increasing relevance and cultural participation among these groups. In autumn 2017, VGM created a think tank of twenty young individuals with non-Western migrant backgrounds who meet with museum staff every two months to provide insights and feedback. From this collaboration, the museum identified four focus areas for improvement: marketing communication, human resources, programming, and hospitality, all aimed at fostering inclusion through a more integrated service approach.
Teaching/learning methodologies/strategies used	Van Gogh Connects is a four-year iterative program where the Van Gogh Museum (VGM) collaborates with Amsterdam's migrant communities to enhance cultural inclusion. The program includes forty activities, continuously refined through feedback from a think tank, an internal sounding board, and an advisory board. A research framework guides this process, measuring the level of engagement and participation based on Simon's (2010) model, tailored to connect the target group with VGM's collections. Each activity's impact on inclusion is assessed through ongoing research to ensure sustainability if successful. A pilot activity was launched with vocational education students, 54% of whom come from target migrant backgrounds, allowing VGM to test its approach through both qualitative and quantitative methods, including surveys.
Learning results (are the aims reached?)	Key findings indicate that vocational students prefer active cultural engagement, find Vincent van Gogh's personal life relevant, and that VGM has the potential to enhance students' sense of social inclusion.
Reported difficulties	No difficulties were reported.

2.3.5 Art museums as a source of well-being for people with dementia: An experience in the Prado Museum

Partner institution	UNED
Title of the experience	Belver, Manuel H.; Ullán, Ana M.; Avila, Noemi; Moreno, Carmen; Hernández, Clara; (2018) Art museums as a source of well-being for people with dementia: An experience in the Prado Museum. Arts & Health: An International Journal of Research, Policy and Practice, Vol 10(3), Oct, 2018 pp. 213-226. Publisher: Taylor & Francis;
Type of museum involved	Art museum
Type of experiences	Guided visits to the museum and creative artistic workshops.
Brief presentation of the activity	The museum set up a complete programme of artistic education activities for people based on on-site guided visits to the Prado Museum. The target group is users with cognitive problems, such as people with dementia (PWD).
Teaching/learning methodologies/strategies used	A group of 12 people participated for two months in a program of artistic activities consisting of visits to the Prado Museum. The program included visits to the museum and creative artistic workshops that were related to the works viewed at the museum. The visits were guided by specific educators. To determine the participants' response to the programme, information was gathered through participant observation.
Learning results (are the aims reached?)	The cognitive difficulties did not deter the users from participating in the program, which was carried out without altering the normal functioning of the Prado Museum and which had positive effects on the participants. It was concluded that the museum can be an important resource for the promotion of PWDs' well-being and social inclusion. The museum visit fostered a relaxed, personalized, and cordial atmosphere, with participants expressing satisfaction and enjoyment, especially with the collage activities. Despite mobility or sensory limitations, cognitive issues did not hinder the experience, and the program successfully encouraged social interactions centred on autobiographical memories. Participants displayed supportive attitudes, humour, and a sense of accomplishment, reinforced by their ability to recall and discuss artworks. Seeing their own signed creations led to positive reflections, enhancing their feelings of capability and satisfaction with the activity.
Reported difficulties	The role of mediation performed by educators is very important since they are responsible for establishing the link between the Museum and the public. They must be reflective and encourage the creation of knowledge of new discourses in which historians participate. Implementing and evaluating programs. The group of educators must have qualities such as patience, kindness, creativity, flexibility and a great sense of humour to impart the visits since they are not limited to explaining the Museum's collections. The educator starts and maintains the conversation while providing information about the work of art at appropriate times; and knows how to spin the comments made in the group conversation and weave it properly with the different answers and opinions. They use their knowledge to provide new perspectives on the works and also to validate the responses and ideas of participants.

2.2.6 Museum object handling: a health promoting community- based activity for dementia care

Partner institution	UNIMORE
Title of the experience	Camic, Paul M., Hulbert, S. and Kimmel, J. (2017) Museum object handling: a health promoting community-based activity for dementia care. Journal of Health Psychology. ISSN 1359-1053.
Type of museum involved	Art museum.
Type of experiences	Museum object handling sessions.
Brief presentation of the activity	In a seven-month intervention held at an art gallery, 80 individuals with mild to moderate dementia participated in 60-minute sessions designed to engage them through tactile interaction with objects. Groups of four to eight people, accompanied by Alzheimer's Society staff, explored five to six objects per session at both a daycare centre and a museum. Each object was passed around, allowing each participant to touch and examine it. Facilitators encouraged discussions by asking non-memory-focused questions, prompting participants to share their impressions and engage deeply with the objects. After each round, objects were placed in the centre for continued viewing.
Teaching/learning methodologies/strategies used	Sessions were carried out through Object-based Learning.
Learning results (are the aims reached?)	Immediately before and after each session the Canterbury Well-being Scales (CWS) were administered. A two-way (5 x 2) repeated measure ANOVA and post-hoc tests were run on the five individual wellbeing scores at Times 1 and 2 to test for differences in wellbeing across domain and time. A second mixed ANOVA (2 x 2 x 2) was performed on composite wellbeing scores to compare the effects of Time (within subjects' factor) across groups of patients of different genders and with different stages of dementia (both as between subjects' factors). Data analysis from the evaluation showed statistically significant results, demonstrating that subjective well-being increased after a museum object-handling session for both men and women across different types of dementia with mild or moderate levels of impairment.
Reported difficulties	No reported difficulties. However, the authors declared a few limitations. The sample consisted of people who volunteered to participate, thus likely having a greater interest and curiosity in the activities than the general dementia population. Furthermore, because this was a quasi-experimental, non-controlled study, authors couldn't assert that the museum object handling activities definitively caused an increase in wellbeing.

2.2.7 State Tactile Museo Omero

Partner institution	Zétema
Title of the experience	State Tactile Museo Omero "Per una estetica della tattilità. Ma esistono davvero arti visive?", Aldo Grassini, Armando Editore, 2015
Type of museum involved	Art museum
Type of experiences	Tactile visits, workshops, meetings, courses.
Brief presentation of the activity	The Omero Tactile Museum in Ancona, one of the few of its kind in the world, offers a unique opportunity for visitors to experience art through touch, particularly designed for people with visual impairments. Established in 1993 by the Municipality of Ancona, with support from the Marche Region and the Italian Union of the Blind and Visually Impaired, the museum promotes accessibility for all. Its collection includes architectural models, replicas of sculptures, original contemporary artworks, and design objects, with around 150 works displayed chronologically. In 2021, a new section dedicated to Design was added. The museum ensures full accessibility by providing Braille descriptions, large print, and mobile platforms for exploring sculptures' higher parts, making it an inclusive space for individuals with visual disabilities.
Teaching/learning methodologies/strategies used	The Museum Omero's strategy focuses on hands-on engagement with original and replica artworks, thematic art history paths, and explorable modular architectural models. Visitors can interact with 1:1 scale artworks, bas-reliefs, and tactile tables. To enhance accessibility, the museum offers an audio pen guide, which allows visitors to explore exhibits at their own pace. The audiopen provides detailed descriptions of the works, ensuring full accessibility for blind visitors. It can be used by anyone, both indoors and outdoors, and is activated by pointing the pen at a paper/map, allowing users to choose a personalized itinerary or content based on their interests.
Learning results (are the aims reached?)	The Omero Museum provides an inclusive and welcoming environment, catering to both general visitors and individuals with various disabilities. Its structure allows for sensory experiences, with sculptures that replicate famous works in 1:1 scale (e.g., the Discobolus, Nike of Samothrace, Venus of Milo) and contemporary pieces by artists like De Chirico and Marini. The museum encourages tactile engagement, with a "DO NOT TOUCH" policy that promotes positive visitor interactions. Spacious, well-lit rooms enhance the experience, and specialized guides tailor the visits to accommodate the specific needs of visitors with disabilities.
Reported difficulties	Difficulties reported by operators and visitors are mainly related to problems of correspondence of the mental image acquired through touch and experienced reality. A congenitally blind person who explores a reproduced pictorial work of art can feel a perception of inadequacy concerning the understanding of the perspective-spatial concepts represented in painting. This sometimes generates emotional stress which often leads to commotion or anxiety.

2.3 Summary of the findings

The results of the desk research, here presented, reveal certain weaknesses in the research scenario, which the Inclusive Memory project intends to highlight to design intervention activities aimed at overcoming specific problems. Firstly, the lack of a large number of scientific studies in the field of the use of cultural heritage for the promotion of health and psychological and social wellbeing demands more research activities in these fields, both by museums, cultural institutions and research organisations. Moreover, the low number of research studies carried out is only rarely disseminated and published in English, thus greatly limiting the possibility of knowing specific experiences and replicating them in other cultural and social contexts. To conclude, there is little or no description of the evaluation tools and phases in the published research reports, thus limiting the scientific contribution of the realised experience in terms of intervention effectiveness. On the other hand, during the desk research process, it became clear that in many countries activities were realised with a focus on inclusion and wellbeing and were shared in congresses and social media, including newspaper news. That is, shared within communities which is one way to work against prejudice towards those that do not fit the norm. That in itself is a positive initiative on a social level in each country.

To sum up, the main conclusions that have been pointed out after the analysis are that professionals should be trained and familiar with the main characteristics of the mental and physical barriers. In that way, they can respond creatively and direct the attention to the strengths of each one, instead of focusing on weaknesses; Also, it is important to promote commitment by museum managers. In this sense, it is crucial the cooperation among museums and care centres and services, schools, and families. Moreover, the organisation of spaces and the structure of the museum sites, the contents of the collections and the museum environment are relevant. Finally, another thing to consider is that although one of the main difficulties reported was the lack of scientific documents and papers, gradually more resources have been published.

The cloud below aims to summarise all the work done by stressing the main concepts that have been explored in the previous report. The bigger the word is, the more important it is for the overall project.

Figure 1. Cloud map

Next pages Figures 2 and 3 include good practices, target groups and types of museums

GOOD PRACTICE	TARGET				TYPE OF MUSEUM	
	People with dementia	People with Alzheimer	Ethnic minorities	People with disabilities	Art	Technology
Art as Therapy. Museums and Alzheimer's (p. 5)		✓			✓	
Women of Cultural Diversity and Complex Post Traumatic Stress Disorder (p. 6)			✓		✓	
Making mosaics with bricks and colours (p. 7)				✓		✓
Measuring the Inclusion of Migrants in the Van Gogh Museum (p. 10)			✓		✓	
Art museums as a source of well-being for people with dementia (p. 12)	✓				✓	
Museum object handling (p. 14)	✓	✓			✓	
State Tactile Museo Omero (p. 15)				✓	✓	

GOOD PRACTICE	TEACHING/LEARNING METHODOLOGIES							PROMOTION OF				
	Visual Thinking	Hands-on	OBL	Learning by doing	Creative Art Work	Storytelling	Skills	Knowledge	Wellbeing	Health	Inclusion
Art as Therapy, Museums and Alzheimer's (p. 5)	✓								✓	✓	✓
Woman of Cultural Diversity and Complex Post Traumatic Stress Disorder (p. 6)	✓								✓		
Making mosaics with bricks and colours (p. 7)		✓	✓	✓		✓	✓	✓	✓		✓
Measuring the Inclusion of Migrants in the Van Gogh Museum (p. 10)											✓
Art museums as a source of well-being for people with dementia (p. 12)					✓		✓		✓		✓
Museum object handling (p. 14)			✓						✓		
State Tactile Museo Omero (p. 15)		✓									✓

3. Inclusive activity design

3.1 Definition of wellbeing

Wellbeing can be defined as multidimensional as its research aims at personal growth and the development of individual and collective strengths. This view is supported by the World Health Organisation (WHO), which defines wellbeing as an element of health, which is a "state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity" (WHO 1946). Given its complex nature, wellbeing can be defined and understood in multiple ways. The most authoritative literature in the field articulates the concept of wellbeing in three main areas:

1. health sphere, i.e. in terms of psycho-physical wellbeing;
2. pedagogical field, i.e. in terms of competencies for active citizenship;
3. psychological field, i.e. in terms of emotional engagement.

Museums can contribute to these three dimensions by providing:

- educational opportunities,
- social interaction and community engagement,
- cultural appreciation and identity,
- therapeutic and healing environment,
- physical activity and well-being,
- mental health benefits.

3.2 What is empathy

In short, empathy means the ability to understand and share the feelings of another. Within that context the Inclusive Memory project's point of departure is understanding disability through the social model and approaching problems of protected characteristic groups through the lens of positive psychology. Proposed activities are a two fold. On the one hand to watch videos of international experts on wellbeing and motivation, empathy, ABCD methodology, teaching and learning methodologies, to build up trust, social model of disability addressed in a museum and assessment tools. [HI professional interviews] The other activity is based on previously acquired knowledge on positive psychology and wellbeing. This is a series of images of selected pieces of art. You are asked to reflect on them and comment in relation to what human emotions and strengths they suggest to you. Try to identify how you feel and possibly others - and if you think of others, please define the others you are thinking of. This activity is divided into two parts: First you are asked to connect a selection of art works with human strengths and emotions. Then to apply this exercise with your own search in digital artwork libraries, local museums, or museum websites. You are asked to select three pieces of art reflecting well-being, positive emotions and some of the 24 human strengths explained in the unit.

To help you focusing and direct to questions on empathy, you will find below Peterson's, and Seligman's classification of Virtues and Strengths, Fredrickson's 10 positive Emotions and a template for Empathy map (Ref PR1A3).

B. Fredrickson's 10 positive Emotions

	0	1	2	3
Joy				
Gratitude				
Serenity				

Interest				
Hope				
Pride				
Amusement				
Inspiration				
Awe				
Love				

Source: Fredrickson, B. (2018). Chapter One - Positive Emotions Broaden and Build. Advances in *Experimental Social Psychology*. Volume 47, 2013, Pages 1-53.https://doi.org/10.1016/B978-0-12-407236-7.00001-2 https://www.sciencedirect.com/science/article/abs/pii/B9780124072367000012?via%3Dihub

HUMAN STRENGTHS Peterson's, and Seligman's classification of Virtues and Strengths

	0	1	2	3
Creativity				
Curiosity				
Judgment				
Love of learning				
Perspective				
Bravery				
Perseverance				
Honesty				
Zest				
Love				
Kindness				
Social Intelligence				
Teamwork				
Fairness				
Leadership				
Forgiveness				
Humility				
Prudence				
Self-Regulation				
Appreciation of beauty and excellence				
Gratitude				
Hope				
Humor				
Spirituality				

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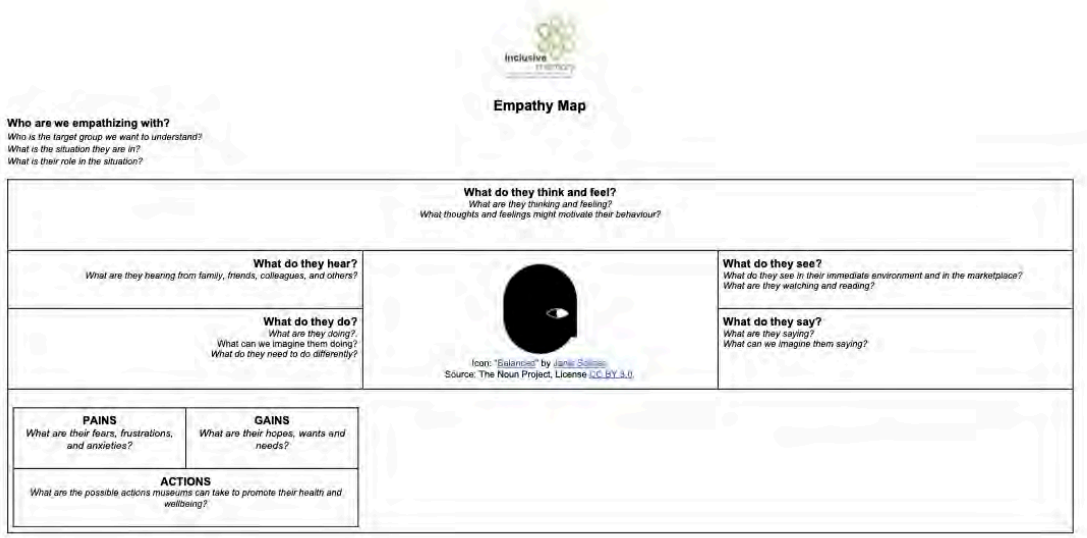

3.3 Cultural Awareness

Cultural awareness includes many factors. They can incorporate inclusive spaces to build a common memory starting from the personal memory or vice versa as well as understanding the Basis of Human Wellbeing through positive emotions and the flourishing model (Positive emotions, Engagement, Positive relationships, Meaning and Achievement). This is applied to Positive Education and Art-health Experience and the use of empathy maps.

We invite the reader of this report to go beyond the issue and to reach out to material mentioned above. That is, video recorded Interviews with international experts for students' inspiration and knowledge seeking promoted by the University of Iceland. We enclose a brief description of each of the experts, the link to the resource and some questions to encourage self-reflection.

John Howard Falk. Director of the Institute for Learning Innovation He's a leading expert on "free-choice learning," learning guided by a person's needs and interests. He is the author of the book, The Value of Museums (2021) and the interview will focus on the value of museums to enhance well-being of people, and then in particular the values achieved (i.e. personal, intellectual, social and physical).
https://www.youtube.com/watch?v=C-d7evfQdhs
Questions: • In your book, ***Value of Museums*, enchancing Societal Well-being**, you lay out different reflections on well-being; personal, intellectual, physical and social. Can you explain this in few words and in particuar well-being in social terms?

- Why do we go to museums (the motivation). What do we do there and what do we take from there? Why are these questions important? Is there a way to know? And, to know the degree of the visitors' well-being? How to measure well-being?
- Could you comment on need of re-evaluating museums studies and the question of well-being for the museum members of staff, please?

Lynn Diane Dierking is a Sea Grant Professor in Free-Choice Learning. She is best known for research on "free-choice learning" and "lifelong learning". Lynn has been active in the museum and the education field since the 1980s

https://www.youtube.com/watch?v=n8YMWk_qnsc

Reflections

- On the **ABCD methodology** and relate to "context" (personal, social and physical) and free-choice learning (as a learning landscape).
- What does Asset mean in the ABCD method and how to connect it in a practical way in society?

Francesca Rosenberg. Director of Community, Access, and School Programs, Department of Education Museum of Modern Art New York

https://www.youtube.com/watch?v=BMlnQgKrqcQ&ab

Questions

- Can you explain the **social model of disability** in the context of MoMA. How do you understand it?
- More precisely, "Museum wide approach" to disability inclusion. How and why?
- How do you know the program is a success? Assessments; what tools do you use?

Carrie McGee. Independent Arts Educator and Disability Equality Consultant.

https://www.youtube.com/watch?v=dSQgnz73fkQ

From the IM-project Research questions:

- Which teaching and learning methodologies are most effective in promoting social inclusion, health and well-being through heritage?

Gema Alava. A Spanish artist and Cultural Adviser to the World Council of Peoples for the United Nations. Close collaborator of the *Art Beyond Sight* institution in New York. Author of the book: *How to Not Be Afraid in a Museum* (El ojo de la cultura, 2020). Gema' reflections focus on **building up trust** as a fundamental element for **inclusion**, whether visually blind people or of other protected characteristics. That is, our perceptions, in different context, always aiming for wellbeing.

https://www.youtube.com/watch?v=IVCN5nGhjbQ

Questions

- Could you please reflect on your Art Project *Trust Me* – and on your book, *How not to be afraid of entering a museum*.
- How to share with people with **visual impairment** the experience of enjoying arts?
- How do they perceive space and measure it?

Barbara Kirshenblatt-Gimblett. Professor Emerita of Performance Studies at New York University and Chief Curator, Core Exhibition, at POLIN Museum of the History of Polish Jews, Warsaw. POLIN Museum won the European

Museum of the Year Award in 2016: *POLIN Museum rose up to the challenge of creating an engaging and persuasive core exhibition without a substantial collection of artefacts.*
Questions and reflections • The „pedagogy of shame" and „innocence" in terms of representing people in a museum. • How to use the **museum as a starting point for a conversation**? • The idea to represent and represent oneself in a museum. • As the chief curator of the core exhibition in POLIN museum in Warsaw, can you explain your approach on sharing knowldege about Jewish history + heritage? • What do you think other museums can learn from your approach in terms of inclusion, or belonging to society?

3.4 Homework on activity design

The final activity design is to plan an Inclusive Museum Activity for Wellbeing Promotion, based on the social model of disability and the design 4all approach. Everyone has an equal right to culture and visit museums. Participants have learnt about wellbeing, positive emotions and human strengths together with how to build up a dialogue and trust relationships as a path to inclusion, with examples of strategies and activities that can be realised within the museums context to include several target groups and foster the role of the museums as inclusive space for health and well-being. In the end, students will realise that an Inclusive Museum for Health and Wellbeing extends its benefits to all members of society without prejudice.

Planning an Inclusive Museum Activity for Wellbeing Promotion, participants put this knowledge into practice in a template for an inclusive activity in museums. The task involves "learning-by-doing". Participants use artwork and/or cultural objects, acquired knowledge about wellbeing, human growth, and positive emotions and technology as tools for achievement. The format for the deliverable is a written text.

Concepts to be covered:

- Design of an inclusive activity to an identified target group/museum context based on participants' acquired knowledge about wellbeing and technological possibilities (Asset based methodology)
- Measuring wellbeing in the inclusive activity

Learning outcomes

Participants should be able to plan an inclusive activity in a museum following the social model of disability and the design 4all approach, with special focus on the protected characteristics groups. By using soft skill, participants should be able to do so by applying the terminology of wellbeing, positive emotions, and human growth in the template for the museum activity, as well as identifying strengths in order to promote wellbeing in the museum. Participants will get familiar with the design of an inclusive activity for different target groups based on a multidisciplinary approach.

Sequence for the Inclusive Museum Activity for Wellbeing Promotion

1. Participants are reminded that this activity is thought out to unite the acquired knowledge, built up in steps. Design an inclusive activity in a selected museum for a specific target group promoting positive emotions and wellbeing and building on strengths.

2. Measuring tools for evaluating inclusion and wellbeing. Participants are provided with resources of possible ways of measuring inclusion and wellbeing in a museum activity. They will be shown two examples: an evaluation scale of Identifying and describing emotions, and a museum wellbeing measures toolkit. Participants will realise how objectives and results go hand in hand depending on the target group.
3. The initial question is: How do you know your museum experience proposal has been successful?
4. A forum offers students to share and exchange observations.

ACTIVITY

An Inclusive Activity in a Museum.

Add an image and a description of your selected museum to your template.

Select two positive emotions and two human strengths embedded in your target group to discuss via the selected artworks/ cultural objects in your museum. Add the description to your template.

Specify your artworks or cultural objects from your selected museum. Add images of them and the description to your template.

Add the description to your template about your target group laying out: characteristics, strengths, vulnerability, and possible needs and desires.

Describe the activity to be realised with the target group/s, venue, setting, materials, duration, skills needed by the participants.

Specify what technological tools could be used in order to achieve inclusiveness in your museum activity and why.

Create your own assessment grid with 3 to 5 elements by choosing them from the following resources depending on your target group:

- Identifying and describing emotions. Toronto Alexithymia Scales (TAS 20) Link: https://scales.arabpsychology.com/s/toronto-alexithymia-scales-tas-20/
- Linda J Thomson & Dr Helen J Chatterjee. UCL Museum Wellbeing Measures Toolkit. Link: https://www.ucl.ac.uk/culture/sites/culture/files/ucl_museum_wellbeing_measures_toolkit_sept2013.pdf
- Michelle A. Mileham. 2021. Measuring the Social Impact of Museums. Link: https://museumsocialimpact.org

Links to narratives, connecting to people within protected characteristics groups.

Disability Equity and Museums Series.

Firsthand audios from New Yorkers about their experiences and perspectives on disability equity + Arts and Dementia Training Resources:

https://www.moma.org/visit/accessibility/resources

PERSPECTIVES FRAME OF MIND

Frame of Mind: Uplifting personal stories about how art supports our well-being https://www.metmuseum.org/perspectives/series/frame-of-mind/podcast

Art Beyond Sight (ABS) is dedicated to empowering and enriching the lives of thousands of children and adults through the life-enriching benefits of art and culture.

We bring access, inclusion and promising opportunities to people with all types of disabilities on a local, national and global scale.

https://artbeyondsight.wordpress.com

The task involves “learning-by-doing”.
The template includes elements regarding the selected museum, artworks and/or cultural objects, target group of protected characteristics and how they are addressed in your proposed activity. Filling in the template, you use tools and acquired knowledge about wellbeing, positive emotions and human growth, and technology.
Formulate 5 statements to address the participants about your inclusive activity.

4 How innovative technologies can contribute to make museums more inclusive and wellbeing promoters?

This section summarises the following PR for practical applicability to cultural heritage:

- PR2.A1 Possible technological applications to cultural heritage for promoting wellbeing and health
- PR2.A3 Short report on evaluation and assessment of museum-based activities for health and well-being development through technology

4.3 Possible technological applications to cultural heritage for promoting wellbeing and health

Various innovative technologies can be applied to cultural heritage to enhance well-being and health, but they should be viewed as tools rather than end goals. Their purpose is to convey messages and achieve specific objectives. Promoting well-being—understood as fostering competencies in a democratic society, emotional engagement, and accessibility—requires designing a process where technology serves as a resource to meet these aims.

A literature review conducted within the Inclusive Memory project (refer to PR1.A1) found no studies explicitly focused on exploring how technology can be used in museums to promote well-being and health. Consequently, none assessed visitor well-being or health levels directly. However, these technologies often support learning processes, encourage emotional engagement, enhance cultural and physical accessibility, and generally aim to improve the overall user experience. Their adoption is typically directed at achieving one or more of these objectives.
A first classification has been developed (see the following figure):

1. Technologies for personalising tours and recognising the most popular museum objects
2. Digital tools to enhance contextual or multimedia information of pieces of art
3. Digital tools to contextualise simulations of real pieces of art
4. Digital methodologies to enhance learning processes
5. Sensory-based Technologies
6. Technologies for studying visitors' emotions and preferences

Next, we summarise these technologies and provide guidance for good practices applied to cultural heritage.

Figure 4. Classification of technologies that can be used in inclusive museums

4.1.1 Technologies for personalising tours

Audio-guides

Audio descriptive guides are used to enhance access and memorability for sighted visitors as well as expand crucial access provisions for blind and partially sighted people.

- Increase Visitor Engagement: Audio guides have been shown to enhance visitor engagement, with participants recalling more details and re-engaging with collections after using audio guides compared to other methods, such as no audio or a standard guide.
- Improve Learning Outcomes for Children: Audio guides positively impact children's learning outcomes, with children using audio guides showing increased interest and engagement and demonstrating higher learning retention through pre-test and post-test analysis.
- Simplicity and User Preference: Audio guides equipped with new technologies, such as computer vision devices, are preferred by users over traditional audio guides, providing a more user-friendly and engaging experience.

Video-guides

Video-guides are multimedia guides that enable the playback of visual content such as images and videos, along with and synchronised with audio content. Especially in more recent times, the development of video guides has also led to the implementation and integration of virtual and augmented reality experiences, for which different types of technological tools are used, such as smartphones, tablets or smart glasses. In general, besides improving accessibility and inclusion, they provide an enhanced and improved learning experience for the visitors, increasing efficacy and satisfaction dimensions - and so, in terms of wellbeing, motivation and participation.

- Interactive and Personalized Experience: visitors are given a Personal Digital Assistant (PDA) that interacts with lifelike characters on a screen, enhancing engagement and providing a personalized museum experience as the guide adapts to the visitor's movements. Once a character is selected, visitors experience interconnected multimedia presentations based on their location in the museum, providing a dynamic and contextual learning experience that adapts to the exhibits.
- Promoting Active Citizenship and Collaboration: Video-guides can enhance collaboration and communication among visitors, fostering skills for active citizenship by encouraging group discussions and interaction around the exhibits.
- Supplementing Learning with Extra Content: Video-guides offer additional information and context about objects and exhibits, enriching the learning experience and providing a deeper understanding of the museum's collections.

Virtual Tours

Virtual tours connect with cultural heritage when museums, sites and places of culture are not accessible for the most different reasons. They are a valuable resource for teaching and learning as they stimulate users' emotional engagement. A virtual tour is a form of semi-immersive VR technology that allows you to experience a certain location remotely. It consists of a sequence of panoramic images that are 'stitched' together to create a 'virtual' experience of any location. Pictures can be taken from your phone, high-resolution cameras or 360° cameras. Users can see an entire panoramic scene

or zoom in to get a closer look at a particular area. Nowadays, two main ways to create free virtual tours are through Google Street View and Matterport.

- Designing for Engagement and Immersion: 360° immersive video applications effectively engage users, with participants feeling comfortable and immersed, while learning entertainingly, showcasing the importance of user-centred design in VR experiences.
- Immersive Experience to Boost Engagement: The immersive virtual tour enhances engagement by offering an interactive, curiosity-driven experience that connects younger generations with their cultural heritage.

Bluetooth and radio beacons

Individual tracking of museum visitors based on portable radio beacons is considered an asset for behavioural analyses and comfort/performance improvements. Conceptually, this approach enables room-level localisation based on a network of small antennas. In doing so, it helps museums that suffer from hyper congestion manage visitor flows as too many people in the same space can be detrimental to the quality of the social and cultural experience.

- Data-Driven Visitor Insights: The use of anonymised data collected via Bluetooth sensors enable researchers to analyse the spatial layout and visitor movements, providing valuable insights into visitor behaviour.
- Innovative Visitor Tracking: advanced visitor tracking method using individual beacons and Received Signal Strength Indicator (RSSI) readings can accurately track movements despite low antenna density.
- Visitor Acceptance: These systems are well accepted by visitors, as they involve the use of a free smartphone application that can function as a beacon, making them easily accessible.

Virtual Museums

In the case studies under review, by using a virtual platform that simulates the museum visit, virtual museums improve learning and self-learning; increase the students' participation; support their academic development; and foster learning motivation and emotional connection to the museum collection.

- Improve Learning and Self-Learning: virtual museums enhance learning and self-directed learning for participants interested in culture.
- Role in Occupational Development: The virtual museum contributes to the occupational development of students, encouraging them to reflect on how the virtual visits influence their career aspirations.
- Widespread Adoption Due to COVID-19: The pandemic has accelerated the use of virtual museums, making them more accessible to a broader audience.

Physical visits systems (Ipad on wheels)

Physical visit systems such as Ipad on wheels, also known as telepresence robots, are adopted in museums and galleries to make heritage accessible remotely, explore unreachable cultural areas but also to function as flexible museum guides on site.

- Telepresence Robot for Inaccessible Areas: using a telepresence robot enables exploration of otherwise inaccessible areas of heritage sites

Indoor GPS tracking systems

Indoor GPS tracking systems are a network of devices that locate people or objects. To collect and provide this information, different devices are used, such as smartphones, WIKI, Bluetooth antennas and Bluetooth beacons. This technology is useful for tracking routes in specific environments.

- Assistance with Navigation: It helps visitors find their way around the building, overcoming the limitations of paper maps which may not include recognizable landmarks.

AI Robot guide interaction

A robot guide is a robot that navigates the museum space or other ambiences and provides visitors with explanations. Some robots are designed with GUI, RFD tags and or speech and face recognition technologies.

- Human-like Robot Design: incorporating more human-like body movements and associating visitors with RFID tags reports low levels of anxiety during interactions with the robot and little concern about future robot interactions.

Chatbots

Chatbots are used in museums to create more meaningful experiences by encompassing individuals' diverse motivations and needs.

- Effective for Teenagers: chatbots are particularly effective with teenagers, finding them useful for learning, especially when used in small groups.
- Emotional Engagement: chatbot using historical figures as an interlocutor are more engaging and emotionally connecting compared to other chatbot models.

4.1.2 Digital tools to enhance contextual or multimedia information of pieces of art

QR Code

Quick Response (QR) code technologies are used to connect collections with data that can deepen their meaning; improve emotional engagement by enhancing the exploration experience with museum specimens; and foster the learning process by making information easily accessible and linkable.

- Two-Way Interaction: Experimenting with 260 college students revealed that two-way QR codes enhance visitor interaction more than one-way QR codes.
- Supporting Independent Learning: At the Lee Kong Chain School of Medicine in Singapore, QR codes facilitated medical students' independent learning and exploration of museum resources, as reported by 32 respondents.
- Emotional and Ubiquitous Learning: combining QR codes with other technologies in a museum environment fosters a more immersive, emotionally engaging learning experience.

NFC TAGS

The Near Field Communication (NFC) technology is a short-range, high-frequency wireless communication technology that enables data exchange between devices. In our case the physical assets and the unique data that are embedded in the NFC chip. This technology is used to help visitors recognise objects in the form of multimedia information (text, images, audio, video, AR, etc.) by scanning the NFC tags near the object. Overall, NFC technology serves a twofold goal: 1) to improve visitors' interaction and overall experience of the exhibit; 2) to give museum management valuable information about visitor activity so that it is possible to profile personas.

- Enhanced Interaction with NFC: users can physically interact with a dynamic display, helping them look up and compose tours.
- Mobile App for Object Recognition: the mobile app allows visitors to access multimedia information about exhibits via NFC tags.
- Cost-Effective and Flexible NFC: NFC technology is affordable and versatile, offering significant potential to enhance museum experiences, limited only by the creativity of museum professionals in its application.

Informative or Multimedia Totems

Multimedia totems are communication technology tools that increase knowledge during a museum tour. Their content is designed according to the museum's message and can be implemented through different technologies and for different objectives.

- Personalized Museum Experience: a touch screen totem with facial coding technology analyses visitors' emotions, age, and gender to suggest personalised exhibition paths, enhancing emotional engagement and positively influencing visitors' mood.
- Augmented Reality on Totems: Totems can engage various age groups by using AR to turn surfaces into dynamic displays, exemplified in the enhanced visual experience of the Parthenon's north frieze, enriching sensory perception with digitally conveyed information.
- Alternative to Indoor Positioning: Multimedia totems offer an effective alternative to indoor

positioning, allowing visitors to access targeted information by pointing their smartphones at totems.

Augmented Reality (AR)

AR is adopted in museum contexts to enhance the discovery-based learning process and promote emotional engagement. It is especially useful to overcome the inaccessibility and untouchability of objects.

- Enhanced Learning through AR: AR's ability to enrich visitor learning by superimposing relevant information onto exhibits, leads to improved engagement and knowledge retention.
- Experiential Learning for Schoolchildren: AR helps schoolchildren identify preferred learning styles, motivates ongoing learning, and further enhances knowledge acquisition.
- Accessible AR Development Options: museums exploring AR for the first time can use free open-source AR SDKs, with options to upgrade to paid plans for complex apps. Unity is recommended for its popularity, ease of use, and strong support for building interactive experiences.

Blockchain (NFTs)

The use of blockchain in museums is varied. It can be adopted to protect data and ensure secure monitoring and management of the museum; it can be used as a form of revenue by licensing objects conserved at the museum via the creation of NFTs; it can foster the exchange of collections between museums thus promoting cultural heritage and dissemination of knowledge and it can be used to explore the concept of guardianship by allowing museum visitors to add a new layer of interpretation on the objects.

- Enhanced Engagement and Knowledge Sharing: digital technologies, including blockchain, help museums engage visitors by offering new educational and social awareness methods, while also collecting valuable visitor data.
- Value Creation Through Social Interaction: encouraging visitors to contribute knowledge about artefacts increases the museum's value by fostering social connections and discussions.
- Secure Information Exchange: a blockchain system demonstrates the feasibility of secure and expandable information exchange.

4.1.3 Digital tools to contextualise simulations of real pieces of art

Virtual Reality (VR)

Most current research is about integrating VR into the traditional frame of a museum to enable a deeper and more meaningful understanding of the displayed artworks.

- Showcasing Hidden Artifacts: An interactive VR exhibit can display artifacts not physically in view, enhancing access and engagement with museum collections.
- Creating Immersive Cultural Experience: VR allows visitors to experience old heritages, highlighting the importance of interdisciplinary collaboration in designing compelling VR for cultural heritage.
- *Impact of Absorptive Experiences: absorptive VR experiences positively influence visitors' overall museum experience and intention to visit, underscoring the importance of immersive design in VR tours.

Wall projectors

Wall projections in museums consist of displaying digital images or videos on surfaces of the museum's walls, pavements, exhibition panels or screens. Wall projectors in museums are not only used to project digital products but also to show enlarged images and descriptions of the exhibited materials, and to shed light on exhibits in a way that hidden details are highlighted.

- Enhanced Exhibit Understanding: wall projectors display information directly onto a whiteboard, integrating guidance and enhancing engagement by minimizing distractions from reading panels.
- Augmented Reality with Real Exhibit Connection: non-immersive AR projections allow visitors to interact with the real environment and exhibits, maintaining a connection with both artefacts and companions.

3D holographic projections

3D holographic projections are one of the areas of greatest interest to make artworks accessible to a mass audience. They are more commonly used in digital art museums, digital art exhibitions, and other digital media art applications to engage visitors and those audiences who cannot be present.

- Customized, Multi-Channel Interaction: Holographic applications often use single technologies focused on visualization, motion, or interaction, which can limit engagement. Multi-channel, customizable modalities are essential for catering to diverse visitor profiles and interests.
- AI-Powered Interactive Displays: An AI-driven holographic stand allows users to view and interact with accurate 3D representations of their machines. This system also supports natural language dialogue, maintaining context in conversation and interactions.
- Broad User Appeal: holographic displays improve understanding and exploration of cultural objects through interactive manipulation and conversation.

3D Printings

3D printing has seen a recent diffusion in the field of Cultural Heritage. Being used for different purposes, such as study, analysis, conservation or access to museum exhibitions, 3D-printed replicas need to

undergo a process of validation also in terms of metrical precision and accuracy.

- Enhanced Accessibility and Engagement: 3D printing supports both physical and cultural accessibility, offering visitors a more immersive and meaningful experience with replicas of museum artefacts.
- Maker Spaces for Hands-On Learning: the use of 3D printing technology in maker spaces helps to engage a diverse range of users in hands-on activities.
- Interactive 3D Exhibits: visitors can recreate artefacts using CAD, 3D pens, and 3D printing making the learning experience interactive and participatory.

Video Mapping

Video mapping is a form of augmented reality that integrates a digital dimension with the tangible one. It usually consists of a projection of digital images and videos on a site, monument or building. It aims to enhance certain features of the sites and interaction among visitors.

- Encouraging Interactive and Collaborative Roles: video mapping installations reveal that the setup encourages participants to take on various roles, enhancing interaction and collaboration.
- Collaborative Control of Projection: Participants can the projector and direct it towards areas of interest, fostering a shared experience and reinforcing group engagement.

4.1.4 Digital methodologies to enhance learning processes

Digital Storytelling

Digital Storytelling (DST) can revolutionise the way we engage with cultural heritage. It has been widely recognised as an important direction for attracting and satisfying the audiences (especially "digital natives") of museums and other cultural heritage sites as well as for supporting teaching and learning at every level of education.

- Promoting Wellbeing and Emotional Engagement: Digital Storytelling (DST) has been explored for its potential to promote wellbeing by stimulating emotional engagement, making content culturally accessible, fostering cultural belonging, and developing transversal and digital skills.
- Competency Development for Active Citizenship: DST can develop competencies for active citizenship, particularly digital skills, by allowing users to create, experience, and interact with narratives.
- Technology Accessibility and Feasibility: DST is no longer technologically challenging, with a wide range of free and licensed software available for creating interactive narratives. Museum professionals should balance resources, goals, and constraints when incorporating DST into their exhibits.

Hands-on (tactile reproductions)

Hands-on in museums has proved to promote emotional engagement and learning for every kind of visitor as it ensures accessibility and inclusivity.

- Motivation and Engagement through Hands-On Exhibits: children prefer partially completed exhibits over fully completed or uncompleted ones, indicating greater engagement and motivation with hands-on learning experiences.
- Tinkering as a Learning Tool: Tinkering programs engage children in engineering practices, such as testing and redesign, depending on exhibit design and interactions with adults.
- Optimising Parent Guidance: parent guidance improves preschoolers' exploration by identifying effective adult coaching styles to enhance children's exploratory behaviour at exhibits.

Gamification

Gamification refers to the use of game elements and game design techniques in non-game contexts. Gamification is widely used in museum contexts for its ability to influence the decision of visitors to attend museums; improve the learning experience; control and direct crowds.

- Enhancing Learning through Gamification: improves learning by activating emotions and curiosity through components like "Quest" and "Achievement," providing visitors with a clear learning path.
- Crowd Control and Engagement through AR and Gamification: A visitor using the gamified AR experience follows a more precise route, suggesting gamification helps manage crowd flow while enhancing visitor engagement.
- Cost-Effective Gamification: gamification reduces hardware costs by enabling the experience on smartphones and tablets, making it a more affordable option for museums.

4.1.5 Sensory-based Technologies

Heighten Sensory Awareness

Heighten Sensory Awareness is a technology that uses a Kinect motion-sensing controller, projectors, and projection mapping software to display video and images within a space with which a user can interact. The users can engage with the installation by moving, waving their hands or touching the projection. It is used in museums to enhance the levels of engagement and participation among the crowds.

- Enhanced Collaboration through Spatial Augmented Reality: spatial augmented reality setups foster communication and collaboration between users, even when the participants ARE strangers, highlighting the potential of Spatial Augmented Reality to encourage teamwork in museums.
- Sensory Awareness and Active Citizenship: sensory awareness, facilitated by augmented reality, can improve competencies for active citizenship, especially in terms of communication and collaboration among visitors.

Smell artefacts

Nowadays, more than just presenting artefacts, museums are creating more participatory experiences by incorporating multisensory effects, with even smells to immerse visitors in a more realistic and complete experience. While smell may be the forgotten sense, many museums are now starting to make use of its unusual psychological properties. Visual stimuli activate different parts of our brain than smells, and when the two modalities are artfully combined, interesting effects can be achieved.

- Olfactory Component in Art Installations: the smell of the used creates an overpoweringly physical experience, complementing the visual element.
- Visual and Olfactory Synergy: provoke thought about materialism and wastefulness, while the olfactory stimuli elicit emotional responses.
- Emotional Engagement Through Smell: smells in art can trigger powerful emotional responses, such as nostalgia or discomfort, enhancing the emotional engagement of museum visitors.

4.1.6 Technologies for studying visitors' emotions and preferences

AI for identifying visitors' behaviours and preferences

Artificial Intelligence (AI) comes in handy when personalising museum content, which is pivotal for enhancing the visitor experience. However, most museums do not offer this kind of service yet, and even fewer museums focus on modelling visitor engagement to foster learning processes.

- Research on Predictive Models of Visitor Engagement: machine learning techniques, including random forests, support vector machines, and gradient boosting trees, to enhance model accuracy. Incorporating additional modalities (like facial expression and posture data) into the models improves predictive accuracy.
- Impact of AI on Psychological Wellbeing and Engagement: AI can play a significant role in supporting psychological wellbeing by increasing visitor satisfaction and self-esteem. It also aids in the development of competencies for active citizenship, especially in terms of critical thinking and digital competencies.

Software Mezzini

Technology can help make on-site visits to museums much more satisfactory, by assisting visitors during their experience. To this aim, it is necessary to monitor the active user and acquire information about their behaviour. This information can be used for various purposes: to provide visitors with personalised services such as recommendations of points of interest and additional textual and multimedia content; to analyse the individual and social behaviour of visitors; to improve artwork arrangement; to optimise visitors' flow.

- Impact on Psychological Wellbeing and Engagement: supports psychological wellbeing by enhancing visitor satisfaction and fostering emotional engagement. By helping museums better profile visitor personas, it contributes to personalized experiences that spark interest and a desire to learn. Additionally, it promotes the development of critical thinking and digital competencies, which are important for active citizenship.

Eye-tracking for mapping emotional responses during museum visits

Eye-tracking can be used in museums to map the visitors' emotional responses and understand how they watch museum objects. On these premises and by adopting different technologies, it is possible to design: 1) explanations that consider the consumption pattern; 2) descriptions in augmented reality, superimposed on the gaze, that enhance the visitor's emotional engagement; 3) individualised explanations.

- The connection between emotions and heritage: mobile eye-tracking technology to explore visitors' emotional experiences in museum settings. Eye-tracking can help reveal connections between how guests interact with specific exhibit features, such as signage, and their emotional responses.

Smartwatch for mapping emotional responses during museum visits

Smartwatch-based systems can facilitate museum gallery exploration, improve engagement, strike a balance between personal and public interactions, and map emotional responses as they can detect emotions directly as opposed to questionnaires.

- Heart Rate and Emotional Engagement: users' emotional impressions can be correlated with a

decrease in heart rate. The locations where users experience emotional arousal are successfully mapped.

- Smartwatch Integration: smartwatches can effectively integrate into a multi-display museum environment, providing a new way of tracking visitor engagement and emotional responses during the museum experience.
- Customer Journey and Smart Technologies: smart technologies have the most significant impact on the prospective and active phases of the visitor experience, though they also influence the reflective phase.

Making visitors visual artefacts - selfies

Selfies, the art of taking pictures of oneself, emerged in the early 21st century in the media and online culture, supported by communication and information technology with internet networks. Since the application of two-sided cameras on cell phone products, selfies have become a global phenomenon. It became a common practice even in museums, where it is used to better understand visitors' behaviour, establish a closer connection to the exhibited objects, provoke emotions, co-create value and promote the museum content.

- Computer Vision and Instagram Analysis: Instagram pictures shared by visitors, particularly those related to an exhibition can provide valuable insights into visitor behaviour. Museums can learn about how visitors interact with exhibits and understand what objects or aspects of the exhibition are most valued by them.

5 Training for inclusive museums

5.1 Training needs for museum staff and professionals

The report on training needs from PR3.A2[2] from the survey made to "check the grounds for the need of a course inclusion; empathy, collaboration, cultural awareness was considered the most important from the survey as to soft skills. Also important to involve people of protected characteristic in the design of a visit. Below the professional and soft skills indicated as most relevant by the respondents:

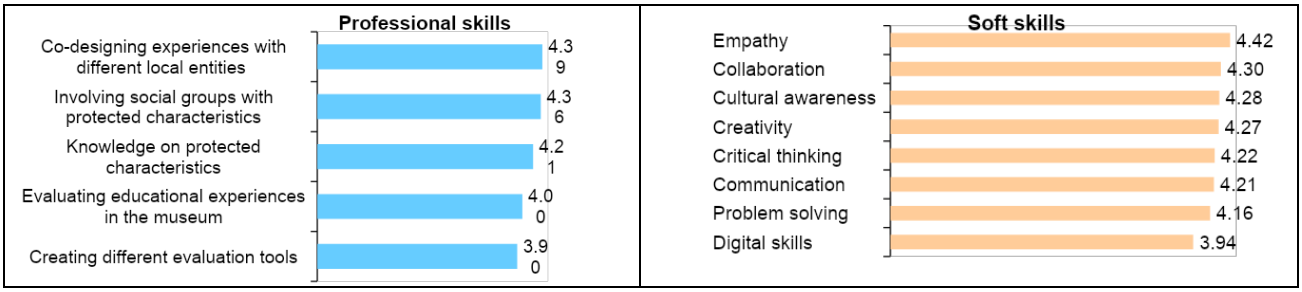

Figure 5 professional and soft skills identified as training needs

5.2 Inclusive Memory MOOC learning design

Open education refers to educational practices and resources that are freely accessible to everyone, eliminating barriers such as costs or prior qualifications. It is founded on the principle that education is a basic human right and should be accessible to all individuals, regardless of their financial circumstances or location. Open education includes a range of initiatives such as open educational resources (OER), open courseware, open textbooks, and massive open online courses (MOOCs). MOOCs have become a widely embraced form of open education. These online courses are accessible to anyone and often feature interactive activities, collaborative peer learning, and guidance from expert instructors. MOOCs are highly regarded for their capacity to reach vast audiences and their potential to revolutionise how education is accessed and delivered.

The MOOC (see PR3.A3) produced within Inclusive Memory prepares future museum professionals, social workers, educators, and healthcare providers to view museums as inclusive spaces. It incorporates the Asset-Based Community Development (ABCD) approach, which emphasises leveraging community strengths and assets to develop learning content and activities aimed at fostering inclusion and promoting wellbeing within local contexts. Students explore their communities to uncover and activate often overlooked resources, driving the development process.

Grounded in the social model of disability and the "design for all" philosophy, the course emphasizes the equal right of all individuals to access culture and museums. Students are encouraged to reflect on building trust and dialogue as a pathway to inclusion, examining how museums represent cultural heritage and how groups with protected characteristics can co-design museum experiences that reflect their identities. Students can understand that an Inclusive Museum for Health and Wellbeing benefits everyone in society, fostering inclusivity without bias or discrimination. At the end of the course students should be able to:

[2] https://www.inclusivememory.unimore.it/pr3-design-of-the-pilot-courses-to-train-future-museum-professionals-social-care-givers-school-teachers-and-healthcare-personnel-into-the-idea-of-museums-as-inclusive-spaces/

- Apply their acquired knowledge and developed competences to redefine the value of museums from within the personal, social, and physical motivating factors.
- Identify professional and soft skills that make museums more inclusive.
- Recognise projects where benefits of Art-Health-Wellbeing is evident.
- Connect artwork with the visitors' condition/life-story.

The MOOC covers the following content for a total of 1 ECTS:

- Unit I. Introduction to the Course and Definition of Basic Concepts on Inclusion and Wellbeing.

  At the end of this unit the student should be able to explain the concepts: social model of disability, inclusion and protected characteristics groups.

- Unit II. Understanding the Basis of Human Well-being applied to Positive Education and Art-Health Experience.

  At the end of this unit the student should be able to understand the relevance of some central human strengths for human well-being, explain the role of human strengths and resources for the development of positive education programmes, with special focus in emotional intelligence and identify the processes of positive emotions under an individual and social perspective and its relationship with art-health-experience.

- Unit III. Museum Education for Wellbeing and Inclusion.

  At the end of this unit the student should be able to build empathy with a target group situation according to a code of ethics as well as to compare museums that have barriers and those who have not. Name barriers and points of inclusion.

- Unit IV. Best practices at Museum for Inclusion and Wellbeing based on the Use of Technology.

  At the end of this unit the student should be able to identity museums that include technology innovations to help achieve inclusion. Describe technological based activities that promote wellbeing among users with special needs.

- Unit V. Plan an Inclusive Museum Visit for Wellbeing Promotion.

  At the end of this unit the student should be able to formulate a template where the acquired knowledge and soft skills (build up trust, empathy) are put into practice together with the competences of own profession.

The IM MOOC was run in a pilot (see PR4.A1[3]) with 461 active learners and 253 who finished all activities. It included a mean of 4-5 videos for each unit and interactive activities such as the use of H5P, forums for discussion, 5 practical activities and a final practical activity. The language is English but platform including its menus could be adapted to multilanguage with automatic subtitles to videos. Similar approach is used in the delivered MOOC which is available and hosted by UaB (PR5[4]).

[3] https://www.inclusivememory.unimore.it/pr4-pilot-and-blended-course-delivery-and-e-content-production-for-digital-inclusion/
[4] https://www.inclusivememory.unimore.it/pr5-inclusive-memory-mooc-course-on-developing-key-competences-to-exploit-the-potential-of-museums-as-inclusive-spaces/

Further read and reference: Rodrigo, C., Iniesto, F., Arnardóttir, H., Sánchez-Elvira, Á., Garcia-Serrano, A., & Hafsteinsson, S. (2024, June). Innovation in inclusive museums education and training through an online pilot course. In 2024 International Symposium on Computers in Education (SIIE) (pp. 1-6). IEEE.