D5.1 – Definition of the target groups

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Project coordinator:	Marco Medici, INCEPTION
E-mail:	marco.medici@inceptionspinoff.com
Project website address:	www.3d4ch-competencecentre.eu

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Produced by:	Michael Culture Association (MCA)
Main author:	Maria Teresa Natale (MCA)
Co-authors:	Alexandru Stan (IN2)
Version:	v1.0
Reviewed by:	Marco Medici (INCEPTION, Kerstin Muff (Time Machine Organisation), Emanuele Piaia (UNIFE)
Approved by:	Marco Medici (INCEPTION)
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Abbreviations

AI	Artificial Intelligence
AR	Augmented Reality
CHIs	Cultural Heritage Institutions
GIS	Geographical Information System
HBIM	Historic Building Information Modeling
LMS	Learning Management System
OCC	Online Competence Center
SRIA	Shared Research and Innovation Agenda
XR	Extended reality

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Executive Summary

This report presents the results and analysis of a sector-wide survey exploring the current use, challenges, and future needs related to 3D technologies within the cultural heritage community.

The insights gathered reflect a broad spectrum of organisations and professionals engaged in preservation, education, research, and public engagement.

The findings highlight that 3D technologies are increasingly recognised as essential tools for the documentation, protection, and promotion of cultural heritage.

Many institutions have already adopted 3D practices such as data capture, digital twins, and immersive experiences, while others are actively planning their first steps. The benefits of applying 3D - including enhanced preservation, accessibility, research opportunities, and public engagement - are widely acknowledged.

However, the survey also identifies clear barriers to wider adoption. Funding limitations, a lack of internal expertise, and difficulties accessing service providers remain common challenges. Additionally, previous learning experiences reveal frustrations related to poor-quality content, limited interactivity, and technical constraints. These lessons underscore the need for accessible, high-quality, and well-structured training opportunities tailored to the cultural heritage context.

A significant majority of respondents expressed strong interest in an integrated Competence Centre for 3D in Cultural Heritage, as envisioned by the 3D-4CH project. Services most in demand include access to training, publishing and archiving platforms, best practice guidelines, knowledge-sharing spaces, and consultancy for digital transformation. There is also clear interest in flexible learning formats, including both comprehensive learning pathways and targeted, modular courses.

Importantly, respondents emphasised the need for training to be tracked, certified, and accessible across multiple devices, with user-friendly, secure platforms. Certification, in particular, is considered as a key motivator for professional development.

The survey demonstrates that the cultural heritage community is not only aware of the potential of 3D technologies but is eager to build its capacity and overcome existing obstacles. The 3D-4CH - Online competence centre in 3D for Cultural Heritage has the potential to play a vital role in meeting these needs — offering practical support, fostering collaboration, and helping to ensure that 3D technologies are applied in an inclusive, sustainable, and impactful way across the sector.

1. Introduction

This deliverable, written by MCA, presents the outcomes of “Task 5.1: Definition of target groups” of the 3D-4CH project, summarising the contribution from the involved partners (INCEPTION, UNIFE, FBK, IN2, DISC, ARCTUR, RDF CNR-ISPC, CYI, PSNC, CNRS-MAP, 3DResearch, EFHA, TALENT, and NISV), the Stakeholder Panel, the Advisory Board and their networks. The purpose of this deliverable is to define and classify the target groups that will benefit from the services of the 3D-4CH Competence Centre, and to explain how these services will be tailored to meet the specific needs of each group.

The scope of the work includes identifying relevant stakeholders across sectors such as culture, education, research, tourism, ICT, policy, and governance, and establishing a structured framework to support targeted engagement, tailored service provision, and effective communication.

The objectives of Task 5.1 are:

1. To establish a comprehensive and inclusive list of target groups;
2. To develop clear classification criteria;
3. To inform future strategies for dissemination, training, and long-term service sustainability within the 3D-4CH Competence Centre.

The methodological approach combined analytical work and stakeholder engagement. It was carried out in close collaboration with the project coordinator and WP leader and relied on iterative consultation among consortium partners. The activities included:

- Initial discussion with the project coordinator and WP leader on how to approach the task;
- Design of a stakeholder survey aimed at gathering input from potential beneficiaries;
- Internal review and refinement of the survey by Consortium partners;
- Finalisation of the survey tool;
- Launch and administration of the survey (open from 10 June 2025 to 20 July 2025):
- Engagement of the Stakeholder Panel and Advisory Board for input on cross-cutting aspects;
- Analysis of the collected data to inform stakeholder classification and service alignment.

While the survey provided valuable insights, it was not intended to be exhaustive; rather, it served as a complementary tool to guide and enrich discussions with the Advisory Group and Stakeholder Panel, helping ensure that the identified target groups and their needs are accurately represented and addressed.

This structured approach ensures that the development of the 3D-4CH Competence Centre is anchored in real needs, aligned with European priorities, and positioned for long-term impact and relevance.

2. Overview of the 3D-4CH Online Competence Centre

2.1 Definition and mission

The 3D-4CH Competence Centre is conceived as a virtual hub designed to support the adoption of 3D technologies within the cultural heritage sector across the European Union and Ukraine. Its mission is directly tied to the findings of this deliverable: to respond to the diverse needs of stakeholders by offering inclusive access to training, tools, knowledge, and innovation that support the digitisation, preservation, and reuse of cultural heritage. By building on the outcomes of past and ongoing initiatives (e.g., 4CH, DS4CH, 5DCulture, XRculture, 3DBigDataSpace), the Centre aims to become a point of convergence for institutions, professionals, and communities seeking tailored 3D solutions. It is intended not only as a resource provider, but as an enabler of capacity building, aligned with real-world stakeholder challenges and opportunities identified through the stakeholder mapping and consultation processes presented in this report.

2.2 Core service provided

As outlined through the stakeholder analysis presented in this deliverable, the 3D-4CH Competence Centre is structured to offer services that reflect the specific expectations and capacities of its diverse target groups - from cultural institutions and SMEs to educational institutions, civil society actors, and policy stakeholders. Its core offer includes multilingual online training, certified learning pathways, and user-friendly resources grounded in the 4CH curriculum framework. The training is adaptable across roles and levels, spanning technical, managerial, and policy-oriented competencies. The Centre also serves as a collaborative environment where researchers, educators, creatives, and decision-makers can exchange materials, follow sector updates, and access guidance on tools, standards, and best practices. By providing flexible learning formats (e.g., self-paced modules, live webinars, and practical workshops) and supporting knowledge exchange, the 3D-4CH Competence Centre addresses the demand for inclusive, accessible, and impactful capacity-building opportunities, as recommended by the Advisory Board and Stakeholder Panel throughout the process of this deliverable.

2.3 The Advisory Board and the Stakeholder Panel

The 3D-4CH Competence Centre is supported by two key bodies: the Stakeholder Panel and the Advisory Board. Together, they ensure that the Centre remains relevant, scientifically robust, and closely aligned with the needs of the cultural heritage sector.

Stakeholder Panel: Composed of representatives from cultural heritage institutions across numerous EU Member States, Ukraine, and candidate countries aspiring to join the EU, the Panel provides direct input from the field. Its role is to define sector-specific requirements, demonstrate the practical applicability of the Centre's services, and secure the active involvement of both data providers and end-users from the earliest project phases.

Advisory Board: Formed by leading international scholars and experts in 3D digitisation – including members from beyond the EU – the Advisory Board validates the scientific approach of the Centre, ensures methodological diversity, and steers its evolution towards next-generation technologies and practices.

Together, these bodies contribute to:

- Defining needs and requirements for the Competence Centre, including through surveys such as the survey on the Target Groups.
- Testing and evaluating services during development, ensuring alignment with identified needs and real-world use cases.
- Supporting training and capacity building within the cultural heritage and education sectors.

- Disseminating information on services, tools, and training initiatives.
- Promoting the use and reuse of 3D digital assets in education, tourism, research, and conservation.
- Fostering international collaboration and partnerships with cultural and academic institutions.
- Assessing the Centre's impact and user engagement to ensure continuous improvement.
- Encouraging a diverse and inclusive culture in all activities.

Both bodies were officially launched during the first consortium meeting in Trento (February 2025) and, in line with the provisions of the Document of Action, were formally established by July 2025 following the completion of the necessary NDA and procedural steps to ensure their active participation in project activities. By bringing together the strategic insight of the Advisory Board and the practical perspectives of the Stakeholder Panel, the 3D-4CH Competence Centre is firmly grounded in scientific excellence while remaining closely attuned to operational realities and stakeholder needs.

2.4 Relevance in the European context

The 3D-4CH Competence Centre responds directly to the objectives set out in the 2021 European Commission Recommendation on 3D digitisation of cultural heritage.

It supports the digital transition of the culture sector by facilitating the uptake of 3D, AI, and XR technologies, and contributes to the European Digital Europe Programme (DEP), especially in the areas of advanced digital skills and technological deployment.

Through its collaboration with European and Ukrainian institutions, its engagement with the Advisory and Stakeholder panels, and its alignment with major European data space initiatives (such as the European Collaborative Cloud for Cultural Heritage), the Centre ensures interoperability, sustainability, and cross-border relevance.

It not only addresses current gaps in digital competencies but also creates a scalable, inclusive model for long-term impact across Europe's cultural heritage ecosystem.

3. Identification of the target groups

3.1 Target group classification criteria

To ensure the effectiveness, inclusivity, and strategic relevance of the 3D-4CH Competence Centre, the project has developed a robust framework for identifying and classifying its target groups.

This classification is based on a combination of functional, sectoral, and strategic criteria, allowing the project to address the diverse range of actors involved in, or influenced by, the digitisation and preservation of cultural heritage using advanced 3D technologies.

The classification model considers six interrelated criteria:

1. **Stakeholder role in the Cultural Heritage Ecosystem**
   Target groups are categorised according to their core roles in the cultural heritage landscape — including heritage custodians (e.g. museums, archives, libraries), technology providers (e.g. 3D developers, ICT companies), content users (e.g. educators, citizens, tourism operators), and those shaping the ecosystem through policy, governance, or advocacy.

2. **Level of engagement with 3D technologies**
   The model differentiates between those who create and develop 3D content (such as practitioners and technical experts), those who facilitate its adoption and application (such as researchers, cultural institutions, or educators), and those who benefit from its use (including students, tourists, and the general public).

3. **Sectoral affiliation**
   Recognising the cross-sectoral nature of digital heritage, target groups are aligned with specific domains - culture, education, tourism, ICT, and governance - enabling tailored services and communications that resonate with sector-specific needs, terminologies, and practices.

4. **Geographical and strategic reach**
   Some stakeholders act at a local or institutional level (e.g. schools, SMEs), while others operate nationally or across Europe (e.g. European networks, policymakers). This distinction supports effective dissemination planning, partnership-building, and capacity-sharing across scales.

5. **Capacity to Influence or multiply Impact**
   Particular emphasis is placed on actors who have the ability to amplify the project's outcomes through their networks, roles, or mandates. These include European associations, public administrations, and policy makers who can shape agendas, influence adoption, and promote sustainable practices.

6. **Training and knowledge needs**
   Stakeholders are also assessed based on their likely needs for training, upskilling, access to standards, and professional development. This ensures that the 3D-4CH Competence Centre offers differentiated services adapted to the readiness levels and learning profiles of diverse users.

By applying these criteria, the 3D-4CH project ensures a targeted and meaningful engagement with a wide array of stakeholders. This approach not only informs the design of services, curricula, and tools, but also strengthens sustainability planning, stakeholder inclusion, and long-term impact across Europe and Ukraine's digital cultural heritage landscape.

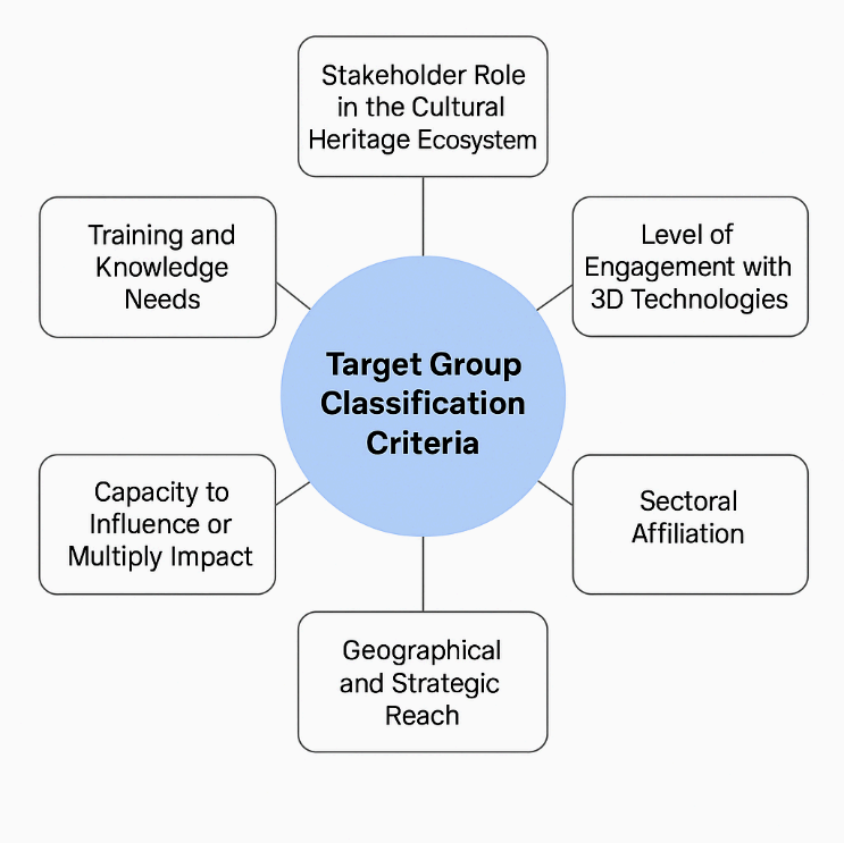

Fig. 1. Target Group Classification Criteria

This classification aligns with the project's Communication, Outreach, Dissemination and Exploitation (CODE) Plan, which defines key messages and outreach strategies tailored to each identified target group (see D6.1). The CODE Plan ensures that communication efforts are coordinated, strategic, and continuously monitored, supporting effective engagement with stakeholders across all sectors.

3.2 List and description of identified target groups

The text provided above offers a detailed narrative for each of the identified target groups involved in the 3D-4CH project.

For each group, it outlines who they are, providing a clear understanding of their profile and role within the broader cultural heritage and digital innovation landscape. It also explains why these groups are important to the project, highlighting their strategic relevance, potential impact, or capacity to contribute to or benefit from the 3D-4CH Competence Centre.

Furthermore, the description clarifies how each group stands to benefit, whether through access to training, tools, standards, visibility, or opportunities for collaboration and growth.

Finally, it elaborates on how the project engages with or supports each group, detailing the specific mechanisms, services, or forms of outreach and interaction foreseen to ensure meaningful and sustainable involvement.

Some of these target groups were already identified in the project description — including CHIs (such as museums, archives, libraries, and galleries), Universities and Researchers, High-profile Networks and Professional Organizations, the Creative Sector, SMEs, and Citizens/Volunteers. Additional target groups were identified during the development of the task, such as the Tourism Sector, Schools and Educational Institutions, University Students, Public Administrators, 3D Practitioners, and Policy Makers.

A more detailed description of each of them follows:

1. Cultural Heritage Institutions (all sizes)
Museums, archives, libraries, heritage sites, and galleries stand at the core of the 3D-4CH initiative. They will benefit from access to multilingual training resources, digitization standards, methodologies, and innovative 3D tools.
The 3D-4CH Competence Centre supports their digital project planning, staff development, audience engagement strategies, and the implementation of new digital models for cultural access and preservation.

2. Broader Cultural and Creative Sectors
Creative professionals and organizations outside traditional heritage institutions - such as digital artists, cultural entrepreneurs, and independent producers - will find valuable tools and inspiration through the 3D-4CH platform.
The project supports them in integrating 3D technologies into storytelling, design, and immersive content creation, fostering innovation at the intersection of culture and technology.

3. Universities and Research Communities
Researchers and academic institutions working in digital heritage, archaeology, museology, computer science, and related fields will benefit from certified courses, collaborative projects, and access to high-quality 3D datasets.
The 3D-4CH Competence Centre promotes interdisciplinary exchange and supports R&D on 3D applications in heritage, bridging academic research with practical tools.

4. University Students
Students across heritage, humanities, architecture, and technology disciplines are a key target group.
They will gain hands-on experience through the Centre's tools, certified learning modules, and access to real datasets, building digital skills and knowledge relevant to both academic and professional careers in the heritage and creative sectors.

5. Schools and Education
Primary and secondary schools will be able to incorporate rich 3D cultural content into educational programmes.
Teachers and learners will benefit from interactive resources and digital narratives that enhance history, culture, and art education, while promoting early digital literacy and heritage awareness.

6. 3D Practitioners
Professionals in 3D scanning, modelling, and digital reconstruction - whether independent or embedded in institutions - will benefit from validated standards, professional development resources, and access to knowledge-sharing networks.
The 3D-4CH Competence Centre enables peer exchange and contributes to harmonising quality benchmarks in 3D heritage documentation.

7. Small and Medium Enterprises (SMEs)
SMEs providing technical, creative, or consultancy services in the cultural or tech sectors will find opportunities to test, demonstrate, and refine their solutions.
The Centre facilitates market access and encourages cross-sector innovation by connecting SMEs to end users in the heritage field.

8. ICT Sector
Tech companies and developers working in AI, XR, cloud, data processing, or visualisation technologies will benefit from collaboration with cultural stakeholders, test environments, and user feedback loops.
3D-4CH offers a living lab for adapting ICT tools to real-world cultural heritage use cases and standards.

9. Tourism Sector
Cultural tourism operators, destinations, and tourism innovation clusters will be able to enhance visitor engagement using 3D content and immersive storytelling.
The Centre supports the integration of digital heritage into tourism services, creating added value and diversification opportunities aligned with sustainable tourism models.

10. European Networks
Networks such as DARIAH, E-RIHS, Europeana, and others play a key role in spreading the project's impact across regions and sectors.
The 3D-4CH Competence Centre offers a shared space for resource dissemination, policy alignment, and collaborative innovation, reinforcing Europe's digital cultural ecosystem.

11. High-profile Professional Organisations
International and European networks like UNESCO, ICOMOS, CIPA, ISPRS, ICARUS, Wikimedia, EEN, NEMO, and others will benefit from access to shared standards, policy briefings, and strategic guidance aligned with their global missions in preservation and digital transformation.

12. European Citizens and Volunteers
Interested individuals and citizen-scientists can engage through volunteer digitisation efforts, training resources, and community-led initiatives.
By empowering citizens with digital skills and access to tools, 3D-4CH promotes inclusive participation in cultural heritage preservation and democratized access to cultural assets.

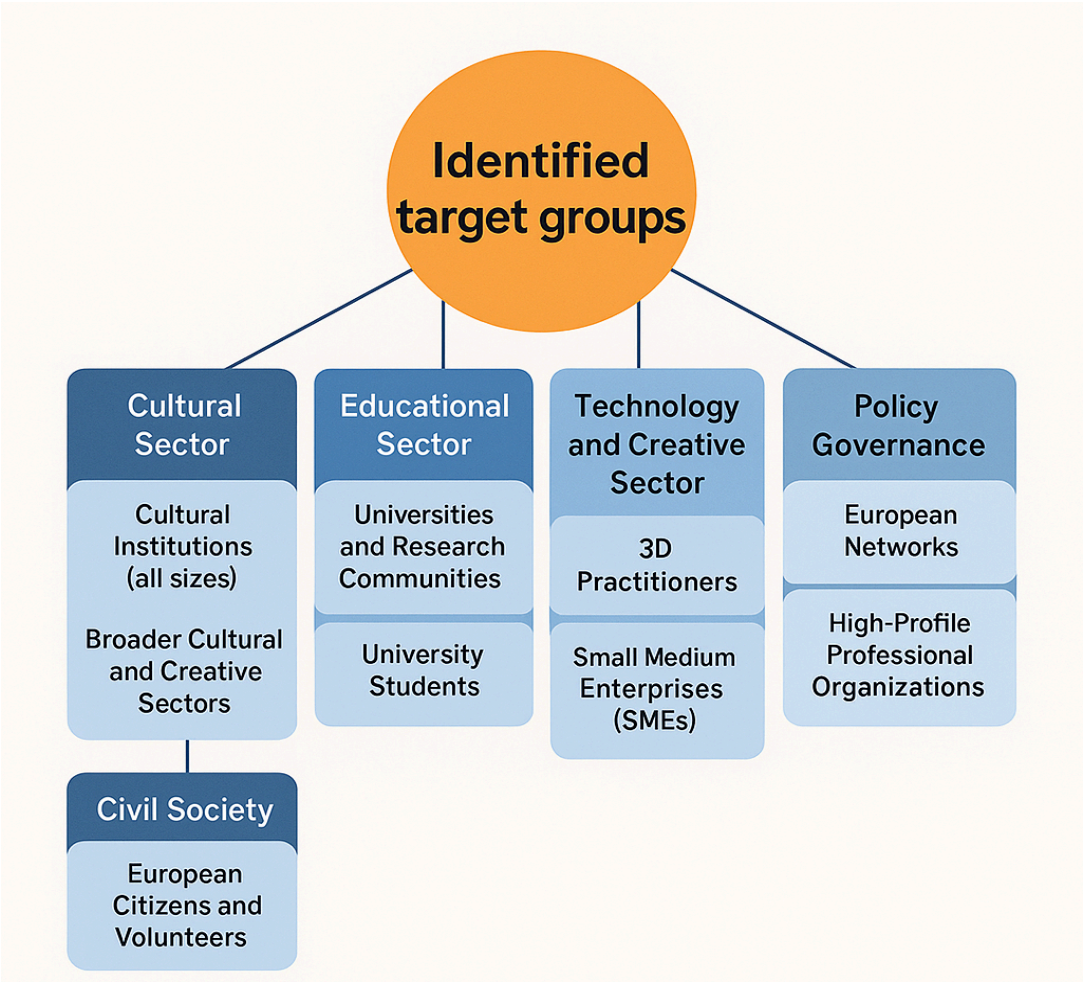

Fig. 2. Identified target groups

4. Survey design and methodology

4.1 Objectives of the survey

The primary objective of the survey was to gain a deeper understanding of the diverse target groups that the 3D-4CH Competence Centre aims to serve. Developed collaboratively by participants of the task and further refined by the project's Consortium partners, the survey was designed to assess the existing level of knowledge, needs, and expectations of professionals and stakeholders in relation to 3D technologies for cultural heritage. Specifically, it aimed to identify the familiarity of respondents with various 3D techniques, their current or planned use of such technologies, and their institutional and individual training requirements. These insights are crucial for tailoring the services, training resources, and tools that the 3D-4CH Competence Centre will offer, ensuring they are both relevant and accessible to the wide range of stakeholders involved in the preservation, promotion and reuse of cultural heritage.

4.2 Survey structure and topics covered

The survey, hosted on Google Forms, was structured into four main sections, each addressing key dimensions relevant to the project.

1. The first section gathered demographic and professional information about respondents, including their affiliation, role, sector, and geographical context - paying particular attention to those working in conflict-affected or high-risk areas.
2. The second section focused on institutional characteristics such as type, size, funding sources, and whether they have internal digitisation capacities.
3. The third section delved into the awareness, usage, and perceived benefits of a wide array of 3D techniques, ranging from data capture and processing to 3D printing, immersive experiences, and digital preservation. It also explored the motivations, barriers, and goals related to adopting 3D services.
4. The fourth and final section addressed the specific needs and expectations of users in relation to the future 3D-4CH Competence Centre, including preferred training formats, skills to be acquired, certification relevance, and learning challenges. Respondents were also asked whether they wished to be updated about the survey results or be available for follow-up interviews.

4.3 Data collection and processing

The survey was made available online and distributed widely through project networks and institutional channels, from 14 June until 20 July 2025.

WP6 responsible for dissemination contributed by providing a communication kit (see Annex 8.4) that included visuals and draft texts for dissemination across various communication channels available through the 3D-4CH project and the consortium. All responses were collected anonymously in line with the General Data Protection Regulation (GDPR 2016/679) and the DMP of the project, with personal data only retained when respondents explicitly agreed to be contacted for follow-up communication.

The data were analysed both quantitatively and qualitatively to uncover trends across different target groups, geographic areas, and professional profiles. Results were aggregated and presented in the following chapter that will inform the design and strategic development of the 3D-4CH Competence Centre. This process ensures that the services and training offerings are rooted in real user needs and reflective of the diverse contexts in which cultural heritage professionals operate. **In total 74 answers were collected.**

5. Survey results and analyses

5.1 General profile of respondents

The following analysis belongs to Section 1 of the survey: “ABOUT YOU”. The section gathered demographic and professional information about respondents, including their affiliation, role, sector, and geographical context - paying particular attention to those working in conflict-affected or high-risk areas.

5.1.1 Country

Spain is the most represented country with the highest number of respondents (25), followed by Greece (16) and Italy (14).

Other countries, such as Ireland, Luxembourg, Ukraine, and Malta, contributed with smaller yet meaningful participation.

This distribution highlights a concentration of responses in Southern Europe, suggesting areas for further outreach in future survey rounds

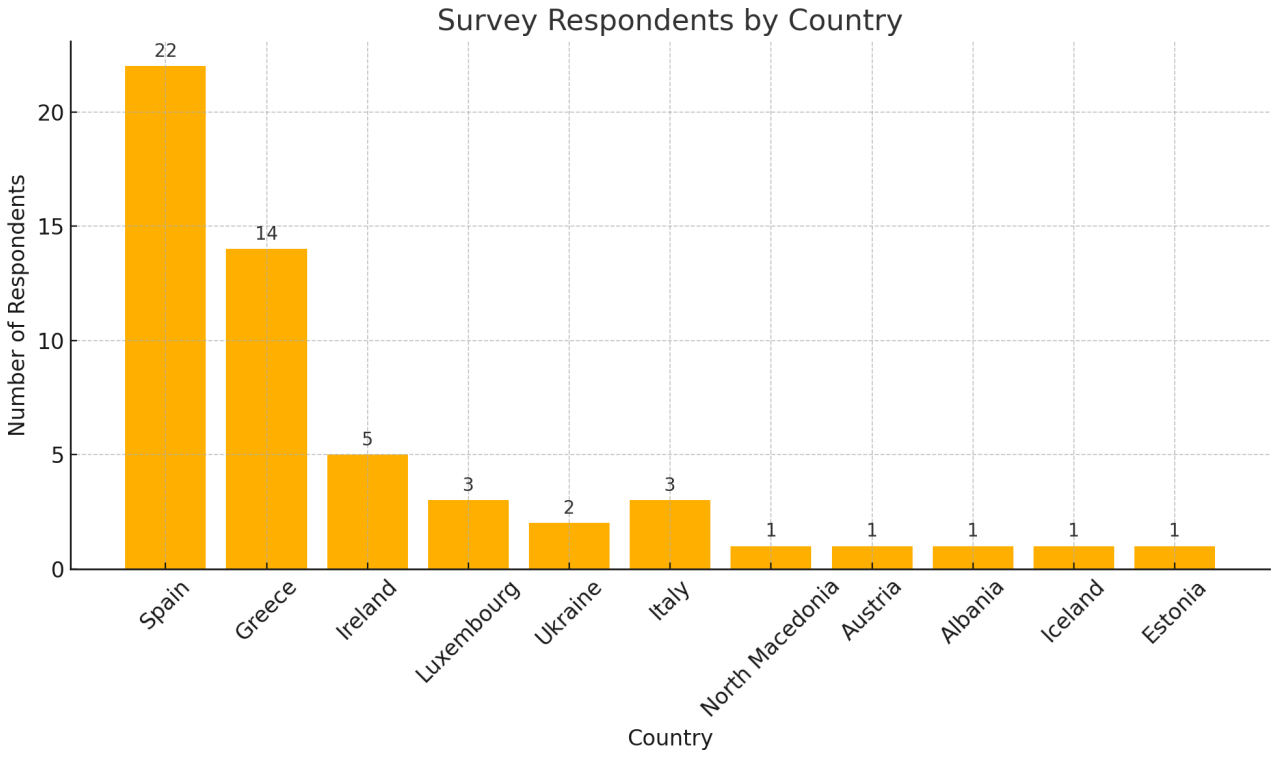

Fig. 3. Respondents by country

5.1.2 Education level

The majority of respondents (over 85%) hold either a Master's or Doctorate degree, confirming that the audience remains highly educated and academically oriented.

Only a small portion reported education levels below a Bachelor's degree, such as vocational training or high school, suggesting that the survey primarily reached individuals with an advanced academic or professional background.

This reinforces the need to develop specialised, high-level training content - while also highlighting an opportunity to engage less-represented groups in future outreach.

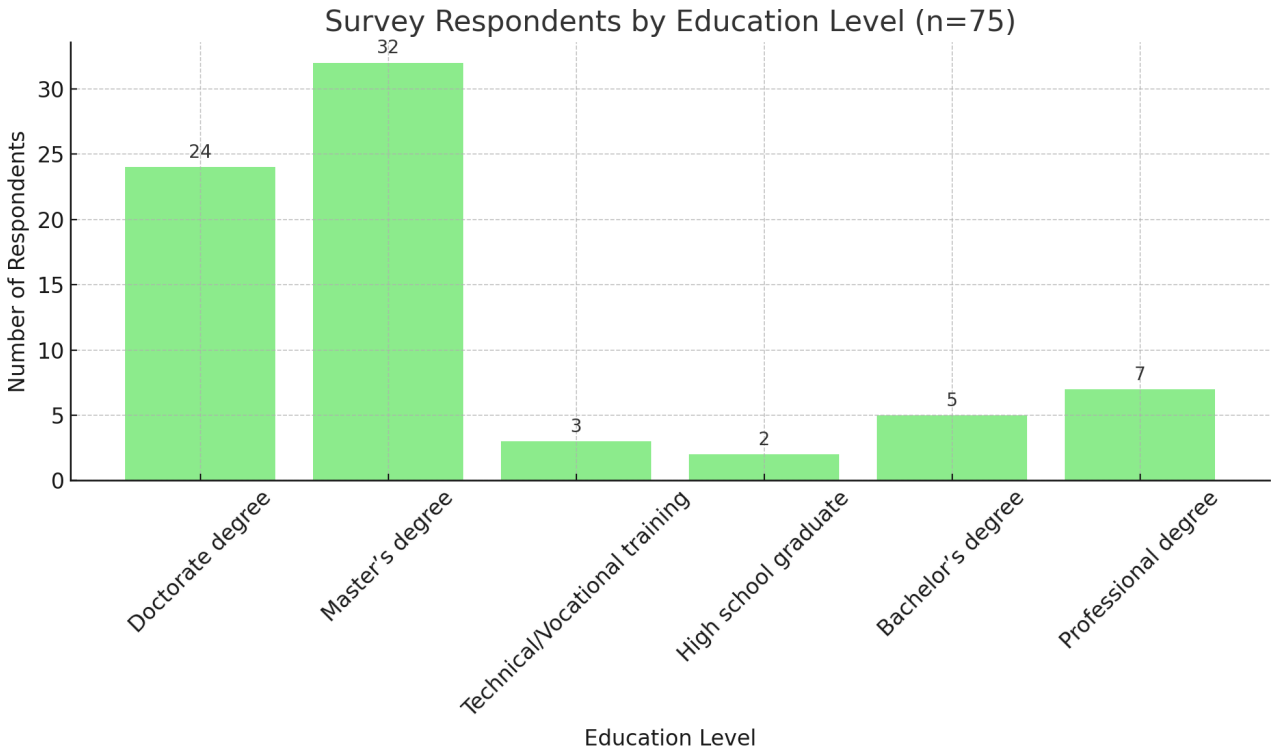

Fig. 4. Respondents by education level

5.1.3 Profession

The clear majority of participants continue to identify as archaeologists (34), confirming the strong heritage focus of the project. There is also a notable presence of museum professionals (17), including curators, educators, and directors, reinforcing the relevance of the 3D-4CH Competence Centre for institutional users. Importantly, around 15% of respondents come from ICT or digital professions (11), reflecting a steady integration of technology experts in cultural heritage work.
Other roles include creatives, project managers, architects, educators, and researchers - demonstrating the interdisciplinary nature of the sector and the diverse user base the 3D-4CH Centre must address

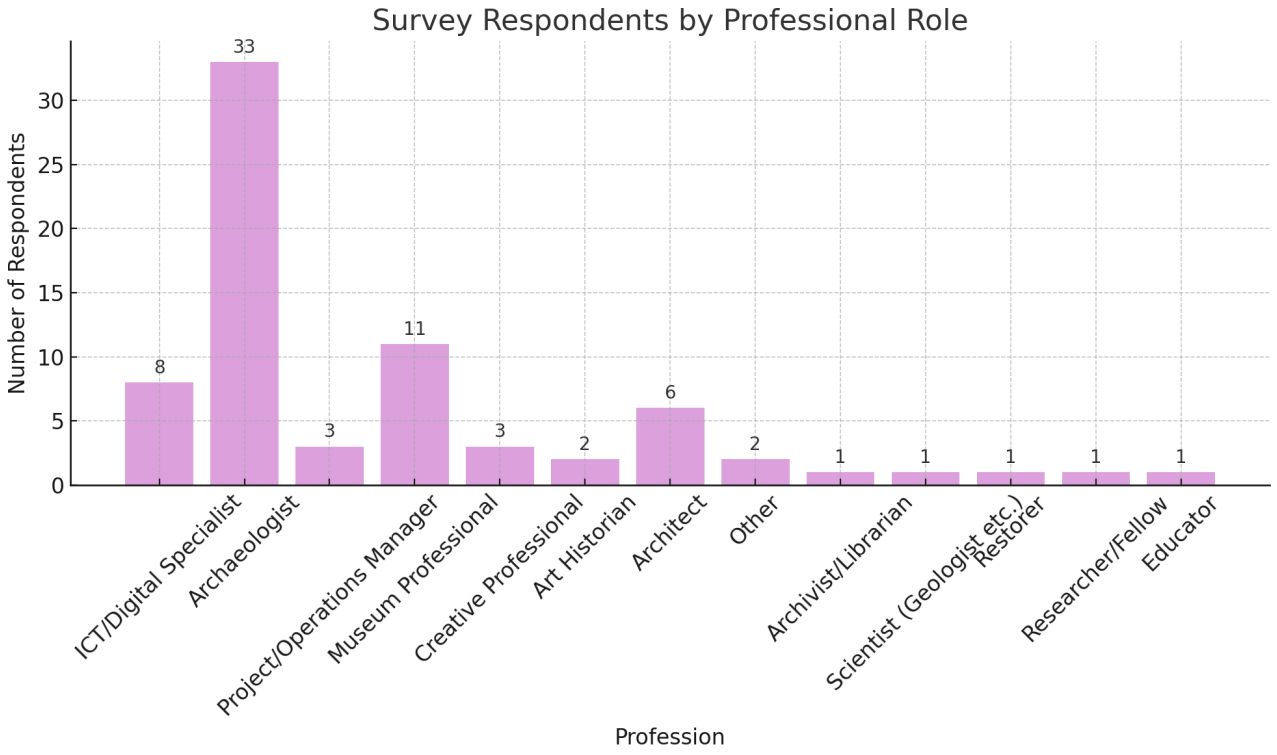

Fig. 5. Profession of survey respondents

5.1.4 Gender and age

The gender and age distribution of the survey respondents shows a balanced sample, with a slight female majority. Out of 74 participants, 39 identified as female, 33 as male, and 1 preferred not to say. In terms of age, the most represented group is 45–54, with over 30 respondents, followed by a strong showing from 35–44 and 25–34 age groups. Notably, there is also a substantial representation of senior experts aged 55–64 and 65+, indicating the project has effectively reached experienced professionals in the field. Only one respondent was under 25, showing limited engagement from very early-career individuals. These results confirm that the 3D-4CH initiative primarily attracts mid-career and senior professionals - consistent with its focus on specialised expertise in cultural heritage and 3D digitisation.

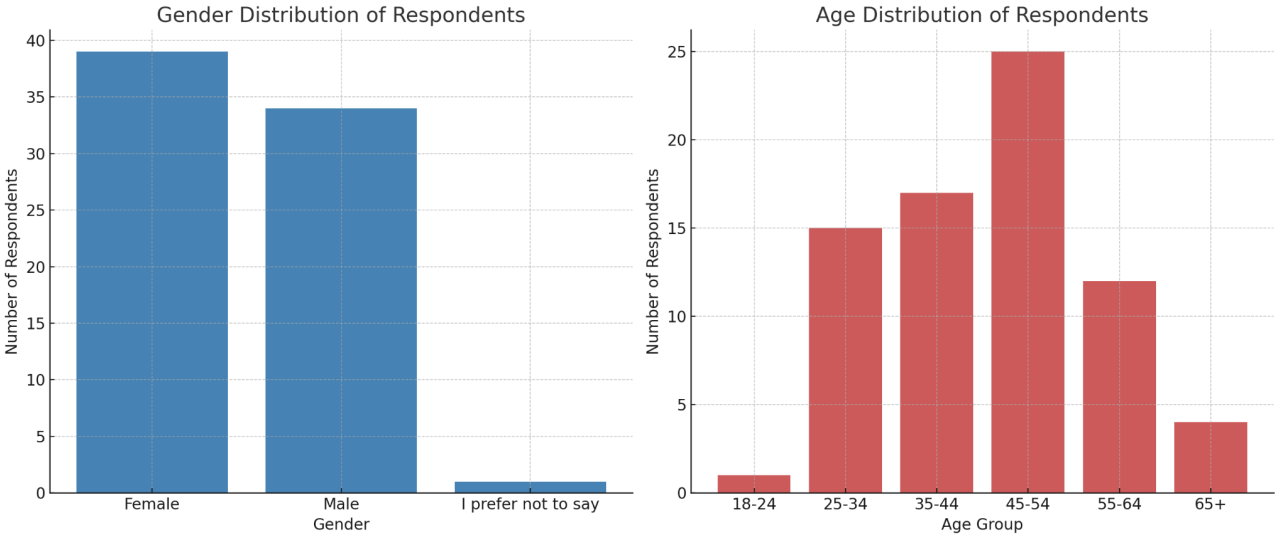

Fig. 6. Gender and age distribution

5.1.5 Target group distribution

The survey results reveal that the Cultural heritage institutions - including museums, archives, libraries, and galleries - remain the dominant respondent group, mentioned in 39 responses. This confirms the central role of CHIs in the 3D-4CH Competence Centre's outreach and services. In addition to CHIs, the survey highlights strong participation from: University and Research Communities (37), showing the importance of academic partnerships in developing and applying 3D technologies;
Public Administrators and Policy Makers (13), who represent strategic stakeholders in the governance and sustainability of digital cultural heritage.; ICT Sector and 3D Practitioners (15), indicating an increasing presence of technology professionals in the heritage field; Creative Sectors and Tourism Professionals (10), which shows cross-sectoral interest in the reuse and valorisation of 3D assets; Educational Stakeholders, including schools, university students, and educators (9), signaling a growing relevance of digital heritage in education and training.; Citizens and Volunteers (3), underlining the inclusivity potential of 3D digitisation efforts.

This diversity confirms that 3D-4CH must serve a multi-layered ecosystem, requiring tailored resources and engagement strategies for each stakeholder category.

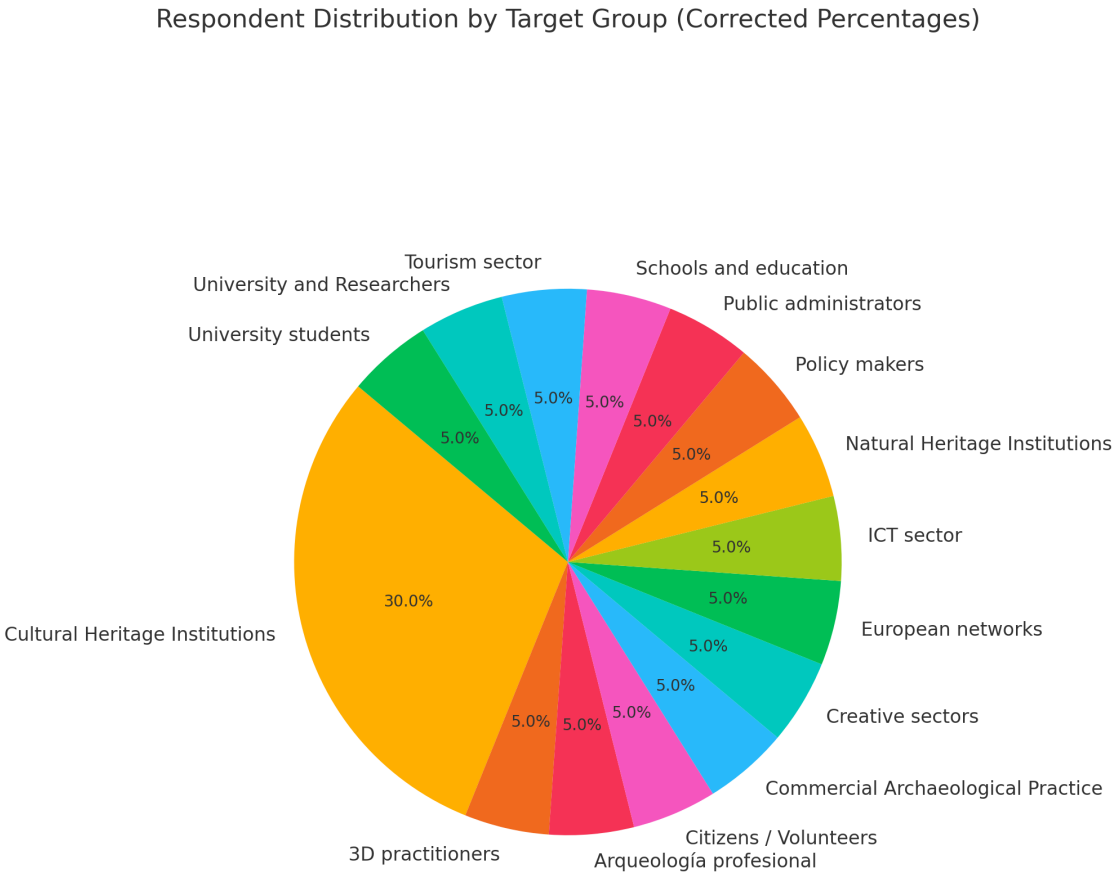

Fig. 7. Target group distribution of the survey respondents

5.1.6 Respondents working in a conflict region

Out of a total of 70 survey respondents, 4 individuals (5.7%) declared that they work in a conflict region, while 66 respondents (94.3%) indicated that they do not.These results confirm that the survey successfully reached a small but significant number of professionals operating in high-risk areas - including those in Ukraine - where cultural heritage is particularly vulnerable to conflict-related threats.

This highlights the importance of ensuring that the 3D-4CH Competence Centre's services are resilient, accessible, and relevant to professionals in such contexts.

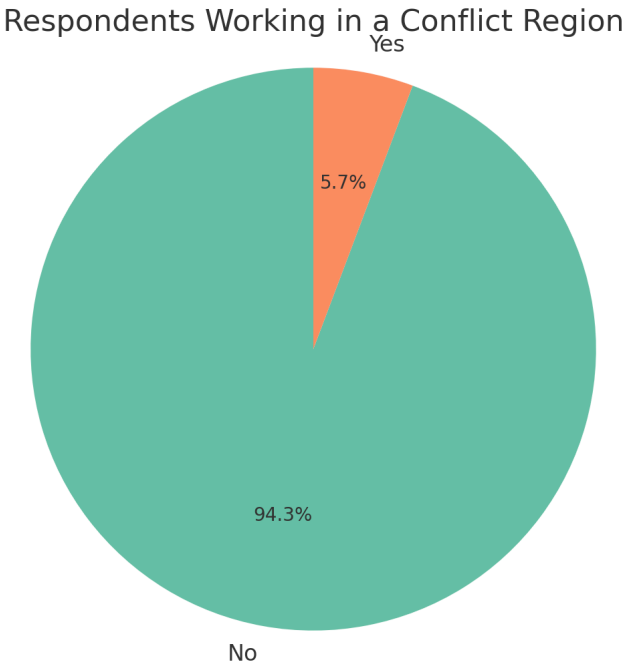

Fig. 8. Respondents working in a conflict region

5.1.7 Working in areas where heritage is at risk from human and climate impact

Out of the respondents who confirmed working in areas where cultural heritage is at risk from human or climate-related impacts, their explanations revealed a wide spectrum of threats, which can be grouped as follows:

- *Climate change & environmental threats* (14 respondents): This was the most cited risk category. Respondents described impacts such as erosion, flooding, extreme weather conditions, and structural damage caused by climate change. Regions particularly affected include Iceland, Saudi Arabia, and Luxembourg, among others.
- *Urban development & infrastructure* (7 respondents): Several participants highlighted the risks from construction, intensive agriculture, solar infrastructure, and urban planning issues. Uncontrolled urban growth and illegal developments were also identified as threats.
- *Neglect & human-Induced degradation* (5 respondents): Respondents pointed to threats such as plundering, neglect, unsupervised renovation or rebuilding, and general decay of heritage due to human inaction or inappropriate interventions.
- *Tourism-related pressures* (3 respondents): Mass tourism, complexity in managing access to sites, and uncontrolled visitation - especially in coastal or UNESCO-listed areas - were seen as risks for degradation and loss of cultural value.
- *Conflict & armed aggression* (2 respondents): The ongoing war in Ukraine was cited in detail, with reports of systematic destruction to over 1,400 cultural heritage sites and more than 2,200 cultural infrastructure facilities due to Russian aggression.

These findings reinforce the importance of the 3D-4CH Competence Centre offering tools, training, and strategies specifically tailored to climate resilience, risk preparedness, and heritage protection in fragile contexts. Supporting stakeholders working under such challenging conditions remains a critical component of the Centre's long-term mission.

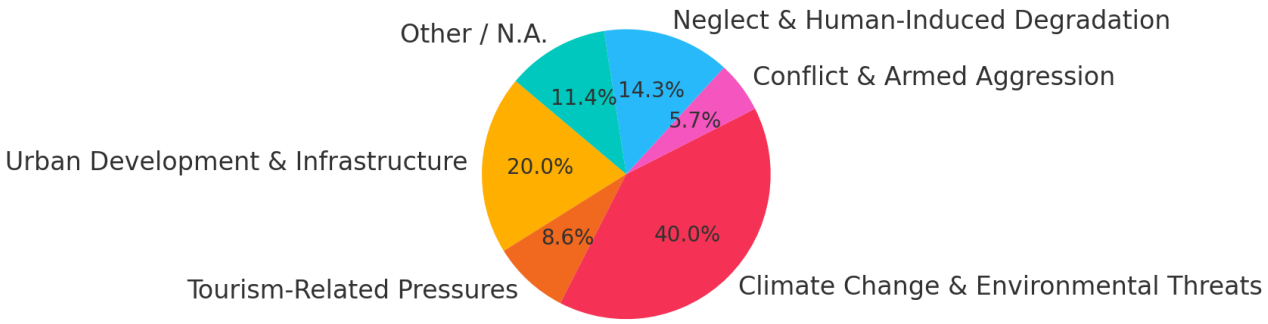

Fig. 9. Types of threats to cultural heritage

5.2 General profile of the institutions

The following analyses belongs to Section 2 of the survey: "ABOUT YOUR INSTITUTION". The section focused on institutional characteristics such as type, size, funding sources, and whether they have internal digitisation capacities.

5.2.1 Cultural heritage institution affiliation

Out of the total 74 respondents, 36 individuals (48%) reported being affiliated with a Cultural Heritage Institution (CHI), while 38 respondents (52%) stated they are not part of this group.

Among those affiliated with CHIs:

- Museums (24) were by far the most common institution type, appearing either alone or in combination with archaeological parks or site complexes.
- Other affiliations include Archives (2), Libraries (2), Archaeological Parks (4), and Galleries, showing the breadth of cultural content overseen by participants.
- A few respondents (3) represent Ephorates, Directorates, and public heritage agencies, reflecting state-level actors engaged in preservation.
- Additionally, some are linked with research centres, or identify as ICOM experts, indicating overlap between institutional, research, and professional domains.

This updated result confirms that museums remain central stakeholders for the 3D-4CH Competence Centre but also highlights meaningful participation from professionals across different types of cultural heritage bodies. The near-equal split between CHIs and non-CHIs confirms that the survey effectively reached a cross-sectoral audience, essential for tailoring diverse service offerings.

Fig. 10. Breakdown of CHIs affiliations

5.2.2. Institution's funding model

The survey data confirms a strong predominance of publicly funded institutions, with 55 respondents identifying their institutions as publicly funded. This aligns with the expected presence of national and regional museums, archaeological parks, heritage directorates, and archives as central stakeholders in cultural heritage governance and conservation.

A smaller but meaningful group - 8 respondents - reported working within privately funded organisations. These include private museums, consultants, and heritage technology firms, reinforcing the active role of private actors in applying innovation, research, and services across the sector.

Non-profit institutions were identified by 10 respondents, reflecting organisations such as foundations, cultural associations, and heritage-focused NGOs. These actors often combine public missions with alternative funding sources, including grants, sponsorships, and memberships.

Finally, 3 respondents selected N/A, possibly indicating freelance professionals, individual researchers, or unaffiliated participants.

This distribution underlines the importance of the 3D-4CH Competence Centre maintaining an inclusive and flexible approach, ensuring accessibility to its services across the spectrum of institutional types—regardless of public, private, or non-profit funding structures.

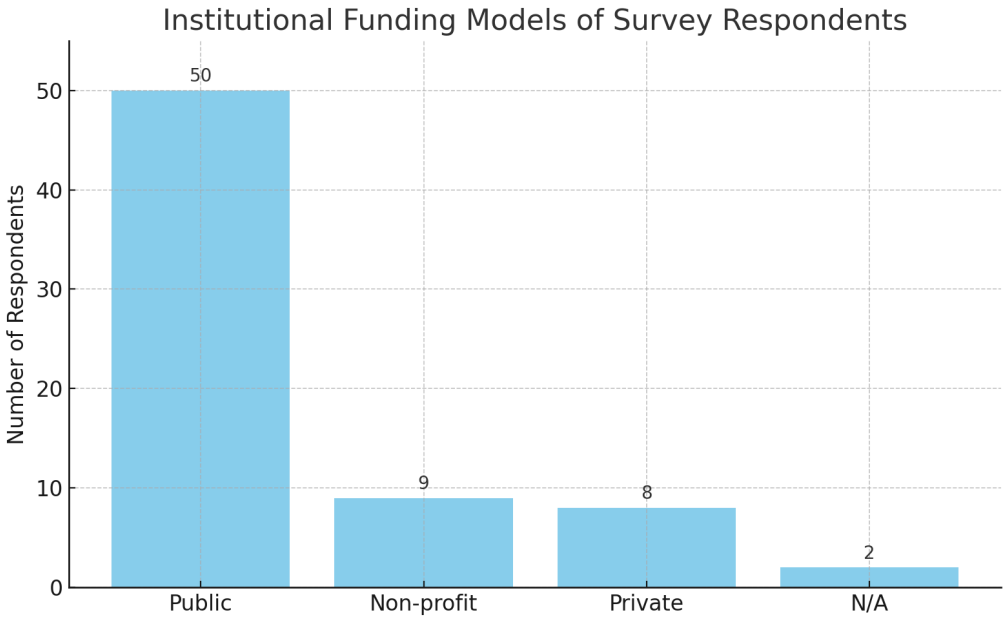

Fig. 11. Institutional funding models

5.2.3. Number of employees

The survey data provides further insights into the institutional size of 3D-4CH project stakeholders: s significant majority of respondents (43) work in institutions with more than 50 employees, reinforcing the strong representation of large organisations such as national museums, public heritage agencies, universities, and major research bodies. These entities often have the resources and capacity to lead or scale digital transformation in cultural heritage.

Medium-sized institutions are also well represented (11 to 20 employees – 10 respondents; 21 to 50 employees – 7 respondents. These likely include regional museums, cultural centres, and specialised research institutes operating at a national or local level.

Smaller institutions also feature prominently (1 to 5 employees – 9 respondents; 6 to 10 employees – 4 respondents). This segment may represent small museums, private consultancies, local heritage NGOs, and independent research teams.

The diversity in institutional sizes highlights the inclusive nature of the 3D-4CH project and underscores the importance of offering scalable tools, adaptable training formats, and support mechanisms that can benefit both large and resource-constrained organisations.

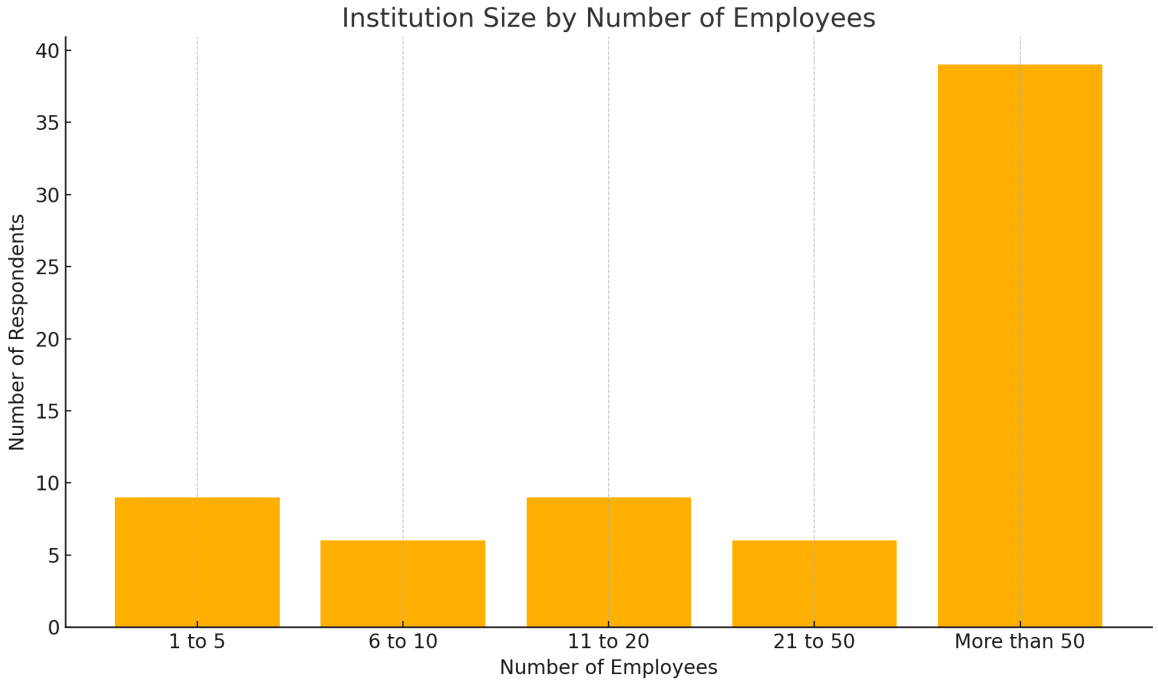

Fig. 12. Institutions' size by number of employees

5.2.4. Typology of collections managed by institutions

The data collected confirms the broad diversity of cultural heritage collections managed by participating institutions, aligning well with the interdisciplinary nature of the 3D-4CH project.

- Archaeological artefacts remain the most frequently managed collection type, strongly reinforcing the centrality of archaeological heritage within the project.
- Archaeological sites and historic buildings are also widely managed, indicating substantial involvement in field-based and built heritage preservation.
- Digital assets repositories ranked high, showing increasing engagement with digitisation, long-term digital preservation, and virtual access.
- Documentary collections - including archival documents, photographs, and books and manuscripts - are well represented, reflecting the participation of archives, libraries, and research institutions.
- More specialised collections such as numismatics artefacts, ethnographic artefacts, and musical instruments also appear in several responses, showing the project's reach across a range of cultural heritage formats.
- A few participants indicated no direct management of collections, which may correspond to policy bodies, research organisations, or technology providers without custodial responsibilities.

These insights confirm the need for the 3D-4CH Competence Centre to deliver tools, training, and support services tailored not only to traditional archaeological and architectural collections but also to documentary and digital heritage, thereby serving a comprehensive cross-section of the cultural heritage ecosystem.

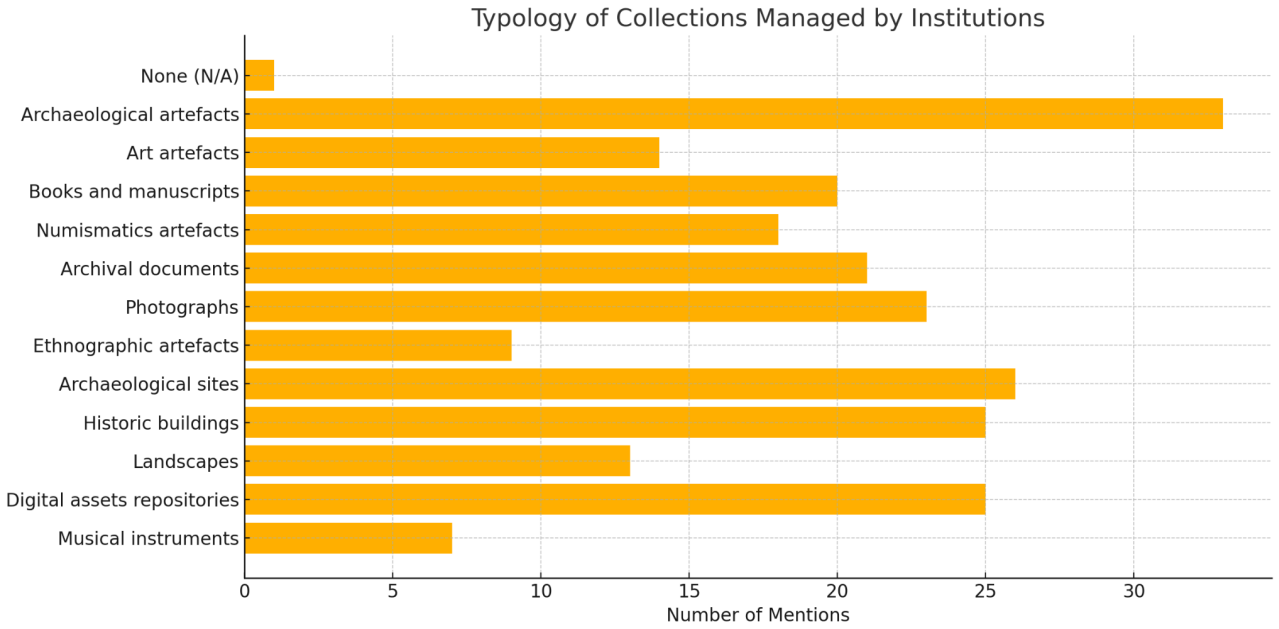

Fig. 13. Typology of collections managed by institutions

5.2.5. Institutions with internal digitisation department

The survey data shows that 29 out of 74 respondents (38.7%) indicated their institution has an internal department dedicated to digitisation, while 46 respondents (61.3%) reported they do not have such a unit.

This distribution suggests that, although the presence of digitisation departments is growing, a majority of institutions still lack dedicated internal structures to support digitisation initiatives. This finding aligns with the broader understanding that digital transformation across the cultural heritage sector remains uneven, even among large institutions. Notably, even institutions with more than 50 employees are not guaranteed to have digitisation departments, indicating that institutional size alone does not determine digital readiness. Factors such as budget, strategic priorities, and leadership engagement likely play a crucial role.

This underlines the importance of the 3D-4CH Competence Centre in filling this gap. By offering external expertise, training, and technical resources, the Centre can provide valuable support to institutions of all sizes, especially those that lack in-house digitisation capabilities. The pie chart visually illustrates the current status and reinforces the need for accessible, scalable support mechanisms to build institutional capacity in digital heritage practices.

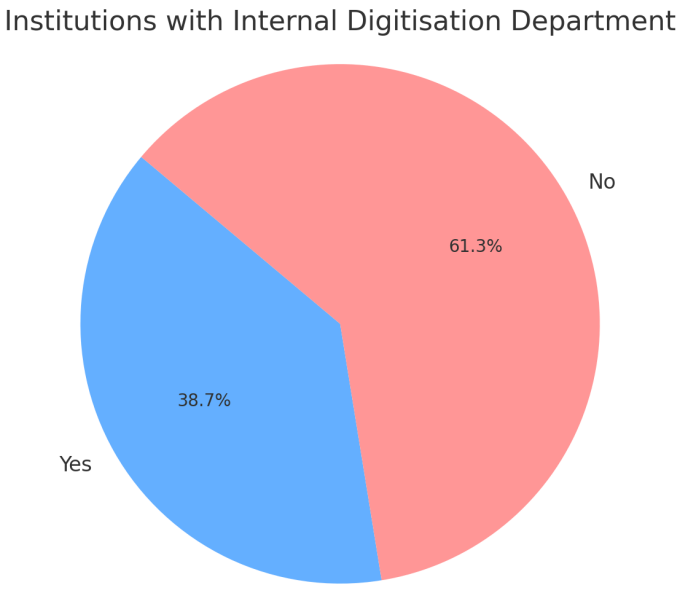

Fig. 14. Institutions with internal digitization department

5.2.6. 3D digitisation outsourcing among institutions without internal departments

Based on the data from institutions that do not have an internal digitisation department, the following main patterns of outsourcing 3D digitisation services emerge: 27,3% (15 institutions) rely entirely on external service providers to manage their 3D digitisation processes. This approach is common among organisations lacking internal capacity or specialised staff. 40% (22 institutions) use a hybrid model, outsourcing some aspects of digitisation while handling others internally or ad hoc. This flexible strategy reflects an intermediate level of digital maturity. 25% (14 institutions) do not outsource 3D digitisation at all. This may indicate either a limited engagement with 3D technologies or internal project-based digitisation efforts that are not formalised as outsourcing.

These insights confirm the varied readiness levels and strategies among cultural institutions in engaging with 3D digitisation. They highlight the critical role of the 3D-4CH Competence Centre in offering guidance, training, and services tailored to institutions at all stages—from those needing full external support to those transitioning toward internal capacity-building.

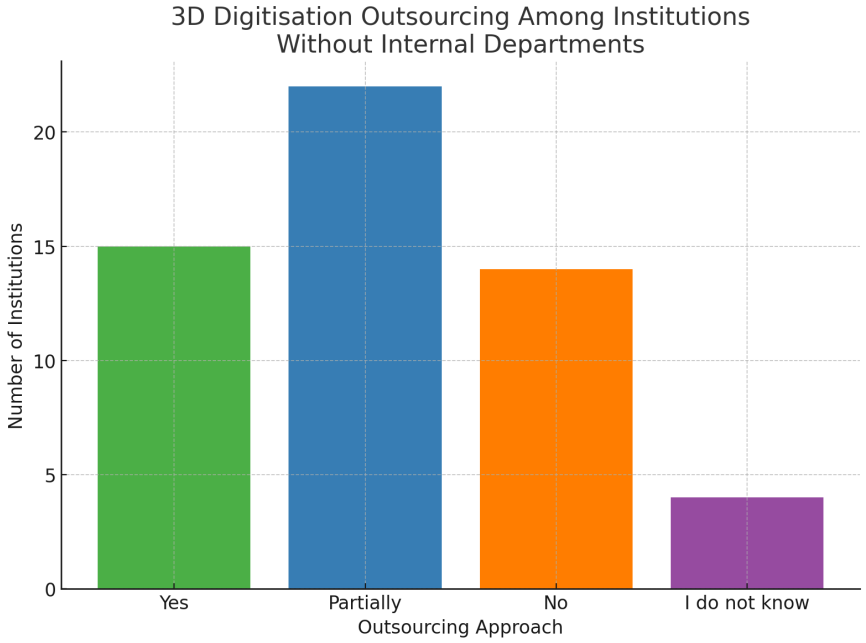

Fig. 15. Outsourcing od 3D Digitisation services among institutions without internal department

5.3 Respondents' awareness and knowledge of 3D technologies

The following analyses belongs to Section 3 of the survey: "AWARENESS AND KNOWLEDGE OF 3D TECHNOLOGIES". The section delved into the awareness, usage, and perceived benefits of a wide array of 3D techniques, ranging from data capture and processing to 3D printing, immersive experiences, and digital preservation. It also explored the motivations, barriers, and goals related to adopting 3D services.

5.3.1. Awareness of 3D techniques and practices

The survey results confirm a very high level of overall awareness of 3D techniques and practices among stakeholders, with 91.9% of respondents declaring familiarity with 3D-related methodologies. This high baseline indicates strong alignment with the 3D-4CH project's focus on digital innovation in cultural heritage.

Among the specific techniques, 3D Data Capture remains the most widely recognised category. Respondents show significant familiarity with technologies such as photogrammetry, laser scanning, and LiDAR, confirming the foundational role of capture tools in the digitisation process. There is also substantial awareness of 3D Viewers and 3D Repositories & Aggregation platforms (such as Europeana), highlighting the sector's commitment to making digital heritage content accessible, shareable, and visible through established platforms. Processes such as 3D Data Processing, 3D Data Management, and 3D Digital Twin creation show strong awareness as well, reflecting an encouraging understanding of the full lifecycle of digital heritage—from acquisition to management and presentation.

In contrast, more technical or specialised areas - such as Source-Based 3D Objects (reconstructed from historical documentation), 3D Architectural & Product Design Visualisation (including HBIM), and GIS Applications - display more limited recognition. These domains, while essential for expert workflows, appear to be known only to a subset of respondents. Similarly, Visual Enhancement, Game Development, and Immersive Experience design receive moderate awareness, indicating that although there is growing interest in engaging and interactive content, further capacity building is needed to broaden familiarity across the sector.

These results underscore the need for targeted training and knowledge dissemination, particularly in areas where awareness is weaker. The 3D-4CH Competence Centre has a clear opportunity to fill these gaps by offering structured guidance, practical resources, and professional development tailored to both foundational and advanced 3D applications in cultural heritage

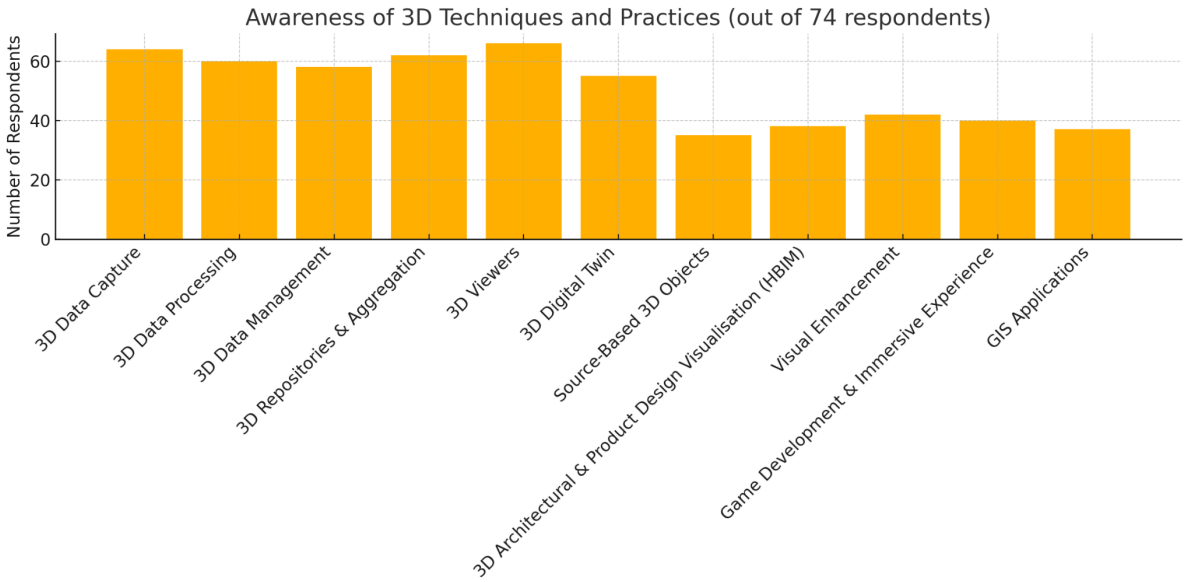

Fig. 16. Awareness of 3D techniques and practices

5.3.2. Application or planned application of 3D techniques and practices

The survey data uncovers several important trends in how cultural heritage institutions are engaging with 3D technologies, pointing to both areas of widespread adoption and those requiring further capacity building.

1. Strong foundation in core 3D practices

The most frequently adopted techniques include 3D Data Capture, 3D Viewers, and 3D Data Processing. These three areas form the technical backbone of digital heritage workflows and were cited by a majority of respondents. This indicates that institutions are prioritising the digitisation of physical assets and their subsequent processing and display, laying a solid foundation for further innovation.

2. Broadening use of visualization and immersive tools

Techniques related to Visual Enhancement and Game Development for Immersive Experiences also appear prominently, suggesting a growing interest in creating engaging and interactive outputs. This trend reflects a shift from passive access to active digital storytelling, using tools like animation, VR/AR, and gamified environments to attract broader audiences.

3. Integration with real-world systems and outputs

The application of 3D Printing, 3D to 2D Representations, and GIS Applications demonstrates a practical orientation among institutions. These tools bridge the digital-physical divide, allowing for the materialisation of digital models and their use in conservation, planning, and education. 3D Digital Twins, although a more advanced technique, were also cited frequently—indicating growing awareness of integrated, data-rich digital replicas.

4. Maturing digital Infrastructure and governance

Many respondents also reported using or being familiar with Metadata and Paradata, 3D Data Management, and Preservation strategies. This suggests that institutions are becoming more mindful of the long-term sustainability, accessibility, and reusability of their digital assets, in line with FAIR principles. These are encouraging signs of digital maturity.

5. Uneven familiarity with advanced or niche techniques

Practices such as Source-Based 3D Objects and 3D Architectural and Product Design Visualisation (e.g. HBIM) were cited less often, pointing to a need for increased awareness and specialised training. These techniques are often used in more technical, conservation-oriented, or reconstruction scenarios, requiring expertise that may not yet be widespread in the sector.

6. Persistence of non-engagement

Despite the positive trends, a significant number of institutions indicated that they have not applied or are not planning to apply any 3D techniques. This underlines ongoing disparities in access, readiness, or perceived relevance - especially among smaller or less digitally mature institutions.

The findings suggest that while foundational knowledge of 3D technologies is widespread, advanced practices and integration strategies are still unevenly adopted. The 3D-4CH Competence Centre can play a key role in supporting institutions with targeted training programmes for underused or complex techniques; promoting best practices in digital preservation, metadata, and management; facilitating collaborations between advanced and less experienced institutions; helping institutions move from digital capture to immersive storytelling and real-world application. This strategic support will help close the gap between early adopters and institutions still at the beginning of their digital journey.

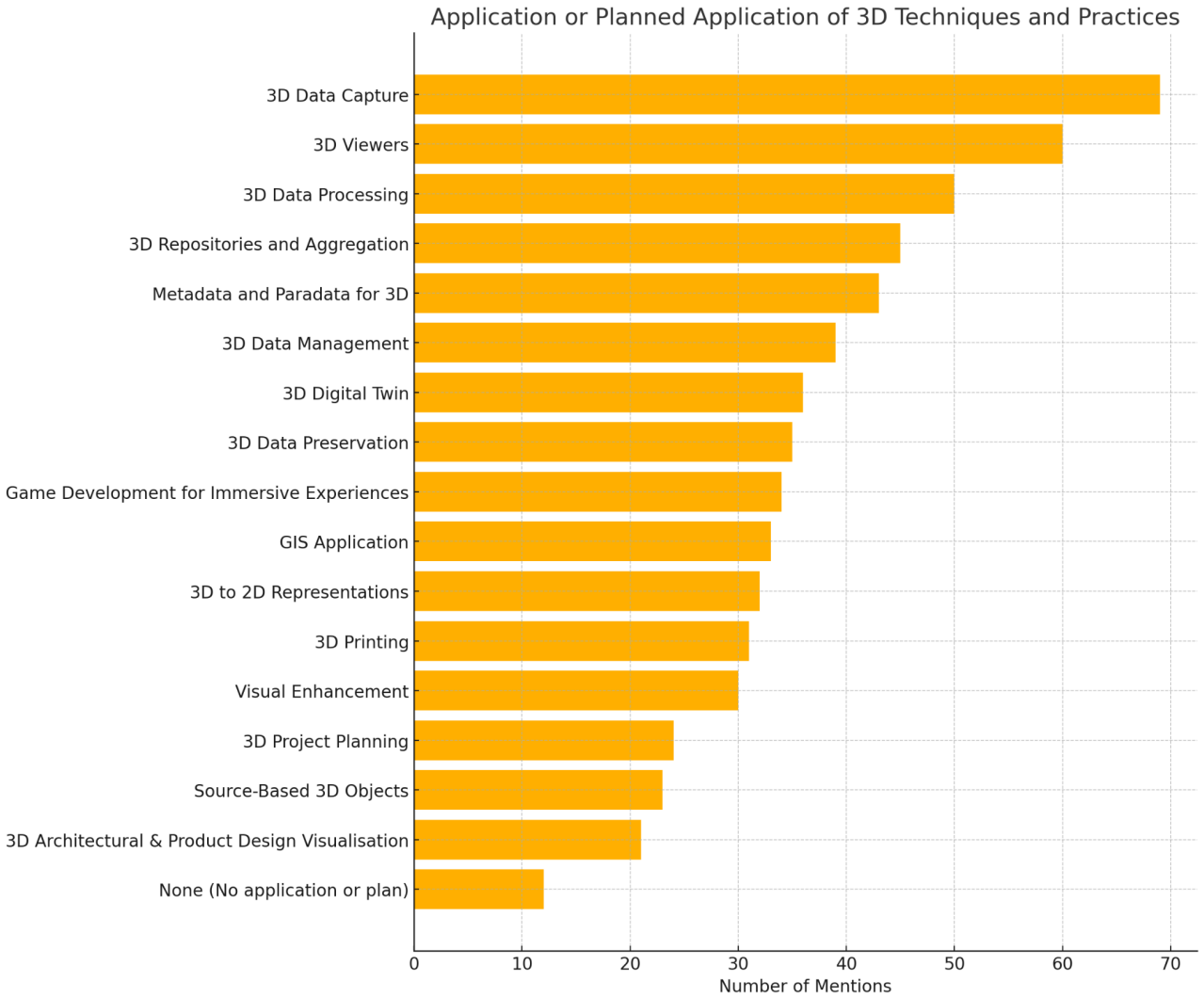

Fig. 17. Application or planned application of 3D techniques and practices

5.3.3 Goals for applying 3D techniques and practices

The results highlight a rich and diverse ecosystem of digital engagement within the cultural heritage sector. Institutions appear to be leveraging 3D technologies for a wide spectrum of objectives, ranging from public engagement to academic research, education, and preservation.

Digital exhibitions emerged as the most commonly cited goal. This includes online galleries, virtual tours, and other forms of digital storytelling that allow institutions to bring their collections to broader audiences. Closely following is the use of Virtual Reality (VR) and Augmented Reality (AR) experiences, which signal a growing trend toward immersive interpretation and visitor engagement. Together, these applications underscore the sector's strong focus on accessibility and audience expansion through innovative formats.

In practical terms, 3D Printing also stands out as a widely adopted goal. Respondents noted its value in creating replicas for handling, education, gamification, and even merchandising. Alongside this, many institutions use 3D technology for State of the Art Documentation, ensuring high-fidelity preservation records of cultural assets. This approach is often integrated with the Management of Heritage, where 3D is used to monitor physical conditions, environmental factors, and restoration planning—demonstrating a clear commitment to safeguarding heritage through digital means.

Another prominent theme is Access and Reach, which includes using repositories, internal platforms, and social media to disseminate 3D content. This reflects a shift toward open knowledge sharing and digital accessibility. In a similar spirit, Immersive Training and Education is gaining ground, particularly through the use of AR/VR simulations to teach conservation techniques or archaeological methods in controlled, interactive environments.

Respondents also highlighted more specialised goals, such as Gaming & Animation, where 3D models are brought into interactive environments for public engagement and educational storytelling. Others mentioned Reverse Engineering, which supports advanced academic research like digital restoration, experimentation, and visual reconstructions.

Lastly, smaller but notable numbers of respondents identified goals such as Media Production and Re-use for Art & Design sectors, pointing to interdisciplinary collaboration and creative re-imagining of cultural assets. A few respondents also indicated Advanced Research uses, particularly for metrological studies and scientific precision work.

Overall, these findings reveal not just a high level of engagement with 3D technologies, but also a broad ambition to use them across nearly all facets of cultural heritage work - from documentation to education, conservation, and public experience. The results reinforce the strategic importance of supporting institutions at all levels through the 3D-4CH Competence Centre, ensuring they have the tools, skills, and guidance to fully realize the potential of 3D digitisation.

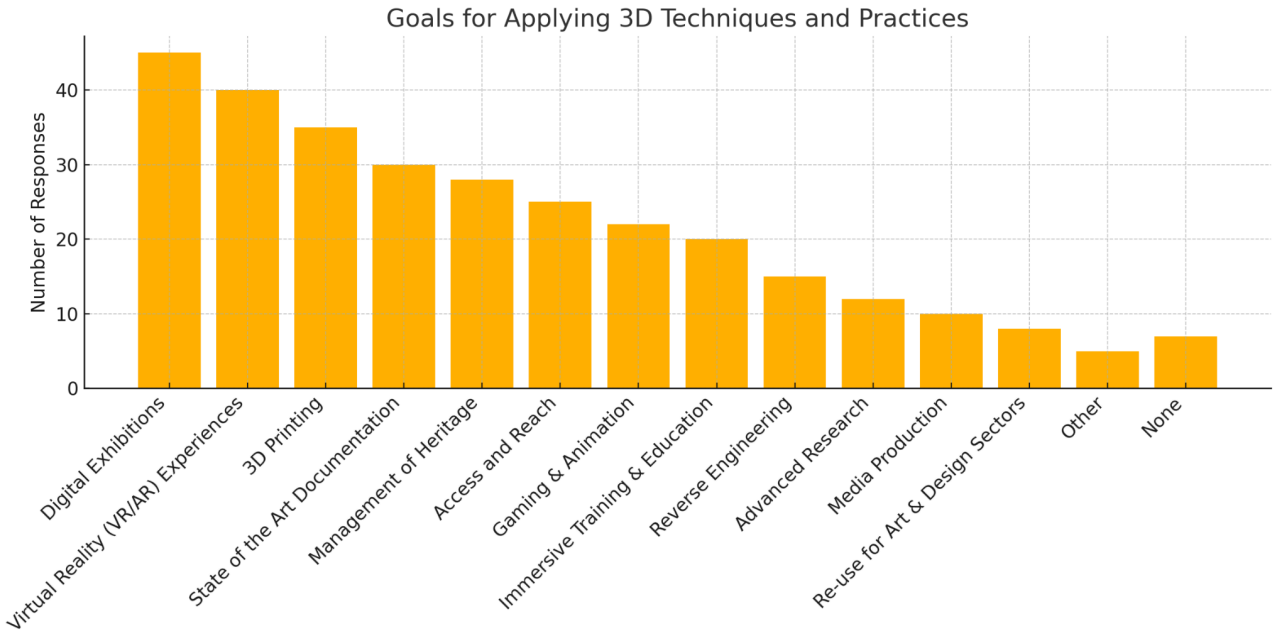

Fig. 18. Goals for applying 3D techniques and practices

5.3.4. Challenges for starting 3D techniques

The most commonly reported challenge for institutions planning to adopt 3D technologies is finding funding, cited by 83% of respondents. This widespread concern reflects persistent budgetary constraints in the cultural heritage sector and underlines the financial barrier that continues to delay or prevent the uptake of digital innovation.

Closely following is the need for training staff, reported by 72% of respondents. This highlights a substantial skills gap in the sector and suggests that even where funding may be available, many institutions lack the internal expertise required to launch or manage 3D projects effectively.

A significant number of institutions also pointed to difficulties in finding or commissioning reliable service providers, noted by 43%. This underscores the reliance on external expertise and the challenges in identifying trusted partners for outsourcing specialised 3D work, particularly in environments where procurement procedures may be complex or unfamiliar.

Equally important is the challenge of explaining the benefits and potential impact of 3D to institutional management, identified by 39% of respondents. This suggests that internal organisational barriers - such as risk aversion or limited understanding of digital opportunities - can hinder decision-making and prioritisation of 3D initiatives.

Other less frequent but notable obstacles include access to adapted infrastructure for manipulating, storing, and archiving 3D data (2%), and access to state-of-the-art equipment (2%), pointing to more technical or logistical constraints that affect a smaller but relevant segment of institutions.

A small group of participants (9%) indicated that they are not planning to use 3D in the future, which may reflect institutional priorities, perceived irrelevance, or resource constraints.

Finally, one respondent explicitly highlighted that cultural heritage institutions generally have weak technical support (2%), a critical observation that echoes broader systemic issues in the sector's digital readiness.

Overall, the main barriers to starting 3D digitisation projects cluster around financial, technical, and organisational dimensions. The findings reinforce the importance of the 3D-4CH Competence Centre in offering not only technical solutions and training but also institutional advocacy and strategic support to help organisations navigate these challenges and move forward in their digital transformation journey.

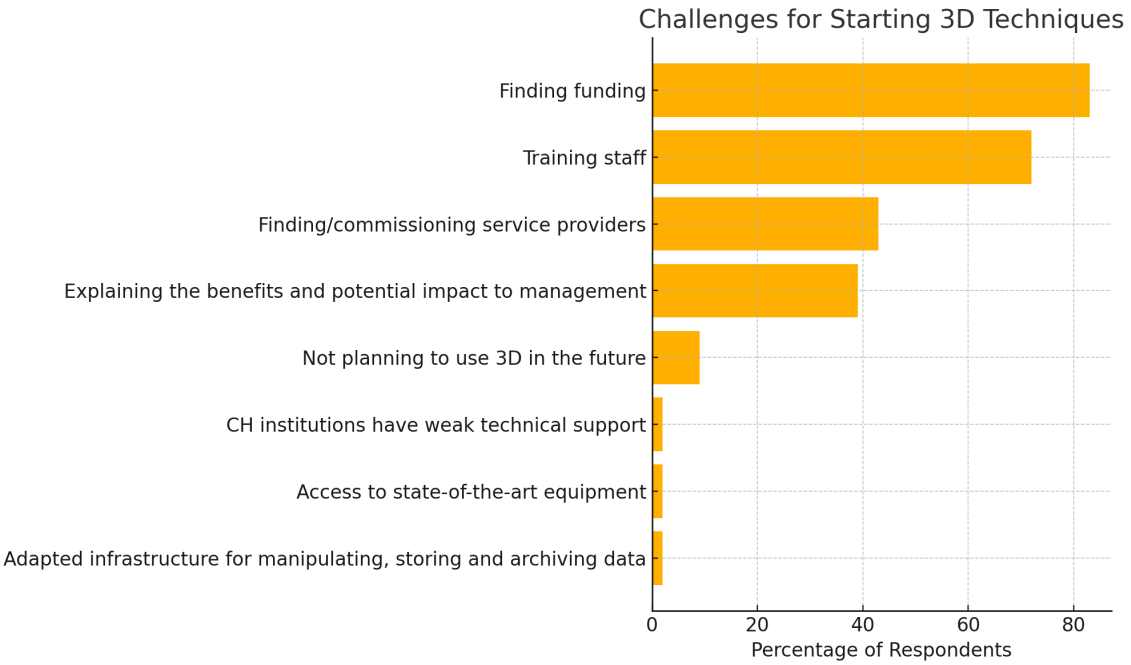

Fig. 19. Challenges for starting 3D techniques

Among the respondents who stated they are not planning to adopt 3D technologies, the primary reasons continue to centre around institutional limitations - most notably, a lack of dedicated staff and insufficient funding. These barriers echo broader challenges faced by many institutions across the cultural heritage sector.

In several cases, respondents pointed to institutional priorities: 3D technologies are simply not a focus for their organisation at this time. This does not necessarily reflect a negative stance toward digital innovation, but rather a current lack of alignment with organisational strategies or available resources. These institutions may remain open to exploring 3D in the future, should priorities or capacities shift.

Additionally, personal factors were mentioned. One respondent cited impending retirement as a reason for not engaging with new technological initiatives, suggesting that career stage can also influence willingness to adopt novel tools or lead innovation efforts.

Interestingly, one respondent highlighted that their institution already uses 3D technologies for exhibition, preservation, and monitoring purposes. This indicates that for some, the survey question may not have applied in a straightforward way, as they are already actively engaged with 3D practices.

In summary, the most common reasons for not planning the use of 3D technologies include:

- Lack of staff and funding
- Low current priority within the institution
- Personal circumstances, such as nearing retirement
- Existing use of 3D technologies, making the question less relevant in some contexts

These findings reflect both structural and individual factors that can influence whether or not an institution embarks on a 3D digitisation journey.

There is also evidence that some institutions already actively use 3D, so the question may not have been fully applicable to them.

5.3.5. Challenges faced by institutions using 3D technologies

The main challenges experienced by institutions using 3D technologies fall into several broad categories:

1. Funding and resources
Lack of financial resources remains the most frequently cited challenge. Institutions report struggling to:

- Self-fund 3D projects and pay skilled professionals (e.g. modelers for retopology).
- Cover high costs associated with hosting, software licensing (e.g. photogrammetry tools), and maintaining 3D infrastructure.
- Secure consistent funding for hardware upgrades or service outsourcing.

This financial strain directly affects sustainability and growth of 3D initiatives.

2. Technical limitations
Numerous respondents point to outdated or inadequate equipment, particularly in managing large and complex 3D files. Specific concerns include:

- Lack of computing power to process or store high-resolution 3D models.
- Absence of adequate digital repositories for long-term storage and reuse of data.
- Need for access to national or international standards and specifications for metadata, licensing, and interoperability.

In Ukraine, the pressure is even more acute due to infrastructure damage, creating an urgent need for rapid digitisation under difficult conditions.

3. Capacity, skills, and awareness
Skills shortages are common, particularly in areas such as:

- 3D modelling, software use, retopology, and digital archaeology.

- Management of 3D data and validation for research.
- Linking geometry with information (e.g. deterioration mapping, HBIM).

Respondents also highlight:

- The need for continuous training tailored to staff roles.
- Difficulty raising awareness among colleagues or leadership about the importance and impact of 3D technologies.

4. Bureaucratic and organisational barriers
Administrative and internal obstacles continue to slow progress:

- Long and complex procedures to obtain digitisation permits in historic or urban areas.
- Slow institutional decision-making and lack of internal coordination.
- Absence of clear strategic objectives for digitisation, resulting in uncertainty about what to digitise and why.

5. Practical and operational issues
Several institutions note issues that arise in the execution phase of 3D work:

- Challenges in capturing very small or intricate objects.
- Difficulty managing annotation procedures and ensuring scientific rigour in archaeological contexts.
- Limited availability of service providers and appropriate technical specifications.
- Need to balance 3D work with other professional responsibilities and project timelines.

6. Contextual and emergency challenges
In Ukraine, respondents describe a pressing need for digital preservation in the face of ongoing threats to cultural heritage sites. The lack of:

- Trained personnel, resources, and legal clarity compounds the urgency and difficulty of 3D documentation in conflict zones.

7. Control and autonomy
Some institutions express discomfort with relying on third-party platforms such as Sketchfab for 3D model hosting. There is a strong desire for:

- State-owned or open-source solutions,
- Full control over long-term accessibility and storage, and
- Greater sovereignty over heritage data management.

8. Ethical and interpretative dimensions
A small but important group of responses touches on inclusive storytelling. Challenges include:

- Incorporating gender, decolonial, or critical interpretative frameworks.
- Ensuring community voices are represented.
- Balancing technical goals with cultural and social considerations.

The integration of 3D technologies in the cultural heritage sector faces substantial and often overlapping challenges - financial, technical, organisational, and contextual. Even among committed institutions, these barriers can delay or limit progress. The data underscores the urgent need for capacity building, targeted funding, better infrastructure, and cross-sector collaboration to ensure sustainable and inclusive digital transformation in heritage contexts.

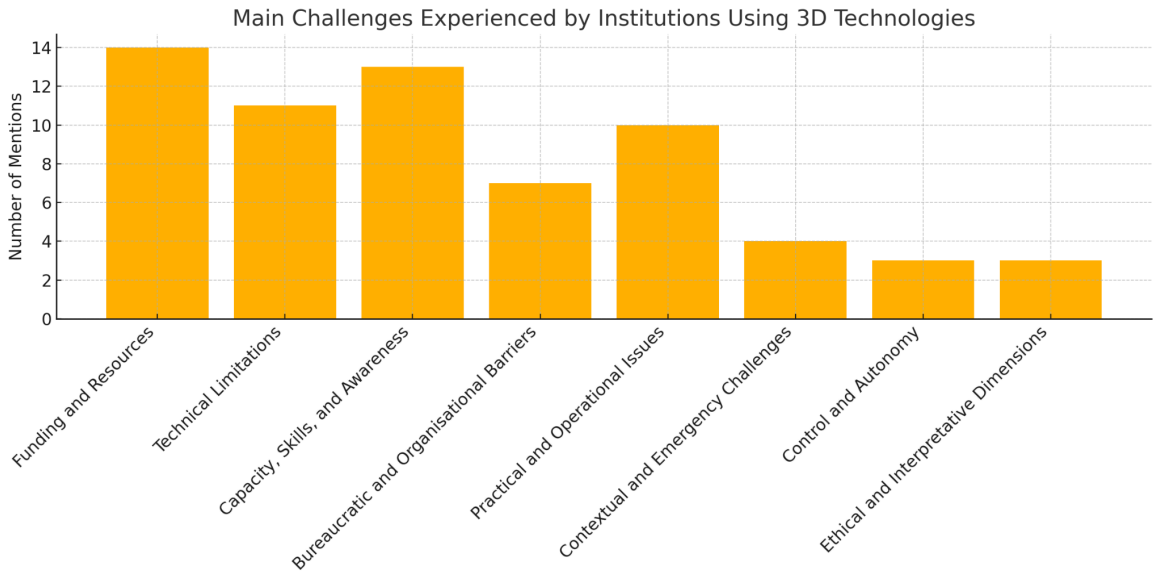

Fig. 20. Main challenges faced by institutions using 3D technologies

5.3.5. Benefit breakdown from the use of 3D technologies

The majority of respondents continue to perceive strong and consistent benefits from the use of 3D technologies, with average scores ranging between 4 and 5 across nearly all categories - reinforcing earlier findings.

Preservation for future generations remains a top-rated benefit, with most respondents assigning it the maximum score of 5. This confirms that safeguarding heritage digitally continues to be a core motivator for adopting 3D technologies.

Helping digital restoration also scores consistently high, indicating that 3D methods are widely recognized for supporting accurate, non-invasive restoration and conservation efforts.

Enhancing accessibility and allowing remote exploration is another highly valued benefit. With many responses scoring 4 or 5, this underscores the relevance of 3D technologies in broadening access to cultural heritage beyond physical constraints.

Offering hands-on experiences while preserving the integrity of original objects shows slightly more variability but still trends positively. This suggests a clear appreciation among stakeholders for the balance between interactive engagement and preservation.

Providing immersive, interactive learning experiences is widely seen as a major strength of 3D applications, particularly for educational and outreach purposes. This is reflected in the high number of top scores (5s).

Although the overall perception is strongly positive, a small number of lower scores (1s and 2s) appear, especially in categories like immersive learning and hands-on interaction. These likely reflect specific institutional limitations such as technical capacity, funding constraints, or strategic priorities.

In summary, the data confirms that preservation, education, accessibility, and digital restoration remain the most widely perceived benefits of 3D applications in cultural heritage. The strong consensus across stakeholder groups highlights the enduring value of these technologies, even as some practical challenges to their adoption persist.

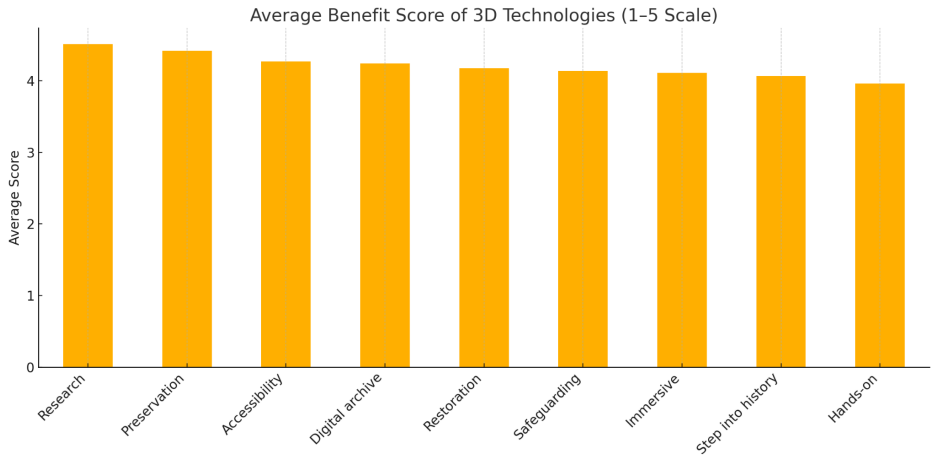

Fig. 21. Perceived benefits of applying 3D technologies

5.4 Specific needs

The following analyses belongs to Section 4 of the survey: "SPECIFIC NEEDS". The section addressed the specific needs and expectations of users in relation to the future 3D-4CH Competence Centre, including preferred training formats, skills to be acquired, certification relevance, and learning challenges. Respondents were also asked whether they wished to be updated about the survey results or be available for follow-up interviews.

5.4.1. Awareness of the 3D-4CH Online Competence Centre for 3D in cultural heritage

The survey responses indicate a moderate but uneven level of awareness of the 3D-4CH Competence Centre - an initiative designed to promote knowledge, skills, and access to 3D technologies in the cultural heritage sector.

- 24% of respondents (18 out of 74) reported that they are already familiar with the 3D-4CH Competence Centre. This suggests that the initiative has successfully reached a segment of professionals, particularly those already engaged in 3D applications for cultural heritage.
- 43% (32 respondents) stated that they had *heard about it*, but admitted they *do not know much* about its activities or goals. This points to a superficial level of awareness—respondents may recognise the name, but lack detailed understanding or active engagement.

- 33% (24 respondents) said they do not know the initiative at all, revealing a significant outreach gap that could limit the Centre's impact, particularly among stakeholders who could benefit from its resources but remain unaware of its existence.

These findings underscore a clear opportunity - and need - for targeted communication and outreach strategies. Increasing awareness of the 3D-4CH Competence Centre among cultural heritage institutions, professionals, and researchers is essential to ensuring broader participation and use of the Centre's services.

Improved visibility, combined with accessible messaging and capacity-building initiatives, will be key to enabling the 3D-4CH Competence Centre to fulfil its mission of supporting the digital transformation of the cultural heritage sector through 3D technologies.

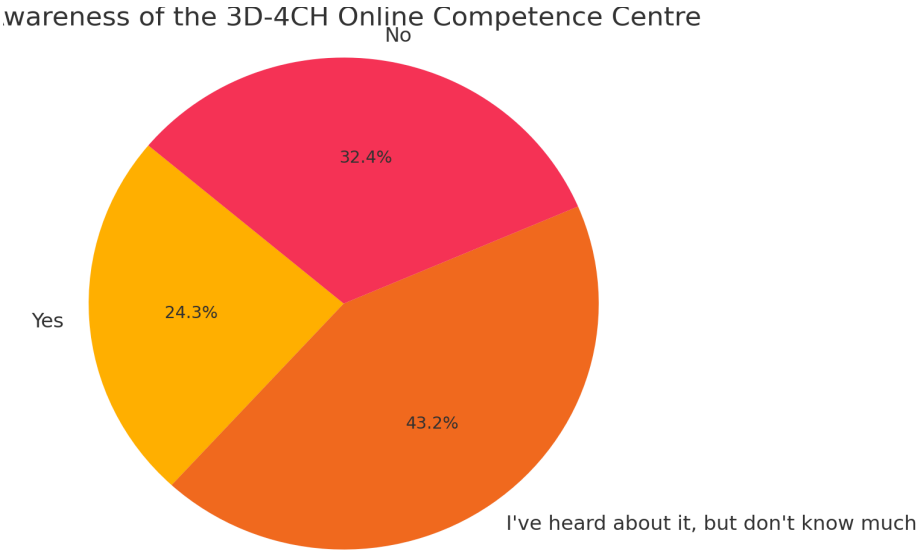

Fig. 22. Awareness of 3D-4CH Online Competence Centre

5.4.2. Expectations from the 3D-4CH Online Competence Center

The responses to the survey paint a clear picture: there is a strong sense of anticipation and hope surrounding the potential of the 3D-4CH Competence Centre among those working in the cultural heritage sector.

For many, one of the most important expectations is the opportunity to improve digital skills among staff. In fact, this emerged as one of the most unanimously high-scoring areas. Across institutions, there is a shared understanding that without proper training, the promise of 3D technologies cannot be fully realised. People are eager for structured, accessible training that empowers their teams to confidently engage with digitisation processes.

Alongside this, participants placed great emphasis on the need to increase the efficiency and quality of those digitisation processes. There is clearly a desire for reliable access to expert knowledge, best practices, and

technical standards. Many respondents seem to recognise that digitisation is no longer an experimental or occasional project. It is fast becoming an essential part of heritage work, and it needs to be done well.

Perhaps unsurprisingly, improving the protection of at-risk cultural heritage stood out as another major priority. In a world where tangible heritage faces constant threats - from environmental damage to conflict - the ability to digitally safeguard these cultural treasures is seen not only as valuable, but as an urgent necessity.

But the potential of 3D extends beyond safeguarding. Many respondents highlighted the exciting prospect of using 3D tools to transform how the public interacts with heritage. There was widespread enthusiasm for the idea that these technologies can enhance visitor experiences, both on-site and online. Respondents believe that with better tools and knowledge, museums, cultural institutions, and heritage sites can create more engaging, interactive, and accessible experiences - inviting people to explore history in ways that would have been impossible just a few years ago.

At the same time, innovation and new ideas are at the heart of what people hope to gain from the 3D-4CH Competence Centre. The responses suggest that the sector is ready to embrace creativity and experiment with new ways of presenting, preserving, and studying cultural heritage. The Centre is seen as a space where such innovation can be nurtured and shared.

There is also hope that through the Centre, organisations can find ways to make their 3D initiatives more sustainable, both in terms of environmental impact and cost. While this was slightly less of a universal priority compared to training or heritage protection, many still expressed the need for cost-effective and environmentally conscious solutions.

Finally, standardisation and collaboration emerged as strong themes throughout the responses. Many believe that access to shared tools, interoperable systems, and international collaboration are key to ensuring the long-term impact of 3D technologies in cultural heritage.

In essence, the 3D-4CH Competence Centre is seen as much more than just a technical resource. For many, it represents an opportunity to build capacity, foster creativity, strengthen collaboration, and ultimately ensure that 3D technologies serve not only institutions, but the wider public and future generations.

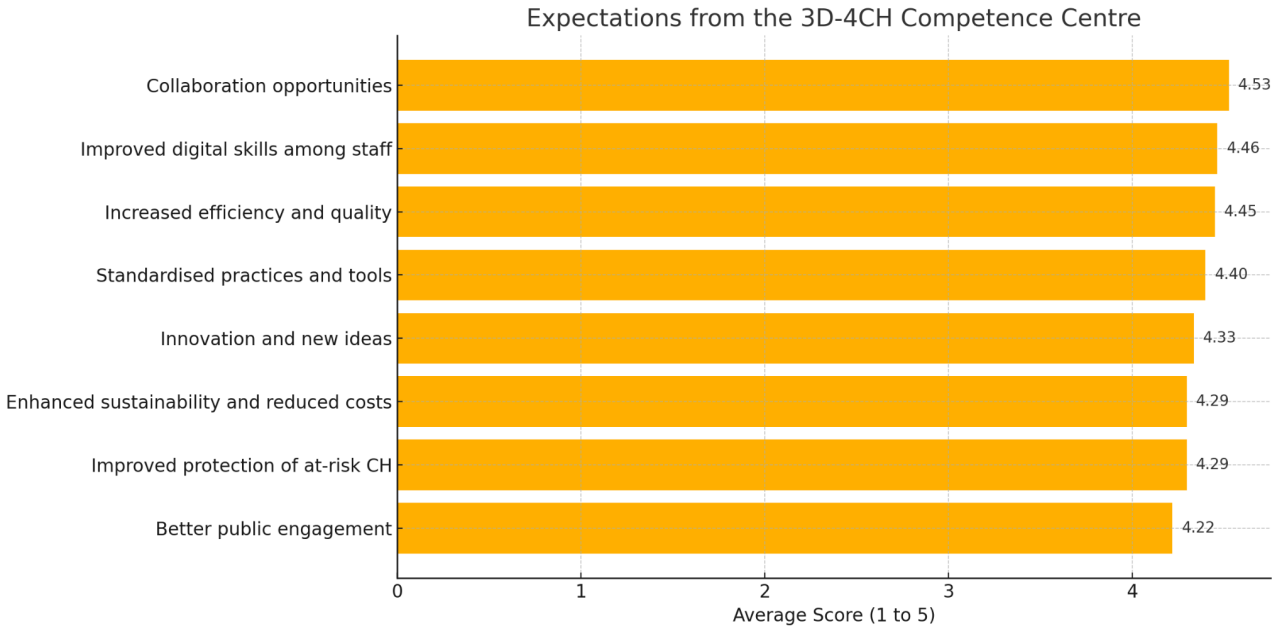

Fig. 23. Mean importance score for 3D-4CH Competence Centre outcomes

5.4.3. Demand for 3D-4CH services

The responses show that there is a widespread desire among professionals in the cultural heritage sector for structured support and accessible resources when it comes to working with 3D technologies. For most, training opportunities sit at the top of the priority list. People are eager to improve their skills, build confidence, and develop the practical know-how to apply 3D tools effectively within their institutions.

Alongside this, there is a strong demand for access to reliable, user-friendly 3D tools and platforms, which are seen as essential for digitisation work, preservation, and outreach. However, simply having access to the tools isn't enough - many participants emphasised the need for clear best practice guidelines and standards, to ensure that their work meets technical expectations, is interoperable, and can be preserved and shared properly.

Beyond technical aspects, respondents clearly value the social and collaborative side of this work. Many expressed a desire for knowledge-sharing opportunities and peer-to-peer connections, indicating that they see the 3D-4CH Competence Centre not just as a resource hub, but as a community where experiences, challenges, and solutions can be exchanged.

There's also a strong practical focus: many respondents see a real need for support in re-using 3D content, as well as publishing and archiving services to ensure that the results of digitisation efforts aren't lost or underutilised. Some also highlighted the value of consultancy for digital transformation, acknowledging that implementing 3D solutions often requires strategic advice and institutional change.

A smaller but still notable group of respondents expressed interest in mentorship programmes, reflecting a need for personal guidance and more tailored support. A few also liked the idea of having virtual assistants or chatbots, which could help answer routine questions and make engaging with the Centre more convenient.

Only a tiny minority said they did not need any of the proposed services, suggesting that for most people working in the cultural heritage sector, a well-rounded, supportive 3D-4CH Competence Centre would fill a clear gap and meet real needs.

Participants shared a range of useful suggestions and insights to help shape the development of the 3D-4CH Competence Centre. A recurring theme was the need for practical assistance with copyright and the reuse of 3D materials. Several respondents stressed that clear guidance in this area would be essential to help institutions navigate legal uncertainties and make full, responsible use of their 3D content.

There was also interest in creating an environment that promotes contribution to and sharing of open-source data and tools. Many see this as an important way to foster collaboration, reduce costs, and build a more sustainable, accessible ecosystem around 3D technologies in cultural heritage.

Another important point raised was the need for tailored advice and strategic planning support, particularly regarding the digital transformation process. Institutions expressed that a “one-size-fits-all” approach would not work, and they would greatly value expert guidance in designing realistic, needs-based digitisation strategies that take into account their specific circumstances, capacities, and resources.

Accessibility was also highlighted as a priority. Some respondents emphasised that the content produced through 3D technologies should be usable and accessible to a wide range of audiences, from experts to casual visitors, ensuring that 3D initiatives contribute meaningfully to both education and public engagement.

Lastly, there were concerns about the complexities created by different national regulations. To address this, respondents recommended that the 3D-4CH Competence Centre develop or provide suggested tools and services that work at both the local and global levels, including for areas such as copyright management, archiving, and platform selection.

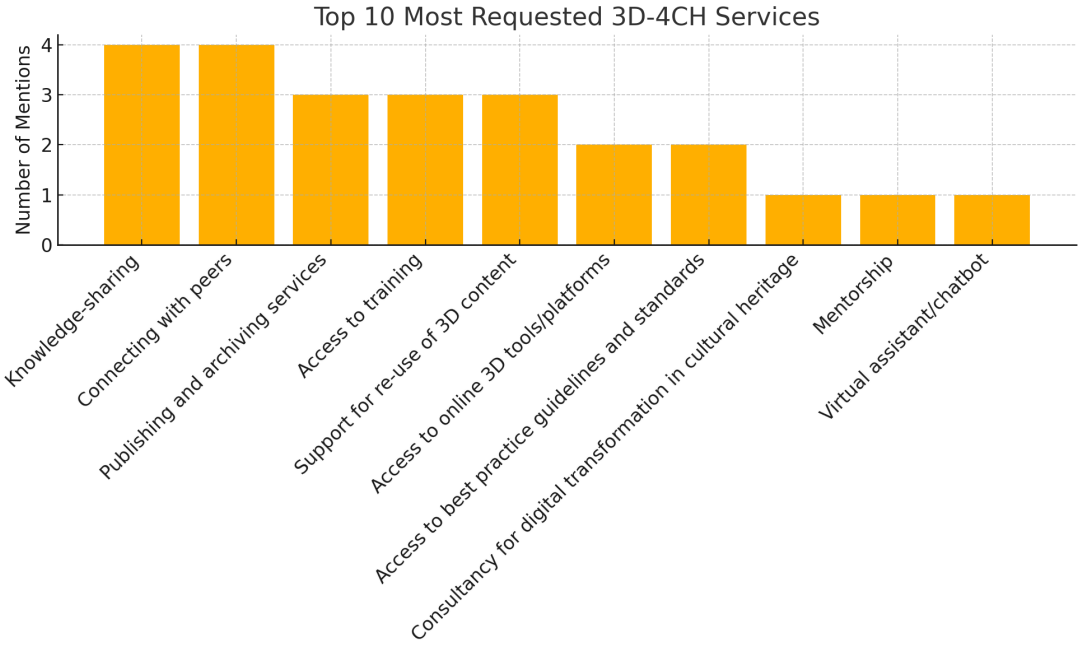

Fig. 24. Top 10 most requested 3D-4CH services

The respondents were asked to share any additional insights, specific requirements, or recommendations regarding the proposed 3D services and the 3D-4CH Competence Centre. The answers touched several issues.

1. Legal and copyright guidance
Multiple respondents expressed the need for clear assistance with copyright and reuse of 3D materials. This includes navigating intellectual property, licensing, and legal uncertainties that may hinder broader use and sharing of 3D content.

2. Open source collaboration
There is a desire for the ability to contribute to and benefit from open-source data and tools. This reflects an interest in building a more collaborative and sustainable ecosystem around 3D cultural heritage technologies.

3. Strategic planning support
One respondent emphasized the importance of tailored strategic advice for institutional digitisation, suggesting that a one-size-fits-all approach is inadequate. Institutions need help in crafting realistic, context-specific digital transformation strategies based on their needs and resources.

4. Accessibility and inclusiveness
A key recommendation was ensuring that 3D content be accessible and usable across different levels of interest, including casual visitors, students, and professionals. The focus is on capacity-building and inclusive access.

5. Localized and globalized tools
Due to regulatory variations across countries, some suggested providing a recommended toolkit (e.g. for copyright, archiving, platforms) that supports both local compliance and international interoperability.

6. Clear use and ownership models
One comment underlined the need to clarify not just preservation and digitisation practices, but also ownership and usage rights of the 3D models themselves.

7. Integrated software solutions
There's interest in a comprehensive software platform that integrates data from various sources (e.g., drones, scanners, cameras) to produce orthographic 3D models. Ideally, such a system would also support annotation (e.g., for deterioration mapping).

8. Financial support for training and research
Finally, respondents recommended funded training programs, scholarships, and institutional exchanges, particularly to support education, capacity-building, and international collaboration in 3D research and digitisation.

These comments reinforce previous findings that institutions are seeking practical, legal, strategic, and technical support, not just tools. They also suggest the 3D-4CH Competence Centre should act as a hub for collaboration, training, and standard-setting, tailored to the complex realities of cultural heritage work across Europe and beyond.

5.4.4. Desired 3D Skill Acquisition

The answers confirm a strong and widespread interest among professionals in acquiring skills across the entire 3D workflow in the cultural heritage sector.

3D Data Processing stands out as the most sought-after area, with approximately 86% of respondents selecting it. This is closely followed by 3D Data Capture, chosen by 83%, underlining a high demand for foundational technical skills required to acquire and prepare 3D content.

Publishing and Archiving 3D data is another priority, mentioned by 70% of respondents. This indicates that institutions are not only focused on producing 3D models, but are equally committed to their long-term preservation, accessibility, and structured management.

Approximately 61% of participants expressed interest in the (re)use of 3D for specific domains and scenarios, showing that many professionals see clear potential for applying 3D technologies in areas such as conservation, education, research, and visitor engagement.

The importance of documentation is also evident: Metadata and Paradata for 3D was selected by around 60% of respondents. This reflects a growing understanding that good 3D practice includes not just technical excellence but also transparency and reproducibility.

Concerns around rights and legal frameworks are also prominent, with 59% seeking skills in Copyright and Access for 3D. This shows that legal clarity and knowledge of intellectual property rights are seen as crucial for sustainable 3D use and data sharing.

Only a small number of respondents (10%) stated they did not aim to acquire any new skills in this area, which may reflect either resource limitations, institutional priorities, or a perception that current capabilities are sufficient.

Additionally, 1 respondent (around 1–2%) specifically highlighted the need for skills in mass, high-quality 3D data capture and processing, pointing to interest in scaling up digitisation with advanced tools and methods.

In summary, the findings point to a strong and multifaceted interest in capacity building for 3D across the sector, with a notable emphasis on core technical skills, data stewardship, legal literacy, and applied knowledge. These insights should help guide the training agenda of the 3D-4CH Competence Centre.

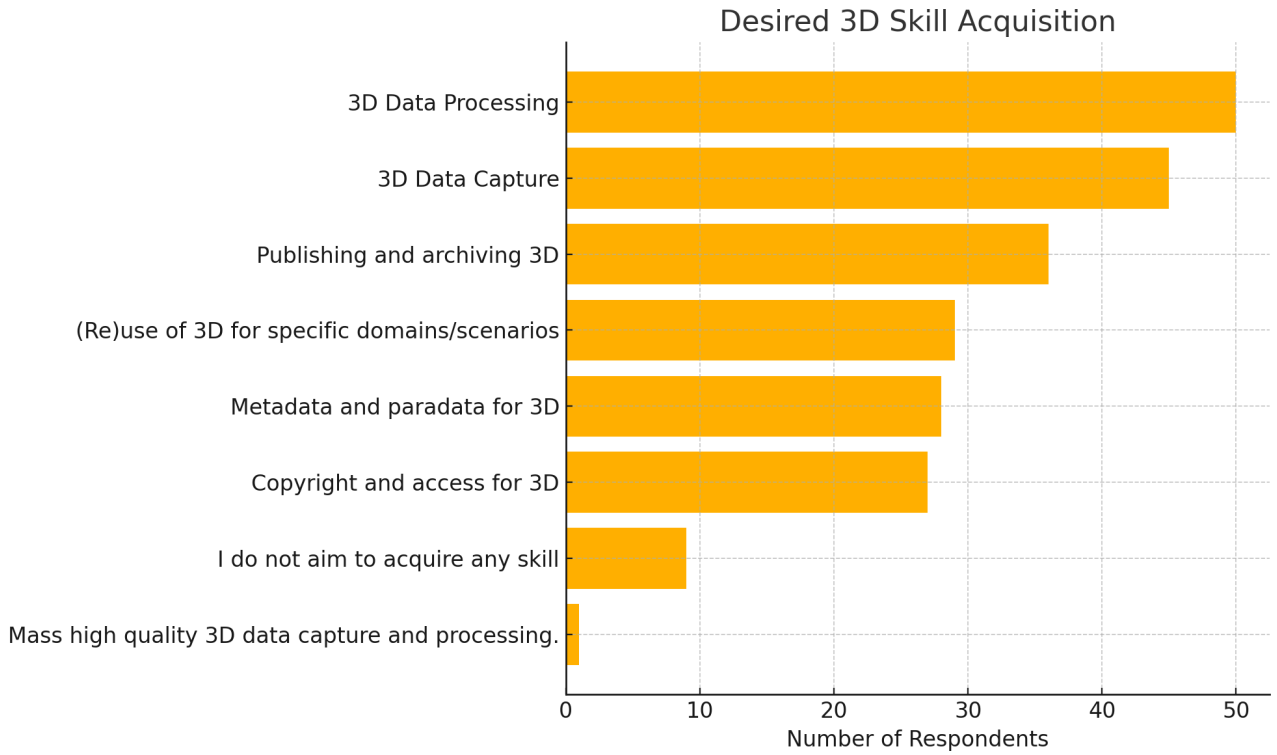

Fig. 25. Desidered 3D skill acquisition among respondents

5.4.5. Reasons for interest in online training

The majority of respondents (56.3%) indicated that Skill development is their primary motivation for participating in online training. This reflects a strong interest in acquiring new capabilities, particularly in 3D technologies and cultural heritage digitisation.

About 21.1% selected Career advancement as their main driver, showing that many view online training as a tool for improving their professional prospects or positioning themselves for new roles.

Personal Interest was cited by 8.5% of respondents, highlighting a segment of the audience motivated by curiosity or passion rather than formal career objectives.

Academic support also accounted for 8.5%, suggesting that some individuals are engaging with training to complement their studies or research work.

A small portion (2.8%) stated they were not interested in online training, while another 2.8% mentioned Certification as their specific motivation.

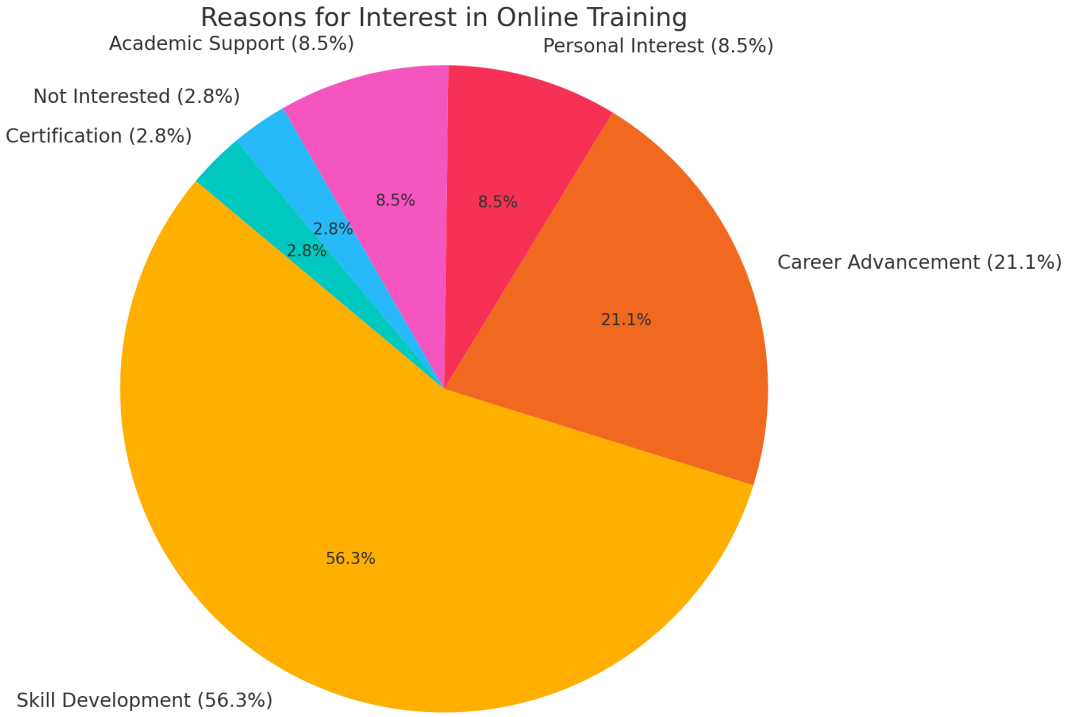

Fig. 26. Reasons for interest in online training

5.4.6. Planned start time for online learning

The results show strong interest in online learning, with most respondents planning to begin in the near to mid-term.

Approximately one-third of respondents indicated they plan to start within the year, suggesting a broad intention to engage with training, though not urgently. Another 26% expressed interest in starting within the next three months, showing a more immediate readiness to participate. A smaller, yet motivated group - about 10% - plan to start immediately, indicating eagerness to begin without delay.

However, a substantial proportion - roughly 40% - responded “Not sure”, pointing to existing uncertainty, whether due to lack of information, competing priorities, or institutional constraints.

In summary, while interest in online learning is clearly present, a large share of undecided respondents suggests the need for further outreach, clearer timelines, or tailored incentives to convert intention into action.

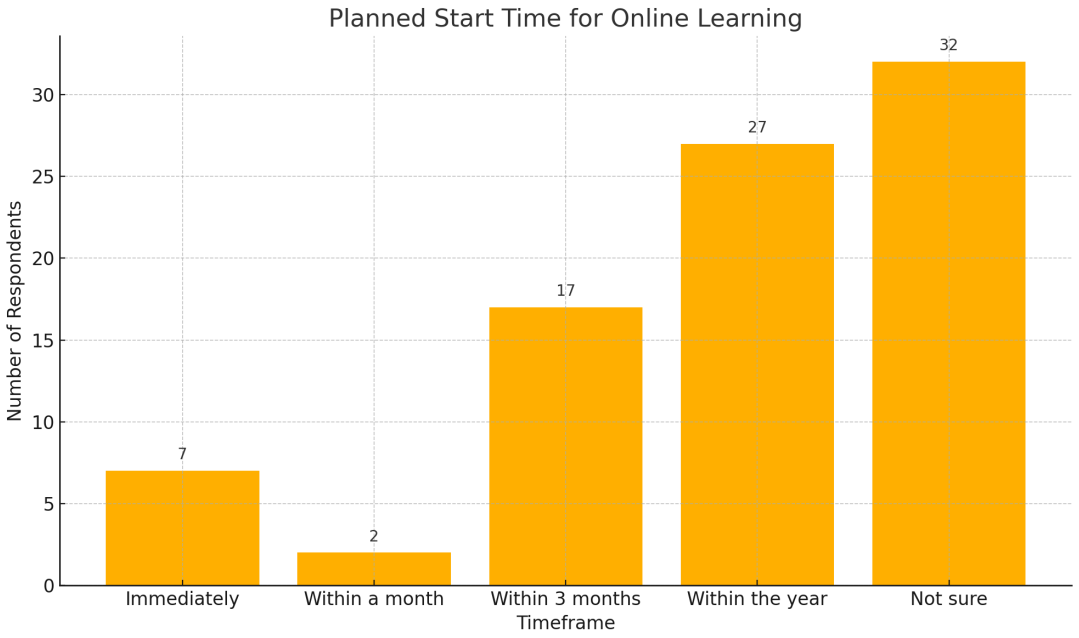

Fig. 27. Planned start time for online learning

5.4.7. Preferred training formats

The majority of respondents showed a clear preference for flexibility and variety in training formats.

Specifically, approximately 35% of participants expressed interest in a combination of all available options, meaning they value both structured, comprehensive learning pathways as well as targeted, skill-specific modules and practical answers to specific questions.

Meanwhile, around 33% of respondents favored targeted training modules, focusing on short, focused courses that address specific skills or needs. This suggests that many learners prefer bite-sized, practical learning opportunities over lengthy, structured programs.

Full learning pathways, which offer comprehensive, structured courses covering end-to-end processes, were preferred by roughly 20% of participants, indicating that a significant minority seek a more formal and in-depth educational experience.

Additionally, a smaller group of respondents, about 6%, indicated they were not interested in training at all, while a few respondents, approximately 4%, emphasized their preference for answers to specific questions, demonstrating a need for highly practical, task-oriented support rather than formal training programs.

In summary

- Combination of all options: ~35%
- Targeted training modules: ~33%

- Full learning pathways: ~20%
- Not interested in training: ~6%
- Answers to specific questions only: ~4%

This highlights a strong demand for modular, flexible training options that cater to both structured learners and those seeking targeted, on-demand learning experiences.

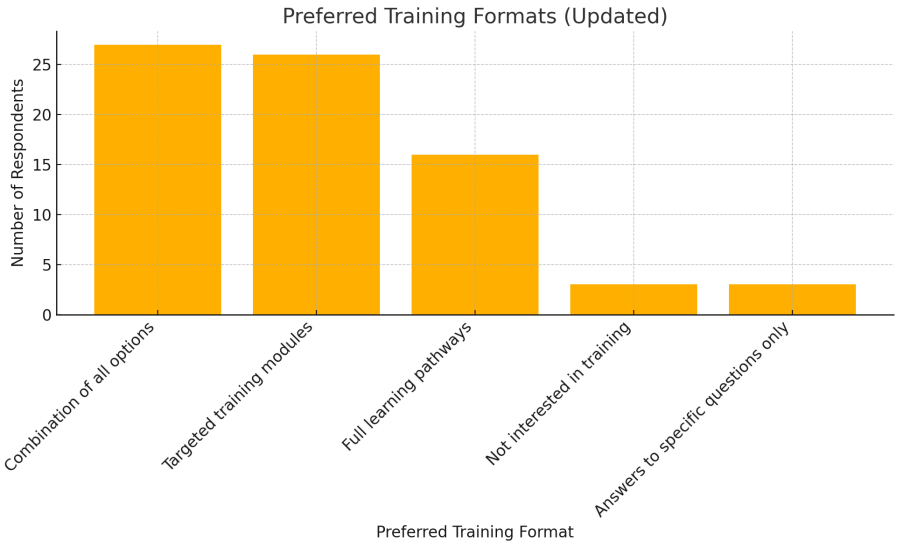

Fig. 28. Preferred Training formats

5.4.8. Average preference score for different training formats

Participants show a clear preference for flexible and interactive learning formats. Online self-paced training emerged as one of the most popular choices, reflecting the need for adaptable learning schedules that fit individual availability.

Similarly, live webinars and online workshops are highly valued, indicating a strong interest in real-time interaction with trainers and peers.

Blended learning, which combines online and in-person elements, also received strong ratings, highlighting the desire for a comprehensive yet flexible approach that allows both self-directed study and face-to-face engagement.

Projects or assignments and group discussions are also well appreciated as practical, hands-on learning methods. While they rank slightly below the top formats like self-paced learning and webinars, they are still preferred over more passive methods.

In contrast, reading materials and interactive quizzes, while useful, are generally seen as supplementary rather than central to participants' preferred learning experiences.

In-person workshops and seasonal schools received moderate feedback: some participants value the opportunity for direct engagement, while others may face logistical or geographic limitations that reduce their appeal.

Overall, the data reflects a strong desire for accessible, flexible, and engaging training formats, with a clear preference for options that balance independent learning and interactive experiences.

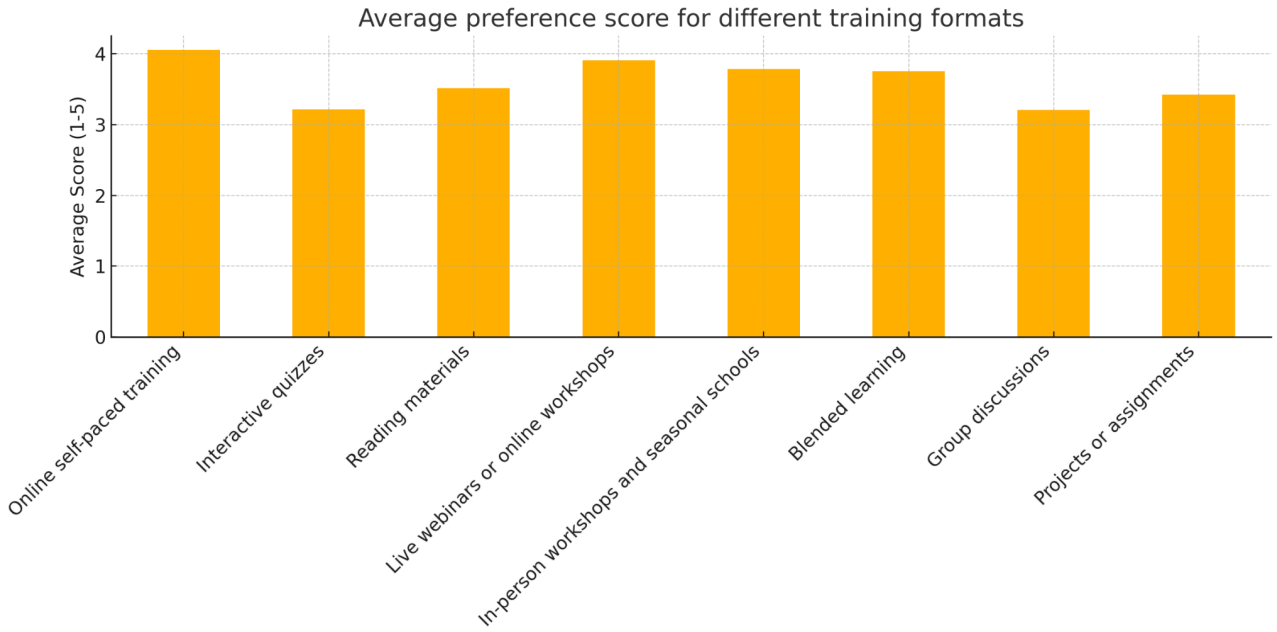

Fig. 29. Average preference score for different training formats

5.4.9. Online learning time per week

The majority of respondents indicated they can dedicate a moderate amount of time to online learning, with 2 to 5 hours per week being the most common response. This applies to approximately 63% of participants, suggesting that learners are willing to engage consistently, but prefer a manageable, part-time commitment that fits around their professional or personal schedules.

A smaller yet significant group - about 24% - reported they could dedicate less than 2 hours per week, reflecting either time constraints or a preference for shorter, focused learning activities.

Roughly 9% said they could allocate 5 to 10 hours weekly, indicating a smaller group ready for more intensive learning experiences.

A few individuals (about 1%) reported being able to invest 10+ hours per week, showing that highly intensive training suits only a small minority.

Finally, 3% stated they cannot currently dedicate any time to online learning, likely due to professional or personal constraints.

In summary, the data suggests that future training programmes should be designed with flexibility in mind - favoring short, digestible modules and self-paced options that align with the common availability of 2 to 5 hours per week.

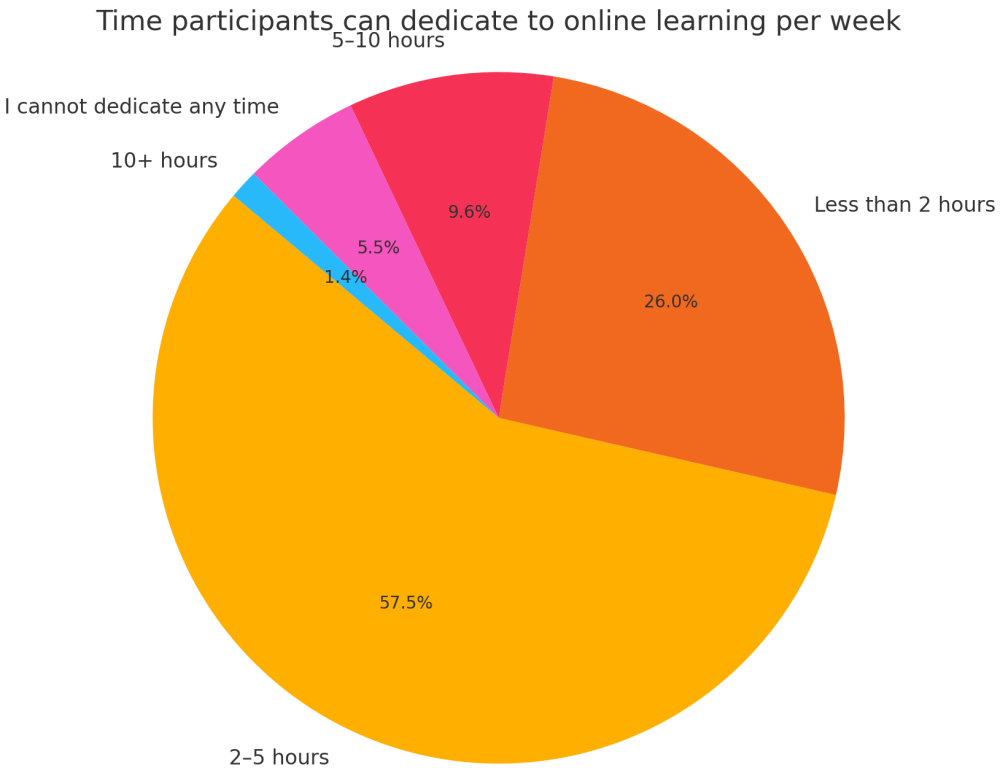

Fig. 30. Time participants can dedicate to online learning per week

5.4.10. Tracking training

Based on the responses, tracking of completed and in-progress training among approximately 47% of respondents indicated that they do track their training activities, while 53% stated that they do not.

This suggests that while nearly half of the participants are already engaged in monitoring their learning progress, a slightly larger proportion either lack systems for tracking or are not yet in the habit of doing so. This insight highlights an opportunity for the 3D-4CH Competence Centre to promote simple and effective tools that support training tracking and encourage more structured learning management practices.

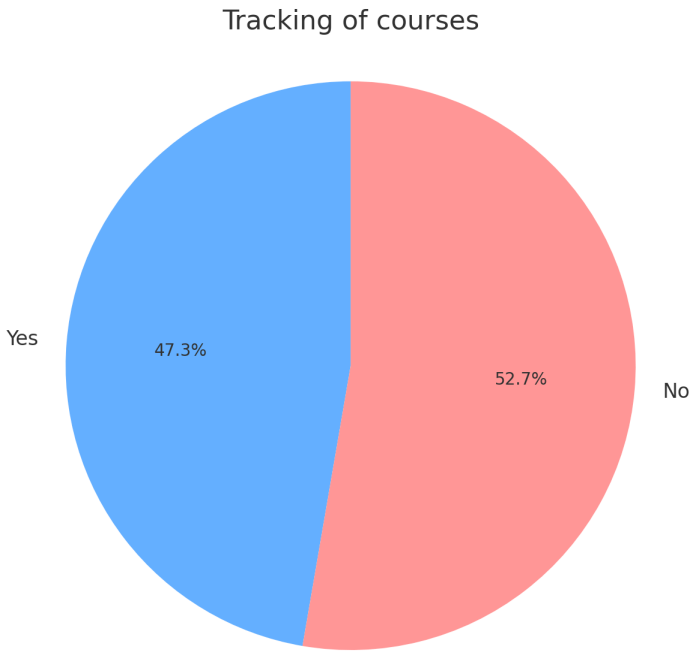

Fig. 31. Tracking of courses

5.4.11. Tracking training methods

The most common method for tracking training is the use of a personal spreadsheet or document, which is employed by a significant majority of respondents. Many participants complement this with more traditional approaches such as a physical notebook or planner, reflecting a preference for both digital and handwritten records.

A considerable portion of respondents also rely on informal mental tracking, indicating that while they may not formally document their progress, they keep a general overview in their minds. Some participants use certification tracking platforms, such as LinkedIn Learning or Coursera, either as a standalone solution or in combination with other methods.

Fewer respondents mentioned using company HR or Learning Management Systems (LMS), suggesting that formal organisational tracking structures are not universally implemented or accessible.

Notably, a significant group of participants stated that they use no system at all, highlighting a gap in structured learning management for some individuals.

In summary, the tracking landscape among respondents is highly varied, combining personal, organisational, and informal approaches, with clear opportunities to promote more systematic and accessible tracking tools, particularly for those not yet using any method.

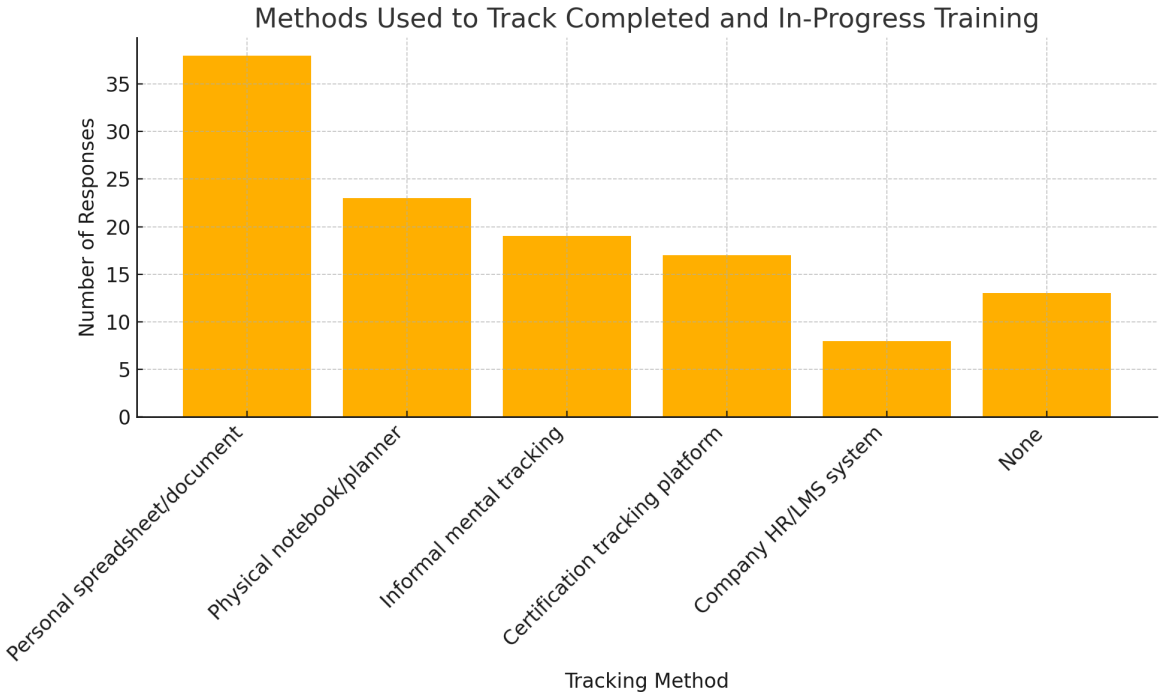

Fig. 32. Methods used to track completed and in-progress training

5.4.12. Importance of system characteristics for training tracking

Based on the responses gathered, the most valued characteristic for a system tracking training and courses is an easy-to-use and intuitive interface, which consistently received high ratings across respondents. Similarly, the ability to upload certificates and documents and maintain a searchable history of all completed trainings were considered essential features by the majority of participants.

Progress tracking for ongoing courses and accessibility from multiple devices, such as desktops and mobiles, were also highly rated, reflecting the growing demand for flexibility and mobile compatibility.

While features like integration with calendars (e.g., Google Calendar, Outlook) and reporting or analytics on learning progress were considered moderately important, they did not score as highly as the core functionalities.

There was slightly more variation in responses regarding the importance of setting learning goals and offline access, with some respondents rating these as critical while others placed less emphasis on them.

Data privacy and security emerged as a crucial factor, with many respondents rating this feature highly, highlighting growing concerns about safeguarding personal data and training records.

In summary, respondents expressed a clear preference for a user-friendly, flexible, and secure system that allows for comprehensive tracking, document management, and easy access across devices, with moderate interest in advanced features like analytics and calendar integration.

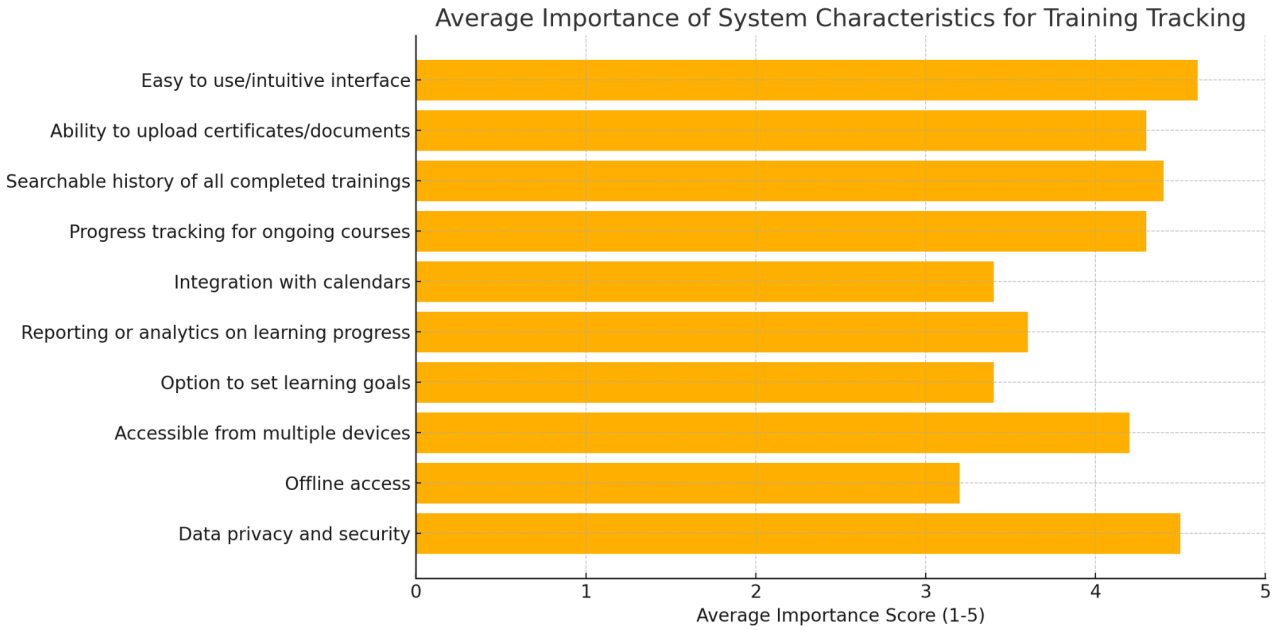

Fig. 33. Importance of system characteristics for training tracking

5.4.13. Importance of certification for training

The vast majority of respondents (around 77%) consider certification to be important for training. While in another question certification may not have appeared as a top priority, these responses suggest it holds significant value for most participants.

A smaller group (approximately 13%) stated that certification is not important to them, possibly indicating a stronger focus on practical skills or learning outcomes rather than formal recognition.

About 10% of respondents were uncertain, selecting “I don’t know”, which may reflect a lack of experience with certified training or ambivalence toward its value.

Overall, the data confirms that certification is widely regarded as a meaningful aspect of training for most participants. Many see it as formal recognition of effort and a beneficial addition to their professional profile. However, training initiatives should remain inclusive and flexible, accommodating those who prioritize skill development over credentials.

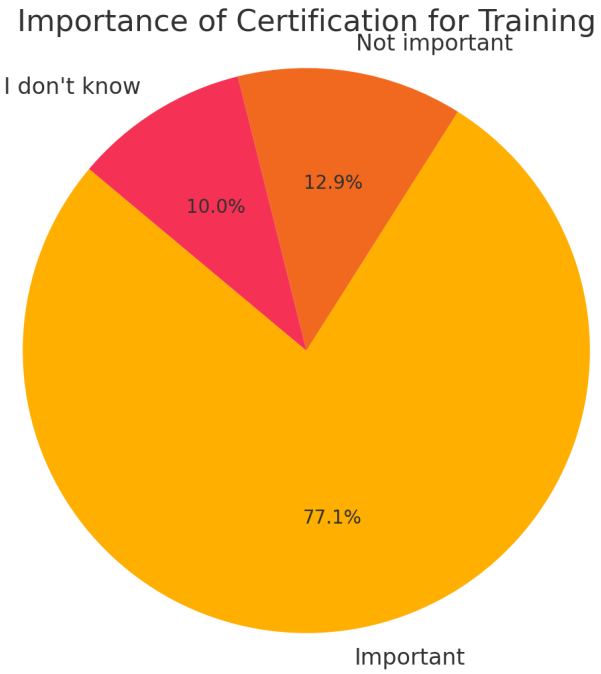

Fig. 34. Importance of certification for training

5.4.14. Challenges faced with learning in the past

Based on the responses, the most common challenges participants faced in previous learning experiences center on the quality and relevance of the content. The most frequently mentioned issue was poor content quality, followed closely by concerns that content was not applicable to the cultural heritage sector. Together, these two factors highlight a pressing need for high-quality, sector-specific training.

Time management also emerged as a significant barrier, cited nearly as often as the top two issues. Many participants noted difficulties in finding sufficient time to engage in training, suggesting the importance of flexible, self-paced learning options.

Other commonly reported obstacles included lack of motivation, technical issues, and limited interaction with instructors, which can all undermine engagement and learning outcomes. Less frequently, respondents pointed to financial constraints, lack of academic recognition for completed training, and insufficient tools for technology-based learning.

Overall, the findings indicate that successful training—particularly in the cultural heritage domain—must be high-quality, relevant, flexible, and engaging, and supported by robust technical infrastructure and clear recognition mechanisms.

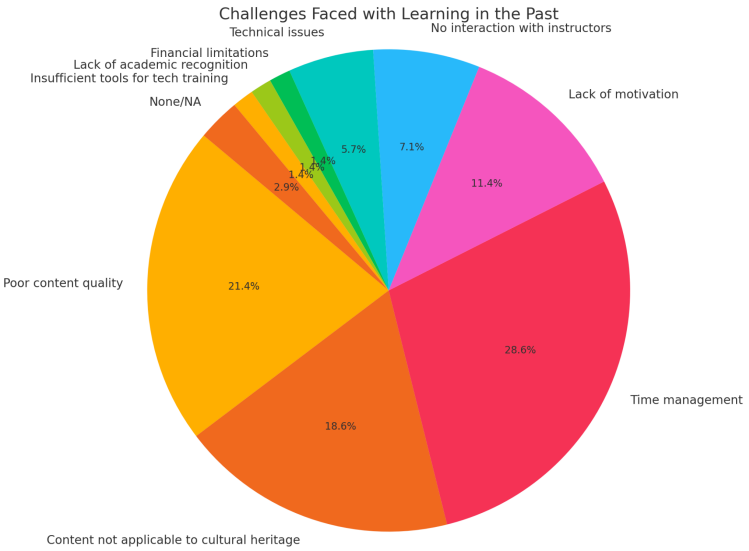

Fig. 35. Challenges faced with learning in the past

5.5 Willingness to engage with the 3D Online Competence Centre

5.5.1. Interest in being informed about the survey results

The majority of respondents expressed interest in being informed about the results of the survey. Specifically:

- 58 participants (approximately 82%) want to be informed about the survey results.
- 13 participants (approximately 18%) do not wish to be informed.

This shows a clear preference among respondents for transparency and feedback on the outcomes of the survey, indicating that participants value staying engaged and informed about how the data they provided will be used.

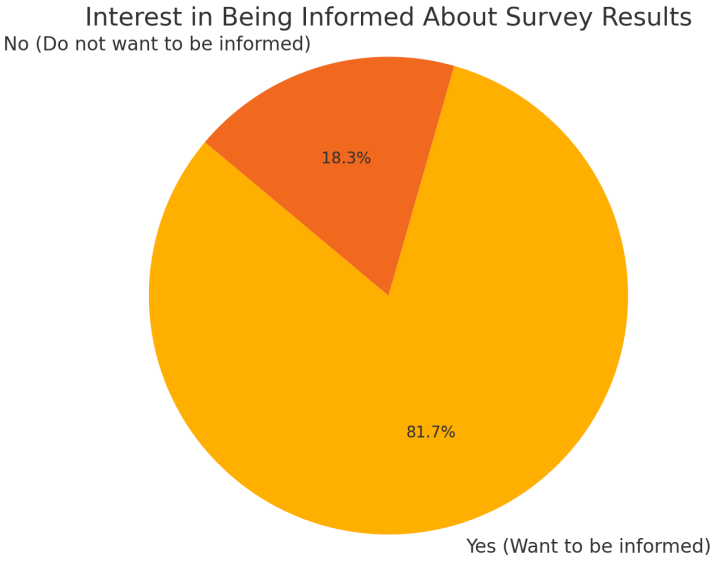

Fig. 36. Interest in being informed about the survey results

5.5.2. Availability for a more in-depth interview

Out of the total respondents, 50% indicated that they would be available for a more in-depth interview to discuss their answers further. On the other hand, the other 50% stated they would not be available for an interview. This shows that while there is significant interest in providing more detailed insights, nearly half of the participants prefer not to engage further beyond the survey.

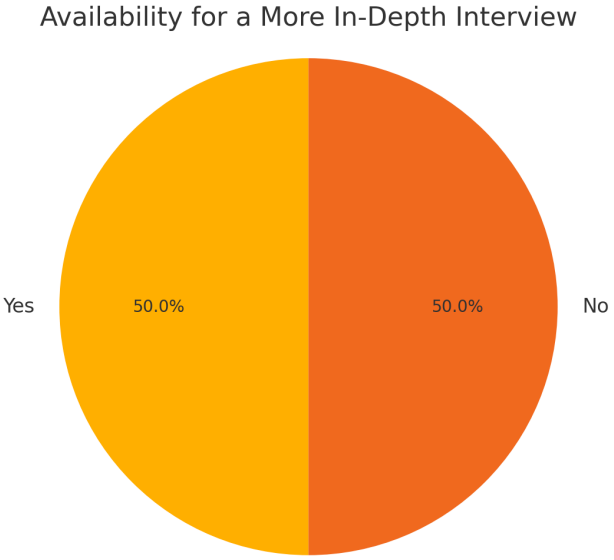

Fig. 37. Availability for a more in-depth interview

6. Advisory board and Stakeholder panel feedback on survey results

After submitting the survey, we convened a first meeting on the 8th July 2025 with the Advisory Board and Stakeholder Panel to present the initial results and propose the identified target groups. The support expressed by the Advisory Group and Stakeholder Panel regarding the proposed target groups and preliminary findings was very positive, with 29 participants attending the initial presentation and most affirming the relevance of the classifications. While the survey provided valuable insights, it was not intended to be exhaustive; rather, it served as a complementary tool to guide and enrich discussions with Advisory Group and Stakeholder Panel members. This combined approach ensures that the identified target groups and their needs are meaningfully validated. Further meetings with both groups will be held throughout the project to continue this collaborative process.

In order to gather as many answers as possible, a Mentimeter session was set up. The session's results follows.

6.1 Classification of target groups

In response to the question, *"Do you believe the current classification of target groups adequately reflects the diversity and reality of the stakeholders that should benefit?"*, the vast majority responded positively. Out of the 29 attendees, 20 provided explicit responses, all of which were positive ("Yes"). This represents 100% affirmative feedback among those who responded, indicating strong endorsement of both the preliminary findings and the direction proposed for identifying target groups.

This feedback validates the approach taken so far and reinforces the alignment between the project goals and stakeholder expectations. The unanimous support from engaged participants suggests that the proposed strategy is on the right track.

6.2 Ensuring inclusion of less visible but relevant stakeholders

In response to the question *"How can we ensure that less visible but relevant stakeholders are better identified and involved?"*, participants offered a range of practical and strategic suggestions to improve outreach and engagement.

Several emphasized the role of larger organizations acting as umbrella entities, capable of reaching smaller or less visible actors within their networks. These stakeholders often have more capacity and existing channels that can be leveraged to disseminate information and extend invitations to participate. Direct personal outreach was also highlighted as a key method - particularly through email and social media - to build relationships and invite participation from overlooked groups. In parallel, many participants stressed the importance of mobilizing representative networks and existing EU-funded projects, which already engage diverse communities and can serve as bridges to harder-to-reach stakeholders.

The need for repetition of calls to action was noted, as visibility often requires sustained communication efforts. Some also proposed featuring stakeholder stories in newsletters, encouraging those who consider themselves underrepresented to self-identify and engage. Participants suggested that an overarching engagement strategy is essential - one that includes cooperation with national and pan-European professional networks and institutions, and is supported by national campaigns, particularly those led by museum networks with strong local and regional ties.

Finally, several respondents underlined the importance of targeted communication through professional networks and sector-specific channels, recognizing that relevance and resonance increase when outreach is tailored to the language, priorities, and platforms of specific communities.

Together, these insights highlight a shared commitment to inclusivity and provide a roadmap for more effectively identifying and involving less visible but highly relevant stakeholders in future initiatives. To better identify and involve less visible yet relevant stakeholders, participants recommended a multi-layered engagement approach. This includes leveraging larger, high-capacity organizations as umbrella bodies to reach smaller or underrepresented actors within their networks. Direct personal outreach - through emails, social media, and tailored messages - was also emphasized as a vital method for fostering inclusion.

Respondents highlighted the importance of mobilizing representative networks and ongoing EU projects, which already engage with diverse communities across Europe. Consistent and repeated calls to action were seen as essential for building visibility and encouraging participation over time. A strong and inclusive engagement strategy was advised, incorporating national campaigns supported by museum networks, and collaboration with both national and pan-European professional institutions. Utilizing newsletters (including offering pre-written content) and sector-specific communication channels was seen as an efficient way to inform and involve various stakeholder groups. Participants also proposed organizing regular meetings or webinars to maintain engagement and facilitate dialogue. Cross-network collaboration between different EU-funded initiatives and a focus on diversity and representation were underscored as key principles to ensure that all voices - especially those less often heard - are given space in the process.

6.3 Barriers to engagement for smaller institutions and communities

In response to the question: "*Are there specific barriers that may prevent certain target groups — especially smaller institutions or communities — from engaging with the OCC?*", participants identified several key barriers that may hinder smaller institutions or underrepresented communities from engaging effectively with the 3D-4CH Competence Centre. A recurring theme was limited access to resources, particularly technology, funding, and time. These constraints often prevent smaller entities from participating in training or accessing digital platforms.

A lack of awareness - both of the 3D-4CH Competence Centre itself and of available resources - was also frequently cited. This includes not only information gaps but also communication challenges, such as the use of overly technical language or jargon, which can alienate or intimidate less experienced users. Suggestions included simplifying language, providing step-by-step guidance, and offering a multilingual thesaurus to improve accessibility across linguistic groups. Scheduling and time constraints were another major concern. Many smaller institutions, especially those reliant on volunteers, find it difficult to engage during standard working hours. Respondents emphasized the importance of offering activities or touchpoints during afternoon or evening hours to accommodate this reality.

Cultural and psychological factors were also noted. Some participants mentioned that smaller or less formal institutions may perceive themselves as "not professional enough" to participate in what they see as "serious" initiatives, highlighting a need for the 3D-4CH Competence Centre to project openness and inclusivity. Additionally, there was concern about overlapping initiatives and a perceived lack of coherence, which can lead to confusion or disengagement. Participants suggested greater coordination and clarity of purpose, particularly when multiple projects operate in similar domains.

Finally, respondents stressed the need to avoid assuming that all institutions have the same structures or governance capacity as larger organizations. Tailored approaches, sensitive to diverse operational realities, will be essential in lowering these engagement barriers.

7. Reflections and strategic considerations

7.1 Current landscape and interest in 3D for cultural heritage

The results of the survey reflect a cultural heritage sector that is actively engaging with or expressing strong interest in 3D technologies.

A significant proportion of respondents already apply or plan to apply 3D techniques such as data capture, processing, and visualisation, with many recognising their value for preservation, accessibility, research, and public engagement.

Notably, the development of 3D digital twins, integration with GIS, and the production of 3D printable assets are among the most explored or desired applications.

Nevertheless, barriers persist. Funding remains the most pressing challenge for those aiming to embark on 3D projects, followed closely by the need for skilled personnel and technical infrastructure. Awareness-raising within institutions also emerges as a critical factor, particularly in securing managerial support and resources. While some institutions have already embraced comprehensive 3D strategies, others remain at an exploratory stage, hindered by limited resources or competing priorities.

Encouragingly, there is widespread recognition of the potential benefits of 3D, with survey participants assigning high importance to its role in preservation for future generations, enhancing accessibility, and creating immersive educational experiences.

7.2 Training needs, preferences and engagement potential

The demand for training opportunities is clear and consistent across the sector. Most respondents indicate strong interest in both structured, full learning pathways and more targeted training modules focusing on specific skills. These suggestions will be taken into consideration while developing activities in WP2.

The preference for a blended learning approach - combining online self-paced content, interactive components, and in-person workshops - is also evident.

Skill development is the primary motivation for pursuing training, with respondents also citing career advancement, personal interest, and academic support as relevant drivers. Time availability varies, but the majority can dedicate between two to five hours per week to learning, suggesting that flexible, modular content is essential to ensure broad participation. Thus, certification is seen as highly important by most respondents, underlining the need for training programmes that are not only accessible but also formally recognised within the sector.

The importance of intuitive, user-friendly systems to track learning progress, manage certifications, and facilitate engagement is similarly emphasised.

Notably, previous learning experiences have been hindered by factors such as poor content quality, lack of interaction with instructors, technical issues, and content not sufficiently tailored to cultural heritage. These insights underscore the need for high-quality, discipline-relevant training, supported by effective technical and instructional design.

It must be also noted that the insights from the survey perfectly aligned with current WP2 activities where both in-person and self-paced trainings are foreseen and certification are under assessment. Furthermore, the 3D-4CH platform has been designed (see D4.1 - Design of the Online Competence Centre platform) to be user-friendly and offer a comprehensive environment for learners. High-quality content will be also ensured by the overall expertise of the consortium and the advice of a prestigious Advisory Board.

7.3 Strategic recommendations for the 3D Online Competence Centre

The 3D-4CH Competence Centre engages a wide spectrum of target groups, reflecting the multifaceted nature of the cultural heritage ecosystem and its intersections with education, technology, civil society, and governance. These groups are organised into four main categories, each with distinct roles, needs, and contributions.

To effectively serve its diverse ecosystem, the 3D-4CH Competence Centre should adopt a differentiated yet interconnected approach to engaging its key target groups.

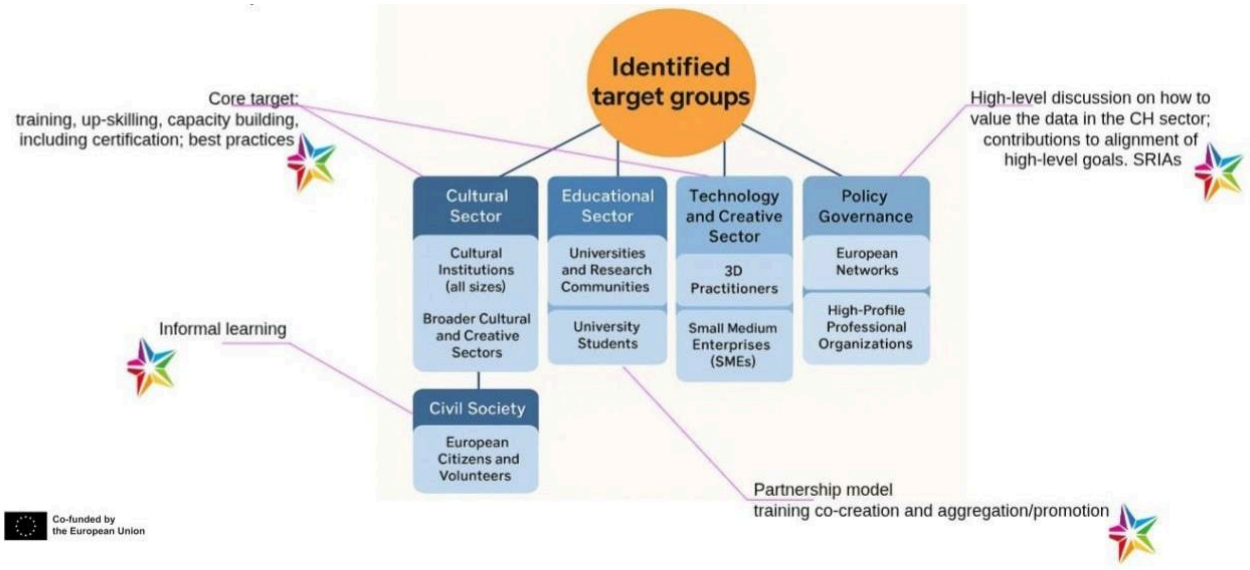

Fig. 37. Identified target groups and their relation with the 3D-4CH Competence Centre

The Cultural Sector and the Technology and Creative Sector are the core audiences, requiring strong support in terms of training, up-skilling, capacity building, and access to certification and best practices. These stakeholders are central to the operational impact of the Centre, and tailored learning pathways should reflect their varied capacities - from large institutions to small and medium enterprises (SMEs) and independent 3D practitioners.

The Educational Sector, including universities, research communities, and students, should be engaged through strategic partnerships that promote co-creation, shared training initiatives, and the aggregation and promotion of educational content. Their involvement will ensure both academic rigor and the long-term sustainability of knowledge within the Centre.

Civil Society, encompassing European citizens and volunteers, represents an important but often less visible group. For them, informal learning pathways and inclusive communication strategies are essential. The Centre should explore innovative outreach formats to foster engagement and digital literacy at the grassroots level.

Lastly, Policy and Governance stakeholders - such as European networks and high-profile professional organisations - should be involved in high-level strategic dialogue. Their role is key in aligning the Centre's activities with broader cultural and digital agendas, including contributions to policy harmonisation and shared research priorities (e.g., Strategic Research and Innovation Agendas, SRIAs).

A balanced and tailored engagement strategy, combining training, dialogue, and co-creation, will ensure the 3D-4CH Competence Centre remains inclusive, relevant, and impactful across the full spectrum of cultural heritage stakeholders.

To succeed, the 3D-4CH Competence Centre must not only offer technical solutions but also foster a sense of community, build trust, and promote inclusivity. It should support institutions of all sizes and levels of maturity, facilitate connections across borders, and advocate for common standards and good practices. By doing so, it can play a pivotal role in bridging gaps, building skills, and accelerating the responsible and sustainable adoption of 3D technologies across the cultural heritage sector.

Thanks to the survey, one thing is abundantly clear: the sector is ready to move forward, but it requires coordinated support, strategic leadership, and accessible, high-quality resources. The 3D-4CH Competence Centre represents an important opportunity to meet these needs — and to do so in a way that amplifies the sector's collective capacity to preserve, share, and celebrate cultural heritage for future generations.

These strategic recommendations directly support the development of the 3D-4CH Competence Centre Platform as described in D4.1, ensuring it serves as a user-friendly digital environment offering accredited training, tools, best practices, reuse scenarios, and collaborative opportunities for professionals across the cultural heritage ecosystem.

8. Annexes

8.1 Survey template

Survey on the target groups of the 3D-4CH Online Competence Centre in 3D

for Cultural Heritage

Introduction

The survey has been created within the 3D-4CH Online Competence Centre in 3D for Cultural Heritage project, co-funded by the European Union. Focusing on the preservation, digitisation and knowledge transfer about cultural heritage in the EU and Ukraine, 3D-4CH primarily aims to advance skills through capacity building and services. This survey is addressed to better understand the target groups that will benefit from the Competence Centres' services and has the goal of identifying what their level of knowledge is with regard to 3D services and the needs of each target group. The results obtained from the analysis of the questionnaires will be collected in a final report, in which the respondents will be kept anonymous.

It takes around 30 minutes to complete the questionnaire. **The survey is open until the 4th July 2025.**

Disclaimer: *Views and opinions expressed are those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.*

Privacy Policy

The 3D-4CH Competence Centre has conformed its Privacy Policy to the General Data Protection Regulation 2016/679. The personal data collected through this survey are used for the aims of this survey and will be treated according to the Regulation.

SECTION 1: ABOUT YOU

Surname and first name

Institution

Country

Town

Education level

- Some high school, no diploma.
- High school graduate
- Trade/technical/vocational training
- Bachelor's degree
- Master's degree
- Professional degree
- Doctorate degree

Profession

- Archaeologist
- Archivist
- Art historian
- Artist
- Creative
- ICT specialist
- Librarian
- Media Manager
- Museum Curator
- Project Manager
- Other (please specify)

Age

- 18-24
- 25-34
- 35-44
- 45-54

- 55-64
- 65+
- Prefer not to say

Gender

- Female
- Male
- Other
- Prefer not to say

Which target group do you belong to? (Select all that apply)

- Cultural Heritage Institutions (museums, archives, libraries, galleries, etc,)
- University and Researchers
- European networks
- Creative sectors
- ICT sector
- Tourism sector
- Schools and education
- University students
- Citizens / Volunteers
- Public administrators
- Policy makers
- 3D practitioners
- Other (please specify below)

Are you a professional working in a conflict region?

- Yes
- No

If yes, which one? (please specify)

Do your activities involve working in areas where heritage is at risk from other human and climate impacts?

- Yes
- No

If yes, could you explain these impacts?

If you belong to the "Cultural Heritage Institutions" target group, could you specify what type of cultural institution? (Select all that apply)

-
- Sponsorship

Other (please, specify)

- I do not belong to the CHIs target group
- Archive
- Library
- Gallery
- Museum
- Archaeological park
- Botanical garden or park
- Other (please specify)

SECTION 2: ABOUT YOUR INSTITUTION (if applicable)

What kind of body is your institution?

- Public
- Private
- Non-profit
- N/A

How is your institution funded? (Select all that apply)

- Public funding
- Private funding
- Membership

How many people work in your institution?

- 1 to 5
- 6 to 10
- 11 to 20
- 21 to 50
- more than 50

What are the typologies of cultural heritage artefacts managed by your institution?

(Select all that apply)

- Archaeological artefacts
- Art artefacts
- Books and manuscripts
- Numismatics artefacts

- Musical instruments
- Archival documents
- Photographs
- Ethnographic artefacts
- Archaeological sites
- Historic buildings
- Landscapes
- Digital assets repositories
- Other (Specify)

Is there an internal department devoted to digitisation?

- Yes
- No

If no, are 3D digitisation services outsourced?

- Yes
- No
- Partially
- I do not know

SECTION 3: 3D SERVICES

Which of these 3D techniques and practices have you heard of?

(Select all that apply)

- **3D Project Planning** (i.e., organisational and resource capacities, business needs, funding opportunities, understanding future impact)
- **3D Data Capture** (e.g., Photogrammetry, Structured Light Scanning, laser scanning, LiDAR, CT scanning, sonar)
- **3D Data Processing stages** (e.g., point clouds, mesh, textures)
- **Metadata and Paradata for 3D** (descriptive structured information about the attributes of the data (metadata), process and methodologies in data creation (paradata))
- **3D Data Management** (Storage and Content Hosting, rights and permissions, FAIR Principles, access and reuse)
- **3D Data Preservation** (archiving and long-term preservation, deposit requirements)
- **3D Viewers** (platforms for 3D viewing and dissemination, web and programmes)
- **3D Repositories and Aggregation** (e.g., Europeana, Thingiverse, Scan the World)
- **3D Digital Twin** (a physical object and its metadata enriched 3D digital counterpart sharing information in real time)
- **Source-Based 3D objects** (digital objects created from indirect data collection, such as drawings, maps, or other sources)
- **Visual Enhancement** (3D animation and motion graphics, annotations, colour and shape augmentation)
- **Game Development for Immersive Experiences** (3D models integrated into game engines, Virtual Reality (VR) and Augmented Reality (AR) interaction, gamification, virtual tours in 360°)
- **GIS Application** (Geographical Information Systems, coupled with 3D models, supports advanced and digital conservation practices)
- **3D to 2D Representations** (e.g., orthophotos, CAD, 2D images/video)
- **3D Printing** (conversion of 3D models to print-ready assets, various material processes, post-printing augmentation)
- **3D Architectural and Product Design Visualisation** (Heritage Building Information Modelling (HBIM), digital assets for conservation and testing function)
- I do not know any of them

Have you applied or are you planning to apply any of these 3D techniques or practices?

(Select all that apply)

- **3D Project planning** (i.e., organisational and resource capacities, business needs, funding opportunities, understanding future impact)
- **3D Data Capture** (e.g., Photogrammetry, Structured Light Scanning, laser scanning, LiDAR, CT scanning, sonar)
- **3D Data Processing stages** (e.g., point clouds, mesh, textures)
- **Metadata and Paradata for 3D** (descriptive structured information about the attributes of the data (metadata), process and methodologies in data creation (paradata))
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- **3D to 2D Representations** (e.g., orthophotos, CAD, 2D images/video)
- **3D Printing** (conversion of 3D models to print-ready assets, various material processes, post-printing augmentation)
- **3D Architectural and Product Design Visualisation** (Heritage Building Information Modelling (HBIM), digital assets for conservation and testing function)
- I have not applied or I'm not planning to apply any of these 3D techniques or practices

If you have used or want to use any 3D techniques or practices, what is the goal for their use? (Select all that apply)

- **State of the art documentation** (preservation record)

- **Management of heritage** (monitoring physical state of heritage, including environmental factors, facilities management, potential restoration)
- **Reverse Engineering** (experimentation for academic research, such as digital restoration, recolouration, animation to demonstrate use)
- **Access and Reach** (repositories, social media, internal website for scientific research, engagement and marketing)
- **Digital exhibitions** (online galleries, virtual tours)
- **Virtual Reality experiences** (Virtual Reality headsets, projections, Augmented Reality with smartphones)
- **3D Printing** (replicas for handling collections, accessibility options, gamification, merchandising)
- **Gaming & Animation** (3D assets placed into virtual reconstructions and environments for historical context)
- **Media production** (for 2D video and photo)
- **Immersive Training & Education** (AR and VR simulations for skills practice)
- **Re-use for Art & Design sectors** (open licenses for derivatives and adaptations)
- **Other,** please specify

If you're planning to use 3D in future, what are the challenges to getting started?

(Select all that apply)

- Finding funding
- Training staff
- Finding/commissioning service providers
- Explaining the benefits and potential impact to the institution's management
- I'm not planning to use 3D in the future
- Other (please, specify)

If you are not planning to use 3D, can you briefly explain which are the main reasons?

[free text]

If you're using 3D, please briefly describe any specific challenges you face

[free text]

From 1 to 5, according to you, which are the main benefits of applying 3D services for the target group you represent? [1 being the lowest score, 5 being the highest]

- Preservation for future generations.
- Helping digital restoration.
- Enhancing accessibility and allowing visitors to explore exhibits without being physically present.
- Offering hands-on experiences while preserving the integrity of the original artworks.
- Providing an immersive, interactive and learning experience more engaging than traditional exhibits.
- Allowing users to "step into" history and experience places that might be physically unreachable or no longer exist.
- Safeguarding fragile materials while improving access for researchers and students.
- Preserving cultural heritage and providing a digital archive of destroyed works.
- Providing a tool for research and education.

SECTION 4: SPECIFIC NEEDS

3D-4CH is developing an online competence centre for 3D in cultural heritage. Do you know it?

- Yes
- I've heard about it, but I do not know much
- No
- Other (please, specify)

From 1 to 5, what would you like to get out of it? [1 being the lowest score, 5 being the highest]

- Improved digital skills among staff (access to training)
- Increased efficiency and quality of digitisation processes (access to knowledge)
- Improved protection of at-risk cultural heritage
- Better public engagement and visitor experience
- Innovation and new ideas
- Enhanced sustainability and reduced costs
- Access to standardised practices and interoperable tools
- Collaboration opportunities

Which of the other following services would you need or use?

(Select all that apply)

- Access to training
- Access to online 3D tools/platforms
- Access to best practice guidelines and standards
- Publishing and archiving services
- Consultancy for digital transformation in cultural heritage
- Support for re-use of 3D content
- Knowledge-sharing
- Connecting with peers
- Mentorship
- Virtual assistant/chatbot
- I do not need any of them

- Other (specify):

Please share any additional insights, specific requirements, or recommendations regarding the proposed 3D services and the Competence Centre:

[free text]

What skills do you aim to acquire?

(Select all that apply)

- 3D Data Capture
- 3D Data Processing
- Publishing and archiving 3D
- Metadata and paradata for 3D
- Copyright and access for 3D
- (Re)use of 3D for specific domains/scenarios
- I do not aim to acquire any skill
- Other: [specify]

Why are you interested in online training?

- Career advancement
- Skill development
- Personal interest
- Academic support
- Certification
- I'm not interested in online training

How soon do you plan to start learning online?

- Immediately
- Within a month
- Within 3 months
- Within the year
- Not sure

Are you more interested in training that covers a complete learning pathway or in targeted training modules addressing specific skills or topics?

(Select all that apply)

- Full learning pathways (comprehensive, structured courses covering end-to-end processes)
- Targeted training modules (shorter, focused courses addressing specific skills or needs)
- Answers to specific questions (how to do specific tasks)
- A combination of all of the above
- I'm not interested in the training

From 1 to 5, what kind of training formats would you prefer?
[1 being the lowest score, 5 being the highest]

- Online self-paced training
- Interactive quizzes
- Reading materials
- Live webinars or online workshops
- In-person workshops and seasonal schools
- Blended learning

- Group discussions
- Projects or assignments

How much time can you dedicate to online learning per week?

- Less than 2 hours
- 2–5 hours
- 5–10 hours
- 10+ hours
- I cannot dedicate any time

Do you currently track your completed and in-progress training and courses, if you are taking any?

- Yes
- No

Which of the following methods do you use to keep an overview of your completed and in-progress training and courses? (Select all that apply)

- Personal spreadsheet/document
- Company HR/LMS system
- Physical notebook/planner
- Certification tracking platform (e.g., LinkedIn Learning, Coursera)
- Informal mental tracking
- None
- Other (please specify):

How important are the following characteristics for a system that tracks your training and courses? (Please rate each on a scale of 1-5, where 1 = Not at all important, 5 = Extremely important)

- Easy to use/intuitive interface

- Ability to upload certificates/documents
- Searchable history of all completed trainings
- Progress tracking for ongoing courses
- Integration with calendars (e.g., Google Calendar, Outlook)
- Reporting or analytics on learning progress
- Option to set learning goals
- Accessible from multiple devices (desktop, mobile)
- Offline access
- Data privacy and security

How important is certification for training?

- Important
- Not important
- Don’t know

What challenges have you faced with learning in the past?

- Lack of motivation
- Poor content quality
- Content not applicable to cultural heritage
- Technical issues
- Time management
- No interaction with instructors
- Other: (please specify)

Conclusions

Thank you for taking part in the Survey. The results will be made available in Summer 2025 by the 3D-4CH Competence Centre.

Do you want to be informed about the results of this survey?

- Yes
- No

Would you be available for a more in-depth interview on some of your answers?

- Yes
- No

If you have answered Yes to one of the last two questions, please provide us with your email:

text

8.2 Detailed data tables

Available at the following link:

https://docs.google.com/spreadsheets/d/1bsfKdjwG0kNRss8BN-Xr5qmXX-qnRrvfMLIgaqL1cBw/edit?usp=sharing

8.3 List of respondents

As we were supposed to keep the respondents anonymised, we are providing here a list with institutions, country and town.

Institution	Country	Town
AIT Angewandte Informationstechnik ForschungsGmbH	Austria	Graz
Ajuntament de Silla	España	Silla
Archaeological Museum of Thessaloniki	Greece	Thessaloniki

Archaeovision LLC	Estonia	Tallinn
Associazione Culturale Verde Binario ETS - MIAI	Italia	Cosenza - Rende (CS)
Athena Research Center	Greece	Xanthi
CNR ISPC	Italy	Rome
CNR ISPC	Italy	Rome
Colegio La Concepción	España	Valencia
Conjunto Arqueológico Madinat al-Zahra	España	Córdoba
CSIC	Spain	Jaén
Directorate for Protection of Cultural Heritage - Skopje	R.N. Macedona	Skopje
Duquesne University	United States of America	Pittsburgh city
EPHORATE OF ANTIQUITIES IN BOEOTIA	GREECE	THIVA
Ephorate of Antiquities of Achaea	Greece	Patras
Ephorate of Antiquities of Arta	Greece	Arta
EPHORATE OF ANTIQUITIES OF DODECANESE	GREECE	RHODES
Ephorate of Antiquities of Thessaloniki City	Greece	Thessaloniki
Gunnar Gunnarsson Institute	Iceland	Egilsstadir

HELLENIC MINISTRY OF CULTURE - EPHORATE OF ANTIQUITIES IN ARGOLIDA	GREECE	NAUPLION
Hellenic Ministry of Culture Directorate of Archaeological Museums, Exhibitions and Educational Programmes	Greece	Athens
Historical and Folklore Museum of Xanthi	Greece	Xanthi
ideas tecnicas y estrategias multimedia SL	spain	Granada
INCIPIT and U.Jaén	Spain	Santiago de Compostela
Institut National de Recherches Archéologiques	Luxembourg	Betrange
Institute of Heritage Science - National Council of Research	Italy	Rome
Instituto Universitario de Investigación en Arqueologia Ibérica	España	Jaén
Instituto Universitario de Investigación en Arqueología Ibérica	España	Jaén
INSTITUTO UNIVERSITARIO DE INVESTIGACION EN ARQUEOLOGIA IBERICA (UJA)	ESPAÑA	JAÉN
KNUCA	Ukraine	Kyiv
MEGALODON IMMERSIVE	Greece	Thessaloniki
Michael Culture	Italy	Bologna
MINISTRY OF CULTURE-Ephorate of Antiquities of West Attica	Greece	Athens
MNAHA	Luxembourg	Luxembourg

MUSARAÑA GESTIÓN INTEGRAL DE MUSEOS S.L.	ESPAÑA	JAÉN
MUSEO ARQUEOLÓGICO DE LA SOLEDAD	CARAVACA DE LA CRUZ	REGIÓN DE MURCIA
Museo Arqueológico de Sagunto	Spain	Sagunto
Museo Arqueológico e histórico castillo de San Antón de A Coruña	España	ACoruña
Museu de l'Empordà	Spain	Figueres
Museu de l'Hospitalet-Ajuntament de l'Hospitalet de Llobregat	Spain	L'Hospitalet de Llobregat
National Archaeological Museum	Greece	Athens
National Archaeological Museum of Reggio Calabria	Italy	Reggio Calabria
National Museum of Natural History, Luxembourg	Luxembourg	Luxembourg
Nikos Kazantzakis Museum	Greece	Myrtia, Heraklion Crete
None	Ireland	Cork
Non-Governmental Organization Volyn Foundation	Ukraine	Lutsk
Pinacoteca di Volterra	Italy	Volterra
Polis University	Albania	Tirana
PROGETTO PELAGO / #TiPortoAlMuseo	Italia	Milano
Programa Giravolt. Agència Catalana del Patrimoni Cultural.	Spain	Barcelona

Restoration & Preservation Department	Malta	Floriana
Restoration and Preservation Department, Ministry for Culture	Malta	Floriana
Sistema Museale Unical	Italia	Cosenza
The Discovery Programme	Ireland	Dublin
The Discovery Programme Centre for Archaeology and Innovation Ireland	Ireland	Dublin
Tourist Info Bocairent	Spain	Bocairent
Transport Infrastructure Ireland	Ireland	Dublin
Transport Infrastructure Ireland	Ireland	Cork
Uja (Instituo de Arqueología Ibérica)	España	Jaén
Unical	Italy	Salerno
Universidad de Jaén	España	Jaén
Universidad de Jaén	España	Jaén
Universidad de Jaén	España	Jaén
Universidad de Las Palmas de Gran Canaria	Spain	Las Palmas de Gran Canaria
Universidad de Salamanca	Spain	Salamanca
Università della Calabria	Italy	Cosenza

Università della Calabria	Italia	Dipignano (CS)
Universitat Alacant	Spain	Alicante
University of Alicante	Spain	Alicante
University of Ferrara	Italy	Ferrara
University of Ferrara, Department of Architecture	Italy	Ferrara
University of Siena	Italy	Siena
Vilnius University	Lithuania	Vilnius

8.4 Communication Kit

The kit is available at the following link:

https://drive.google.com/drive/folders/15mNCfmAF-iF5Sc6YXCKuHm_bXgz8o4tM