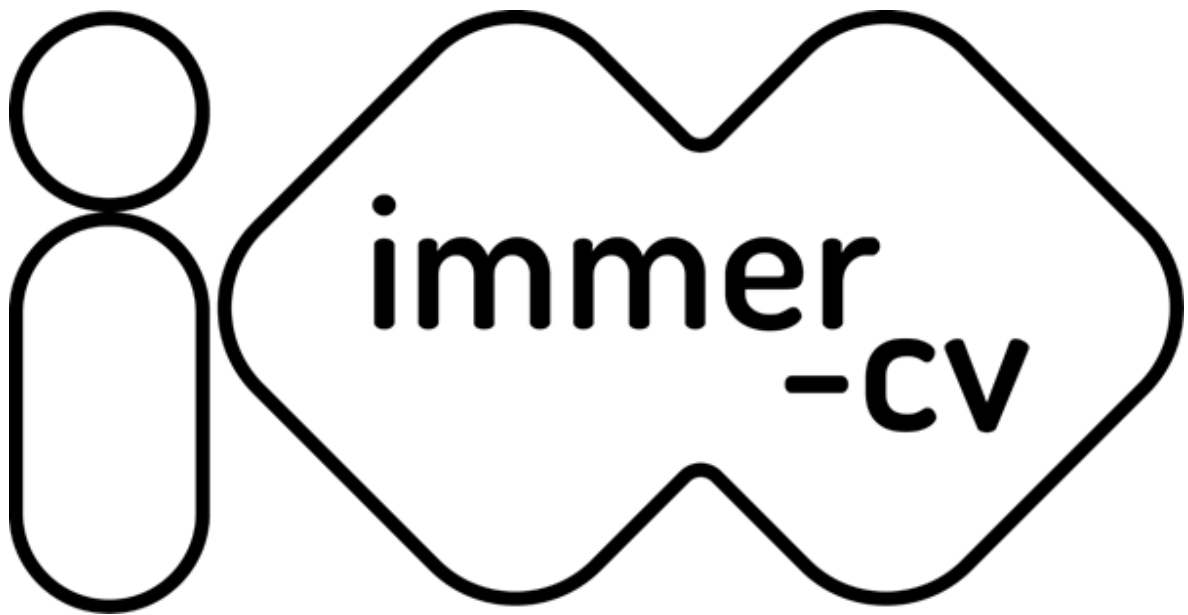




IMMER-CV: Curriculum development for Management of Immersive technologies by Professionals in Cultural and Creative Sectors

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EXECUTIVE SUMMARY

This report presents the outcomes of Activity 3 of the IMMER-CV project, which focused on the participatory validation and co-design of a curriculum for immersive technology management in the Cultural and Creative Sectors (CCS) in Athens. Two co-creation workshops were conducted—in Athens and Valencia—engaging professors, researchers, students, and cultural professionals through a structured, interactive methodology.

Participants collaborated across four exercises to identify current training gaps, prioritise sectoral needs, generate practical solutions, and co-design curriculum modules. The results revealed strong interest in immersive technologies, especially among students, who expressed high motivation, creativity, and a preference for hands-on, challenge-based learning. Professors provided strategic and pedagogical insight, often pointing to structural issues in current educational offerings.

The findings confirmed the relevance of the IMMER-CV curriculum's modular structure and underscored the need for hybrid formats, soft skill development, and institutional support. The workshops successfully shaped the curriculum, ensuring it is grounded in real-world needs and aligned with the evolving demands of the CCS.



1. INTRODUCTION

1.1. Background and goals

Rapid technological progress has been accompanied by a major transformation in many sectors. Among them, their involvement in the creative and cultural industries has transformed the way we see, feel and represent art and culture. However, merging immersive technology with the creative and cultural industries requires intense interdisciplinary collaboration that is not always easy to achieve.

For this reason, the IMMER-CV project aims to develop a curriculum for the management of immersive technologies by professionals in the culture and creative industry. On the one hand, the IMMER-CV project aims to provide cultural managers and technology professionals with the necessary knowledge to effectively use immersive technologies and, on the other hand, to develop comprehensive educational training and workshops adapted to the different learning needs.

The following section presents Activity 3 of the IMMER-CV project, which aims to explore the practical needs of teachers, students and professionals through a participatory co-creation workshop, with the aim of defining learning outcomes and formulating practical strategies.

1.2. Purpose and importance of the co-creation workshop

As mentioned, the co-creation workshop aimed to create solutions together with all the participants, so that everyone involved could work together to identify their needs and jointly develop solutions. Thus, rather than being a mere consultation or collection of opinions, the workshop was set up in such a way that all voices were taken into account, encouraging dialogue and discussion to enrich the decision-making process during the workshop.

Co-creation is a methodology that encourages the participation of all actors involved in the development of a project. In this Workshop, co-creation made it possible to align the objectives, needs, expectations and experiences of those who teach, apply or learn knowledge in their respective areas. In this way, the interaction between the different actors involved allowed the emergence of needs, problems and solutions that would not have been apparent in other more traditional methods. Furthermore, this collaborative approach not only improves the quality of the results but also highlights the importance of shared knowledge and interdisciplinarity as a driver of innovation. In conclusion, the co-creative workshop made it possible to develop more inclusive and effective solutions, built on the listening and participation of all agents.



2. Workshop design and methodology

For the workshop, a dedicated co-creation guide was developed to support both the session held in Valencia and the one in Athens. This guide served as a flexible framework to help orient the facilitation of the workshops, while allowing space for in-situ adaptations based on the specific context and characteristics of each location.

Participants were divided into two groups of similar profile, and the activities were carried out collaboratively in group format. The guide was structured around four main exercises. The purpose of these exercises was to enable participants to identify challenges they had encountered in using immersive technologies within their field, and to define their training needs through open dialogue and collaborative exploration with other participants. The ultimate aim was to generate ideas and outline a training plan that meaningfully connects the technological domain with the artistic and cultural sector.

All activities were conducted using the Miro platform. The full co-creation guide is presented in the following section.

2.1. Co-creation framework design

The co-creation workshop was structured into four sequential exercises, each designed to progressively explore challenges, identify needs, generate ideas, and collaboratively build curriculum components tailored to immersive technologies in the cultural and creative sectors. The total duration of the workshop is estimated to be approximately 1.5 to 2 hours, and the methodology combined group discussion, guided reflection, and hands-on collaborative tools, both physical and digital. Each exercise builds upon the previous one, allowing participants to move from problem identification to practical solution development.

The guide used was as follows:

Target group:

- 5-6 art professionals/art curators/professors/cultural managers/future end users
- 3-4 postgraduate students enrolled in master programs or similar.

Resources required:

- Wide space.
- Paper, pens and/or electronic devices
- Blackboard, screen or projectors.

Agenda: duration between 1,5-2 hours

Table 1 IMMER-CV Co-creation workshop programme

Co-creation workshop programme	Duration
Introduction to the objective of the session and presentation of the participants	10 minutes
A brief overview of the current challenges	20 minutes
Defining sectoral needs	20 minutes
Brainstorming of ideas	25 minutes
Co-creating solutions	30 minutes
Conclusions and Closing session	10 minutes

Introduction to the objective of the workshop and presentation of the participants

The workshop will start with a brief presentation of the IMMER-CV project, the aim of the study (i.e. identify user's needs and develop vocational training solutions to improve their skills in the use of immersive technology in the artistic and cultural field) and the introduction of the participants. Participants will be asked to share personal information i.e. their name, surname, occupation and role in the company, field of expertise, company of employment, and if they have some experience using immersive technology in their field. This process will allow participants and workshop managers to get to know each other better and facilitate the discussion.

Exercise 1: a brief overview of the current challenges - Empathy Map

In the beginning of this session, the workshop managers/facilitators will present successful use-cases of the application of immersive technology in the cultural field (either extended reality or other immersive experiences). Then they will initiate a discussion about problems already identified in other contexts in relation



to training plans in immersive technology applied to the cultural and artistic sector.

Method: Participants will meet in two separate groups initially only with peers (students with students, cultural managers with cultural managers...). During these sub-group discussions, participants are requested to present the problems faced by their sector in the application of immersive technology from their viewpoint in order to discuss with the whole group at a later stage. To guide this step, you can use the questions described below based on an Empathy Map (Fig. 1) adapted to the context of the Workshop.

This step can be done in an introductory way, highlighting some important questions to provide a general overview of the emerging issues and the current state of the CCI environment.

- Guide questions tailored to Art Managers (AM), Students (S) or both (B):
- What do they **think and feel**:
 - B: Do you have the necessary skills to apply immersive technology in your field, in your opinion? Please scale from 1 (Not at all) to 10 (Yes).
 - B: Have you ever received any training on VR, AR or any other immersive technologies? If so,
 - What frustrations have you encountered when you are trying to learn these immersive technologies?
 - Did you identify any gaps/topics missing in your training?
 - B: Do you think that the current educational curriculum available at training schools, universities, institutes, seminars, etc. is satisfactorily adapted to new technologies? And why? Please scale from 1 (Not at all) to 10 (Absolutely)
 - AM: Do you feel that art practitioners are sufficiently qualified to apply immersive technology nowadays? Explain why. Please scale from 1(Not at all) to 10 (Absolutely)
 - S: Do you feel confident that after completing your studies you will have acquired the required knowledge and skills to apply immersive technology? Scale from 1 (Not at all) to 10 (Absolutely).
- What do they **see**:
 - B: Do you know of any practical examples of the use of immersive technology in your field?



- B: Have you participated/attended/watched any immersive technology shows? What were your thoughts about the use in immersive technologies in the art sector?
- B: Have you ever seen any immersive training plans and/or curriculums announced for the cultural and artistic field? Would you be interested in participating? Please scale from 1 (Not at all) to 10 (Absolutely).
- What do they **say and do**:
 - B: During conversations with your colleagues about the use of immersive technology in the CCI sector,
 - have you ever talked about the lack of information as an important problem?
 - what other issues did you discuss, eg. pros and cons, artistic results, etc.?
 - S: Do you think that you and your peers have the necessary resources to be adequately trained in immersive technology?
 - AM: Do you think that students and future art practitioners have access to the necessary resources to be adequately trained in immersive technology?
 - B: Did you take any initiatives to learn/train about immersive technology?
- What do they **hear**:
 - B: Have you received recommendations of courses or training programs in immersive technologies? If yes,
 - Do you think they are suitable for the arts or cultural sector?
 - B: Do you know people from your sector, who have been trained in the use of immersive technologies or people in general, who have participated in similar projects? If so,
 - Do you know what their experience was like?

Miro Board Setup and Interaction: The Miro board for Exercise 1 was structured around an Empathy Map, depicted as a central circular diagram divided into four colored quadrants: Think & Feel, See, Hear, and Say & Do. This visual served as the orientation point for the activity. Two horizontal arrows, labeled Group A (left side) and Group B (right side), indicated the direction in which each group of

participants would work. The board was mirrored, with each group assigned to a symmetrical layout of four large colored boxes corresponding to the empathy areas. Each box included pre-formulated guiding questions and emoji-based response scales (e.g. 1 to 10 or YES/NO), along with space for open-text answers using sticky notes.

Participants were first shown the central circle, and then asked to move to their designated half of the board. Group A responded on the left-hand side, while Group B used the right-hand side. Each participant interacted directly with the board by adding digital sticky notes, icons, or written inputs to the relevant sections. This spatial division allowed for easy comparison between groups and created a clear visual mapping of individual and group perceptions across the four empathy dimensions. The setup also enabled facilitators to synthesize the results and identify common patterns, training gaps, and perceived barriers from the participants' perspective.

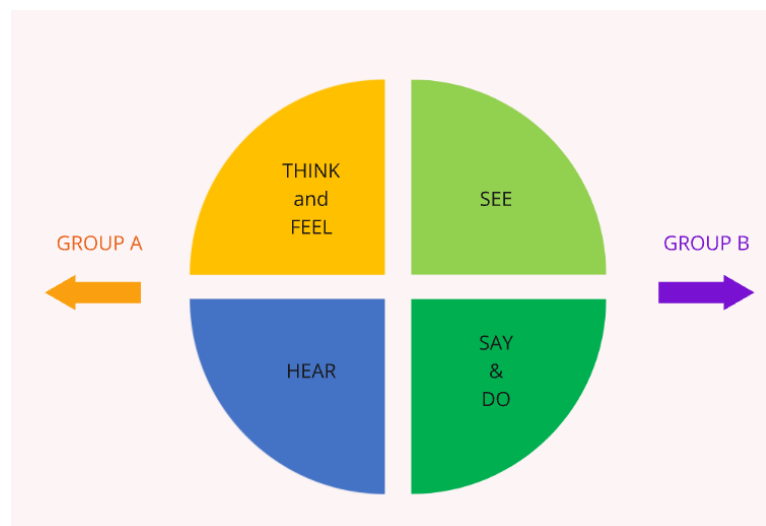


Figure 1 Miro Board Exercise for Empathy Map framework used in Exercise 1, with four core quadrants: Think & Feel, See, Hear, and Say & Do.

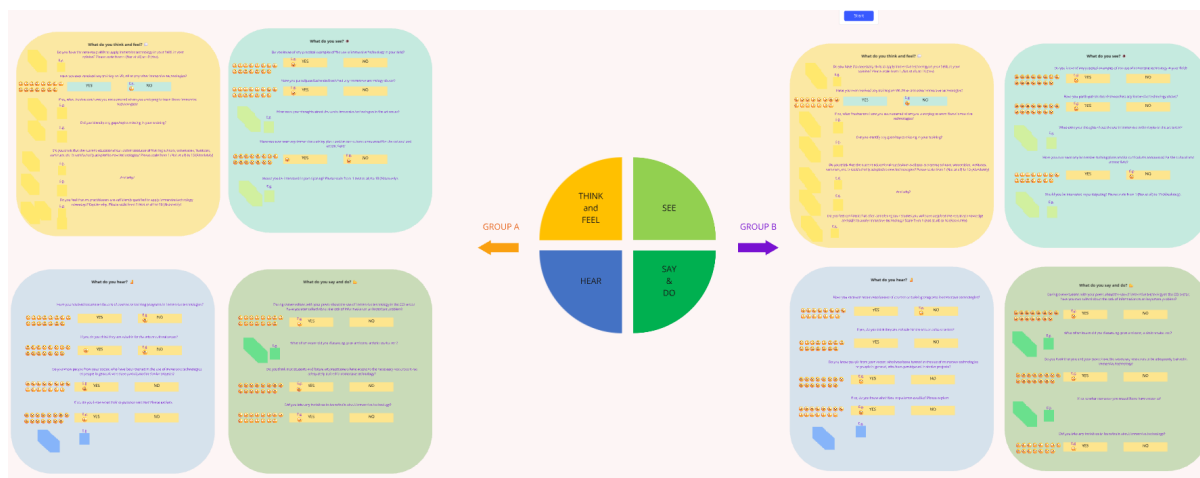


Figure 2 Full Miro board view of Exercise 1, showing Group A and Group B working in parallel across mirrored empathy quadrants

What do you think and feel?

Do you have the necessary skills to apply immersive technology in your field, in your opinion? Please scale from 1 (Not at all) to 10 (Yes).

E.g. 2

Have you ever received any training on VR, AR or any other immersive technologies?

YES NO

E.g.

If so, what frustrations have you encountered when you are trying to learn these immersive technologies?

E.g.

Did you identify any gaps/topics missing in your training?

E.g.

Do you think that the current educational curriculum available at training schools, universities, institutes, seminars, etc. is satisfactorily adapted to new technologies? Please scale from 1 (Not at all) to 10 (Absolutely)

E.g. 2

And why?

E.g.

Do you feel that art practitioners are sufficiently qualified to apply immersive technology nowadays? Explain why. Please scale from 1 (Not at all) to 10 (Absolutely)

E.g. 4

Figure 3 Empathy Map – Think & Feel section

What do you see? 🧐

Do you know of any practical examples of the use of immersive technology in your field?

E.g. YES NO

Have you participated/attended/watched any immersive technology shows?

E.g. YES NO

What were your thoughts about the use in immersive technologies in the art sector?

E.g.

Have you ever seen any immersive training plans and/or curriculums announced for the cultural and artistic field?

YES NO

Would you be interested in participating? Please scale from 1 (Not at all) to 10 (Absolutely).

E.g. 8

Figure 4 Empathy Map – See section

What do you hear? 🗣️

Have you received recommendations of courses or training programs in immersive technologies?



If yes, do you think they are suitable for the arts or cultural sector?



Do you know people from your sector, who have been trained in the use of immersive technologies or people in general, who have participated in similar projects?



If so, do you know what their experience was like? Please explain.





Figure 5 Empathy Map – Hear section

Figure 6 Empathy Map – Say & Do section

Exercise 2: Defining sectoral needs - Map of Needs

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Method: Creation of a Map of Needs to summarize the specific needs of the different stakeholders. This activity can be carried in two separated groups. Each group will discuss what competences or training they need to effectively apply immersive technology. The questions and table below can serve as a guide for the activity:

To facilitate the process, the following questions can be asked:

- B: What kind of training do you think you need to effectively apply immersive technology in your field?
- What kind of training do you think you need to supervise the application of immersive technology in your field?
- B: What resources would help you to improve your competences in the use of immersive technology?
- B: What kind of training do you think would be most useful (specialized courses, further training, practical training, on-line courses, etc.)
- B: What skills do you think that need to be improved to use immersive technology in your field?
- B: What resources do you think you would need to create an adequate training plan applied to your field or work/study?
- B: What kind of institutional support do you think you would need to be able to carry out this training?

For example, you can follow the table below:

Write your current field of expertise....

Write the sector in which the activity is carried out.....

Table 2 Map of Needs

Category	Description	Priority (high, medium, low)
Training needs		
<i>Specialised courses</i>	Training programmes focused on immersive technology applied to art or culture.	
<i>Practical training</i>	Workshops and activities that offer a real experience in the use of immersive technology	

<i>General training</i>	General (Theoretical) knowledge of the available tools and the use of immersive technology.	
Resources needs		
<i>Spaces for experimentation</i>	Spaces where technology can be experimented with	
<i>Technical support</i>	Technical assistance in the training process	
<i>Up-to-date technology</i>	Have the latest technology available	
<i>Online tutorials</i>	Available on-line tutorials on how to use immersive technology	
Competence requirements		
<i>Technical skills</i>	Technical skills for using immersive technology	
<i>Management skills</i>	Training in the planning and executing projects integrating immersive technology	
<i>Creative skills</i>	Training in the creation of cultural/artistic content integrating immersive technology	
Support and collaboration needs		
<i>Education funding</i>	Scholarships/Opportunities to financially support training	
<i>Institutional partnerships</i>	Communication between educational, cultural and technological institutions.	
Need for information		
Information about new technologies	Access to information on emerging technologies and their application	
Information spaces	Informative spaces on new cases, application of immersive technology in art or culture.	
<i>(Please indicate any others that you think are important)</i>		

Each group will rate each priority accordingly. Once they have finished, the groups will share those needs they have identified as high priority, and a list will be compiled. This will provide an overview of the main needs of the participants in immersive training and capacity building.



Miro Board: The Miro board for Exercise 2 was designed to visually capture the training and resource needs of participants through a structured prioritization exercise. The board mirrored the layout of Table 2 mentioned above, with columns organized by category: Training Needs, Resources Needs, Competence Requirements, Support and Collaboration Needs, and Need for Information. Each row included a short description of a specific need. Participants were divided into two groups: Group A and Group B. Each group was given a set of colored dots to indicate their evaluation of each need's importance:

- Group A used yellow-toned dots:
 - Light Yellow = Low priority
 - Yellow = Medium priority
 - Orange = High priority
- Group B used purple-toned dots:
 - Light Purple = Low priority
 - Purple = Medium priority
 - Dark Purple = High priority

By placing their respective dots next to each item, participants indicated how critical they considered each need. The color-coded input allowed for quick visual comparison between the two groups, highlighting both differences and consensus areas. The result was a clear, side-by-side mapping of sectoral priorities from both student and professional perspectives.

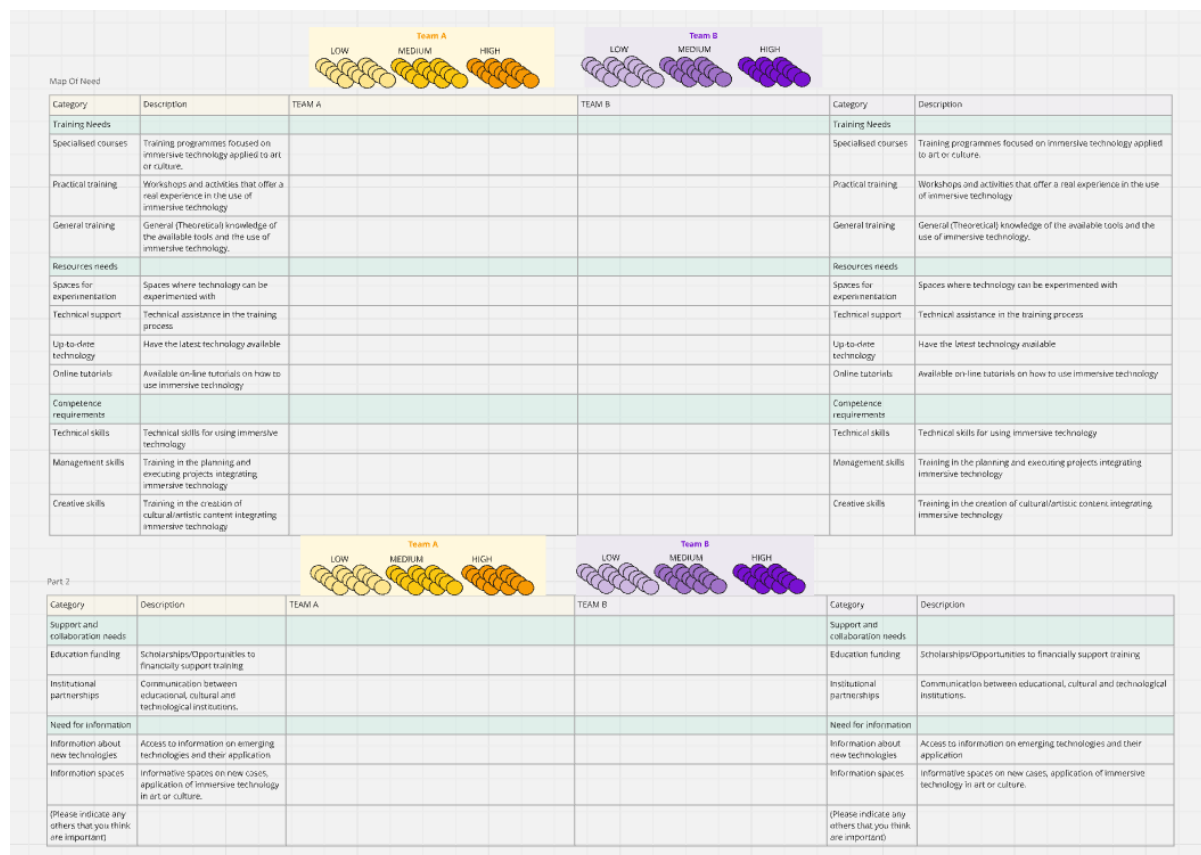


Figure 7 Miro Board Exercise for Map of Needs

Outcome: To have a visual map that can serve as a guide for finding solutions.

Exercise 3: Brainstorming of ideas - Brainwriting Technique

Based on the Map of Needs and the identification of problems, ideas will be provided with the aim to design training plans that meet the needs outlined above.

Methodology:

Brainwriting technique: each participant (or group) starts by writing 3 ideas (based on the needs outlined above) on a piece of paper in 5 minutes. Then, they pass it to the partner (or group) on the left, who must write 3 more ideas based on the ones they have just received. Several rounds take place and once finished, each participant (or group) must read out the ideas on their card to select the best ideas and, by voting, the participants choose which ones the organization should work on.

For example, you can follow the questions below to guide the process based on the “How might we” technique:

- How might we manage collaboration between artists, cultural managers and technical staff to improve training?
- How might we make a training plan flexible enough to meet the needs of each artistic-cultural sector?
- How might we ensure that the training programme addresses both technical and creative aspects?
- How might we create experimental spaces for immersive technology?
- How might we ensure that stakeholders are properly informed about the training modules?
- How might we ensure that the immersive training plan is adapted to the (artistic-cultural) knowledge of the participants?
- How might we develop an immersive training plan that enhances the previous skills of the participants?
- How might we ensure information on new application cases of immersive technology?

Table 3 Brainwriting Table

Category	“How might we”	Ideas
Training needs	Ex: how might we make a training plan flexible enough to meet the needs of each artistic-cultural sector?	
Resource needs	Ex: how might we create experimental spaces for immersive technology?	
Competence requirements	Ex: how might we ensure that the training programme addresses both technical and creative aspects?	
Support and collaboration needs	Ex: how might we collaborate between artists, cultural managers and technical staff to improve training?	
Need for information	Ex: how might we ensure information on new application cases of immersive technology?	

Miro Board: The Miro board for Exercise 3 was structured to support a two-part brainwriting activity focused on generating practical solutions to previously identified training and resource needs. Each column represented one of the five core categories: Training Needs, Resource Needs, Competence Requirements, Support and Collaboration Needs, and Need for Information. Each block contained a guiding “How might we...” question to spark idea generation.

In Part A, participants were split into Group A and Group B, each assigned to a specific row of blocks:

- Group A worked left to right on the top row.
- Group B worked right to left on the bottom row.

In each block, team members collaborated to write three initial ideas. Once completed, the groups rotated across the board until they encountered the other group's responses. They then added three new ideas—ensuring these were distinct from the previous ones—resulting in a total of six ideas per category. This design encouraged both original input and iterative thinking.

In Part B, participants selected the most promising solution in each block using color-coded dot voting:

- Group A used blue, green, and yellow dots.
- Group B used red, pink, and purple dots.

This allowed for transparent selection of top ideas while making group preferences and consensus immediately visible. The exercise concluded with one “winning” idea per category block, forming a participant-generated shortlist of actionable solutions for curriculum development.

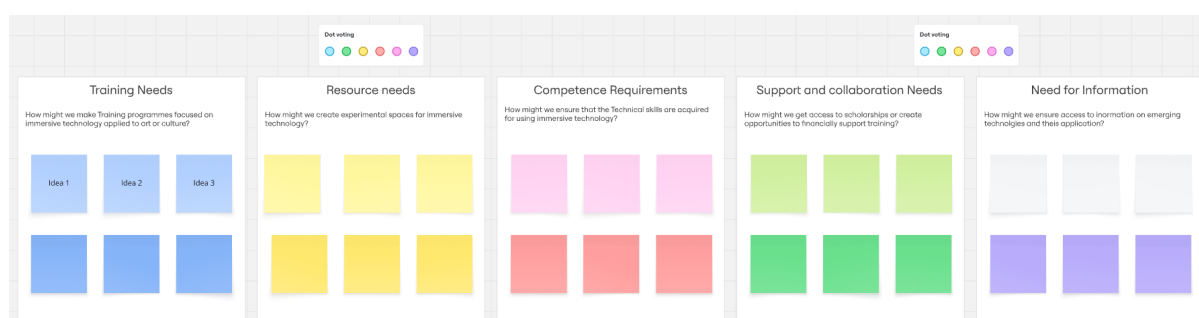


Figure 8 Miro Board exercise for Brainstorming of Ideas

Outcome: Come up with clear ideas that respond to the needs of the sector to continue to provide workable solutions.

Exercise 4: Co-creation solutions - Building a suitable curriculum per module

The workshop will end with the design of a training plan according to what has been discussed above (problems and needs). This activity can be carried out in mixed groups. The activity can be carried out using digital platforms (e.g. PowerPoint, Miro-Board) or on paper.

- **First step:** participants will be divided into mixed groups and will have to design a module or training plan according to the competence or training they have identified as missing in the previous sessions. The idea should

include name of the module, objective, importance, type of training, duration, competence to be developed and format.

- You can use these questions to guide the process:
 - Should we learn how to use immersive technology technically or is it more important to know how to integrate the technology into a creative process?
 - Should it focus more on general training, or on specialized courses?
 - Should it be more theoretical or practical, or both?
 - Should it focus on a specific sector, or can it apply to all those related to culture/art?
 - Should other types of competences, such as the “soft skills”, be incorporated?
 - Should it be delivered online, face-to-face or blended?
- You can use the following table:

Table 4 Curriculum Development per Module

Module	Module development
Name of the module	
Aim of the module	
Relevance of the module	
Training type	
Competence developed	
Duration	
Format	

- **Second step:** Feedback in real time. Each group presents its module or training plan to the other participants. After the presentation, a short questions-and-answers session is opened with an emphasis on the feasibility of the proposal in a real context and how it could be applied in practice.
- **Last step:** Final discussion. After the presentations, the groups will be able to adjust their prototypes, based on the recommendations they have received.

Miro Board: The Miro board for Exercise 4 was designed to facilitate collaborative curriculum design through a structured, side-by-side format. Participants were



divided into two groups: Group A and Group B. Each group was assigned a blank module template—Group A worked on Module 1, and Group B on Module 2.

Above the module tables, a set of guiding questions was presented to help structure the group's thinking. These prompts addressed key curriculum design aspects, including whether training should be technical, creative, or integrative, the target audience and sectoral relevance, the theoretical vs. practical balance, and others. Each group collaboratively completed their assigned template, filling in fields such as Module Name, Aim, Relevance, Training Type, Competence Development, Duration, and Format. At the end of the session, each group presented their proposed module to the other, opening the floor for a short exchange of feedback, clarifications, and suggestions. This peer-review component helped refine the proposals and encouraged participants to reflect on the feasibility and relevance of each curriculum element.

Image 1 Miro Board exercise for Building a suitable curriculum per module

Closing session

Final questions:



- What did you learn in the workshop?
- What is the most important thing that you took away from this experience?

2.2.Methodology

As already described in the guide, the participants were divided into two groups: for Valencia Group A was for workers and Group B for students, while for Athens Group A was for professors and Group B for students. The exercises were continuous with each other, where they started by defining the problems that each group had identified in their field and ended up developing a training module based on all the identified inputs. Thus, in the first exercise, each group had to develop an empathy map to identify the problems they have encountered in relation to the adaptation of immersive technology in the field of culture and art. Then, with the problems identified, needs were identified through a Needs Map that was divided into 5 key categories for the correct integration of technology with the artistic-cultural sector: training, resources, skills, collaboration and support from other institutions, and information. Exercise 3 was prepared for the groups to start thinking about solutions to the problems and needs identified in the previous exercises, and Exercise 4 consisted of the final objective of the workshop: to develop a curriculum or training plan that would adapt technology with the cultural and creative industries.

The Miro platform was used to carry out the activities. Miro is an online workspace that allows you to develop team workflows remotely through an infinite virtual whiteboard. In fact, its constructed templates cover the following areas of action: brainstorming and ideation processes, methodologies and workflows in agile environments, mapping, diagrams and schemes, research and design thinking, strategy and planning, and practical meetings or workshops. In addition, it has a simple voting system or a timer with a countdown. Therefore, Miro was an ideal platform for the Workshop and allowed the different activities to be carried out in a more dynamic and agile way.

3. Workshop execution in Athens

3.1. Co creation workshop in Athens

The co-creation workshop in Athens took place on Wednesday, December 18, 2024, from 11:00 to 13:00 at the Department of Informatics and Computer Engineering of the University of West Attica. The session was organized with the kind collaboration of Dr. Christos Troussas, Assistant Professor, and Dr. Foivos Mylonas, Associate Professor, and was held in the presence of Dr. Ioannis

Vogiatsis, Deputy Head of the Department. The selected venue was a computer lab, providing participants with fully equipped workstations and seamless access to the Miro platform, which was used throughout the session for collaborative exercises. Before the start of the activities, participants were welcomed with a brief presentation of the IMMER-CV project, its objectives, and the purpose of the workshop. This was followed by an explanation of the methodology and structure of the four exercises. Participants were then divided into working groups, and all exercises were carried out in parallel within the scheduled timeframe.



Image 2 Co-creation Workshop, Athens



Image 3 Co-creation Workshop, Athens



Image 4 Co-creation Workshop, Athens



Image 5 Co-creation Workshop, Athens

3.2.Key stakeholders involved

The Athens workshop gathered a group of professors, academic researchers, MSc students, and PhD candidates from the fields of informatics, computer engineering, and digital media. All participants had either prior experience with immersive technologies or active research engagement in the field. They shared a strong interest in the application of these technologies within the cultural, creative, and educational sectors, contributing valuable academic and practical perspectives to the workshop discussions.

3.3.Exercise 1 – Overview of current challenges

The first exercise aimed to capture participants' personal and professional perceptions regarding immersive technology in the Cultural and Creative Sectors. Using an empathy map structure, participants reflected on four areas: Think & Feel, See, Hear, and Say & Do. For all exercises, the responses of Group A were from professors and researchers, while for Group b were from MSc students and PhD candidates. So starting from the results of the "Think & Feel" quadrant, the participants were asked to answer questions about their skill levels, training experiences, frustrations, and opinions on current educational offerings.



The responses from Group A (professors) and Group B (students) revealed both shared concerns and distinct perspectives regarding immersive technologies in education. Students reported higher overall confidence in their ability to apply immersive technologies, with self-assessment scores ranging from 4 to 11. Professors also expressed confidence but with more variation and lower averages. Both groups indicated they had some form of prior training, though students noted slightly more lack of exposure. Concerning the frustrations and gaps, while professors generally reported few frustrations, students cited multiple barriers, including difficulties adapting to new hardware/software, the complexity of realistic environments, and physics in development. Similarly, students identified more training gaps—particularly in keeping pace with emerging tools and the lack of clear guidance—while professors mentioned only minor gaps, such as the lack of personalization. Furthermore, both groups agreed that current educational offerings are not sufficiently aligned with technological advancements. Students gave overall lower satisfaction scores and pointed to structural issues such as budget constraints, lack of infrastructure, and insufficient teacher training. Professors also shared a skeptical view but framed their critique around curricula fragmentation and limited topic coverage (e.g. HCI, programming). Professors also expressed concerns about the readiness of art practitioners, citing practical skill deficits. In contrast, students showed moderate to high confidence in their future readiness, despite acknowledging the gaps in current training.

The second quadrant of the empathy mapping exercise invited participants to reflect on their exposure to immersive technologies in real-world contexts. Participants were asked whether they had seen practical examples in their field, attended immersive shows, observed training opportunities, and how they perceived the value and accessibility of immersive tools in the arts and culture sector. So, overall exposure and perceptions were high across both groups, though students reported more varied opinions about the availability of training options. Professors (Group A) overwhelmingly responded "Yes" to questions about having seen practical examples and attended immersive experiences, with only minor opposition. They viewed immersive technologies as "extremely fertile ground" and "very useful" for the arts sector. However, most had not seen formal training curricula in their domain. Their interest in participating in such programmes was high, with reported scores ranging from 7 to 10. On the other hand, students (Group B) expressed even stronger positivity. All but one had seen practical applications or attended immersive experiences. Their descriptions included "positive," "moderately optimistic," and "love it," though one participant noted it may "not be for everyone." In terms of curriculum awareness, most had not seen relevant training offers. Still, their willingness to engage was very strong, with interest scores between 7 and 10. Despite high enthusiasm in both groups, the results highlight a shared lack of visibility of structured training in immersive technologies—further validating the purpose of the IMMER-CV curriculum.



The “Hear” quadrant explored participants’ indirect exposure to immersive technology through recommendations, peer experience, and sectoral awareness. While Group A (professors) gave a mixed response to whether they had received course or training recommendations—with two voting “No” and one “Yes”—Group B (students) leaned slightly towards “No”, with three voting negatively and two responding positively. When asked if the recommended courses were suitable for the arts or cultural sector, only one professor confirmed, while students showed a slightly more reluctant attitude, with one affirming, and one remaining neutral. Both groups were familiar with individuals in their field who had engaged in immersive technology training or related projects. Students showed a stronger awareness here, with three confirming and only two indicating otherwise. Professors were also mostly affirmative. Regarding the impressions of others’ training experiences, professors offered limited but generally positive insights, describing them as “interesting”. In contrast, students described the experiences of their peers in more expressive terms like “very good,” “cool,” and “so and so,” indicating a broader exposure to and curiosity about peer experiences in immersive training. These results suggest that while both groups have a general awareness of immersive technology training in their networks, students appear to be slightly more engaged in peer-driven information exchange and more positive about perceived training outcomes. Professors showed more caution, with some uncertainty about the suitability or value of existing training opportunities.

Based on the “Say and Do” quadrant, this section reveals how participants engage with immersive technologies in their peer discussions and personal initiatives. Both groups—professors (Group A) and students (Group B)—almost unanimously acknowledged the lack of information as a key concern and topic for discussion. When discussing immersive technologies with colleagues, professors primarily focused on the absence of adequate technical infrastructure while, students raised a broader set of concerns, including missing content, loss of creative jobs, and insufficient realism in outputs—suggesting a more experience-based critique. Regarding access to necessary resources, all professors agreed that current provisions were sufficient, while on the contrary students strongly disagreed. Among the students who felt under-resourced, the most frequently cited needs included affordable hardware, training equipment, and better access to tools such as Apple Vision Pro. Lastly, both groups reported having taken personal initiatives to train or learn about immersive technologies, reinforcing their proactive attitude and motivation despite existing limitations. The findings confirm that while both user groups are motivated, students face more practical barriers that should be addressed through targeted curriculum support and resource provision.

3.4. Exercise 2 – Map of Needs

In Exercise 2, participants were asked to evaluate and prioritize specific categories of needs for immersive technology training, using a dot-voting method to assign



levels of importance: low, medium, or high. Group A (comprising professors and researchers) used yellow-orange tones to register their votes, while Group B (MSc and PhD students) used shades of purple. The resulting data provides a comparative overview of how each group perceives training, resource, competence, and support needs within the Cultural and Creative Sectors (CCS). So, across the training needs category, both groups acknowledged the importance of specialized and practical training. Students showed unanimous agreement that both are of high priority, whereas professors presented a more subtle view, with ratings spread across high, medium, and low. General training was perceived as less critical by both groups, though students still assigned medium-to-high importance. In the resources needs category, students prioritized the four sub-categories as high (unanimous voting) for spaces for experimentation, as medium to high for technical support, as medium mostly for up-to-date technology, and medium to low for online tutorials. Professors, on the other hand, showed moderate concern, with half identifying all categories as high priority and the other half as low for spaces for experimentation and technical support, and as medium for up-to-date technology and online tutorials. This reveals a strong discrepancy between the opinions of the 2 groups with students prioritizing spaces for experimentation and technical support, whereas some professors consider it as low priority. When it comes to competence requirements, technical skills were seen as a central need by both groups. Students showed slightly stronger agreement, with four high-priority votes compared to professors' split between medium and high. Management and creative skills were also rated highly by students, indicating a desire for a well-rounded skillset that combines leadership with artistic innovation, while professors gave these skills medium to high priority but were less uniform in their evaluations. Regarding support and collaboration, students strongly highlighted the need for education funding and institutional partnerships, which they deemed vital to enabling access and implementation. Professors acknowledged these needs too, though they ranked them lower—perhaps reflecting their greater access to institutional infrastructure or a more systemic viewpoint. In the final category—need for information—students once more demonstrated a greater sense of urgency. They considered access to up-to-date knowledge to be high priority whereas informative spaces to be mostly medium priority. On the same topic, professors gave these needs a more measured medium-to-high rating. Overall, the results indicate that while both groups broadly agree on the relevance of each category, students consistently perceive them as more urgent and require greater institutional, pedagogical, and technical support. Professors confirmed the same needs, but with a more cautious or segmented prioritization. This divergence reflects students' limited access and higher dependency on formal structures, while professors may already be partially equipped or view these needs in a longer-term, strategic context.



3.5.Exercise 3 – Brainstorming of Ideas

Based on the results of Exercise 3, participants proposed and prioritized concrete solutions to key training challenges in immersive technologies. Each group contributed ideas across five thematic areas and used dot voting to identify the most promising interventions.

The highest-rated solutions reflected a strong preference for experiential and practice-based methods. In the category of Training Needs, “Through MSc programs” received 3 votes, while “Courses in art schools” and “Adding technologies to formal curriculums” both gathered 2 votes, indicating interest in integrating immersive technologies into existing formal education structures. “Through Immersive Rooms” received 1 vote, highlighting a lower interest in context-specific training spaces. Under Resource Needs, the standout solution was “Competitions / Hackathons / Ideathons,” which received 5 votes, showing enthusiasm for dynamic, collaborative, and problem-solving-based training formats. “Through experimental rooms” followed with 2 votes, indicating also support for hands-on environments. In Competence Requirements, “Gamification of standard procedures” attracted 4 votes, suggesting strong support for innovative, engaging instructional strategies. “Through evaluation” and “Use of frameworks like DigComp” also received modest support with 2 and 1 votes respectively. For Support and Collaboration, the most highly rated solution (5 votes) was “Internship/Residency in related institutions,” highlighting the importance of real-world application and professional immersion. Other ideas, such as “Research Programs” and “R&D projects through universities,” received 1 vote each, indicating some support for formal institutional engagement. In the final area, Need for Information, the top solution was “Using Open-Source Data” with 6 votes—demonstrating a clear call for accessible, democratized, decentralized learning and development tools. Other proposed ideas received limited or no support.

Interestingly, all voted solutions in Exercise 3 were put forward by students and endorsed by both professors’ and students’ group (Group B), revealing not only their active engagement but also their clear vision for what effective immersive technology training should look like. This strong student-driven input highlights a generational shift toward more dynamic, collaborative, and experiential learning environments. Their preference for solutions such as hackathons, exchange programs, and open-source data access underscores a desire for real-world engagement and peer-driven experimentation rather than traditional classroom instruction. The high ranking of gamification and integration into MSc programmes further reflects their motivation for innovative pedagogies that blend formal education with interactive and applied formats.

This trend suggests that future immersive curricula must be responsive to learners’ expectations—not only in terms of content but also in delivery methods. Their proposals align closely with the principles of the IMMER-CV curriculum,



which seeks to embed immersive technologies within practical, interdisciplinary, and learner-centered frameworks. So, overall, the results show a preference for participatory, applied, and accessible training approaches. The participants valued hands-on experiences, real-world exposure, gamified learning, and collaborative innovation formats—strongly aligning with the experiential learning goals of the IMMER-CV curriculum.

3.6.Exercise 4 - Building a suitable curriculum per module

Based on the final output of Exercise 4, participants proposed two training modules that reflect their perceptions of current gaps and priorities in immersive technology education for the Cultural and Creative Sectors (CCS). Each group was tasked with developing a module by collaboratively defining its aim, format, type of training, competencies addressed, and relevance.

Group A designed a module titled "XR in Virtual Museums". This module aims to familiarise learners with both the technical and theoretical aspects of immersive technology, with a particular focus on its applications in museum environments. The training is intended to be balanced between theoretical and practical components and includes soft skills development. The proposed format is blended learning, and the estimated duration is 13 weeks. The module is described as widely applicable, covering general concepts that can benefit learners across different domains of the CCS.

Group B proposed a module titled "Immersive Technologies in Culture", with a focus on understanding and critically applying immersive tools in contemporary art. It emphasizes hands-on experience, exploring how technologies reshape the viewer's relationship with art. This module also introduces the concept of "virtual art galleries" and digitisation of artworks. The training is described as more practical in nature, with a hybrid learning format and a three-month duration. The target audience includes institutions of art and culture, and the module explicitly calls for the development of soft skills alongside technical knowledge.

Overall, the proposed modules reflect a strong orientation toward applied, experiential learning with complementary emphasis on conceptual understanding and sector-specific relevance. Participants demonstrated an awareness of the interdisciplinary needs of the sector, proposing formats that support flexibility and deeper engagement with immersive technologies.

3.7.Overall Outcomes – Input to IMMER-CV Curriculum

The results of the four workshop exercises offered valuable input for shaping the IMMER-CV curriculum. By engaging both students and professors, the workshop highlighted shared priorities, differing expectations, and practical needs for training in immersive technologies. The conclusions below summarise how each



exercise informed the structure, content, and delivery approach of the IMMER-CV training programme.

Based on the detailed analysis of Exercise 1, the following key conclusions can be drawn:

- **Confidence and Motivation:** Both professors and students demonstrated motivation and interest in immersive technologies, with students expressing higher confidence and stronger willingness to participate in training.
- **Exposure and Experience:** Participants from both groups had prior exposure to immersive experiences, but students reported broader awareness and more positive peer feedback regarding training programmes.
- **Training Gaps and Barriers:** Students highlighted more frequent frustrations and skill gaps, particularly in staying up to date with tools and accessing resources. Professors reported fewer barriers but recognised fragmentation in curricula and a lack of hands-on training.
- **Curriculum and Infrastructure Deficits:** Both groups agreed that current educational offerings are insufficient. Students focused on lack of funding, infrastructure, and teacher training, while professors pointed to limited topic coverage and insufficient practical components.
- **Call for Action:** The findings underline the need for a well-structured, modular, and practical training programme such as IMMER-CV—one that addresses resource gaps, supports interdisciplinary collaboration, and adapts to diverse user needs across the Cultural and Creative Sectors.

Based on the detailed analysis of Exercise 2, the following key conclusions can be drawn:

- **Shared Priorities, Different Emphasis:** Both students and professors identified specialised training, technical skills, and creative competences as important. However, students consistently prioritised them as high importance, while professors expressed more cautious or segmented prioritisation across low to high.
- **Resource and Support Discrepancies:** Students considered access to resources—such as spaces for experimentation, technical support, and updated equipment—as critical, highlighting infrastructure gaps. Professors were less uniform, with some ranking these needs as low, possibly reflecting better access or differing perspectives.
- **Demand for Institutional Support:** Students strongly highlighted the need for education funding and collaboration between academic and cultural institutions. Professors also acknowledged these needs, but



assigned them medium priority, likely due to their institutional roles and systemic familiarity.

- **Information and Technological Awareness:** Both groups recognised the importance of staying informed about new technologies. Students again showed higher urgency, with emphasis on access to informative spaces and updated knowledge, while professors remained more moderate in their evaluation.
- **Student Enthusiasm vs. Faculty Caution:** Students' consistently high prioritisation may be linked to their younger age, limited infrastructure access, and stronger desire for skill-building opportunities. Professors showed more nuanced responses, possibly reflecting a strategic outlook or contentment with current resources.
- **Preference for Practice-Based Learning:** Students demonstrated a clear preference for hands-on, experiential training. Professors, while not dismissive, seemed more open to theoretical or blended approaches, indicating a difference in pedagogical expectations.
- **Implications for IMMER-CV:** These results reinforce the importance of designing a modular, adaptable curriculum that provides both theoretical grounding and strong practical engagement—responding to students' urgency and professors' strategic vision within the Cultural and Creative Sectors.

Based on the results of Exercise 3, the following conclusions can be drawn:

- **Student-driven solutions dominated:** All of the proposals that received votes were contributed by students (Group B), indicating a strong engagement with the brainstorming activity and a high level of creativity and problem-awareness among this group.
- **Hands-on and collaborative learning preferred:** Solutions like “Competitions / Hackathons / Ideathons” and “Gamification of standard procedures” received the most support, highlighting a clear preference for interactive, challenge-based learning formats that promote collaboration and experiential learning.
- **Practical infrastructure and access are priorities:** Proposals such as “Through experimental rooms,” “Internships/Residencies,” and “Affordable hardware” demonstrate the importance students place on having access to real-world environments and up-to-date equipment as part of their training.
- **Digital openness and innovation valued:** The highly voted suggestion “Using Open-Source Data” reflects student interest in open and accessible digital tools that foster experimentation and self-guided learning.



- **Limited input from professors:** Notably, none of the ideas proposed by professors received votes. This may reflect either a more traditional view on training methods or a preference for top-down instructional formats, in contrast with students' focus on flexible and participatory learning.

Based on the comparison of the two co-designed modules in Exercise 4, the following conclusions can be drawn:

- **Shared foundations with different emphases:** Both modules target similar audiences and support hybrid learning formats, but Module 1 leans more toward technical and theoretical understanding, while Module 2 prioritises critical and creative engagement with immersive tools.
- **Soft skills consistently recognised:** Both groups included the development of soft skills—such as collaboration, communication, and adaptability—alongside technical or creative competencies, underscoring the transversal nature of immersive project work in the CCS.
- **Preference for hybrid format and short-duration courses:** Both modules propose a hybrid learning approach, combining online and onsite elements. Despite being developed independently, both groups converged on a similar duration—13 weeks and 3 months respectively—suggesting a shared preference for short, intensive training formats rather than long-term academic programmes.
- **Cultural vs. broader institutional orientation:** Module 2 references specific concepts like “virtual art galleries” and cultural digitisation, suggesting a more arts-centred framing, whereas Module 1 is positioned more broadly for general technological fluency.

These variations reflect the similarities and diversities of perspectives brought by the two groups and reinforce the need for flexible modular training pathways within the IMMER-CV curriculum.

4. Workshop evaluation

Based on the feedback collected through the post-workshop evaluation form, the overall reception of the IMMER-CV co-creation workshops was overwhelmingly positive across all assessed areas. Participants—ranging from students and self-employed professionals to employees in the cultural and creative sectors—rated the organisation, quality, usefulness, and relevance of the workshop consistently high, with most scoring 4 or 5 out of 5 in all categories. Participants described their experience using terms such as innovative, enriching, collaborative, and motivating, reflecting the effectiveness of the participatory format and the quality of engagement. All respondents reported feeling “very comfortable” sharing their ideas and experiences, confirming that the workshop fostered a safe and open environment for dialogue and co-creation.

Please, rate on a scale of 1 to 5, where 1=very dissatisfied; 2=dissatisfied; 3=neutral; 4=satisfied; 5=very satisfied, the following aspects of the workshop:

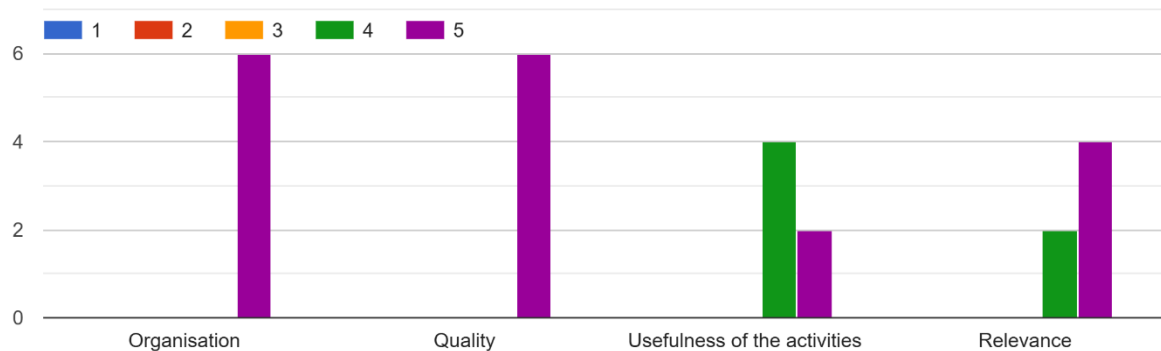


Image 6 Participants' satisfaction ratings across key dimensions of the workshop (Organisation, Quality, Usefulness, and Relevance).

How would you describe your experience at the workshop (you can select more than one option)?

6 απαντήσεις

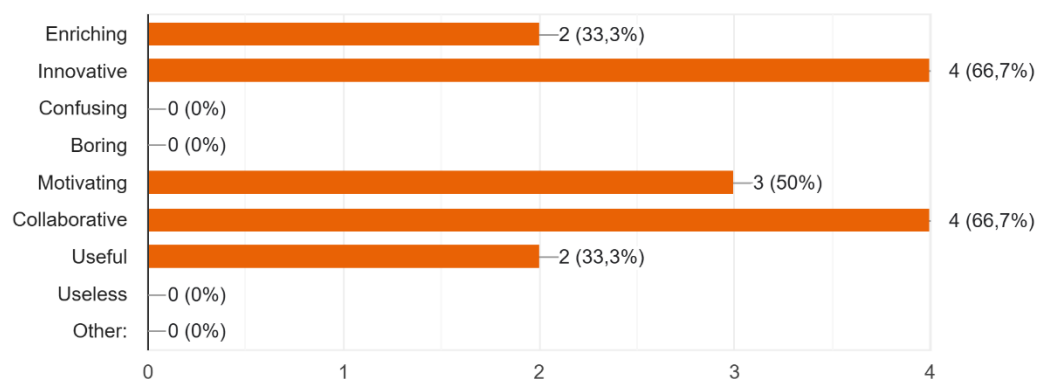


Image 7 Participants' Workshop Experience Evaluation

Nearly all participants had either previously attended or considered attending immersive technology training, and all confirmed that their participation in the IMMER-CV workshop increased their interest in further exploring the field. Suggestions for improvement included integrating a live demonstration of immersive technology—specifically, hands-on interaction with VR headsets—to enhance the practical relevance of the activities. Several participants also suggested adding practical exercises or case studies to deepen experiential understanding. Importantly, participants affirmed that their contributions were

taken into account and that the co-created solutions reflected their training needs. While some noted that the training plans may require adjustments for implementation in specific domains, the overall feedback confirmed that the outputs were relevant, feasible, and useful—scoring between 4 and 5 in perceived value.

Do you think that the training plans presented can be implemented in your domain?

6 απαντήσεις

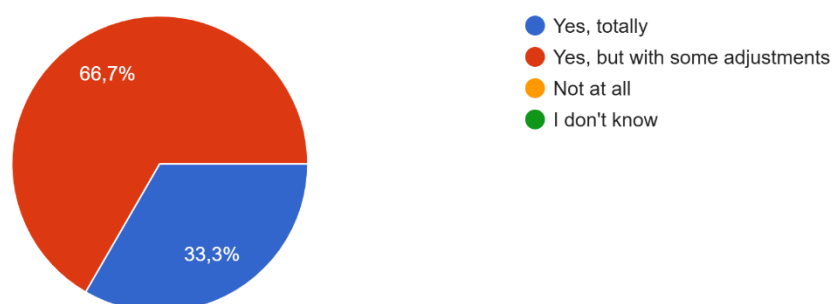


Image 8 Perceived Applicability of the Training Plans

In conclusion, the feedback validates the co-creation approach used in the workshops and supports the direction of the IMMER-CV curriculum development. It also points to the value of adding live or hands-on immersive demonstrations in future editions to bridge the gap between conceptual discussion and applied experience.

5. Conclusions

The co-creation workshops carried out in Athens and Valencia served as a crucial step in ensuring that the IMMER-CV curriculum reflects the real needs, expectations, and learning conditions of professionals, educators, and students in the Cultural and Creative Sectors. Through participatory methodologies, structured exercises, and open dialogue, the workshops captured diverse insights on skill gaps, infrastructure limitations, pedagogical preferences, and sectoral trends. The outcomes clearly require a modular curriculum's, emphasis on hands-on learning, and the integration of both technical and transversal competencies. Importantly, the active involvement of both experienced professionals and emerging learners confirmed the relevance and adaptability of the training approach. The findings from this activity have been instrumental in shaping a responsive, inclusive, and practice-oriented curriculum that can support the digital transformation of the CCS through immersive technologies.