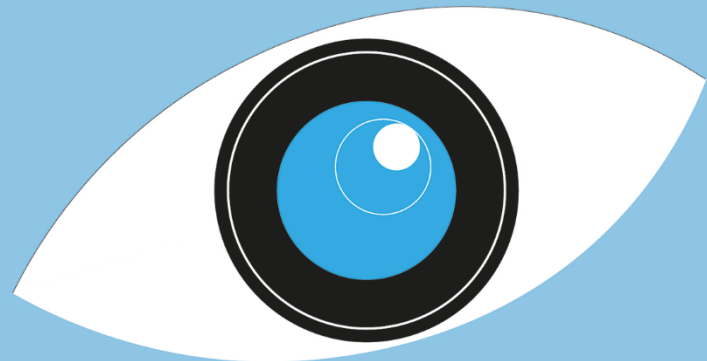




SHOOT

Students Have Optimal Opportunities Together

Practical guide for setting up an immersive learning space

WP5 - The SHOOT Immersive Experience

DANMAR COMPUTERS

SEPTEMBER 2026



**Co-funded by
the European Union**

Project number: 2023-1-IT02-KA220-SCH-000164931

Funded by the European Union. Views and opinions expressed are however 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.

Table of content

1. Introduction	4
1.1. Purpose of the guide	4
1.2. How to use this guide	5
2. Preparing the immersive learning space.....	6
2.1. Room requirements.....	6
2.2. Projection surfaces and lighting	6
2.3. Furniture arrangement and participant space	7
2.4. Power supply and cable safety	8
3. Equipment and technical requirements	10
3.1. Essential equipment.....	10
3.2. Optional equipment	10
3.3. Recommended technical parameters	11
4. Setting up the immersive space.....	12
4.1. Planning the room layout	12
4.2. Positioning the projectors	12
4.3. Connecting the computer and displays	13
4.4. Configuring multiple displays.....	13
4.5. Adjusting image size, focus and keystone	14
4.6. Aligning multiple projections.....	14
4.7. Setting up the audio	14
4.8. Final technical check.....	15
5. Preparing content for an immersive lesson.....	16
5.1. Images, videos and other materials	16
5.2. Resolution and aspect ratio	17
5.3. Preparing content for large-scale projection	17
5.4. Organising lesson files and backup materials	18
6. Running an immersive lesson	19
6.1. Preparing the session flow	19
6.2. Introducing participants to the space	19
6.3. Managing visual and audio content during the lesson.....	20
6.4. Supporting participant engagement	20
6.5. Closing the session and collecting feedback	21
7. Troubleshooting and practical recommendations.....	22
7.1. Common technical problems and solutions	22



7.2. Common setup mistakes.....	23
7.3. Practical tips for first-time implementation.....	24
7.4. Safety considerations	24
8. Quick setup checklist.....	26
9. References	27
10. Annexes	28
Annex 1. Equipment preparation sheet	28
Annex 2. Room layout planning sheet	30



1. Introduction

The SHOOT project explores how digital photography, video and sound can be combined to create engaging learning experiences and support digital storytelling in schools. Within the project, students and teachers develop visual narratives that can be presented in a classroom using large-scale projection and audio.

This guide focuses on the practical organisation of such a learning space. Its purpose is to help schools prepare a classroom for the presentation of SHOOT digital photo stories and similar multimedia lessons, using equipment that is commonly available in educational settings.

The approach described in this guide does not require a dedicated immersive room or specialised technologies such as virtual reality systems, interactive walls or 3D projection. A standard classroom can be adapted by combining several practical elements: large projected images, appropriate lighting, sound, suitable room organisation and, where possible, projection on more than one surface.

The level of immersion will depend on the equipment available. A school may start with a single projector and a large projection surface, while a more advanced setup may use two, three or four projectors to extend the visual content across several walls. The guide therefore presents different options that can be adapted to the technical conditions, room size and available budget of each school.

1.1. Purpose of the guide

The guide provides practical instructions for setting up and using an immersive learning space for SHOOT activities.

It covers:

- preparation of the classroom,
- selection and positioning of projectors,
- connection and configuration of equipment,
- preparation of projection surfaces,
- use of lighting and sound,
- preparation of digital photo stories for large-scale display,
- testing the setup before a lesson,
- common technical problems and their solutions,
- different setup options depending on the number of projectors available.

The aim is to make the setup reproducible by a school that has not previously worked with immersive or multi-surface projection.



1.2. How to use this guide

The guide is intended to be used as a practical reference during preparation of the classroom.

Schools setting up the space for the first time should follow the sections in order, beginning with the room requirements and equipment list and continuing through projector positioning, connection, image adjustment and final testing.

Schools that already have projection equipment installed may use individual sections as a reference, particularly those concerning image alignment, content preparation, troubleshooting and the final setup checklist.

Before preparing a lesson, it is recommended to complete the full technical setup using the actual images, videos and sound files that will be used during the session. Testing only a blank desktop or presentation screen may not reveal problems related to image proportions, video playback, sound levels or differences between projectors.



2. Preparing the immersive learning space

A standard classroom can be adapted for an immersive lesson without major structural changes. Before installing the equipment, the room should be assessed in terms of available space, display possibilities, lighting conditions and safe equipment placement.

2.1. Room requirements

Select a room that provides enough space for both the technical setup and the participants. The visual content may be displayed using projectors, large multimedia screens, interactive displays or a combination of different devices, depending on the equipment already available in the school.

When selecting the room:

- choose a space with as few permanent obstacles as possible,
- avoid rooms with large amounts of fixed furniture,
- check whether the available walls or screens are clearly visible from the participant area,
- if projectors are used, make sure there is sufficient distance between the projector and the projection surface,
- make sure students can sit, stand or move without blocking the projected image or the view of the screens,
- check whether doors, windows, radiators or other fixed elements may interfere with the planned visual setup,
- ensure that projectors, screens, computers and other equipment can be placed securely.

A dedicated immersive classroom is not required. A standard classroom, training room or school hall can be used if the space can be temporarily reorganised and the visual material can be displayed at a sufficiently large scale.

Where a large multimedia or interactive screen is already installed, it can be used as the main display surface. Additional projectors or screens may be added if a wider visual field or multi-surface presentation is required.

2.2. Projection surfaces and lighting

The quality of the visual experience depends strongly on the surface used to display the content and on the amount of light in the room. The aim is to provide a clear, large and easily visible image without reflections, excessive brightness loss or visual distractions.

Projection surfaces

When preparing the display area:

- use plain, light-coloured and matte surfaces whenever possible,
- avoid glossy walls, glass surfaces and highly reflective materials,



- remove posters, decorations or objects that may interfere with the projected image,
- if a wall is unsuitable, use a projection screen, white panel or tightly stretched light-coloured fabric,
- position large multimedia or interactive screens so that all participants have an unobstructed view,
- avoid placing the main display directly opposite strong sunlight.

If projectors are used, white or light grey surfaces usually provide the best image quality. Dark or strongly coloured walls may affect brightness and colour reproduction.

If the classroom uses a large multimedia screen or interactive display, check for reflections from windows and ceiling lights. Adjust the screen angle where possible and reduce unnecessary light sources around the display.

Lighting

The room does not need to be completely dark, but the lighting should support the visibility of the visual material.

Recommended practice:

- close blinds or curtains if daylight reduces image visibility,
- switch off lights located directly above or in front of the display surface,
- keep enough ambient light for participants to move safely,
- avoid strong light sources behind the participants if they create reflections on screens,
- test the actual lesson materials under the planned lighting conditions before the session.

For darker photographs or video sequences, reducing the room light can significantly improve visibility. For brighter content or activities that require students to take notes, partial lighting may be more appropriate.

When several display surfaces are used, try to maintain similar lighting conditions across the room so that one projection or screen does not appear significantly darker than the others.

2.3. Furniture arrangement and participant space

The arrangement of furniture should support visibility of the visual material and allow participants to move safely within the room. Traditional classroom rows are not always suitable, especially when content is displayed on more than one wall or screen.

For a single main display, chairs can be arranged in rows or in a slight semicircle. If two or more display surfaces are used, a more open layout is preferable, allowing participants to turn towards different parts of the room without moving furniture during the lesson.

Keep the area directly in front of projectors and screens clear. Tables, cabinets, standing participants or other objects should not block the image or restrict visibility.



Where possible:

- remove unnecessary tables and chairs before the session,
- place participants within comfortable viewing distance of the main display,
- avoid seating students directly in front of projector beams,
- leave clear walking routes between the participant area and the exits,
- keep technical equipment outside the main circulation area,
- make sure all participants can see the displayed content without major obstructions.

For SHOOT activities based mainly on photographs, video and sound, a less formal seating arrangement may work better than a standard classroom layout. Chairs placed in a semicircle, small groups or an open central arrangement can make it easier to follow content displayed across several surfaces.

If participants are expected to move, discuss the material in groups or interact with the space, leave additional free space around the seating area. Furniture should be easy to move and should not create narrow passages around cables or equipment.

2.4. Power supply and cable safety

Before connecting the equipment, identify the available power sockets and plan how cables will be routed through the room. Power and signal cables should be kept away from the main participant area whenever possible.

Avoid connecting several high-power devices to one extension lead. Projectors, large displays, speakers and computers should be distributed across available power sources in accordance with the capacity of the electrical installation.

Cable routes should be planned before furniture is placed in its final position. Cables crossing walking areas should be avoided. If this is not possible, secure them using cable covers or suitable floor tape.

Particular attention should be paid to:

- loose extension leads,
- cables stretched across doorways,
- power strips placed where they can be kicked or moved,
- cables under unstable furniture,
- connectors placed under tension,
- power adapters left hanging from sockets or equipment.

Projectors positioned on stands or tables should have enough cable length to prevent pulling. The same applies to laptops, speakers and external displays.

All connections should be completed and tested before participants enter the room. After the setup is finished, walk through the space once from the participant perspective and



check that no cable, adapter or power supply creates a trip hazard or blocks access to an exit.

Where possible, keep one clearly defined technical area for power strips, adapters and spare cables rather than distributing them around the room.



3. Equipment and technical requirements

The equipment required for a SHOOT immersive lesson depends on the room, the number of display surfaces and the type of content used. A basic setup can be created with one computer and one large display, while a wider multi-surface setup may require several projectors or screens.

3.1. Essential equipment

Equipment	Purpose	Practical note
Laptop or desktop computer	Plays the lesson content	Use a device capable of playing video smoothly and supporting the required number of displays
Projector, multimedia screen or interactive display	Shows visual content	At least one large display surface is required
HDMI, DisplayPort or USB-C cables	Connects the computer to displays	Check connector compatibility before the session
Power extensions and power strips	Supplies equipment with power	Use only where necessary and keep them outside walking routes
Audio output	Plays narration, music and sound effects	Built-in speakers may be sufficient in a small room; external speakers are preferable for larger spaces
Adapters	Connects devices using different ports	Common examples include USB-C to HDMI and DisplayPort to HDMI

For multi-screen or multi-projector setups, the computer must be able to send video to several displays at the same time. This may require additional video outputs, a docking station or a compatible USB-C hub.

3.2. Optional equipment

Additional equipment can improve flexibility or simplify the setup, but it is not essential in every classroom.

Useful additions include:

- external speakers or a portable sound system,
- projector stands or ceiling mounts,
- blackout curtains or temporary window covers,
- HDMI splitters or video distribution devices,



- wireless presenter or remote control,
- portable projection screens,
- cable covers,
- additional monitor for the teacher or facilitator,
- external hard drive or USB drive containing a backup copy of the lesson materials.

Where possible, use equipment that is already available in the school. The purpose of the setup is not to create a specialised installation, but to make effective use of existing classroom technology.

3.3. Recommended technical parameters

The following parameters should be treated as practical reference points rather than strict requirements.

Component	Recommended specification
Projector resolution	Full HD (1920 × 1080) where available
Multimedia screen	Full HD or higher
Projector brightness	Approx. 3,000 ANSI lumens or more for a standard classroom
Video output	HDMI, DisplayPort or USB-C with video support
Computer memory	8 GB RAM or more
Video playback	Smooth Full HD playback
Audio	Stereo speakers appropriate to room size
Internet connection	Not required if all lesson materials are stored locally

Lower-specification equipment can still be used successfully, especially in a darkened room and with carefully prepared content.

Before the lesson, test the complete setup using the final materials rather than sample files. A device that displays static images correctly may still have difficulties with high-resolution video, audio playback or several simultaneous displays.



4. Setting up the immersive space

The setup should be completed in a fixed sequence: define the display layout, position the equipment, connect the devices, configure the outputs, adjust the image and sound, and carry out a complete technical test using the final lesson materials.

4.1. Planning the room layout

Begin by deciding which surfaces will be used to display the content and which of them will serve as the main visual focus.

In a simple SHOOT setup, one large screen or one projected wall may be sufficient. If several surfaces are available, assign a clear function to each one. For example, the central surface may present the main video sequence, while side surfaces display photographs, supporting visuals or additional scenes.

Avoid using several screens only for the sake of increasing the number of displays. Additional surfaces are useful when they extend the visual field or support the narrative. If they distract from the main material, a simpler setup is preferable.

A basic layout should define:

- the main display surface,
- any secondary display surfaces,
- the position of the computer or control device,
- the location of the audio source,
- the approximate participant viewing area,

It is useful to mark the planned positions before connecting the equipment, particularly when several projectors are used.

4.2. Positioning the projectors

If projectors are used, position each unit before connecting the signal cables.

Start with the main projection surface. Move the projector forward or backward until the image fills the required area without extending unnecessarily onto the ceiling, floor or adjacent walls.

Whenever possible, position the projector so that the lens is approximately centred on the projection surface. Excessive side angles increase image distortion and require stronger digital correction.

For additional projectors:

1. Set up one projector at a time.
2. Establish the final image size before moving to the next unit.
3. Check whether the projections visually relate to one another.
4. Leave a small adjustment margin around each image.



Short-throw projectors can be useful in smaller rooms because they reduce the distance required between the projector and the wall and decrease the risk of participants crossing the beam.

4.3. Connecting the computer and displays

Connect all visual devices before opening the lesson materials.

A typical configuration may include:

Computer → HDMI / USB-C / DisplayPort → projector or multimedia screen

For several outputs, the connection may instead use:

Computer → docking station or multi-display adapter → Display 1 / Display 2 / Display 3

Check whether the computer supports multiple independent displays. A simple HDMI splitter usually duplicates the same image on several screens. It does not normally allow different content to be shown on each surface.

This distinction should be determined before the lesson is prepared:

- **Duplicated output** – the same image appears on all connected screens.
- **Extended output** – each display acts as a separate screen and may show different content.

For SHOOT activities, duplicated output may be sufficient when the aim is to enlarge or repeat the same visual story. Extended output is more appropriate when different images are intended for different walls.

4.4. Configuring multiple displays

After connecting the devices, open the computer display settings and confirm that all screens or projectors are detected.

Arrange the display icons in the settings so that their digital position corresponds to their physical position in the room. For example, a projector placed on the left side of the classroom should also appear to the left of the main display in the operating system settings.

Select either duplicate or extended display mode according to the planned presentation.

For an extended setup:

- assign one display as the main screen,
- check the numbering of all connected displays,
- move a test window between screens,
- confirm that the cursor moves in the expected direction,
- open the intended content on the correct display.

Do not leave this configuration until the participants are already in the room. Multi-display settings may reset after cables are disconnected or equipment is restarted.



4.5. Adjusting image size, focus and keystone

Once the image is visible, complete the optical adjustment before making extensive digital corrections.

Use the following order:

1. Position

Move the projector until the image is approximately in the correct location.

2. Image size

Adjust the projector distance or optical zoom, if available.

3. Focus

Use the focus control until photographs and text are clearly visible.

4. Keystone correction

Correct trapezoidal distortion only after the physical position has been adjusted.

Digital keystone correction should be kept to a minimum. Strong correction can reduce image quality and may make it more difficult to align several projected surfaces.

Use actual SHOOT photographs to check focus. Fine photographic details often reveal focus problems more clearly than presentation slides or menu screens.

4.6. Aligning multiple projections

When two or more projections are used, the images should appear visually consistent even if they are not technically blended into one continuous image.

Check:

- the upper and lower image edges,
- image height,
- visible gaps between projections,
- major differences in brightness,
- differences in colour temperature,
- unwanted overlap.

For a simple school setup, perfect edge blending is not required. A small gap between two projected images is usually preferable to an obvious overlap or double image.

If the projectors have different brightness or colour characteristics, adjust their basic picture settings so that the difference is less distracting. Use the same or similar picture mode on all projectors where possible.

For SHOOT digital stories, visual continuity is more important than technical perfection. Photographs should remain easy to see, and transitions between surfaces should not draw attention away from the content.

4.7. Setting up the audio

Audio should support the visual story rather than compete with it.



Co-funded by
the European Union

Funded by the European Union. Views and opinions expressed are however 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.

Use the final soundtrack, narration or ambient sound during testing. Set the volume from the participant area rather than from directly next to the speakers.

For a small classroom, the built-in speakers of a large multimedia display may be sufficient. In larger rooms, external speakers generally provide clearer and more even sound.

Speaker placement should support balanced coverage of the room. Avoid placing all audio equipment behind the participants if the visual content is presented in front of them, unless this effect is intentional.

Check separately:

- spoken narration,
- music,
- environmental or background sounds,
- transitions between quieter and louder sections.

If the video contains both narration and music, make sure spoken content remains understandable at normal playback volume.

4.8. Final technical check

Run the complete lesson sequence once before participants enter the room.

Do not test individual files only. Play the materials in the same order and from the same software that will be used during the lesson.

Confirm that:

- all displays remain connected,
- the correct content appears on the correct surface,
- videos start and play smoothly,
- photographs retain the correct proportions,
- audio is audible throughout the participant area,
- transitions between files or scenes work as intended,
- no system notifications appear over the content,
- the computer does not enter sleep mode,
- remote controls and presentation devices are functioning.

Keep the final lesson files open and ready before the session starts. If several applications are required, arrange them in advance and close all unrelated software.

A complete pre-session test should reproduce the actual conditions of the lesson as closely as possible. This is the most effective way to identify display, playback or audio problems before they affect the session.



5. Preparing content for an immersive lesson

Before using an existing SHOOT lesson in an immersive classroom, review the material in the conditions in which it will actually be presented. Content that works well on a laptop or standard classroom screen may require adjustments when displayed at a larger scale or across several surfaces.

The purpose of this stage is not to redesign the lesson, but to confirm that the existing photographs, videos, sound and text remain clear, technically reliable and suitable for the selected display setup.

5.1. Images, videos and other materials

Review each visual and audio element before the lesson is presented.

For photographs, check whether:

- the image is sufficiently sharp when enlarged,
- important details remain visible from the participant area,
- the photograph is not excessively dark or overexposed,
- the orientation of the image matches the planned display,
- important subjects are not located too close to the image edge,
- any text embedded in the image remains readable.

Avoid using small preview files, screenshots of photographs or images downloaded in reduced quality if the original files are available.

For video materials, play each file from beginning to end and verify that:

- playback is smooth,
- image and sound remain synchronised,
- no unwanted black frames or long pauses appear between sections,
- subtitles, captions and titles are readable,
- the sound level remains reasonably consistent throughout the video.

If the lesson includes narration, music or ambient sound, check whether the audio supports the visual sequence rather than obscuring spoken content. Sudden changes in volume should be corrected before the session where possible.

Also review the overall rhythm of the lesson. Very long static sequences may lose impact when projected on a large surface, while very rapid image changes may make photographs difficult to observe. The timing should allow participants to recognise and understand the visual material.



5.2. Resolution and aspect ratio

Resolution and aspect ratio should be checked against the equipment that will be used for the lesson.

Where possible, use the original high-resolution photographs and export final videos **in Full HD (1920 × 1080) or a comparable format**. Higher resolution is particularly useful when images will be enlarged significantly.

Low-resolution content may appear acceptable on a laptop but become visibly pixelated on a wall-sized projection.

The aspect ratio should also be consistent with the target display. Common formats include:

- **16:9** – suitable for most modern projectors, multimedia screens and televisions,
- **4:3** – still used by some older projectors,
- **portrait or square formats** – suitable for individual photographs but may leave unused areas on widescreen displays.

Do not stretch photographs or video to fill the entire screen if this changes their proportions. Cropping or placing the image on a neutral background is preferable to visible distortion.

For multi-display setups, confirm that each file is suitable for the surface on which it will appear. A composition prepared for one wide screen may not work correctly when divided between two separate walls.

5.3. Preparing content for large-scale projection

The final lesson should be tested at the actual display size before use.

During the test, view the material from the same area where participants will be located. Check especially:

Text size

Titles, captions and instructions must remain readable from the back of the participant area. Text that appears clear on a computer screen may be too small once projected.

Image composition

Check whether important faces, objects or details remain visible. Projection onto a very large surface can make peripheral elements more noticeable and may expose poor cropping.

Brightness and contrast

Dark photographs may lose detail when projected, particularly in rooms that cannot be fully darkened. Very bright images may appear washed out on some screens or projectors.

Transitions

Check fades, cuts and scene changes on the final display. Transitions that are almost invisible on a laptop may become more noticeable at large scale.

Visual consistency

If several images or videos are shown consecutively, check for large differences in



brightness, colour temperature and visual style. Some variation is natural, but abrupt changes may distract from the narrative.

Multiple surfaces

If more than one display is used, verify which material appears on each surface. Important text or key visual information should not be split across separate screens unless the lesson has been specifically designed for that arrangement.

As a final check, watch the entire lesson without stopping it. This makes it easier to identify pacing problems, unnecessary blank screens or transitions that interrupt the visual flow.

5.4. Organising lesson files and backup materials

All files required for the lesson should be stored locally on the computer before the session. Do not rely on an internet connection unless online access is an essential part of the activity.

Use one clearly organised lesson folder containing:

- the final video or presentation,
- photographs used separately during the session,
- audio files,
- subtitles or supporting documents,
- any additional media required during the activity.

Avoid keeping several unfinished or similarly named versions in the same folder. The file used during the lesson should be easy to identify.

A simple naming system can reduce mistakes, for example:

01_Introduction.mp4

02_Photo_Sequence.mp4

03_Discussion_Image.jpg

04_Final_Sequence.mp4

Keep at least one backup copy of the complete lesson on a USB drive, external storage device or second computer.

Before the session, open every required file directly from the lesson folder and confirm that it works without access to the original editing software or cloud storage.

If the lesson uses linked files, embedded media or presentation software, test the final version on the same computer that will be used during the session. Missing fonts, broken file links or unsupported video formats are easier to correct before participants arrive.



6. Running an immersive lesson

Once the room, equipment and lesson materials are ready, attention should shift from technical setup to the way the session is delivered. The aim is to ensure that the visual and audio content supports the learning activity and does not become a distraction.

6.1. Preparing the session flow

Before participants enter the room, review the lesson sequence from the facilitator's perspective.

Decide in advance:

- how the session will begin,
- when the first visual material will appear,
- whether the lesson will run continuously or include pauses,
- when discussion or reflection will take place,
- when audio should be started, reduced or stopped,
- whether participants will remain seated or move within the room,
- how the session will end.

Keep the sequence simple. If several files are used, open them in advance and arrange them in the order in which they will be needed.

For lessons based on digital storytelling, it is useful to identify natural stopping points. These may occur after a group of photographs, at the end of a video sequence or before a major change in topic.

Avoid unnecessary interruptions once a visual sequence has started. Frequent switching between applications, searching for files or adjusting settings during the lesson can break the continuity of the experience.

6.2. Introducing participants to the space

At the beginning of the session, give participants only the information they need to use the space comfortably and safely.

Explain:

- where they should sit or stand,
- whether they are expected to move during the activity,
- which display surfaces will be used,
- when they should focus on the visual material and when discussion will take place,
- any restrictions related to equipment or cables.

Keep the introduction brief. The technical setup does not need to be explained unless it is relevant to the activity.



If several screens or projection surfaces are used, allow participants a short moment to become familiar with the room before the lesson begins. This is particularly useful when visual content may appear in different parts of the space.

6.3. Managing visual and audio content during the lesson

The facilitator should control the lesson from a position that provides access to the computer or presentation controls without obstructing the participants' view.

During playback:

- avoid standing in front of projected images,
- do not change display settings unless necessary,
- keep the mouse cursor away from the main visual content,
- close pop-up windows and unrelated applications,
- maintain a consistent audio level,
- pause the content only at planned or meaningful points.

When photographs are shown individually, leave enough time for participants to observe them properly. The duration will depend on the complexity of the image, but rapid changes should be avoided if the photographs contain important details.

If narration or spoken commentary is used, avoid talking over it. Additional explanations should be given before or after the audio sequence unless simultaneous commentary is intentionally part of the lesson.

For multi-surface setups, guide attention when necessary. If key content moves from one display surface to another, a short verbal cue can help participants follow the sequence without confusion.

6.4. Supporting participant engagement

The visual material should be used as part of the learning activity rather than only as background content.

Depending on the lesson, participants may be asked to:

- identify details in a photograph,
- compare two or more images,
- describe what they notice before receiving additional information,
- interpret the mood or meaning of a visual sequence,
- connect photographs with sound, narration or written information,
- discuss how the material relates to the lesson topic,
- reflect on how different images influence their understanding of the story.

Questions should be short and directly related to the displayed content.



For example:

- What is the first detail you notice?
- What changes between these two images?
- What does the sound add to this scene?
- Which image best represents the main idea of this sequence?
- Does the meaning change when the image is shown together with audio?

Avoid stopping the visual sequence too frequently. Discussion is more effective when it is placed at selected points rather than after every image.

If the activity includes student movement, make sure the movement has a clear purpose, such as comparing different displays, observing details from another position or working in small groups around specific visual material.

6.5. Closing the session and collecting feedback

The final stage should help participants reflect both on the lesson content and on the way the visual environment supported the activity.

A short closing discussion is usually sufficient. Useful questions may include:

- Which part of the lesson was easiest to remember?
- Did the large-scale images or multiple displays help you understand the topic?
- Was the sound helpful or distracting?
- Was any part of the visual material difficult to follow?
- Which element of the setup worked best for you?

Feedback does not need to be formal. A short discussion, a written note or a simple rating can provide useful information for improving future sessions.

After participants leave, the facilitator should also record any practical observations, such as:

- content that was too fast or too slow,
- photographs that were unclear when enlarged,
- audio levels that need adjustment,
- moments when participants could not see the display clearly,
- parts of the session that caused unnecessary delays,
- activities that generated strong engagement.

These notes should be used to make small adjustments before the lesson is delivered again. In most cases, improving the timing, visibility and flow of the session is more useful than making major changes to the technical setup.



7. Troubleshooting and practical recommendations

Even a simple immersive setup can fail because of small technical issues, incorrect display settings or poor preparation. Most problems can be solved quickly if the cause is identified before the session begins.

7.1. Common technical problems and solutions

Problem	Possible cause	Recommended action
No image appears on the projector or screen	Incorrect input source selected	Select the correct HDMI, DisplayPort or USB-C input
The computer does not detect the display	Loose cable, unsupported adapter or incorrect output settings	Reconnect the cable, test another port or adapter, and open the display settings
The same image appears on every screen	Duplicate display mode is active	Switch to extended display mode if different content is required
One display shows the wrong content	Displays are arranged incorrectly in the system settings	Reorder the displays and move the content to the correct screen
The projected image is blurred	Incorrect focus or projector position	Adjust focus and check the distance between projector and wall
The image is trapezoidal	Projector is positioned at an angle	Reposition the projector first, then apply limited keystone correction
The image is too dark	Strong room lighting, low projector brightness or dark source material	Reduce ambient light, use a brighter picture mode or adjust the content
Colours differ between projectors	Different picture modes or projector models	Use similar image settings and reduce extreme brightness or colour differences
Video playback is not smooth	Computer performance is insufficient or the file is too demanding	Close unnecessary applications or use a lower-resolution version of the video
Video plays without sound	Incorrect audio output device selected	Select the correct speaker or display in the sound settings



Sound is too quiet or uneven	Speaker position or volume level is unsuitable	Reposition the speakers and test the volume from the participant area
Subtitles or text are difficult to read	Font size is too small or contrast is insufficient	Increase text size and improve contrast before the session
Black bars appear around the image	Aspect ratio does not match the display	Keep the original proportions or prepare a version adapted to the target display
The lesson stops because a file cannot be opened	Missing codec, broken link or cloud-only file	Store a tested local copy in a common file format
Notifications appear during the lesson	Email, messaging or system alerts are active	Enable Do Not Disturb or Presentation mode before the session

If a problem appears during the lesson and cannot be solved immediately, use the simplest available backup option. It is usually better to continue on one functioning display than to interrupt the session for a long technical adjustment.

7.2. Common setup mistakes

Several recurring mistakes can reduce the quality of the session even when the equipment is working correctly.

Using more displays than necessary

Additional projectors or screens do not automatically make the lesson more immersive. Use them only when they support the visual story or extend the participant's field of view.

Relying on a laptop preview

A lesson should never be approved only on the basis of how it looks on a computer screen. Large-scale display may reveal low image quality, unreadable text or poor timing.

Excessive keystone correction

Strong digital correction can reduce image quality. Physical projector positioning should always be adjusted first.

Placing key content at the edges

Important text, faces or objects should not be positioned too close to the outer edge of the image, especially when the material may be shown on different screen sizes.

Using very small text

Long paragraphs and small captions are unsuitable for large display. Text should be limited to information that participants need to read during the session.

Unbalanced sound

Music or background audio should not make narration difficult to understand.



Leaving all technical decisions until the lesson begins

Display mode, file order, audio output and screen assignment should be set in advance.

Creating unnecessary complexity

A stable one-screen setup is preferable to a technically ambitious multi-screen configuration that is difficult to control.

7.3. Practical tips for first-time implementation

For the first implementation, start with the simplest reliable setup available in the school.

A single large multimedia screen or one projector may be sufficient to test the lesson flow, image quality and sound. Additional surfaces can be introduced later if they provide a clear benefit.

It is useful to carry out a short trial session with a small group before using the setup with a full class. This makes it easier to identify problems related to visibility, sound, pacing and participant positioning.

Other practical recommendations include:

- use the same computer during testing and during the actual lesson,
- store all lesson files locally,
- keep a backup copy on a USB drive or second device,
- use consistent file names and a clear sequence,
- prepare one simple fallback version of the lesson,
- keep remote controls, adapters and spare cables in one place,
- assign one person to operate the technical setup during the session,
- note any changes immediately after the lesson while they are still easy to remember.

When resources are limited, prioritise clear images, good sound and a stable presentation over additional technical effects.

7.4. Safety considerations

The immersive setup should not reduce normal classroom safety.

Before every session, confirm that:

- emergency exits are fully accessible,
- cables do not cross main walking routes unless properly secured,
- projectors and screens are placed on stable supports,
- extension leads are not overloaded,
- ventilation openings on projectors and computers are not blocked,
- participants cannot easily touch hot projector surfaces,



- equipment is positioned away from liquids,
- the room remains sufficiently lit for safe movement,
- temporary curtains, fabrics or screens do not block exits or ventilation,
- all temporary equipment is removed or secured after the session.

If participants are expected to move during the activity, review the space again after the final equipment setup. Movement routes should remain clear even when the room is darkened.

For schools implementing the setup for the first time, it is advisable to complete one full technical and safety check before the first participant session.



8. Quick setup checklist

Use this checklist before each session to verify that the room, equipment and lesson materials are ready for use.

Keep a copy of the checklist with the technical setup materials so that it can be easily reused for future sessions.

Room and display
☐ The selected room is suitable for the planned setup. ☐ The main display surface is clearly visible from the participant area. ☐ Curtains or blinds are closed where necessary. ☐ Unnecessary lights have been switched off or reduced. ☐ Furniture does not block the view of the screen or projection surface. ☐ Walking routes and exits remain clear.
Equipment
☐ The computer is connected to all required displays. ☐ Projectors, multimedia screens or interactive displays are switched on. ☐ All connected displays are detected by the computer. ☐ Duplicate or extended display mode is set correctly. ☐ The image appears on the intended display surface. ☐ Projector focus and image position have been checked. ☐ Audio output is connected and working. ☐ Remote controls, adapters and essential accessories are available.
Lesson materials
☐ The final lesson files are stored locally on the computer. ☐ All photographs and videos open correctly. ☐ Video playback is smooth. ☐ Images remain clear when shown at full size. ☐ Text, captions and subtitles are readable from the participant area. ☐ Audio and narration are clearly audible. ☐ The order of files matches the planned lesson sequence. ☐ A backup copy of the lesson is available.
Before participants enter
☐ The complete lesson sequence has been tested on the final setup. ☐ Unnecessary applications and browser windows are closed. ☐ Notifications are disabled. ☐ Automatic sleep or screen-lock functions are disabled for the duration of the session. ☐ The starting file or opening screen is ready. ☐ Speaker volume has been checked from the participant area. ☐ Cables and power supplies do not create a trip hazard. ☐ The facilitator can access the controls without blocking the display.

If all essential items have been checked, the space is ready for the session. Any non-essential technical issue that does not affect visibility, sound or safe use of the room should not delay the lesson unnecessarily.

9. References

1. Barrett, P., Davies, F., Zhang, Y., & Barrett, L. (2015). The impact of classroom design on pupils' learning: Final results of a holistic, multi-level analysis. *Building and Environment*, 89, 118–133. <https://doi.org/10.1016/j.buildenv.2015.02.013>
2. CAST. (2024). Universal design for learning guidelines version 3.0. <https://udlguidelines.cast.org/>
3. Higgins, S., Hall, E., Wall, K., Woolner, P., & McCaughey, C. (2005). The impact of school environments: A literature review. Design Council. <https://eprints.ncl.ac.uk/12574>
4. Mayer, R. E. (2020). *Multimedia learning* (3rd ed.). Cambridge University Press. <https://doi.org/10.1017/9781316941355>
5. OECD. (2017). *The OECD handbook for innovative learning environments*. OECD Publishing. <https://doi.org/10.1787/9789264277274-en>
6. Robin, B. R. (2008). Digital storytelling: A powerful technology tool for the 21st century classroom. *Theory Into Practice*, 47(3), 220–228. <https://doi.org/10.1080/00405840802153916>
7. UNESCO. (2018). *UNESCO ICT competency framework for teachers (Version 3)*. <https://unesdoc.unesco.org/ark:/48223/pf0000265721>



10. Annexes

Annex 1. Equipment preparation sheet

A. Core equipment

Item	Required	Available	Tested	Notes
Laptop / desktop computer	☐	☐	☐	
Main projector / multimedia screen / interactive display	☐	☐	☐	
HDMI / DisplayPort / USB-C cable	☐	☐	☐	
Required adapter(s)	☐	☐	☐	
Audio output / speakers	☐	☐	☐	
Power extension / power strip	☐	☐	☐	
Backup copy of lesson files	☐	☐	☐	

B. Additional equipment for multi-display setup

Item	Quantity Needed	Available	Tested	Notes
Additional projector(s)		☐	☐	
Additional multimedia screen(s)		☐	☐	
Additional video cable(s)		☐	☐	
Docking station / multi-display adapter		☐	☐	
Projector stand / mounting equipment		☐	☐	
External speakers		☐	☐	
Projection screen / white panel		☐	☐	
Cable covers		☐	☐	
Wireless presenter / remote control		☐	☐	



C. Spare technical kit

- ☐ Spare HDMI cable
- ☐ Spare adapter
- ☐ Spare extension lead
- ☐ USB drive with lesson files
- ☐ Batteries for remote controls
- ☐ Cable tape / cable covers
- ☐ Screen / projector lens cleaning cloth

D. Final equipment check

Computer used for the lesson: _____

Main display device: _____

Number of additional displays: _____

Audio system: _____

Backup lesson location: _____

Date of test: _____

Test completed by: _____



Annex 2. Room layout planning sheet

A. Room information

Room / classroom: _____

Approximate room size: _____

Number of participants: _____

Main display type:

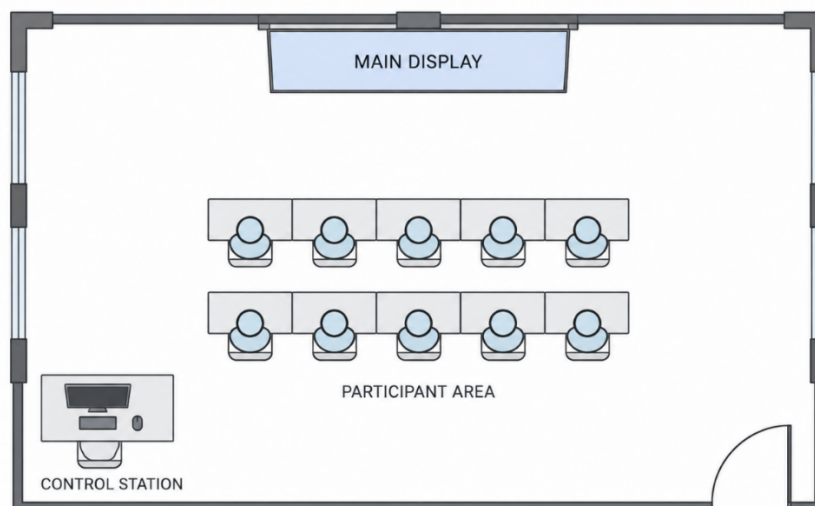
- ☐ Multimedia screen
- ☐ Interactive display
- ☐ Projector
- ☐ Other: _____

Additional display surfaces:

- ☐ None
- ☐ One
- ☐ Two
- ☐ Three or more

B. Select the intended layout

Layout A – Single Main Display



Best suited to a standard classroom using one large display or one projector.

Use this layout when:

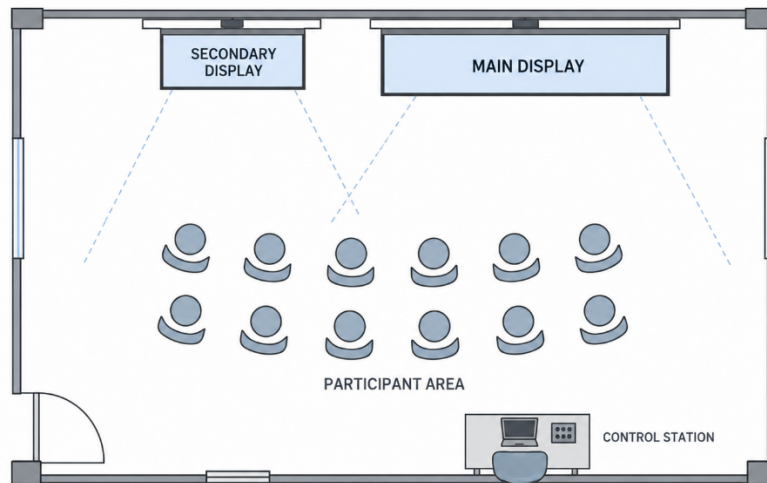
- ☐ One visual surface is sufficient
- ☐ The lesson is presented as one continuous video or visual sequence
- ☐ A simple and reliable setup is preferred



Co-funded by
the European Union

Funded by the European Union. Views and opinions expressed are however 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.

Layout B – Main Display + Secondary Display

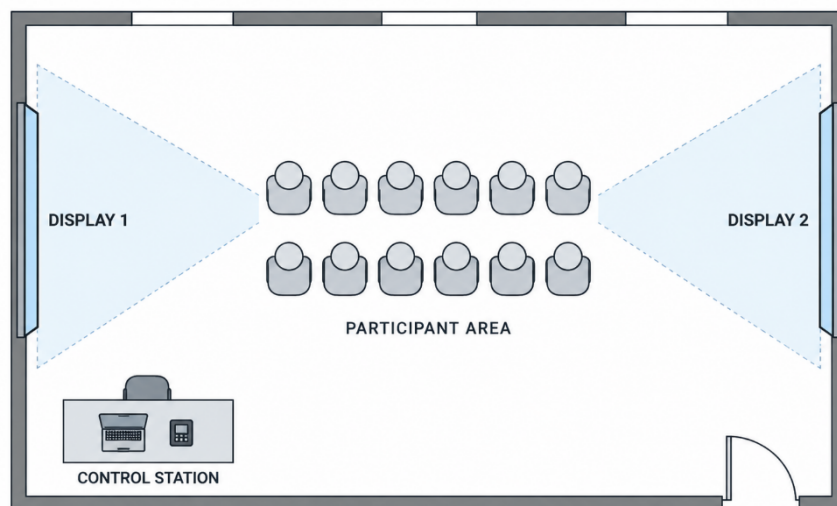


Suitable when the main lesson content is supported by additional visual material on a second display.

Use this layout when:

- ☐ One surface contains the main content
- ☐ A second surface provides complementary visuals
- ☐ Participants can comfortably see both displays

Layout C – Two Adjacent Visual Surfaces



Suitable for a wider visual presentation using two projectors, two screens or a combination of both.

Use this layout when:

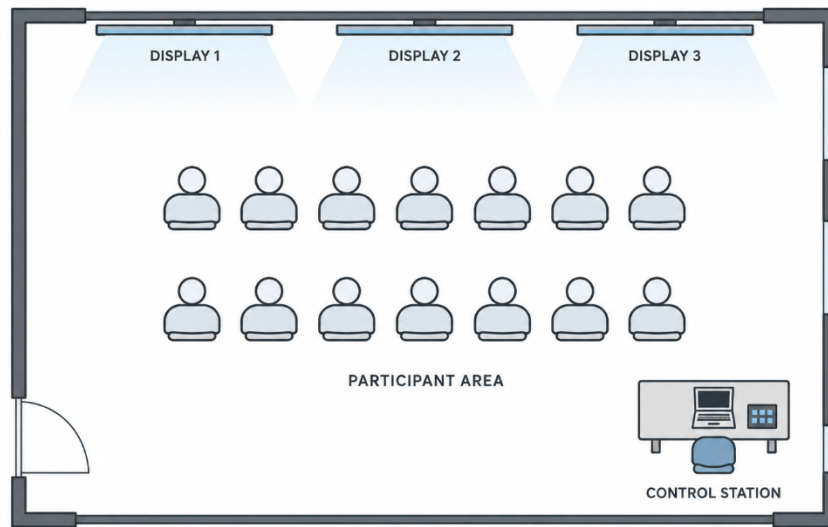
- ☐ Content is intentionally divided between two surfaces
- ☐ Participants do not need to turn excessively
- ☐ Both displays can be controlled reliably



Co-funded by
the European Union

Funded by the European Union. Views and opinions expressed are however 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.

Layout D – Multi-Surface Setup



Suitable for larger rooms where several display surfaces are available.

Use this layout only when:

- ☐ Additional surfaces contribute to the lesson
- ☐ The computer supports all required outputs
- ☐ Content has been tested on every display
- ☐ Participants can follow the visual sequence easily

C. Draw your own room layout

Mark:

- display surfaces
- projector positions
- participant area
- control station
- speakers
- doors and exits
- main cable routes



D. Layout approval check

Check	Yes	No	Adjustment needed
Main content is visible to all participants	☐	☐	
Additional displays have a clear purpose	☐	☐	
Participants do not block projector beams	☐	☐	
Control station is accessible	☐	☐	
Speakers provide sufficient coverage	☐	☐	
Cables are outside main walking routes	☐	☐	
Doors and exits remain clear	☐	☐	
Final lesson has been tested in this layout	☐	☐	

Selected layout: _____

Adjustments required before use:

Approved by: _____ **Date:** _____



**Co-funded by
the European Union**

Funded by the European Union. Views and opinions expressed are however 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.