Deliverable 3.1

Online course on VR/AR documentation

Hochschule Anhalt (HSA), Lead Beneficiary
Work Package # 2

Co-funded by the European Union

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V 1.0	13. December 2024	Final	Project manager

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TEAM#UP- Knowledge on Ecological Restoration to Maximize Benefits for Nature and People

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Summary

Work Package 3 (WP3) of the TEAM#UP project is working on creating interactive learning content on the topic of ecological restoration. With this learning content, a) teachers of the partner schools and scientific members and b) students and members from partners schools should be able to independently create interactive learning content and, in the case of teachers, pass on the knowledge required for this.
In order to record the respective status quo in the partner countries, surveys were created for the teachers and students and addressed to the respective groups. The following factors (selection) were queried as part of this survey:

- Prior knowledge in the field of virtual reality (VR)
- Expectations of VR learning courses
- Equipment (hardware and software) of the schools
- Time available in the curriculum to teach the creation of VR learning content

This document, Deliverable 3.1, focuses on the steps that have been taken so far Firstly, it provides an overview of the topics of virtual reality and interactive video tours as well as the possible applications in knowledge transfer.

Secondly, the LUMI and 3D Vista applications used in the project are presented and compared in terms of their properties and utilisation scenarios. The webinar 'VR Documentation and creation of learning material' created for teachers, scientific members and partners of the private sector is also described.

Lastly, this document provides an outlook on the work steps for the coming months.

1. List of Abbreviations

AR	Augmented Reality
CoVE	Centre of Vocational Excellence
DERTO	Digital Ecological Restoration Toolbox
EC	European Commission
ER	Ecological Restoration
GA	Grant Agreement
HSA	Anhalt University of Applied Sciences
H5P	HTML5 Package: an open-source tool that enables educators, designers and content developers to create, share and reuse interactive HTML5 content.
LUMI	An educational software that offers a variety of content types, primarily focused on creating interactive learning experiences.
OER	Open Educational Resources
VET	Vocational Educational and Training
VR	Virtual Reality
WP	Work Package
3D Vista	A specialised software for creating virtual 360-degree tours, interactive 3D tours and presentations.

2. Overview of the project

TEAM#UP will contribute to promoting, through innovative educational schemes, the transition to greener and climate-resilient economies, as called for in the Green Deal. It underpins educational programs liaising with practitioners via green VET that includes a wide range of learnings, to name a few:

Digital tools (e.g., visualisation of demonstration sites with augmented/virtual reality); Standards, protocols and priority of actions; Ecological restoration methods and approaches; Monitoring and surveying techniques; Financial mechanisms; Stakeholder engagement and Science-education-industry interface.

Our main goal is to mobilise extensive knowledge and skills in ecological restoration to fill gaps in green VET. Overcoming the barriers to knowledge transfer and improving training in ER will be critical to upscaling the practice of ER across Europe to counteract biodiversity loss and habitat degradation in the face of climate change.

2.1 Objectives

TEAM#UP has set up eight specific objectives. Its work is organised in seven Work Packages. For more details, visit https://teamup2restore.eu/workplan

1. **Develop ecological restoration curricula** for VETs targeting pressing needs of future professionals across sectors to successfully implement European green strategies, engaging multiple actors from the public, private and non-profit sectors.
2. **Implement four specific curricula** as OER (Open Educational Resources) in ecological restoration for VET.
3. **Use and advancement of demonstration sites** to spur hands-on skills, responsibility and autonomy in VET on ecological restoration.
4. **Foster reciprocal exchange** of needs, knowledge, skills, and competences between secondary and tertiary education providers, scientists and practitioners at regional and national level

5 **Initiate international knowledge exchange** and collaborative curricula development of students and teachers at nationally-oriented VET providers.

6 **Showing the added-value of ecological restoration** as a business model and career opportunity (Ideathon)

7 **Communicate on education of ecological restoration** in the context of VET and transfer to other countries.

8 **Sustainability and long-term impact** of TEAM#UP on education in ER.

2.2 TEAM#UP Consortium

The consortium comprises 15 institutions and organisations from five European countries: Belgium, the Czech Republic, Germany, Norway and Spain. Among them are researchers, educators, practitioners and communicators passionate about ecological restoration and its benefits to society and our planet. Learn more about them on our website: https://teamup2restore.eu/partners

2.3 About Work Package Three (3)

The declared aim of WP3 is the creation of Open Educational Resources (OER). The OER to be created are freely accessible and open teaching, learning and research resources that are often published under licenses such as Creative Commons. These licenses allow the materials to be used, shared, modified and further developed free of charge. The aim of OER is to make education accessible to more people and to offer the opportunity to customize teaching materials, which plays a particularly important role in digital education. OER in TEAM#UP includes interactive video tours & online courses related to ecological restoration.

2.4 Centres of Vocational Excellence

To support the transfer of knowledge and innovation to practitioners via VET schools, TEAM#UP national partners are establishing four CoVEs:
(1) Germany - multifunctional and sustainable land use in agricultural systems
(2) Norway - restoration of infrastructure, ecological compensation & landscaping
(3) Czech Republic - restoration across urban and rural landscapes
(4) Spain - forest restoration and disaster risk management

2.5 Workplan

TEAM#UP partners are developing teaching materials and implementing ecological restoration curricula with VET schools in Spain, the Czech Republic, Germany, and Norway to fill gaps in knowledge and skills in the agricultural, forestry, landscaping and gardening sectors. TEAM#UP aims to remove barriers between research in restoration ecology and these sectors by serving this knowledge in ways suitable to VET education.

The following figure shows how TEAM#UP organises its work, the interaction among WPs and the flow of information.

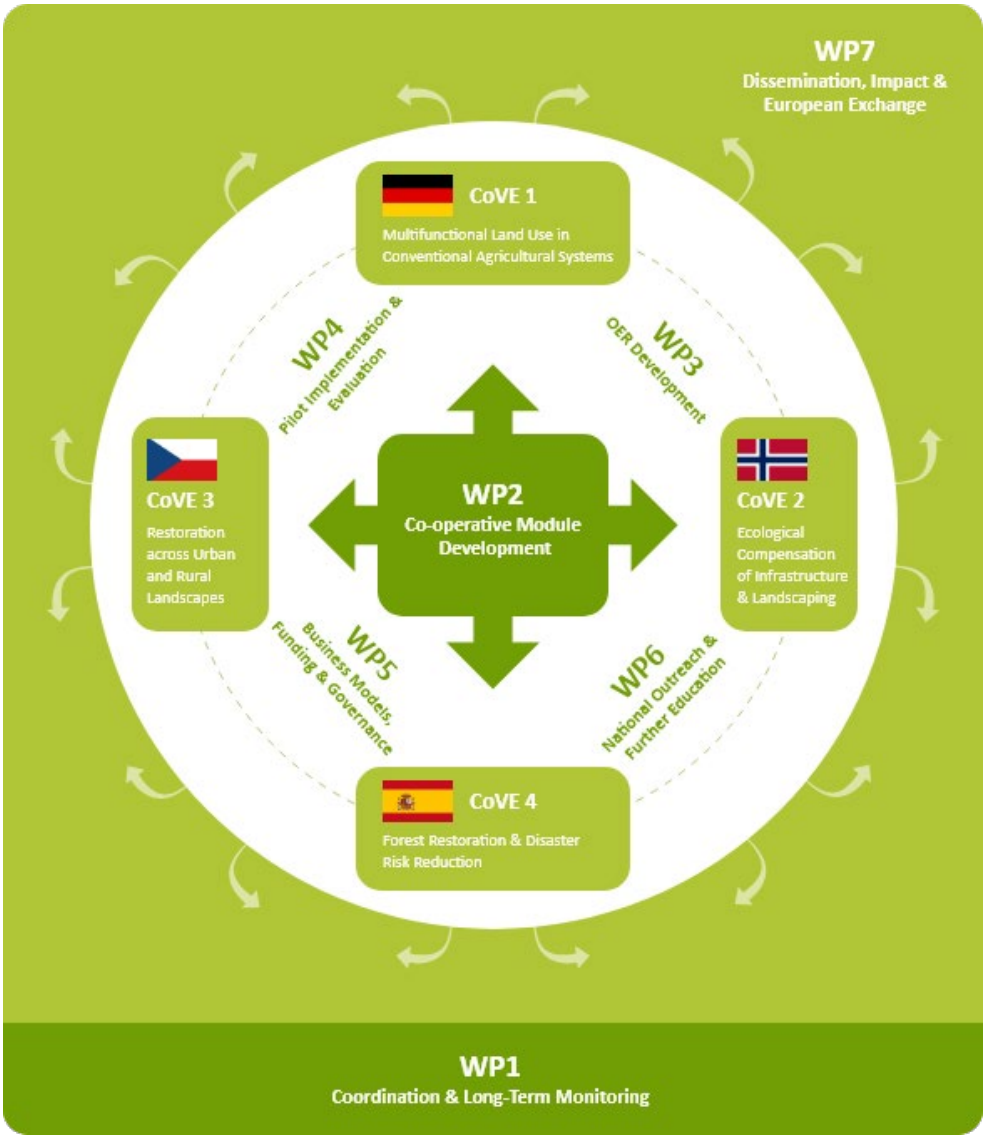

Figure 1: TEAM#UP Workplan

3.Virtual Reality and its utilisation in WP3

3.1 What is Virtual Reality (VR)

Virtual reality (VR) is full of possibilities. Possibilities that leave earthly boundaries and limitations behind. VR has enormous potential, especially when combined with education and as an interactive teaching method. Virtual tours in particular offer the opportunity to impart knowledge in a simple way. By immersive travel in a virtual world, complex issues can be conveyed, temporally divergent processes (seasons) can be depicted and places that are logistically difficult to access can be travelled to. This makes it possible, for example, to experience phenological processes or work on agricultural machinery and familiarise yourself with restoration measures.
The aim of the project is to incorporate this potential into lessons and enable teachers and pupils/students to access this topic.

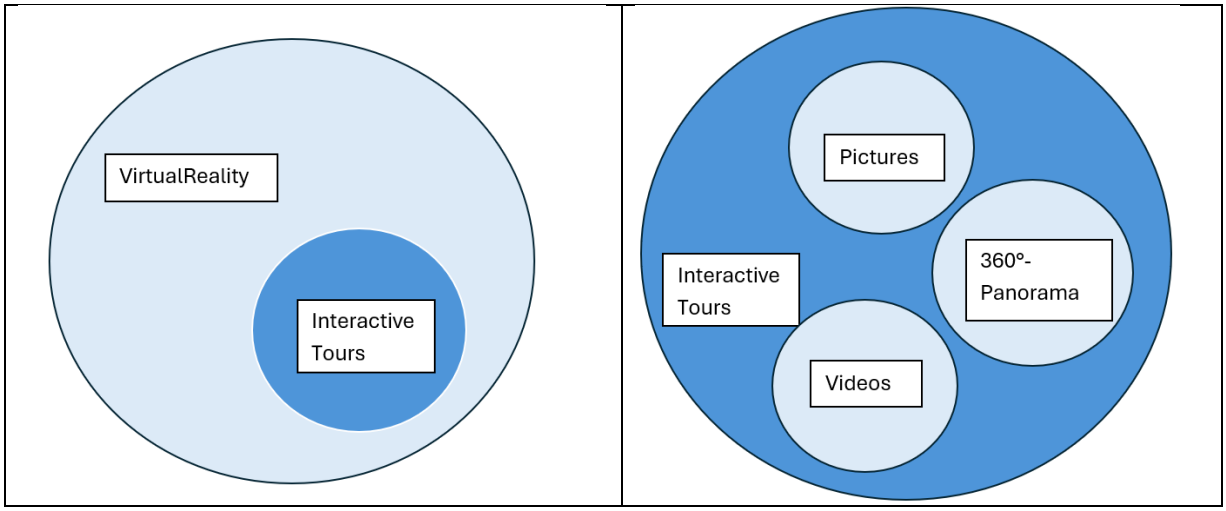

Figure 2: Interactive video tours are part of the virtual reality subject area (left). Interactive video tours can contain elements such as images, videos or panoramas (right).

3.2 Why we are using interactive Video tours

Virtual 360-degree tours have gained increasing importance in recent years and offer an innovative way to present and experience different topics interactively. WP3 aims to help e.g., teachers, scientific members or partners of the private sector to develop a concept for a virtual 360-degree tour that is both informative and engaging.

By using 360-degree technology, learners can immerse themselves in a virtual environment and explore landscapes and restoration measures from various perspectives. This allows them to develop a deeper understanding of ecological restoration and the interconnected aspects of the web of life called nature.

Virtual tours can also serve as a planning tool, helping conservationists, landscape architects, famers, foresters or ecologists to visualize their ideas and communicate with clients and stakeholders.

Furthermore, virtual 360-degree tours provide an opportunity to make the importance of ecological restoration accessible to a wider audience. By utilizing mobile devices and VR headsets, people who are unable to physically visit a locality can still participate in the exploration. This not only increases the reach and visibility of projects but also fosters general interest and understanding in importance and meaning of ecological restoration.

3.3. Didactic Possibilities

The didactic possibilities of VR are enormous. This technology promotes active learning by allowing users to interact directly with and explore content. Furthermore, VR simulates complex scenarios that would be difficult to reproduce in the real world. These interactive elements can increase learner engagement and motivation, making knowledge transfer more effective.

4. Online Training (Webinar)

4.1 Online training for teachers and students

An essential part of WP3 is to provide students and teachers with the tools to create and use their own interactive content.
To determine the country-specific requirements (previous knowledge, existing hardware and software, and expectations of the learning materials), surveys were conducted among students and teachers.
The feedback received will help with the future development of courses. Also based on the feedback from the surveys, courses are being developed that are aimed at beginners and advanced learners.

4.1.1 Students – basic training – Content creation with LUMI and H5P

The basic course teaches the theoretical and practical basics required to create simple VR applications in the form of interactive 360° panorama tours as part of an online course. The necessary technical understanding is taught in this basic course using the example of the content type "Interactive Tours" of the H5P software "LUMI". The necessary training materials, e.g., photos, panoramas, 360-degree panoramas, are provided. Students should learn to create virtual tours of demonstration sites, make them accessible online to a wider public and thus deepen their own knowledge, using with LUMI /H5P.

4.1.2 Students – advanced training – Creating interactive content based on Demonstration sites

As a demonstration task to prove the acquired practical competences, it is intended that the students independently create a simple interactive 360° panorama tour with the content type "Interactive Tours" of the H5P software for a specific demonstration site or best practice example for an ER measure/project as individual or group work. The concept or "story book" for the interactive 360° panorama tour is to be developed by the students, whereby the practical implementation of the ER measure/project using the demonstration site/best practice example is to be linked with theoretical principles for planning, production and monitoring.
The media (assets) required to create the 360° panorama tour should be created by the students themselves as part of excursions or taken and prepared from specialist literature and other sources.

4.1.3 Teachers – basic training – Content creation with LUMI and H5P

The basic course for teachers teaches the theoretical and practical basics required to independently create VR applications in the form of interactive 360° panorama tours with the "LUMI" software and to pass this knowledge on to the students. The basic course also includes a detailed introduction to "LUMI" and interaction with the "Absorb" learning management system. The materials required for this, e.g. photos, panoramas, 360-degree panoramas, are provided.

4.1.4 Teachers – advanced training – Creating interactive content with 3D-Vista

The advanced course for teachers introduces the 3D-Vista software, which offers numerous other options for creating interactive 360° panorama tours as a learning application for students.

4.2 LUMI and 3D Vista - a comparison

LUMI and 3D Vista are two software tools used in the field of interactive and immersive media, but they offer different focuses and functions.

4.2.1 LUMI

Focus

LUMI is an open-source software for creating interactive learning content based on the H5P standard. It enables the creation and integration of interactive elements such as quizzes, videos, presentations and other learning activities into an e-learning environment.

User-friendliness

LUMI is very suitable for beginners as it offers a simple user interface and requires no programming knowledge. The software guides the user through the process of creating interactive content with a variety of pre-built H5P modules, which makes creating simple tasks and content straightforward.

Possibilities

LUMI offers a wide range of interactive possibilities, but these are mainly designed for educational purposes. It does not support 3D content or complex tours but rather offers more linear learning interactions (e.g. quizzes, text links, drag-and-drop tasks). The software is particularly suitable for schools, universities and other educational institutions that want to provide interactive learning materials.

4.2.2 3D Vista

Focus

3D Vista is specialised software for creating virtual 360-degree tours, interactive 3D tours and presentations. It is often used for sophisticated and modern presentations (e.g. landscape architecture, medicine).

User-friendliness

The barrier to entry is a little higher with 3D Vista than with LUMI, as it is specialised software for 3D tours and the user interface is more extensive and complex. Nevertheless, there are many guides and templates to help beginners get to know the functions.

Possibilities

3D Vista offers a much wider range of design options for virtual tours. Users can integrate 360-degree images, videos, hotspots, text fields and other interactive elements. The software makes it possible to create highly detailed, immersive environments that can be viewed on mobile devices, VR headsets and web browsers.

4.2.3 Summary

User-friendliness

LUMI has a clear advantage here, as it is easier to use, and the functions are focused on educational content. 3D Vista requires more training but offers tutorials and templates to support the users.

Possibilities

3D Vista has greater reach, offering greater immersion, particularly useful in professional settings, and greater design possibilities. LUMI offers interactive content for learning, but without the immersive depth or 3D integration. LUMI is ideal for simple e-learning; 3D Vista is suitable for immersive tours and complex presentations.

	LUMI	**3D Vista**
Focus	interactive elements (quizzes, videos...)	specialised software for creating virtual 360-degree tours and interactive 3D tours
User-friendliness	suitable for beginners as it offers a simple user interface and requires no programming knowledge	the barrier to entry is a little higher than with LUMI, as it is specialised software for 3D tours and the user interface is more extensive and complex
Possibilities	a wide range of interactive possibilities but no 3D support	3D Vista offers a much wider range of design options for virtual tours. Users can integrate 360-degree images, videos, hotspots, text fields and other interactive elements.

Table 1: An overview of the LUMI and 3D Vista programmes.

4.3 Teach the Teachers – first steps with LUMI

The project partners' previous knowledge of the LUMI software varies greatly. To reach a uniform starting level, a webinar was created that allowed all interested parties to learn the basics of content creation with LUMI. An additional opportunity was offered at this year's Steering Committee Meeting in Budweis (Czech Republic). The presentation showed how to use a 360-degree camera to capture, edit and implement optimal image material in LUMI. A live demo also showed how to quickly and easily create the first interactive video tours.

4.3.1 Creating a webinar and materials for teachers, scientific members and partners of the private sector

The webinar aimed to provide partners with the knowledge and tools they need to create their own interactive content. To this end, the webinar was divided into a concept part and a practical part (each 60 minutes), which are described in more detail below.
The materials shown or used in the webinar (images, PDFs, slides) were made available to the participants and will be continuously updated as needed. The materials provided include:

- Demo Assets VR Content creation (2D and 360-footage), infographics, icons
- Slideshow with the concept part (short and full version)
- Video about the concept and practical part in English and national project languages
- Document/Script 'VR Scene Documentation'
- PDF Manual abut the first steps in LUMI (v. Dec 2024)

The webinars were held and recorded on 7 November 2024 (19 members) and 11 November 2024 (11 members). These recordings can also be used for training purposes at the partner schools.
After the respective lectures and demos, the participants from VET schools, science and the private sector had sufficient time to ask questions.

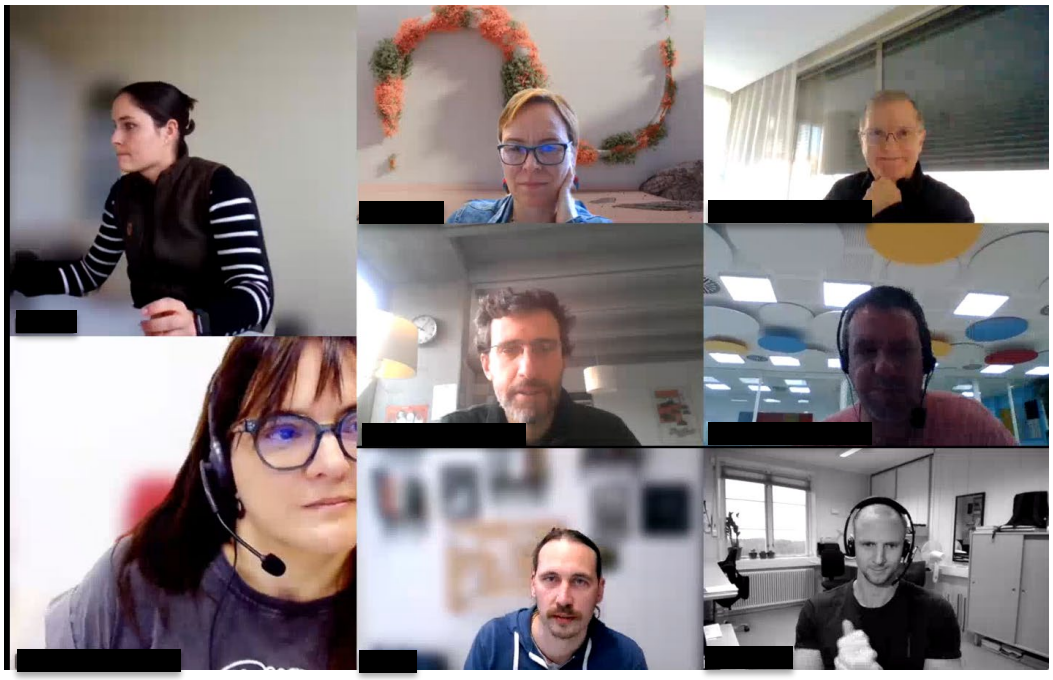

Figure 3: Participants in the first webinar on 7 November 2024.

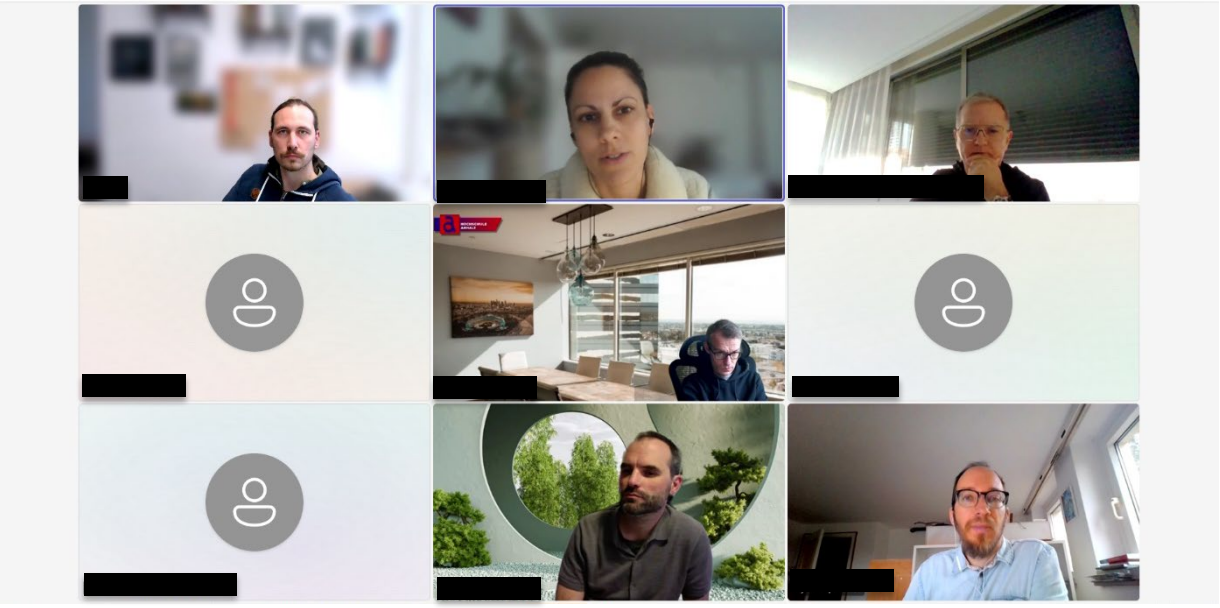

Figure 4: Participants in the second webinar on 11 November 2024.

Outline

1. Introduction
- What is VR and why to use it?
- Purpose of the Guide
- Importance of Virtual 360-Degree Tours in the Educational Landscape

2. Target Audience Analysis
- Identification of Target Groups
- Needs and Expectations of the Target Groups
- Segmentation of the Target Groups

3. Media Selection
- Technical Requirements and Platforms
- Interactive Elements and Multimedia Content
- Accessibility and User-Friendliness

4. Didactic Planning
- Define Learning Objectives
- Methods of Knowledge Transfer (Storytelling, Gamification)
- Plan the Structure and Layout of the Tour (Themes/Setting)
- Sequence (Logical, Coherent)
- Create a Storyboard for Complex Tours (Define Goals, Content, Suitable Elements)
- Develop (Interactive) Content

5. Addressing the Target Audience
- Communication Strategies
- Designing Content for Different Target Groups
- Feedback Mechanisms and Evaluation

6. Implementation and Technical Realization (**2nd Part**)
- Software and Tools for Creating the Tour
- Production of Content (Photos, Videos, Texts)
- Testing Phase and Adjustments, Revision Loops, Storyboard Adjustment
- Export, Integration into LMS

TEAMUP

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Figure 5: Webinar Outline

4.3.2 Conceptual Introduction

In this theoretical part of the webinar, we discussed the things that need to be done as preliminary work for the actual content creation. These included the topics:

Overview of virtual reality (VR):

Virtual Reality (VR) is a technology that creates a simulated, immersive environment using computer-generated graphics, sounds, and sometimes physical sensations. In our case, we use VR to bring various areas of ecological restoration to life. To do that we focus on interactive 360 Video Tours.

Why use VR:

Virtual tours in particular offer the opportunity to impart knowledge in a simple way. In a virtual world, complex issues can be conveyed, temporally divergent processes (seasons) can be depicted and places that are logistically difficult to access can be travelled to. This makes it possible, for example, to experience phenological processes or work on agricultural machinery and familiarise yourself with restoration measures.

Advantages and challenges of VR in knowledge transfer:

Virtual Reality (VR) offers significant advantages in knowledge transfer. By providing immersive learning experiences, VR allows students to engage in real-world scenarios across various contexts and safely conduct experiments that might otherwise be dangerous. This approach enhances retention and understanding in specific areas, as students can interact with complex concepts in a more meaningful way. Additionally, VR enables knowledge to be conveyed interactively and in a visually appealing format, which can boost learners' interest and motivation, making the educational experience both engaging and effective.

But there are several challenges associated with using Virtual Reality (VR) in education as well. One key issue is the exclusion of non-VR users; not all students are able to participate in VR-based activities due to factors such as motion sickness, visual impairments, or other limitations. Ensuring equal access for all students is essential. Additionally, the high costs associated with acquiring VR equipment can be prohibitive, especially for educational institutions in low-income areas. Another challenge is the lack of didactic concepts; concrete instructional designs and theoretical discussions on the use of AR/VR in education are still limited in research literature.

Target group analysis:

Target Audience Analysis in the educational context refers to the process of understanding the specific needs, characteristics, and preferences of the learners or students for whom a program, course, or teaching material is designed. This analysis

involves examining factors such as age, prior knowledge, learning styles, cultural background, motivations, and goals. By identifying these key traits, educators can tailor their instructional approaches, content delivery, and engagement strategies to better meet the needs of their students, improving learning outcomes and overall educational effectiveness.

Media selection with LUMI:

LUMI is an educational software that offers a variety of content types, primarily focused on creating interactive learning experiences. The Software is highly recommended for the creation of online courses on a basic level of complexity.
The LUMI software is used to visualise H5P content and is very well suited for getting started with content creation. Another advantage is that LUMI is basically free of charge.
At this point a short explanation of H5P: H5P (HTML5 Package) is an opensource tool that enables educators, designers and content developers to create, share and reuse interactive HTML5 content. It is commonly used to develop engaging learning activities such as quizzes, interactive videos, presentations, timelines and flashcards. H5P integrates easily with platforms such as Moodle or WordPress.

Didactic planning:

Didactic planning is a structured approach to designing educational experiences. Here are three key steps to guide you through the content creation process. First, define learning objectives by clearly identifying what learners should know or be able to do by the end of the session. Next, create a storyboard for complex tours (like a film script); for more intricate sessions, outline the goals, content, and elements such as visuals or interactive components to maintain clarity and focus. Finally, develop interactive content, crafting engaging materials like quizzes or simulations to encourage active participation and reinforce learning.

Didactic planning – an example:

VR allows restoration measures to be brought to life. But virtual reality is already an important aid in the preparation phase. The individual steps of planning, realisation and monitoring can be shown clearly in virtual space.

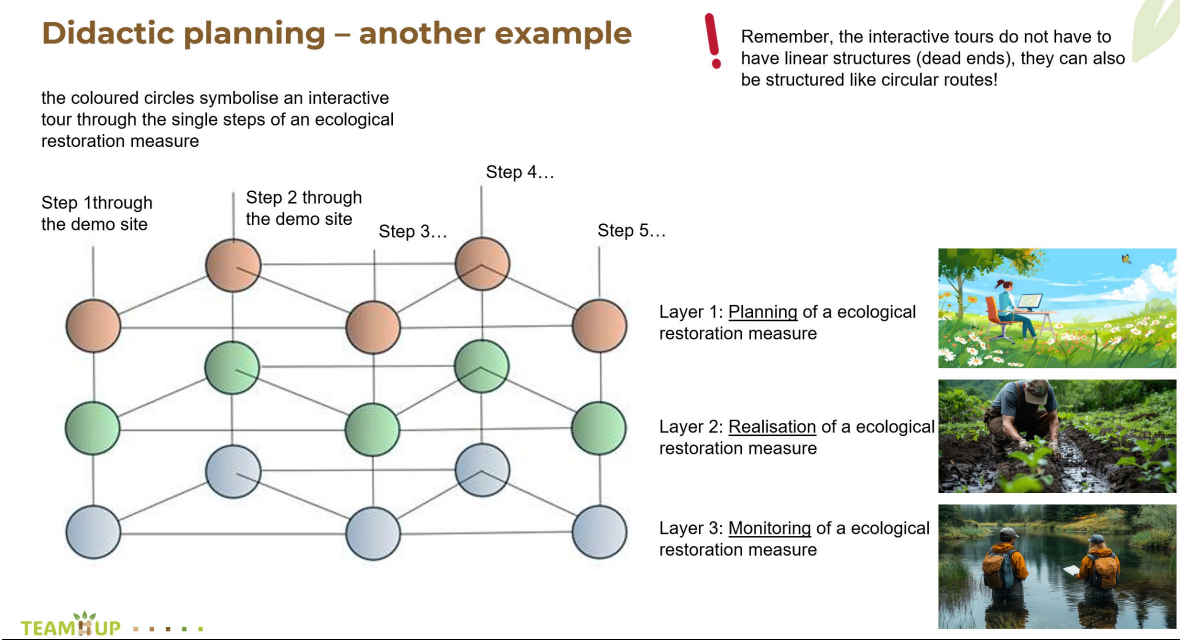


Figure 6: Virtual reality is a powerful tool for vividly demonstrating the individual phases of ecological restoration measures. Virtual tours can be used to plan these measures and bring them to life.

Organisation is half the battle – the importance of a script:

For a better understanding of the course, it is recommended to create a profile for each scene (see Annex I). This also provides structure and ensures a standardised procedure.

Addressing the target group:

When creating educational content, it's essential to tailor it to your target audience. Choosing the right topic is key to capturing their interest. Make the content as beginner-friendly and accessible as needed to ensure that it meets the learners' level. Additionally, gather feedback both before and after the courses and analyse it. This will help you gain insights into your audience and adjust the content to better suit the learners' needs.

4.3.3 Practical Teaching (How-to)

The centrepiece of the practical part was a live demo with LUMI. This demo showed how to create interactive video tours from scratch. First, the general structure of the software and the available content types were presented and a new LUMI project was created.

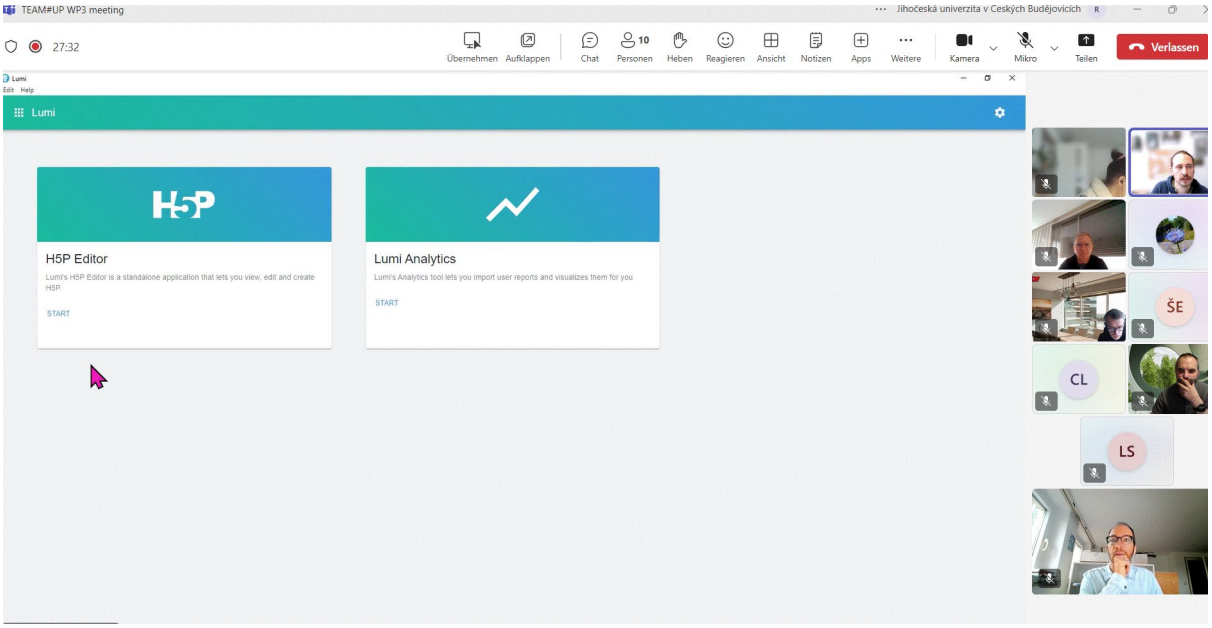


Figure 7: During the webinar, the various steps to create interactive content with LUMI were shown.

The focus of the following section was on creating so-called scenes (photosphere). The participants were shown how scenes can be created using 360-degree panoramas and how they can be filled with content. They also learned how the

respective scenes can be linked to one another and the possibilities that arise from this.
The final step was to discuss exporting as a SCORM package. The participants were informed about the special features and advantages of this data format.

The steps shown in the instructional video for creating interactive tours are described in a dedicated manual (Appendix 2).

5. Moving Forward with Interactive Video Tours & Content Development

After the foundations for the independent creation of learning content have been laid, the next few weeks and months will be spent on the follow-up steps. This includes creating professional VR tours using various demo sites as examples, with the help of the software 3D Vista. For this purpose, a webinar for teacher training will also be created, which will be structured similarly to the LUMI webinar.

The materials already created with LUMI will be expanded and filled with additional content to illustrate the topic of ecological restoration.

With this recorded webinar and training as a starting point, VET partners are now able to create their own interactive content and virtual tours to be used for teaching and placed in the OER. Please refer to the report on ecological restoration needs for an overview of learning objectives that could be developed using this interactive, virtual based software. For more information and the public version of Deliverable 2.1. “Report on Ecological Restoration Needs”, please visit the website https://teamup2restore.eu/

Annex 1-VR Documentation Fact Sheet

TEAM UP
Knowledge on Ecological Restoration to Maximize Benefits for Nature and People

VR Documentation Fact Sheet

Tour name:	
Layer number:	
Layer content/topic:	
Scene number:	
Scene name:	
Szene location:	
Learning objectives of the scene:	
Content:	**Media/Assets/Interactive elements:**
Hotspots for further scenes:	
No.:	***Titel:***
Special features/remarks/notes:	

Annex 2-PDF Manual-LUMI

This manual refers to Lumi version 0.9.4.0.

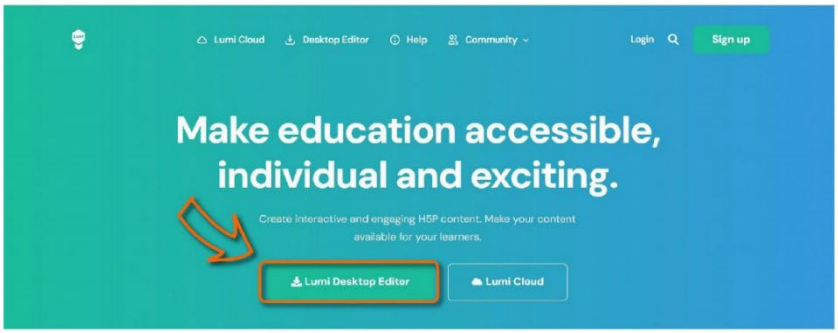
Manuel Lumi H5P – Virtual Tour (360)

We're excited to guide you through creating your very own Virtual Tour (360) using the Lumi Application! This PDF provides step-by-step instructions on how to download the application, set up your first scene, and customize your virtual tour experience. You'll learn how to add stunning 360-degree images, adjust camera angles, and ensure you include proper copyright information. Let's embark on this creative journey together!

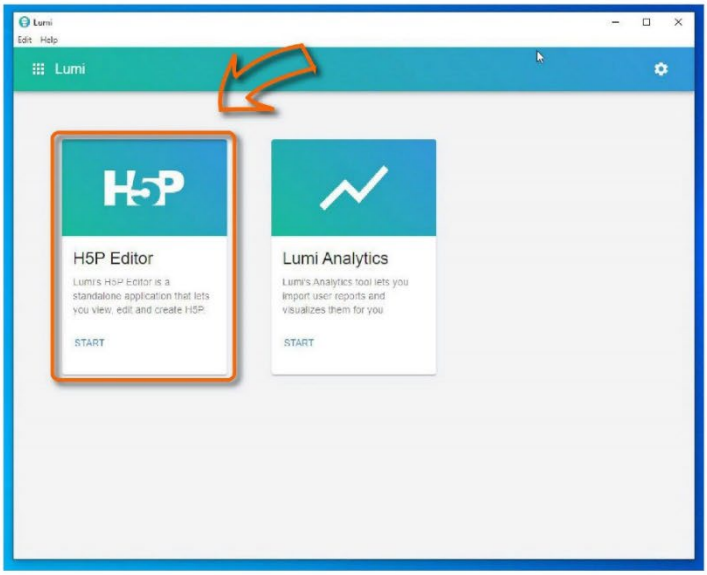
Visit the Lumi Webpage and download the Lumi Application.

The 360 degree pics to test the 360 Tour in H5P you can find here.

Link: https://lumi.education/en/



Then install it. Open the application and select the H5P Editor.



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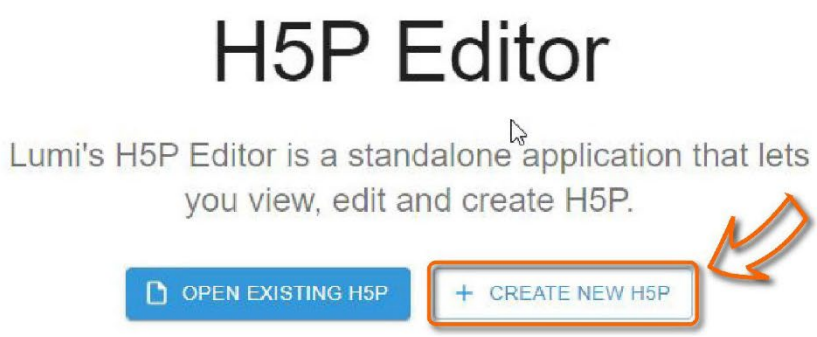
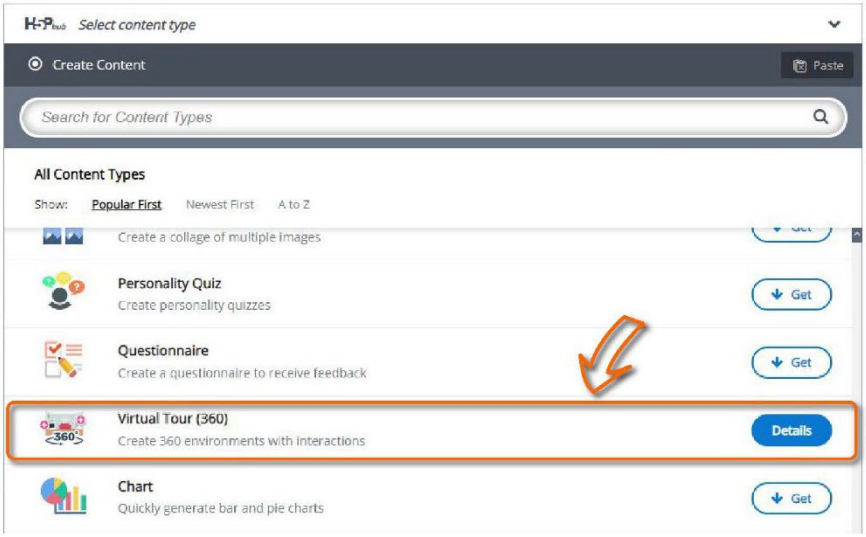
Select ´New H5P´ to create a new one.



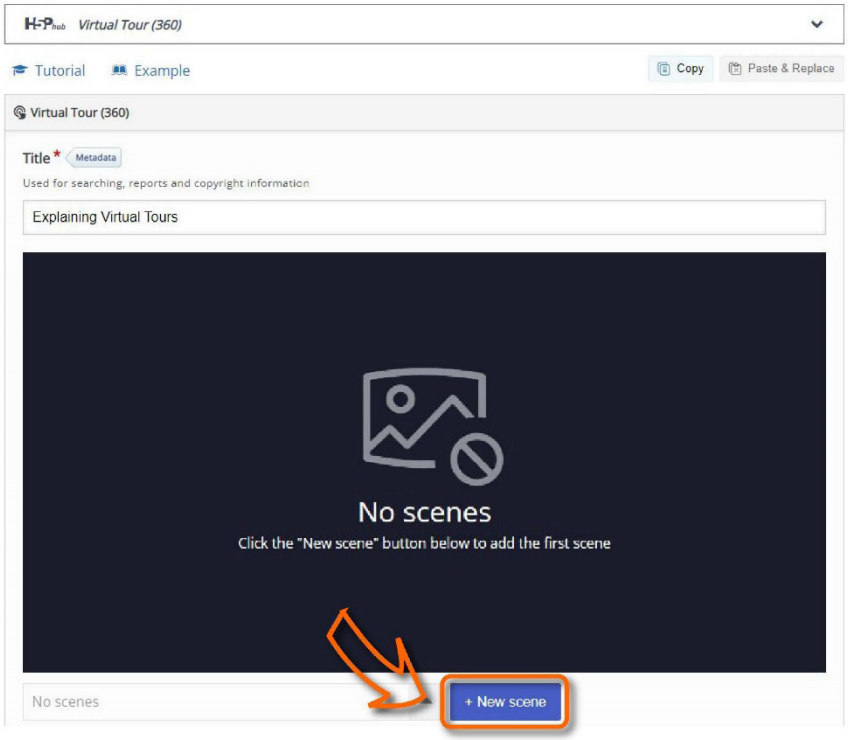
Choose the New content option and select Virtual Tour (360) from the list of Content types:



The Virtual Tour (360) editor should now appear. Add a title: "Explaining Virtual Tours".

2

The editor should look like this:



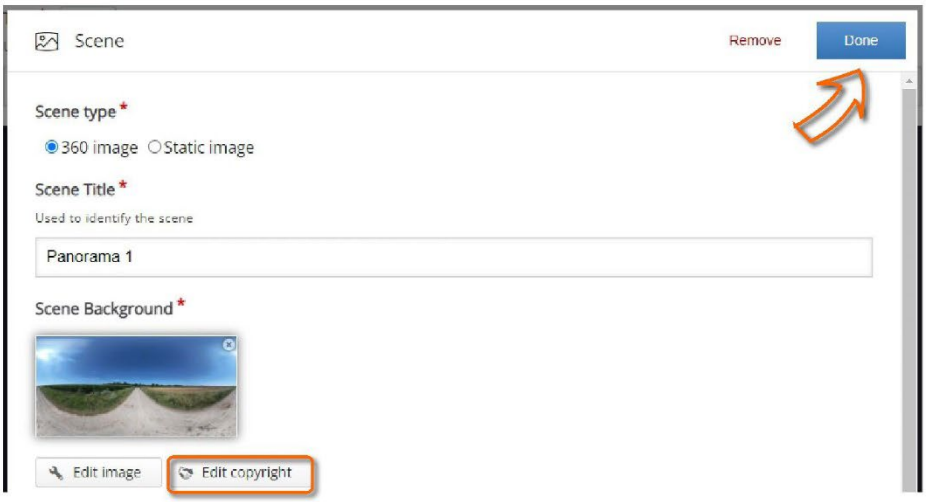
Adding your first 360 degree scene.

We are going to add our first 360 scene now. First, we need to download a background image. You can find some examples on following side: ###

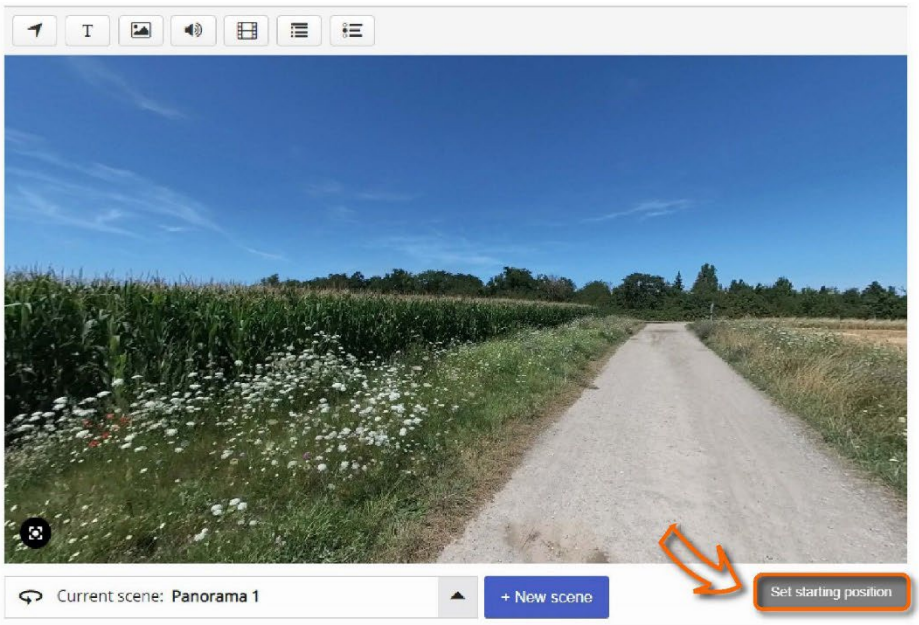
This is the image we'll use in our example:

To add a scene click "New scene" button. Type in the title of your Choice, in example ´Panorama 1´ and upload the background image. The scene popup should look like this:

3



Click "Done". You've added your first scene. Remember to include copyright information for the image. The editor should now resemble the following:



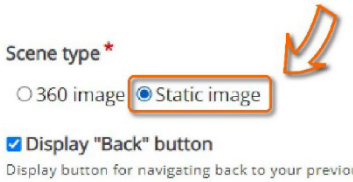
The starting camera angle is set by default. If you want to change the camera angle you can move the scene by dragging it with your mouse. Once you've set the view to your preferred starting angle, press the "Set starting position" button in the bottom right corner. Now, your scene will always start with this camera angle.

4

Add a second scene

This is the image we'll use for our second scene:

To add a second scene, follow the same steps as in the first scene. Click 'Done' when you are ready. If you want to add a **static scene**, ensure you choose the appropriate type of image.



Don't forget to fill in the copyright information.

Comparison between Static Images and 360-Degree Images

1. Perspective and Viewing Experience

- Static Images: Provide a fixed perspective, directing focus and ideal for controlled presentations.
- 360-Degree Images: Offer an immersive exploration from all angles, creating a sense of presence.

2. Interaction

- Static Images: Require no interaction; viewers observe passively.
- 360-Degree Images: Demand active navigation using a mouse, touchscreen, or VR headset.

3. Technical Requirements

- Static Images: Easy to capture with standard cameras; require less processing power and storage. Accessible for beginners.
- 360-Degree Images: Require specialized equipment and more storage and processing power. More complex to produce.

5

4. Emotional Impact

- Static Images: Can evoke strong emotions through specific focus and composition.
- 360-Degree Images: Create a sense of exploration and connection with the scene.

5. Scientific Perspective

- Static Images support learning by keeping text and images close together.
- 360-Degree Images enhance learning through physical interaction and provide authentic contexts.

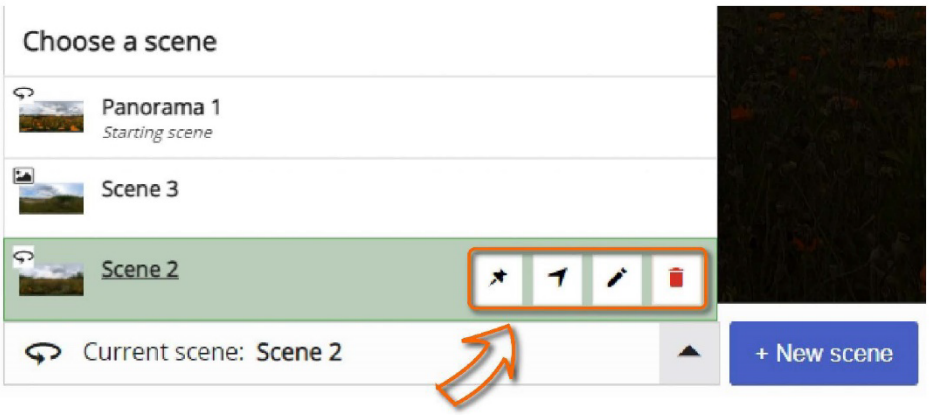
Conclusion

Static images excel in simplicity and artistic focus, while 360-degree images offer interactivity and immersion. The choice depends on the purpose, audience, and desired engagement level.

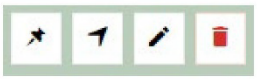
Navigation between scenes

We currently have three scenes set up. To move between scenes, click on the dropdown menu located in the bottom left corner that displays "Current scene...". This will open the Scene Selector, where you can view all the scenes you have created so far.

Here's what it looks like:



Screen selector buttons:

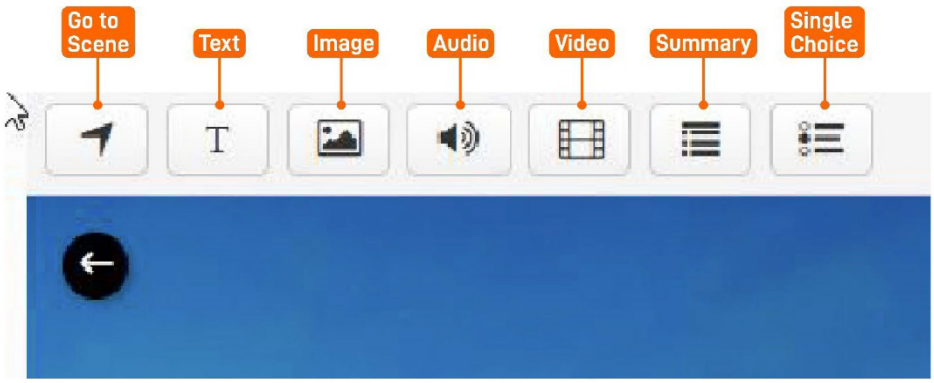


We'll explain each part of a scene selector:

	Icons above the image	This icon indicates if the scene is static or 360.
	Green outline and green background	This is how we mark the currently selected scene (the one we are working on now)
	"Set as starting scene" button	Click here to set this scene as the starting scene for your content. The Starting scene is the first scene end user sees.
	"Go to scene" button	Click this to open the scene
	"Edit" button	Click this to edit the scene (Background, Title, Description, etc.)
	"Delete" button	Click this to delete the scene

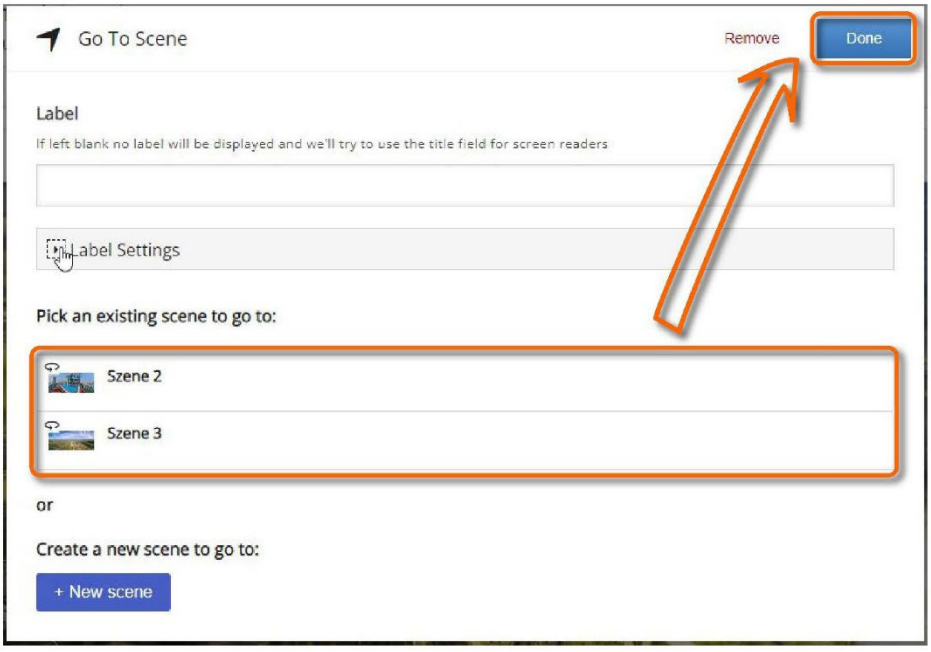
Connect scenes together

You can connect scenes together by using the scene selector. To allow users to navigate from scene to scene, you need to add navigational elements. These elements can be created using the "Go to scene" tool, which is located in the top menu.



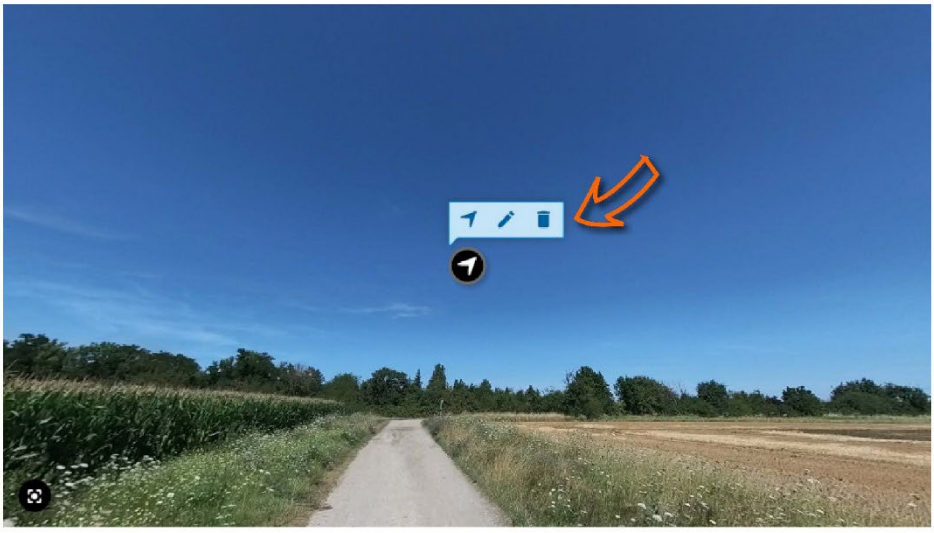
7

Let's create some navigation. Click on the scene selector and go to our 1st scene. We want to create navigation from this scene to scene #2. Click on the "Go to scene" icon in the top menu. A dialog like this will appear:



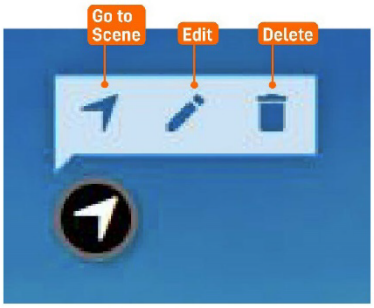
Click on the scene you want to connect to´, name it if you want and click ´Done´.

The navigation arrow will now appear in your panorama:



8

The user will click this button to transition from scene #1 to scene #2. You can move this element by dragging it within the scene. When you click on it, a context menu will appear (as shown in the image above).



1st option "Go to scene" will navigate (open) the scene that the "Go to" object leads to

2nd option will edit the "Go to" object itself

3rd option will delete the "Go to" object itself

Optional: Re-linking of the other scenes

Now we want to create navigation from scene #2 to scene #1. Click on the scene selector and go to the 2nd scene.

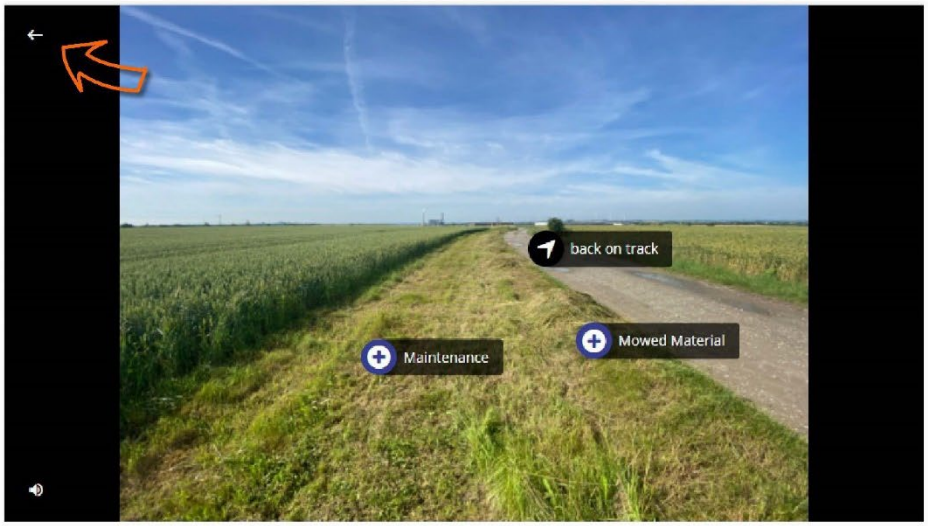
Click on the "Go to scene"  icon in the top menu, select "Scene 01" and click done.
Now we have navigation both from scene #1 to scene #2 and vice versa.

The last navigation element we want to add is from scene #1 to scene #3 (static scene). Click on the Scene selector and pick scene #1. Click on the "Go to scene"  icon in the top menu, select "###" and click done. We've got one additional "Go to scene" element in our scene #1. It should look like this:

Optional: Pic with two Navi-Arrows

As you can see, this scene has a "Back" button in the top left corner:

9



It's also possible to turn this "Back button" off and create a "Go to scene" element by yourself instead.

Add interactions

Now, we will add more interactions to our static scene:

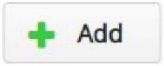
image for specifying information's

Text element with information's

An related video

We are going to add some interactions to our scenes now. First, we will add one image interaction to scene #2.

Therefore navigate to scene 2 and click on the  icon. Now you can upload your image

by the 

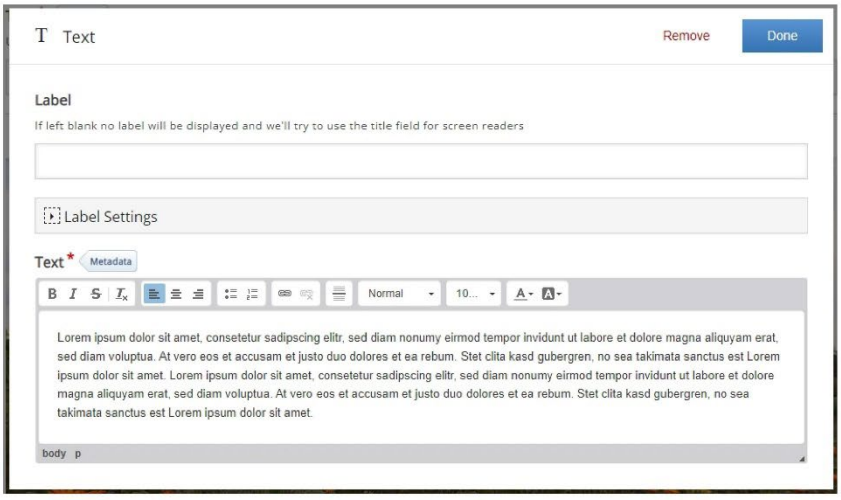
Button. Filling out the licensing information's for the picture.

To do so, click the

Button. Click "Done". You've added your first interaction. Drag it around by click and hold to position it as shown here:

10

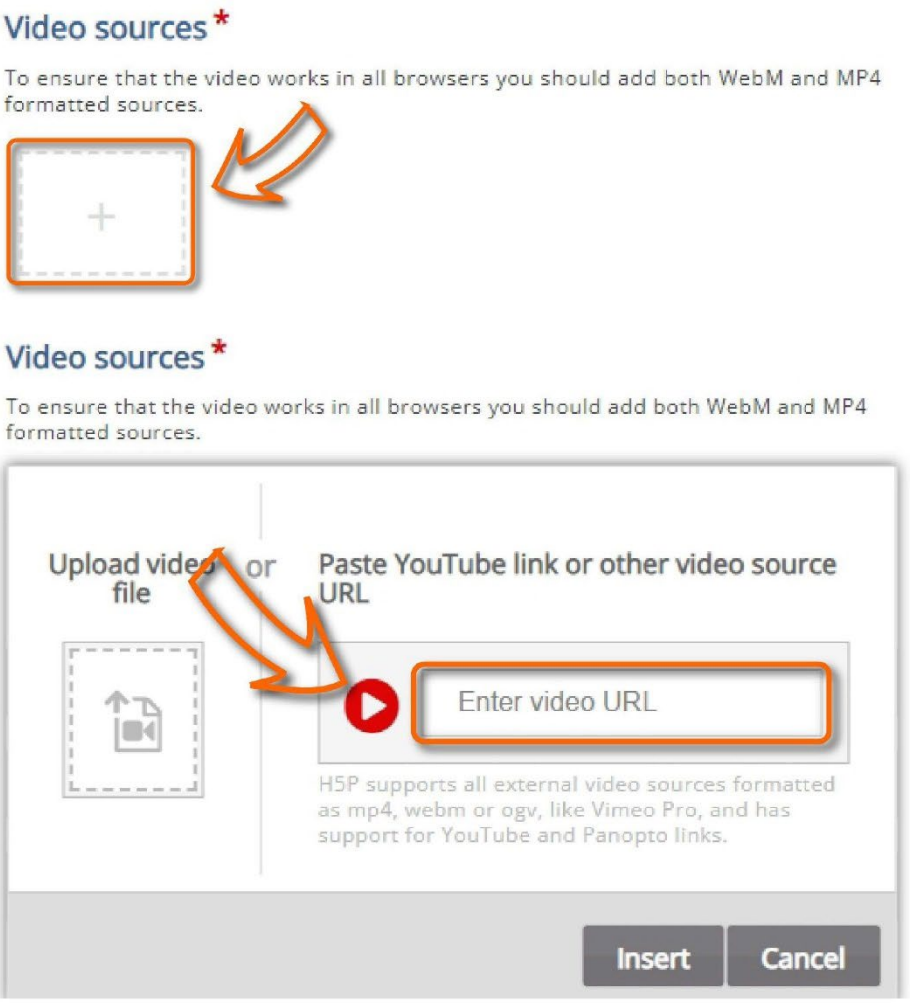
Click on the T icon in the top menu. A dialog will appear. Copy the text above and paste it into the dialog, it should look like this:



After clicking ´Done´ the interaction button should appear in the middle of the scene - Drag it to your desired position.

Now we will add some video to our tour. Click on the Button in the upper menu. In the appearing dialog title the video and ad the source.

11



Drag the button to its position. Done. To ensure the video works in all browsers you should use the mp4 format. To avoid long time loading take care, the video is not too big.

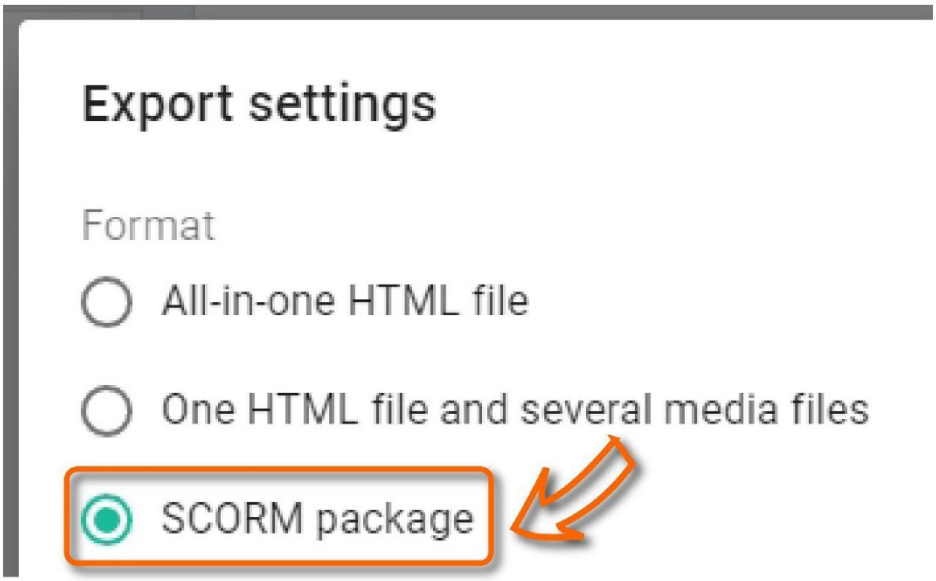
12

Finishing your Virtual Tour

Save your Virtual tour to your computer by clicking the ´file´ menu and selecting ´save as´ button in the menu on top.

To export your h5p file to SCORM use the ´export´ function in the same menu.

Choose `SCORM package' and hit EXPORT NOW .



Now you can use the finished tour in a Learning System of your choice - have fun with creating Virtual Tours in H5P with LUMI.

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Annex 3-Didactic Planning examples

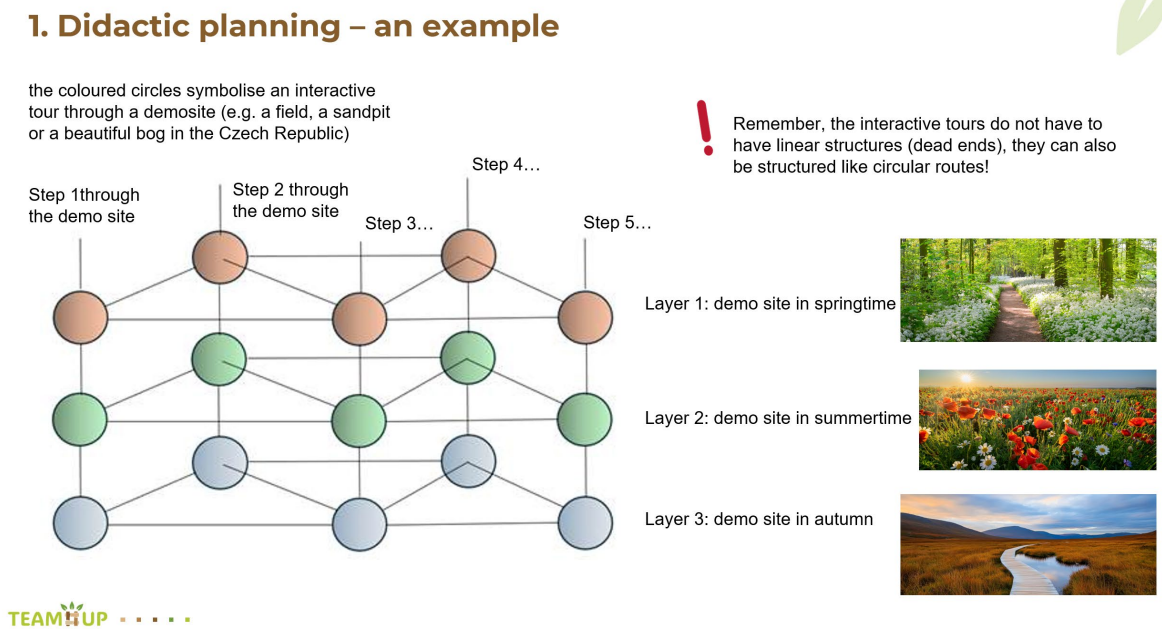


Figure 8: Virtual reality can be used, for example, to accelerate phenological processes. This makes it possible to show the demo sites over the course of the year.

2. Didactic planning – another example

Remember, the interactive tours do not have to have linear structures (dead ends), they can also be structured like circular routes!

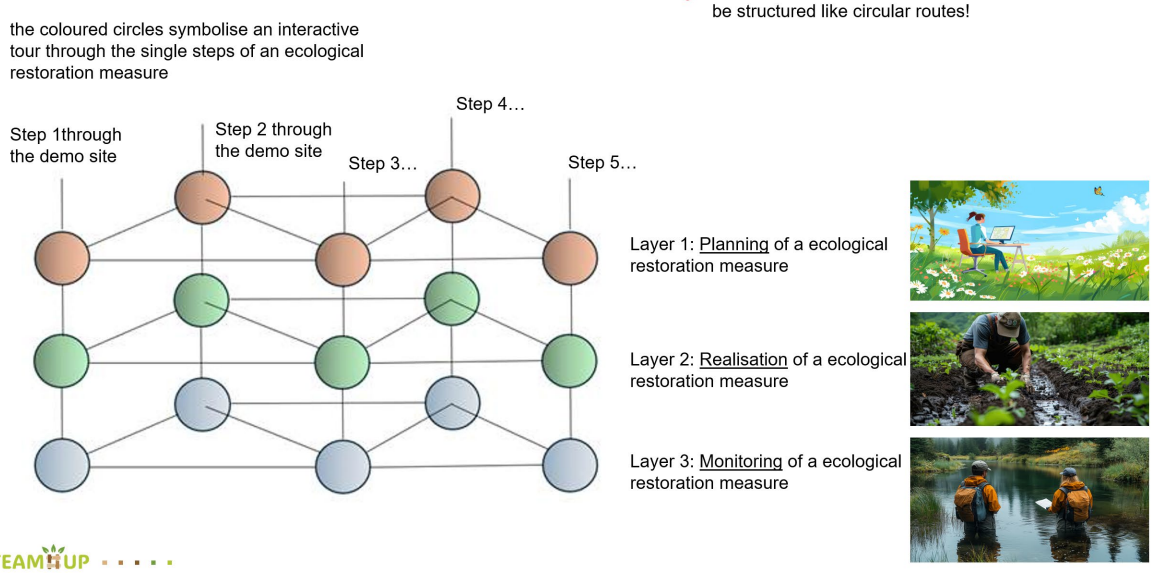


Figure 9: Planning, realisation and monitoring are essential work steps in restoration measures. These can be visualised and brought to life via virtual reality.

3. Didactic planning – another another example

Remember, the interactive tours do not have to have linear structures (dead ends), they can also be structured like circular routes!

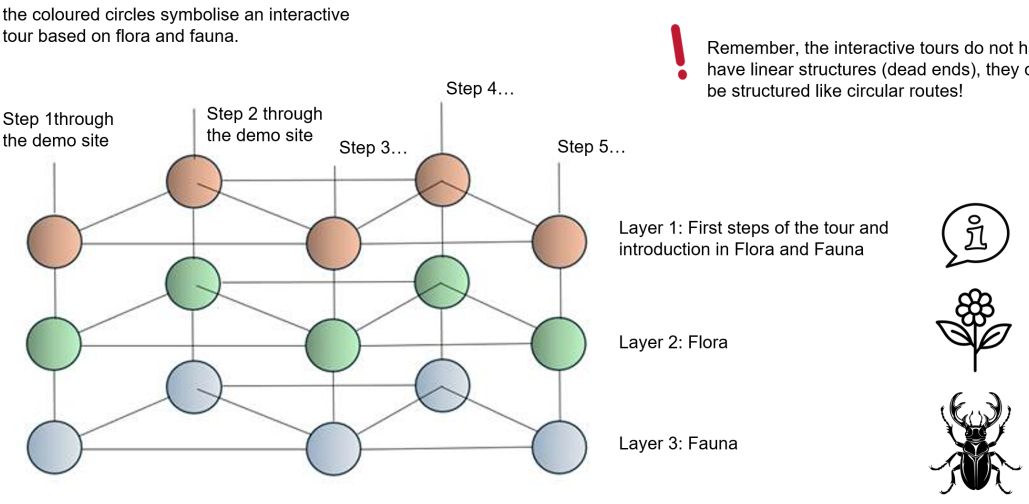


Figure 10: Virtual reality allows different topics to be linked together. For example, content from flora and fauna can be combined and brought closer to the audience.

Annex 4-VR Training Concept slides

HOCHSCHULE ANHALT University of Applied Sciences

Co-funded by the European Union

TEAM UP

Knowledge on Ecological Restoration to Maximize Benefits for Nature and People

Online course on V(irtual) R(eality)-documentation

November 2024

Online course on V(irtual) R(eality)-documentation

Part 1: Concept phase

Outline

1. Introduction
- What is VR and why to use it?
- Purpose of the Guide
- Importance of Virtual 360-Degree Tours in the Educational Landscape

2. Target Audience Analysis
- Identification of Target Groups
- Needs and Expectations of the Target Groups
- Segmentation of the Target Groups

3. Media Selection
- Technical Requirements and Platforms
- Interactive Elements and Multimedia Content
- Accessibility and User-Friendliness

4. Didactic Planning
- Define Learning Objectives
- Methods of Knowledge Transfer (Storytelling, Gamification)
- Plan the Structure and Layout of the Tour (Themes/Setting)
- Sequence (Logical, Coherent)
- Create a Storyboard for Complex Tours (Define Goals, Content, Suitable Elements)
- Develop (Interactive) Content

5. Addressing the Target Audience
- Communication Strategies
- Designing Content for Different Target Groups
- Feedback Mechanisms and Evaluation

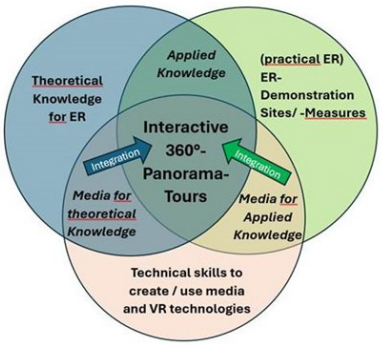
6. Implementation and Technical Realization (**2nd Part**)
- Software and Tools for Creating the Tour
- Production of Content (Photos, Videos, Texts)
- Testing Phase and Adjustments, Revision Loops, Storyboard Adjustment
- Export, Integration into LMS

Introduction

Overview Virtual Reality

Specific questions on teaching skills and the use of virtual reality in the TEAM#UP project

One of the set learning objectives in the TEAM#UP curriculum is the visualization of demonstration sites using virtual reality (VR) or augmented reality (AR). This means: "Students are able to create virtual tours of demonstration sites, make them accessible online to a wider public and thus deepen their own knowledge."

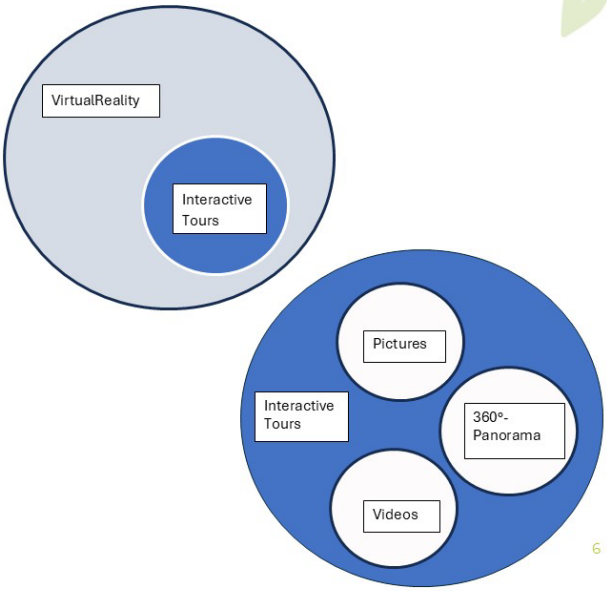


Why using Virtual Reality?

Virtual reality (VR) is full of possibilities. Possibilities that leave earthly boundaries and limitations behind. VR has enormous potential, especially when combined with education and as an interactive teaching method.

Virtual tours in particular offer the opportunity to impart knowledge in a simple way. By immersively traversing a virtual world, complex issues can be conveyed, temporally divergent processes (seasons) can be depicted and places that are logistically difficult to access can be travelled to.

This makes it possible, for example, to experience phenological processes or work on agricultural machinery and familiarise yourself with renaturation measures.



Why using Virtual Reality?

The use of Augmented Reality (AR) and Virtual Reality (VR) in education has gained increasing importance in recent years. Studies show that these technologies can offer advantages over traditional teaching methods:

- A meta-analysis by Villena-Taranilla et al. (2022) found a significant improvement in learning outcomes through the use of VR in education.
- McGovern et al. (2019) found that VR can be advantageous in certain educational settings and even surpass traditional teaching methods when assessing communication skills.

However, the authors also highlight the need for further research to determine the exact impact of VR on education.

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Advantages and challenges of VR in Knowledge Transfer

Advantages of VR in Knowledge Transfer

- Immersive Learning Experiences: VR allows students to access real-world experiences in a variety of contexts and conduct dangerous experiments in a safe environment.
- Improved Retention and Understanding: The use of VR can enhance learning in certain areas and promote students' understanding.
- Interactive and Visual Knowledge Transfer: VR enables content to be presented interactively and visually appealingly, which can increase learners' interest and motivation.

Challenges

- Exclusion of Non-VR Users: Not all students can participate in VR-based activities due to motion sickness, visual impairments, or other reasons. It is important to ensure equal access for all students.
- High Costs: Acquiring VR equipment can be costly for educational institutions, especially in low-income areas.
- Lack of Didactic Concepts: Concrete didactic designs and theoretical discussions on the use of AR/VR in education are still scarce in the research literature.

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Target Audience Analysis

Target audience analysis

Target Audience Analysis in the educational context refers to the process of understanding the specific needs, characteristics, and preferences of the learners or students for whom a program, course, or teaching material is designed.

This analysis involves examining factors such as age, prior knowledge, learning styles, cultural background, motivations, and goals.

By identifying these key traits, educators can tailor their instructional approaches, content delivery, and engagement strategies to better meet the needs of their students, improving learning outcomes and overall educational effectiveness.

tl;dr:
- Identification of Target Groups
- Needs and Expectations of the Target Groups
- Segmentation of the Target Groups

Media Selection

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Media selection

Not everything that is possible has to be used. Rather, the technical implementation should support the transfer of knowledge and the media tools should be used in a targeted manner.

Bulletpoints to keep in mind:

- Technical Requirements and Platforms
- Interactive Elements and Multimedia Content
- Accessibility and User-Friendliness

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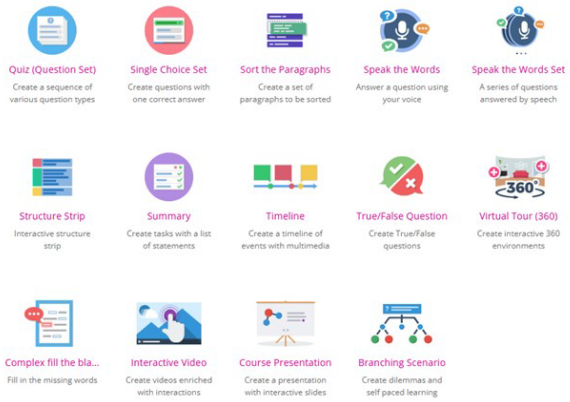
Media selection with LUMI

LUMI is an educational software that offers a variety of content types, primarily focused on creating interactive learning experiences. The Software is highly recommended for the creation of online courses on a basic level of complexity.

Content types LUMI has to offer (selection)
See the full list of content types here:
Examples and Downloads | H5P



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Didactic planning

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Didactic planning

Didactic planning is a structured approach to designing educational experiences. Here are a brief explanation based on bullet points:

1. **Define Learning Objectives:** Clearly identify what learners should know or be able to do by the end of the session.

2. **Methods of Knowledge Transfer:** Use techniques like storytelling or gamification to make learning engaging and relatable.

3. **Plan the Structure and Layout of the Tour:** Organize the learning experience by selecting relevant themes and settings that support the learning objectives.

4. **Sequence:** Ensure that the content is presented in a logical and coherent order to build understanding step by step.

5. **Create a Storyboard for Complex Tours:** For more intricate sessions, outline the goals, content, and elements like visuals or interactive components to maintain clarity and focus.

6. **Develop (Interactive) Content:** Craft engaging content, such as quizzes or simulations, to encourage active participation and reinforce learning.

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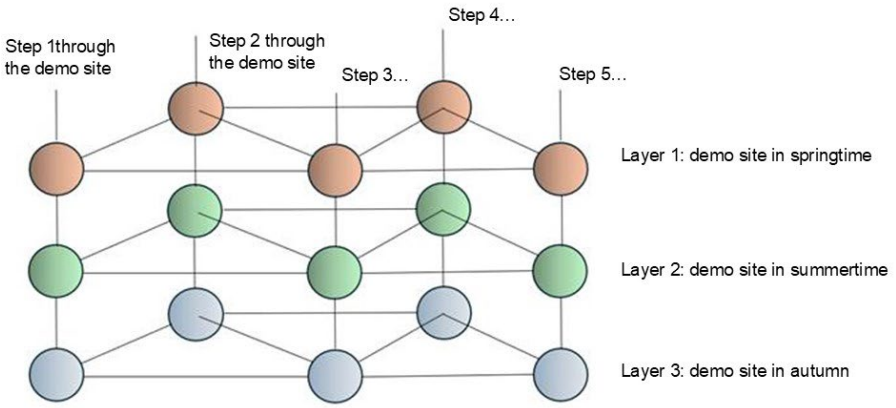
1. Didactic planning – an example

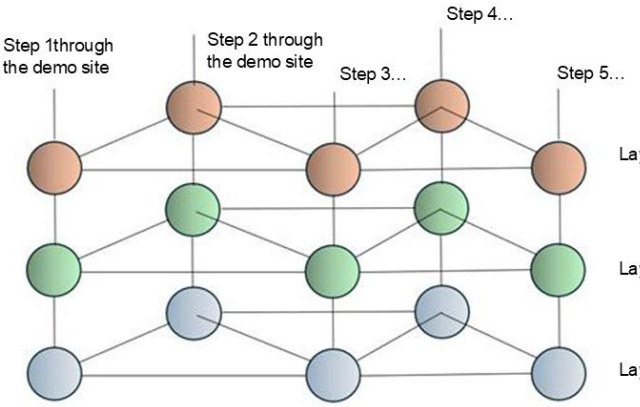
the coloured circles symbolise an interactive tour through a demosite (e.g. a field, a sandpit or a beautiful bog in the Czech Republic)



16

1. Didactic planning – an example

the coloured circles symbolise an interactive tour through a demosite (e.g. a field, a sandpit or a beautiful bog in the Czech Republic)



Remember, the interactive tours do not have to have linear structures (dead ends), they can also be structured like circular routes!

Layer 1: demo site in springtime

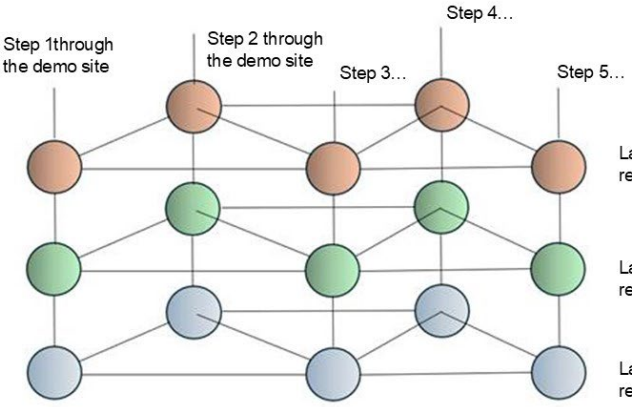
Layer 2: demo site in summertime

Layer 3: demo site in autumn

2. Didactic planning – another example

Remember, the interactive tours do not have to have linear structures (dead ends), they can also be structured like circular routes!

the coloured circles symbolise an interactive tour through the single steps of an ecological restoration measure



Layer 1: Planning of a ecological restoration measure

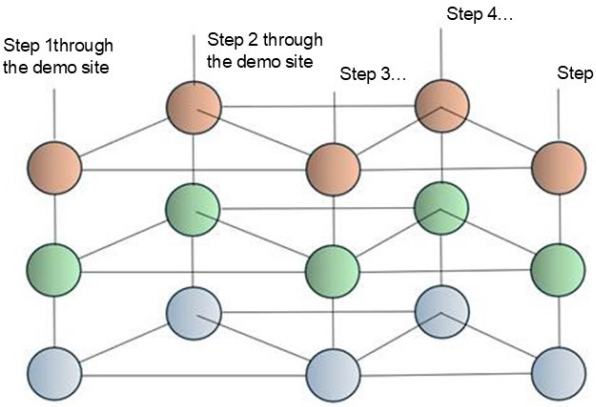
Layer 2: Realisation of a ecological restoration measure

Layer 3: Monitoring of a ecological restoration measure

3. Didactic planning – another another example

the coloured circles symbolise an interactive tour based on flora and fauna.

Remember, the interactive tours do not have to have linear structures (dead ends), they can also be structured like circular routes!



Layer 1: First steps of the tour and introduction in Flora and Fauna

Layer 2: Flora

Layer 3: Fauna

Didactic planning – Order is half the battle

For a better understanding of the course, it is recommended to create a profile for each scene. This also provides structure and ensures a standardised procedure.

A template of the profile will be made available to you as a PDF and .docx file.

Tour name:	
Layer number	
Layer content/topic	
Scene number:	
Scene name:	
Szene location:	
Learning objectives of the scene	
Content	**Media/Assets/Interactive elements**
Hotspots for further scenes:	
No.:	***Titel:***
Special features/remarks/notes	

Adressing the target audience

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Addressing the Target Audience

- **Communication Strategies:** Tailor messages to the specific needs, preferences, and behaviors of your audience using appropriate channels, tone, and style to effectively engage them.
- **Designing Content for Different Target Groups:** Adapt content in terms of language, format, and visuals to match the demographic, interests, and consumption habits of each target group, ensuring relevance and resonance.
- **Feedback Mechanisms and Evaluation:** Implement tools like surveys, social media polls, and analytics to gather audience feedback, measure the effectiveness of your communication, and adjust strategies accordingly.

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Thank you for your attention!

TEAM#UP
Knowledge on Ecological Restoration to Maximize Benefits for Nature and People

HOCHSCHULE ANHALT University of Applied Sciences

For more information:

www.teamup2restore.eu
#TeamUp2Restore

Co-funded by the European Union

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