



**OLMEdu**

**OLMEdu: Open Lab for the up skilling of higher educational staff in on-line Management Education**

**I03 Toolbox for developing on-line simulations in management education**

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## Table of Contents

<b>Table of Contents .....</b>	<b>2</b>
<b>IO3 A1 Research and Analysis of Open Source Simulation Tools.....</b>	<b>4</b>
<b>1. Desk Research and Overview of the Open-Source Digital Tools.....</b>	<b>4</b>
1.1. Introduction .....	4
1.2. Open-Source Simulation Tools: Definitions .....	5
1.3. Defining Simulation Tools .....	6
<b>2. Storytelling.....</b>	<b>6</b>
2.1. Knight lab .....	7
2.2. Timeline JS .....	7
2.3. StoryMap JS – Maps that tell stories. ....	8
2.4. StoryJumper.....	9
2.5. Digital Storytelling, Google Slides or Microsoft PowerPoint .....	10
2.6. Twine.....	11
2.7. Scratch.....	12
2.8. Inklewriter.....	13
2.9. Yarn .....	14
2.10. TextureWriter .....	16
2.11. flowSVG .....	16
<b>3. Augmented Reality / Virtual Reality / Media Editors..</b>	<b>17</b>
3.1. Marzipano.....	18
3.2 Pannellum .....	19
3.3 Krpano .....	20
3.4 ForgeJs.....	21
3.5 GuriVR .....	22

3.6 H5P .....	23
<b>4. Virtual Worlds (3D) and Game Engines .....</b>	<b>24</b>
4.1 Open Simulator .....	25
4.2 OpenSpace3D .....	26
4.3 Quest .....	27
<b>5. Conclusions: Open Source Tools Desk Research .....</b>	<b>29</b>
Annex 1 Scenario Example from GrantXpert .....	29
<b>IO3.A2 Design and Development of a Simulation</b>	
<b>Tool .....</b>	<b>30</b>
<b>6. The OLMedu Toolkit.....</b>	<b>30</b>
6.1 Overview .....	30
6.2 Education Management Scenarios.....	32
6.3 Low-Fidelity Prototype.....	38
6.4 Education Scenario Definition.....	40
6.5. Decision making skill in Management.....	41
6.6. Narrative Script – Decision making skill in Management.....	42
<b>IO3.A3 Toolbox Integration .....</b>	<b>46</b>
7. The OLMedu Tool .....	46
<b>IO3.A4 Piloting Use of the Toolbox .....</b>	<b>57</b>
8. Protocol for the OLMedu Piloting .....	57
9. Results of the Pilot Testing in partner countries.....	59
<b>IO3.A5 Translations and Adaptations of the</b>	
<b>Toolbox .....</b>	<b>72</b>
<b>7. Conclusions: The OLMedu Toolkit.....</b>	<b>73</b>
<b>References .....</b>	<b>75</b>

# IO3 A1 Research and Analysis of Open Source Simulation Tools

## 1. Desk Research and Overview of the Open-Source Digital Tools

### 1.1. Introduction

In the digital era many stakeholders (European and National educational bodies, policy-makers, educators, researchers in management education) have emphasized the contribution of educational technologies and many digital tools to improving the educational procedure. As a result, many educators have been engaged with these learning activities and even more during Covid 19. The pandemic has created challenges in the teaching-learning procedure in Higher Education Institutions (HEIs) and has influenced the engagement of teachers and students. Furthermore, and as a consequence of the pandemic, HEIs were constrained to carrying out their educational process with students exclusively online. Higher Educational Staff (HES) are confronted with the need to adapt the online teaching-learning process and semester examinations. Therefore, it is time to rethink gravely on this matter with emphasis on use of online education and need to adjust HE management education and improve the on-line educational strategies to meet the students' expectations. This document comprises a Desk Research and Overview of the Open-Source Digital Tools that can be used in online HE training and educational technologies, with explicit focus on education management education and the ability to carry out online education management education scenarios that usually are carried out in the classroom. COVID-19 pandemic, is both creating challenges and providing opportunities to support community voices and empower citizens.

#### Acronyms

HE – Higher Education

IO – Intellectual output

OL – Output Leader

HEI: Higher Education Institute

ME: Management Education

VET: Vocational Education and Training

HES: Higher Education Staff

## 1.2. Open-Source Simulation Tools: Definitions

At the moment, digital transformation has become one of the most important educational trends, especially when taking into consideration the current unpredictable situation with the pandemic that's occurring worldwide. Due to this shift in online learning it is easier to gain knowledge and complete tasks from any part of the world when the access to education is easy, fast and constant. The response to the latest requirements of the educational sector are eLearning tools and many educational institutions advise students to opt for open-source software for their learning process. Open-source tools for the OLMedu project could provide educators and students the freedom to teach and learn without restrictions. It is a fact that nowadays open-source software can help everyone deliver better results. At the same time, it is undeniable that with the rise of COVID-19 pandemic the need for open source data and applications has been more demanding than ever before. From document sharing to help desk needs, the pandemic has only increased demands on IT teams. The Open source tools provide unique advantages at difficult times like this.

Open-source tools are software tools that can be used without incurring any fees and/or extended with additional features depending on the actual license they are distributed. The various types of open-source tools allow developers and users to complete specific tasks in programming, maintaining technologies or other types of technological activities. Open source has made big inroads in consumer communities as well. Most common example of an open source tool is the Mozilla Firefox which is mainly a free download browser with its own appeal to the user community, as well as the Linux operating system. (techopedia, 2019)

Open-Source Tools have many advantages as listed below:

- 1) security wise, open source tools ensure that learner's and educator's sensitive personal information and their data are protected. Open-source tools ensure that the learner can gain full control over confidential data and it's considered as a safeguard for potential threats.
- 2) open source tools are cost-efficient and in contrast to many other software, you do not have to pay for it or you may only pay if you require support. Since the price of a software can range, it is equally important for teachers, students and educational establishments. Students might not be able to spend enormous budgets for IT equipment and infrastructure and this is why they usually prefer free open-source software, instead of expensive ones.
- 3) the flexibility that open-source products provide is a big asset since they can easily add extra features, e.g., for teaching and learning, bring in new ideas and functionality and be combined with other open-source tools. As a result, open-source tools can help students and teachers achieve great results in the digital education process.

***Open source is a term that originally referred to open source software (OSS). Open source software is code that is designed to be publicly accessible—anyone can see, modify, and distribute the code as they see fit. (Red Hat , 2021)***

### 1.3. Defining Simulation Tools

To examine the ways that HES can deliver good quality of online learning, this report identifies the most relevant open source simulation tools that enable innovative technology learning, teaching and assessment strategies. A simulation tool or simulation software is defined as:

“Simulation is the imitation of the operation of a real-world process or system over time. The act of simulating something first requires that a model be developed; this model represents the key characteristics or behaviors of the selected physical or abstract system or process. The model represents the system itself, whereas the simulation represents the operation of the system over time.” (The simulation society, 2021)

When someone is using intuitive simulation software he can build a visual mock-up of a process, similar to the creation of a flowchart. By adding timings and rules around the tasks, resources and constraints that make up your system, the simulation can accurately represent a real process. Simulation offers a powerful, evidence-based approach to decision making - by using a virtual representation to test the impact of process changes and 'what-if' scenarios, you can find an approach that delivers the best results. There are different types of simulation tools as these are described in the following section (Simul8, 2021).

***Simulations are usually computer-based, using a software-generated model to provide support for the decisions of managers and engineers as well as for training purposes. Simulation techniques aid understanding and experimentation, as the models are both visual and interactive. (TWI, 2021)***

## 2. Storytelling

Storytelling is the conveying of events in words, and images, often by improvisation or embellishment. Stories or narratives have been shared in every culture as a means of entertainment, education, cultural preservation, and to instill moral values. Stories are presumed to simultaneously convey information, explain problems and evoke emotions (Fischer, et.al., 2020). Crucial elements of stories and storytelling include plot, characters, and narrative point of view. Storytelling is about using stories to engage an audience, or a way to present something clearer. Photos, pictures and film of course really help to tell a good story as well. A digital story with the use of storytelling is a powerful tool.



Figure 1 Digital Storytelling Illustration

More to the point and as defined in [16]:

“Simulations allow students to act as protagonists of hypothetical stories, and by doing so, students build invaluable skills that prepare them for today’s complex workforce. Simulations combine the power of digital storytelling with project-based learning. Students are able to make connections between the concepts they are taught in class and the real world.”

Based on the above definition and concept of storytelling, the desk research performed in this work has identified storytelling simulation tools as defined below.

## 2.1. Knight lab

**Description:** The Knight lab offers a variety of open-source tools for education and learning.

**Website:** <https://knightlab.northwestern.edu/>

## 2.2. Timeline JS

**Website:** <https://timeline.knightlab.com/#make>

**Type:** Static Storytelling

**Description:** Easy-to-make, beautiful timelines. TimelineJS is an open-source tool that enables anyone to build visually rich, interactive timelines. Beginners can create a timeline using nothing more than a Google spreadsheet, like the one we used for the Timeline above. Experts can use their JSON skills to create custom installations, while keeping TimelineJS's core functionality.

**Screenshot:**

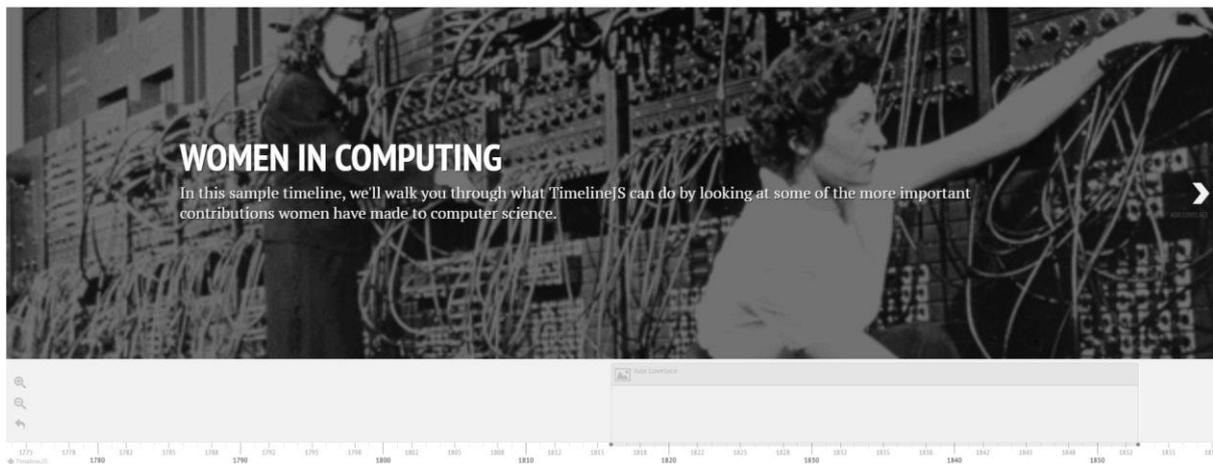


Figure 2 TimelineJS

### Tips & tricks

- Keep it short. We recommend not having more than 20 slides for a reader to click through.
- Pick stories that have a strong chronological narrative. It does not work well for stories that need to jump around in the timeline.
- Write each event as a part of a larger narrative.
- Include events that build up to major occurrences — not just the major events.
- Media sources

TimelineJS can pull in media from a variety of sources. Twitter, Flickr, YouTube, Vimeo, Vine, Dailymotion, Google Maps, Wikipedia, SoundCloud, Document Cloud and more!

**Examples:** <http://timeline.knightlab.com/#examples>

**Tutorial:** <http://timeline.knightlab.com/#make>

**Tutorial Video:** <https://vimeo.com/143407878>

### 2.3. StoryMap JS – Maps that tell stories.

Website: <https://storymap.knightlab.com/>

#### **Type: Static Storytelling**

**Description:** Maps that tell stories. StoryMapJS is a free tool to help you tell stories on the web that highlight the locations of a series of events. It is a new tool, yet stable in our development environment, and it has a friendly authoring tool.

#### **Screenshot:**



Figure 3 StoryMapJS

There are a couple ways you can make a StoryMap.

- Maps: Add a slide for each place in your story. Setting the location is as easy as a text search for the name or address. You can change the visual style of your map with a few presets, or you can use Mapbox to create your own style.
- Really big images: You can tell stories with large photographs, works of art, historic maps, and other image files. Because it works best with pixel-dense files, we call these gigapixel. Setting one up requires you to host files on a web server.

### Tips & tricks

- Keep it short. We recommend not having more than 20 slides for a reader to click through.
- Pick stories that have a strong location narrative. It does not work well for stories that need to jump around in the map.
- Write each event as a part of a larger narrative.
- Include events that build up to major occurrences — not just the major events.

StoryMap JS can pull in media from a variety of sources. Twitter, Flickr, YouTube, Vimeo, Vine, Dailymotion, Google Maps, Wikipedia, SoundCloud, Document Cloud and more!

Examples: <https://storymap.knightlab.com/#examples>

## 2.4. StoryJumper

Website: <https://www.storyjumper.com/>

### Type: Static, Animated Storytelling

**Description:** StoryJumper is an online open-source tool that allows teachers to create their stories in the form of story books, with features such as designing the characters of the story, adding voice and 3D animations to providing a static storytelling but with an animated experience.

### Features:

- Design characters for your books. Pick your expressions, clothes, and colors.

- Add your voice. Listen to your hardcover books.
- Produce video books. Watch and listen to your 3d animated books.

**Screenshot:**



Figure 4 StoryJumper

Online tool: <https://www.storyjumper.com/sjeditor/edit/115203022/615dcf4cf110d>

Tutorial: [https://www.youtube.com/watch?v=QlqrpmFL55E&feature=emb\\_imp\\_woyt](https://www.youtube.com/watch?v=QlqrpmFL55E&feature=emb_imp_woyt)

Examples: <https://www.storyjumper.com/book/search>

## 2.5. Digital Storytelling, Google Slides or Microsoft PowerPoint

Website: <https://www.google.com/slides>

**Type: Static, Animated Storytelling**

**Description:** Create awesome animated videos using just PowerPoint, these will include adding background music, sound effects, and voice-overs. You could use this for explainer-style videos, product demonstrations, educational content, or other kinds of videos you want to create. And even if you are not using PowerPoint for videos you can still use these tips to create awesome animated slides to take your next presentation to the next level.

**Screenshot:**

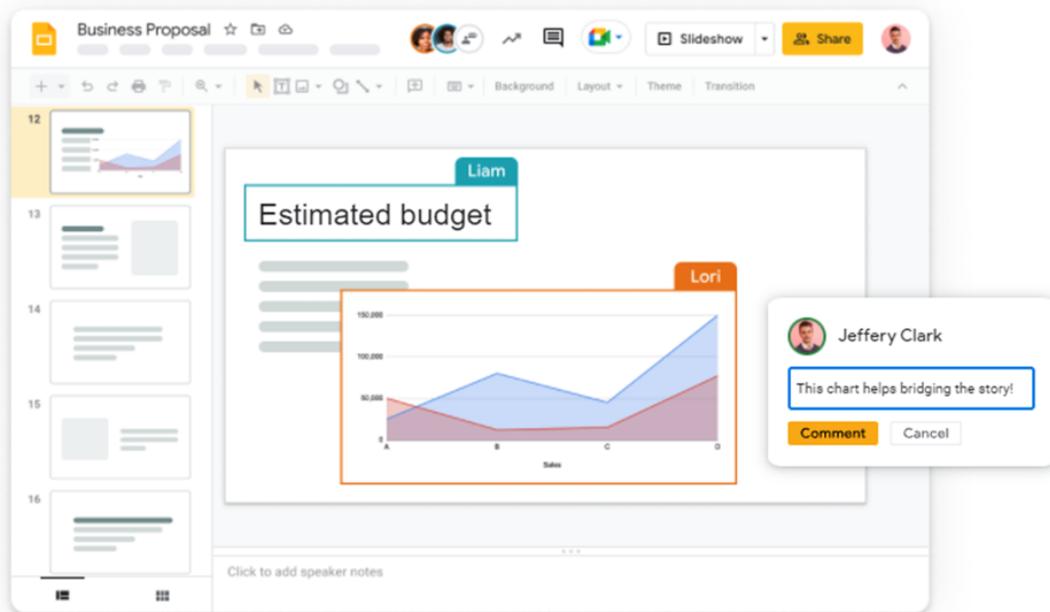


Figure 5 Google Slide

**Online tool:** <https://www.google.com/slides/about/>

**Tutorial:** <https://www.youtube.com/watch?v=DoyE48W3RUJ>

**Examples:** <https://www.youtube.com/watch?v=CXVjTpakDf8>

<https://www.youtube.com/watch?v=KzENmFK0fag>

<https://www.youtube.com/watch?v=3sgMEFJUppqI>

## 2.6. Twine

**Website:** <http://twinery.org/>

**Type:** Interactive, Non-Linear Storytelling

**Description:** An open-source tool for telling interactive, nonlinear stories. You don't need to write code to create a simple story with Twine, but you can extend your stories with variables, conditional logic, images, CSS, and JavaScript when you're ready. Twine publishes directly to HTML so you can post your work nearly anywhere. Anything you create with it is completely free to use any way you like, including commercial purposes.

**Screenshot:**

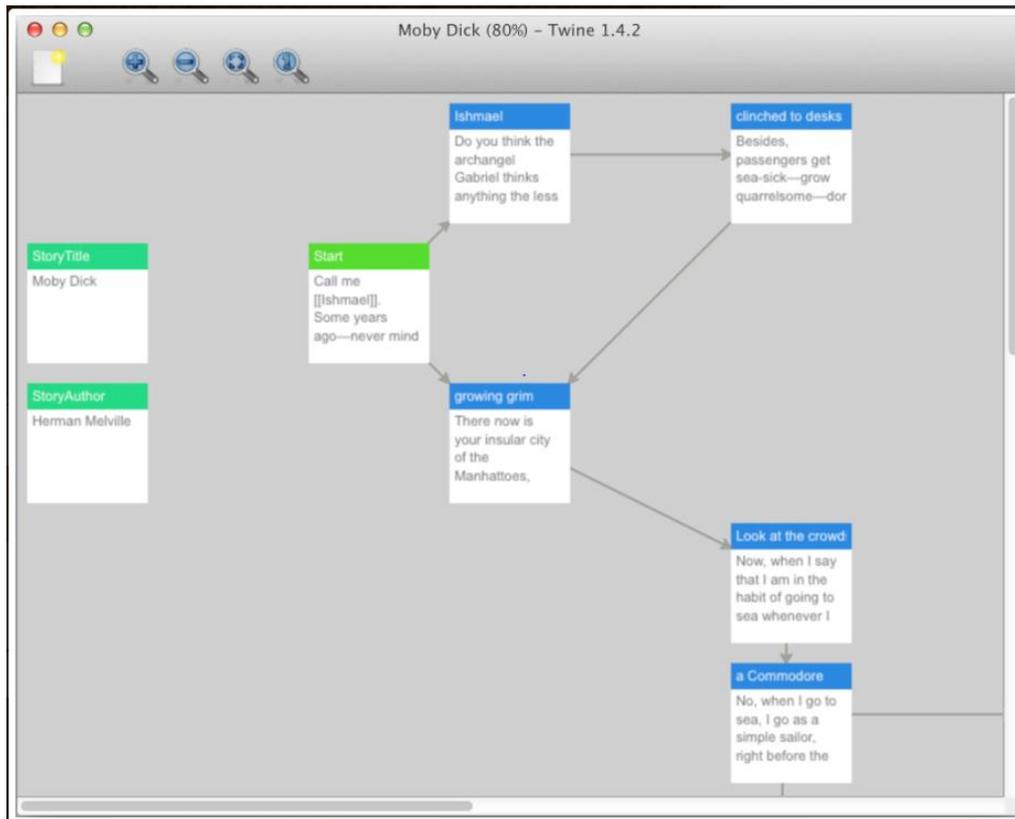


Figure 6 Editing a Story in Twine

**Online tool:** <http://twinery.org/2/#!/stories>

**Tutorial:** <https://catn.decontextualize.com/twine/>

**Examples:** <https://itch.io/c/314317/twine-examples>

## 2.7. Scratch

**Website:** <https://scratch.mit.edu/>

**Type:** Interactive, Non-Linear Storytelling

**Description:** An open-source tool for telling interactive, nonlinear stories. With Scratch, you can program your own interactive stories, games, and animations — and share your creations with others in the online community. Scratch helps young people learn to think creatively, reason systematically, and work collaboratively — essential skills for life in the 21st century. Scratch is designed, developed, and moderated by the Scratch Foundation, a nonprofit organization. It is provided free of charge.

**Screenshot:**

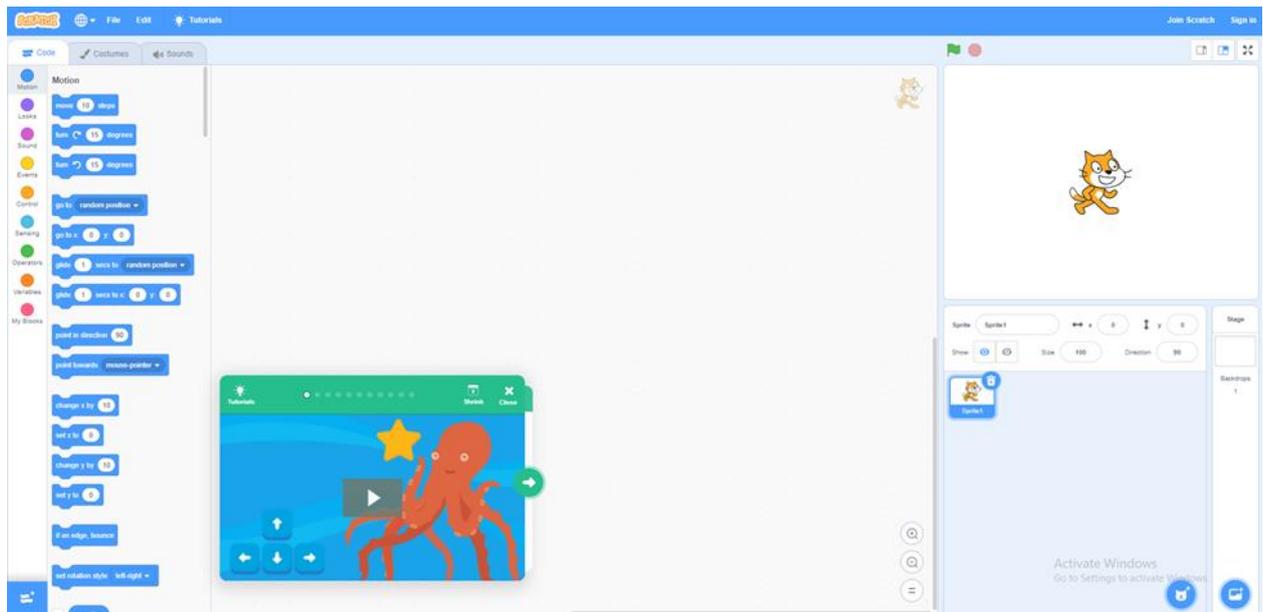


Figure 7 Scratch

**Online tool:** <https://scratch.mit.edu/>

**Tutorial:** <https://scratch.mit.edu/projects/editor/?tutorial=getStarted>

**Examples:** <https://scratch.mit.edu/explore/projects/all>

**Story:** <https://scratch.mit.edu/projects/185663988>

**Game:** <https://scratch.mit.edu/projects/142240429>

## 2.8. Inklewriter

**Website:** <https://www.inklestudios.com/inklewriter/>

**Type:** Interactive, Non-Linear, Card-Based Storytelling

**Description:** inklewriter is a free tool designed to allow anyone to write and publish interactive stories. It's perfect for writers who want to try out interactivity, but also for teachers and students looking to mix computer skills and creative writing.

**Features:**

- The inklewriter lets you write as you play, branching the story with choices, and then linking those branches back together again.
- It keeps track of which paths you've finished, and which still need to be written.
- There's no set-up, no programming, no drawing diagrams – so there's nothing between you and the empty page.
- It's free to use. And once written, you can share your stories with whomever you like.

**Screenshot:**

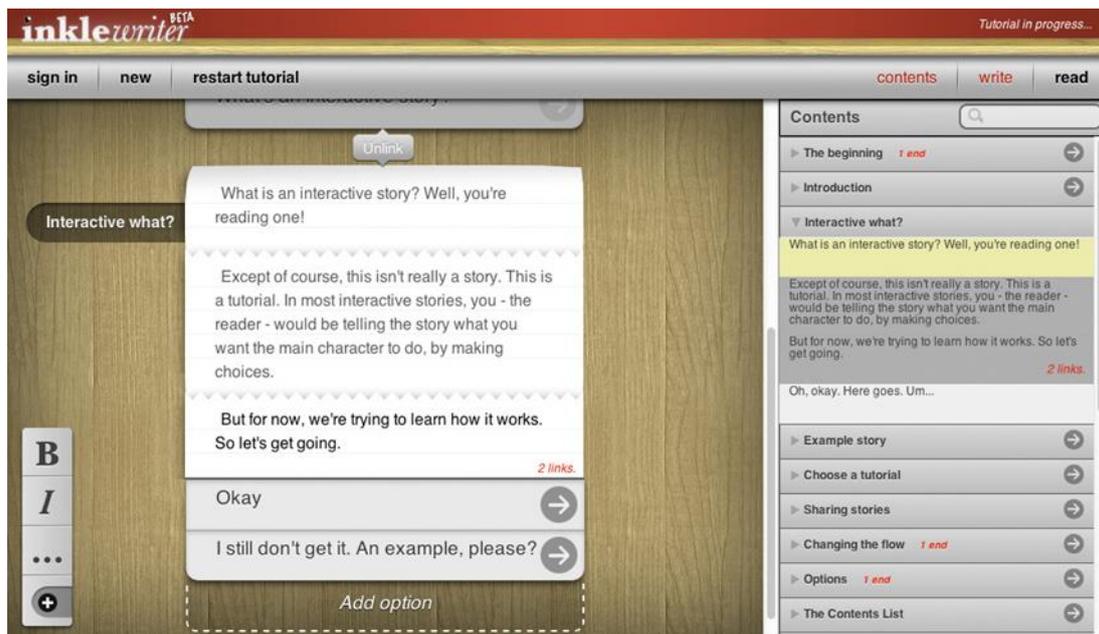


Figure 8 Inklewriter

**Online tool:** <https://www.inklewriter.com/>

**Tutorial(s):** <https://www.inklestudios.com/inklewriter/getting-started/>

**Demo Video(s):** <https://youtu.be/OLkvLMiGj7w>

**Examples:** <https://www.inklestudios.com/inklewriter/> (end of page)

## 2.9. Yarn

**Website:** <https://github.com/YarnSpinnerTool/YarnEditor>

**Type:** Interactive, Non-Linear, Diagram-Based Storytelling

**Description:** Dialogue editor, supporting editing, syntax highlighting and testing, which allows to create interactive, non-linear stories

**Features:**

**Portability:**

- YarnEditor has a version you can install and run when offline, which has a much smaller footprint than other editors using electron.
- The pwa can run on mobile devices with smaller screens - you can use it on your phone and it's much easier to install.
- There is of course also an electronic online version of the editor, which is slower on updates but more stable

**BBcode and HTML-ish markup styling in editor, Spellchecking, Autocompletion, and more:**

- Optional syntax autocompletion (auto close tags)
- preview of bbcode/html tag effects and goto in trimmed nodes
- optional word guessing and autocompletion
- optional preview bbcode in editor mode
- a color picker (using spectrum.js) to set font color in bbcode
- emoji picker to insert emojis
- nodelink suggestions as you type in the right places

- Night mode - Toggling it will invert all the light colors which the editor currently uses
- A context menu command to visit other nodes via their links in the editor and even create new ones
- Button to go back to the previous edited node. If there is no previous - save and close the current one

#### Language, writing and debugging tools built right into it (Yarn and Ink):

- Ability to playtest Yarn and Ink stories you are working on - straight inside the editor
- Spell Checking of words (supported for different languages too)
- misspelled word suggestions in the new context menu - if you have selected a misspelled word
- Similar word suggestion for highlighted words (supported for english only)
- Transcribe text - ability to "talk" to yarn without using hands :o (multi-language supported)
- Yarn can also talk to you - tell you what is written (multi-language supported)
- Support for compilation and debugging of ink files via the wasm port inklecat. It catches the error and opens the knot containing it when exporting or testing!

#### Load and Save your yarns from your computer, github gists or anything you can send it to on your tablet/phone:

- A variety of export formats supported - yarn, json yarn, tweek, tweek2, xml
  - When used from a mobile device, yarn can send its data to any other app, including to google drive
  - Ability to store and load all your yarns using a github gist - private or public, doesn't matter
- Customization!
- Support for different themes (you can make your own too)

#### Screenshot:

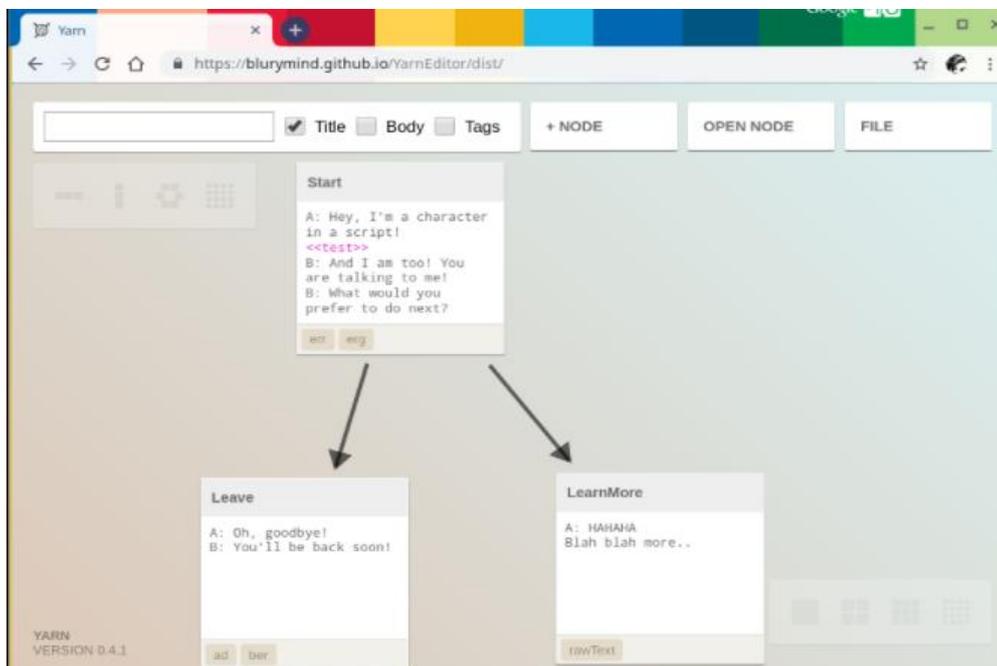


Figure 9 Yarn

**Online Tool/Download:** <https://github.com/YarnSpinnerTool/YarnEditor/releases/tag/v0.4.172>

**Tutorial:** <https://yarnspinner.dev/docs/tutorial/>

## 2.10. TextureWriter

Website: <https://texturewriter.com/>

**Type:** Interactive, Non-Linear, WYSIWYG Storytelling

**Description:** TextureWriter is an open-source tool that allows end-users to read and write interactive stories with no coding requirements.

### Features:

- Easy to play: We created a word-on-word interaction mechanic suitable for touchscreen phones and tablets, as well as web browsers.
- Easy to create: Our WYSIWYG editor makes composition and design a right-brained, no code affair — right in the browser.
- Easy to share: Click a button to publish and publicly share your work on social media. Or download an .html file to host it yourself or share via email.

### Screenshot:

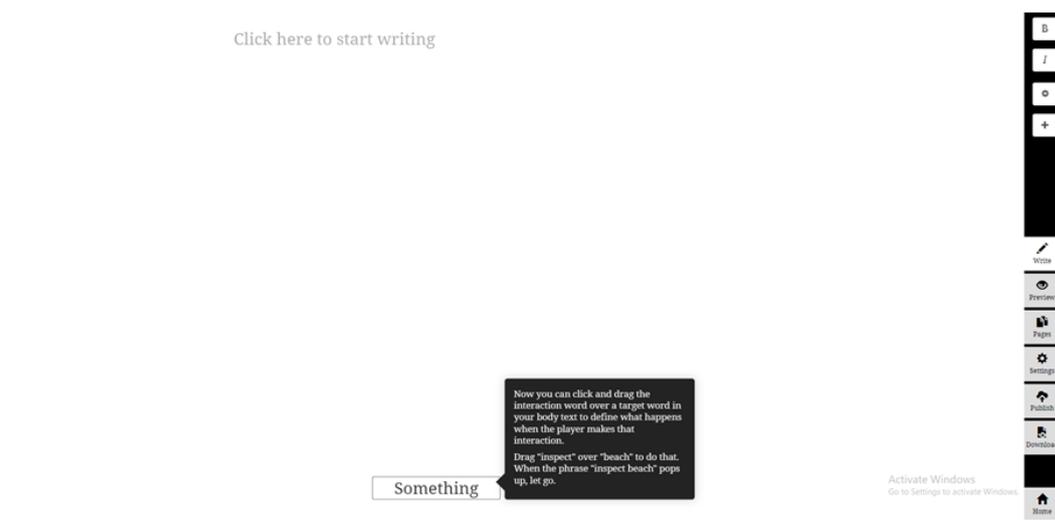


Figure 10 Texturewriter

**Examples:** <https://texturewriter.com/>

**Tutorial (From Creators' YouTube Channel):** [https://www.youtube.com/watch?v=ST\\_Lcgosxks](https://www.youtube.com/watch?v=ST_Lcgosxks)

**Online Tool:** <https://texturewriter.com/projects>

## 2.11. flowSVG

Website: <https://github.com/rtalbot89/flow-svg>

**Type:** Interactive, Non-Linear, Flowchart-Based Storytelling

**Description:** flowSVG is a jQuery diagram plugin that uses SVG.js to draw interactive and statistical flow charts for representing algorithms, workflows or processes.

Features:

- Create simple static flow charts using JavaScript and SVG.
- Create decision making driven, complex interactive flow charts using JavaScript and SVG.
- Represent stories, algorithms, workflows or processes using either static or interactive flowcharts.

Screenshot:

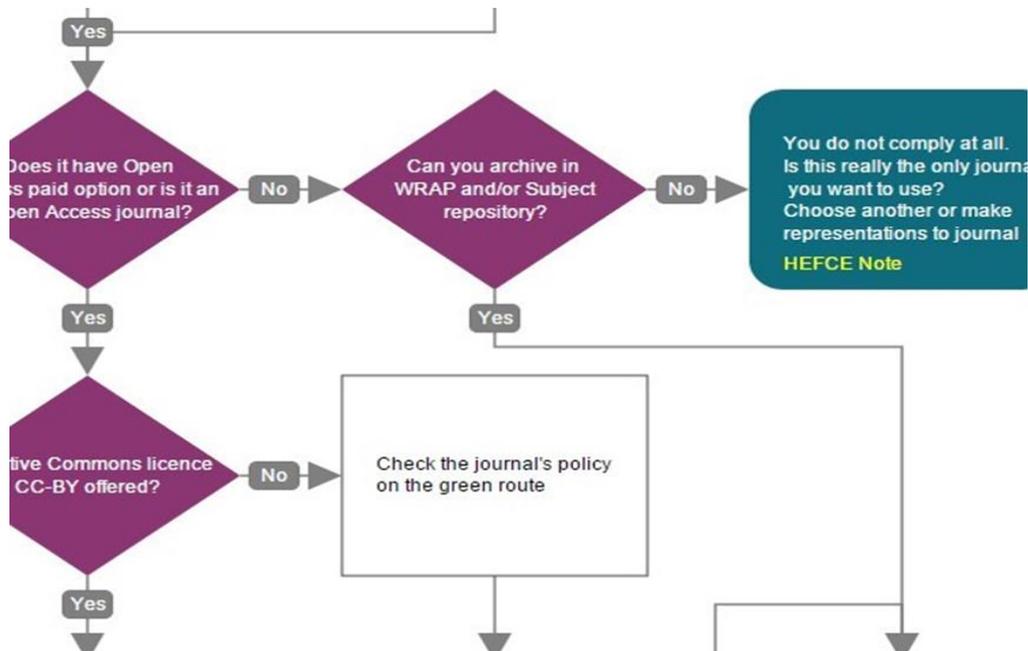


Figure 11 flowSVG

Online Tool: Not Available – needs to be installed and setup.

Tutorial: <https://github.com/rtalbot89/flow-svg#usage>

Example: <http://rtalbot89.github.io/flow-svg/>

### 3. Augmented Reality / Virtual Reality / Media Editors

It is undeniable that Virtual reality (VR) and augmented reality (AR) have shown enormous potential in the future of technology such as education, marketing, e-commerce, gaming and many other sectors. Both AR and VR technologies are well known for providing enriched experience which can combine a virtual world and a real one with 3-D visuals. VR and AR are two technologies that are changing the way we use screens, creating new and exciting interactive experiences. AR augments your surroundings by adding digital elements to a live view, often by using the camera on a smartphone. VR is an immersive experience which manages to replace a real-life environment with a simulated one. The main difference among the two is that in VR commonly a headset is used to place the person in a computer-generated world, while in contrary AR instead of transporting the user to a virtual world, it takes digital images and layers them on the real world around you, mainly through the use of a smartphone, but can be also using a headset.

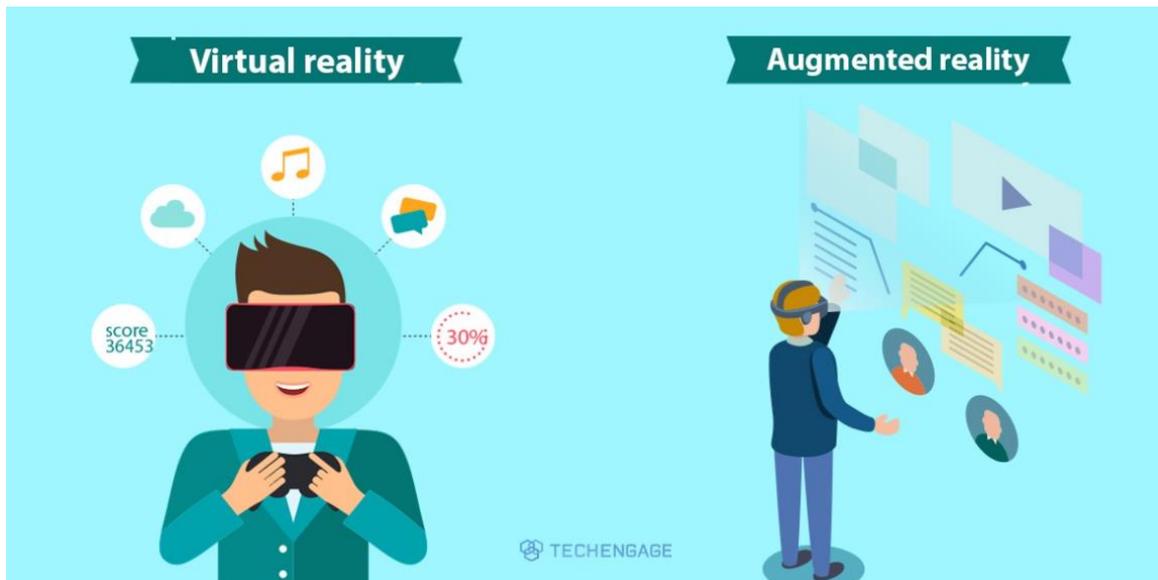


Figure 12 VR and AR illustration

### 3.1. Marzipano

Website: <https://www.marzipano.net/>

**Type:** Multipurpose 360° media viewer

**Description:** A 360° media viewer for the modern web. Supports all major desktop browsers and mobile devices. Embraces standard web technologies and provides a powerful JavaScript API. It provides the capability to add panorama images to create a virtual tour, which can be used to create a location-specific, interactive storytelling.

**Features:**

- Embraces the web: Designed to work with web standards. Control the viewer with a powerful JavaScript API and create interfaces using standard HTML and CSS.
- Browser support: Built with WebGL technology supported on all modern desktop and mobile browsers and devices.
- Great performance: Marzipano is optimized to display 360° images of any size with the best performance possible. It is also lightweight: 55KB when gzipped.

**Screenshot:**



Figure 13 Marzipano Demos

**Online Tool:** <https://www.marzipano.net/tool/> (The tool processes your panoramas on the browser. Both sphere (equirectangular) and cubeface formats are supported. After processing you can export a virtual tour application that can be deployed to any web hosting platform. This application may also be used as a boilerplate for further customization using standard JavaScript, HTML and CSS. The Marzipano tool requires the latest version of Firefox or Chrome)

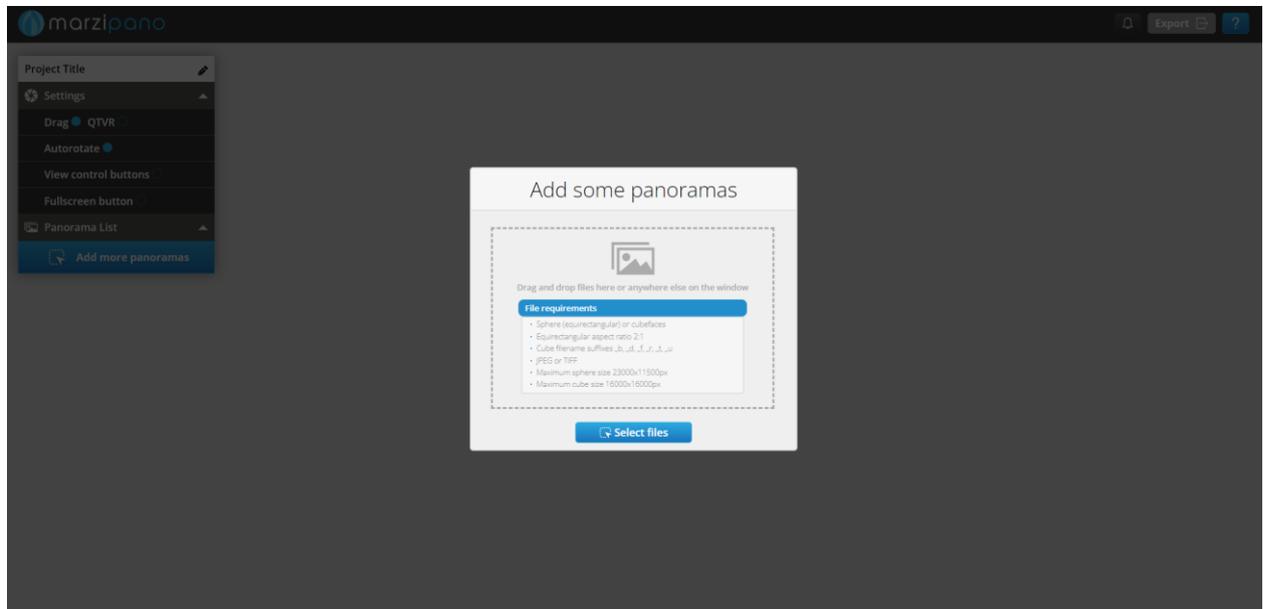


Figure 14 Marzipano tool

**Examples/Demos:** <https://www.marzipano.net/demos.html>

**Documentation:** <https://www.marzipano.net/docs.html>

## 3.2 Pannellum

**Website:** <https://pannellum.org/>

**Type:** Multipurpose 360° Panorama Viewer for the Web

**Description:** Pannellum is a lightweight, free, and open source panorama viewer for the web, which allows mainly to create virtual tours including information, custom controls, hotspots, videos, etc. Built using HTML5, CSS3, JavaScript, and WebGL, it is plug-in free. It can be deployed easily as a single file, just 21kB gzipped, and then embedded into pages as an <iframe>. A configuration utility is included to generate the required code for embedding. An API is included for more advanced integrations.

**Features:**

- Equirectangular, partial, cubic, and multi-resolution panoramas
- WebGL and CSS 3D based renderers
- Hot spots / tours
- Compass headings
- Plug-in free
- Framework free

- Video support
- API

### Screenshot:

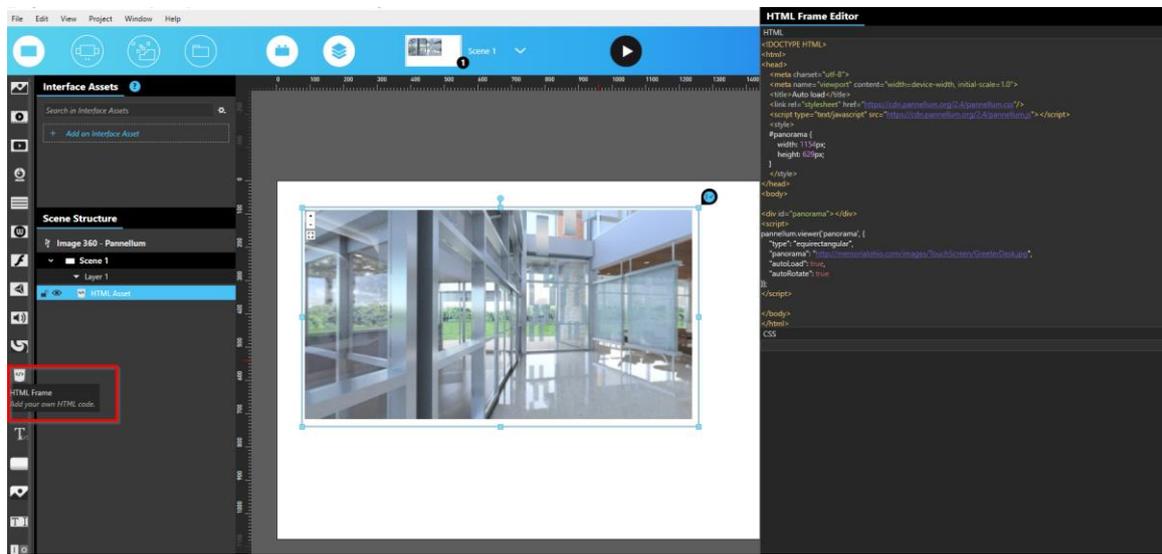


Figure 15 Pannellum

**Overview:** <https://pannellum.org/documentation/overview/>

**Examples:** <https://pannellum.org/documentation/examples/simple-example/>

**Tutorial:** <https://pannellum.org/documentation/overview/tutorial/>

## 3.3 Krpano

**Website:** <https://krpano.com/home/>

**Type:** Multipurpose 360° Panorama Powerful Editor for the Web

**Description:** A small and very flexible high-performance software for showing all kind of panoramic images on the web. It can be used for very detailed high-resolution images, for interactive virtual tours, custom designed user-interfaces and many things more.

### Features:

- Image Quality – the image-generation-algorithms of the krpano tools and the rendering-algorithms of the krpano viewer are trying to present the images in the best possible image-quality, with high details and sharpness.
- Performance – optimized for fast image-rendering and quick loading while trying to use as few system resources as possible.
- Flexible and Customizable – krpano provides a build-in layout- and scripting-system and also several APIs for external custom solutions. The viewer can be fully customized, there are settings and interfaces for almost everything.
- Supports many Panoramic Images Formats – Spherical, Cubical, Cylindrical, Flat-images, the direct use of Fisheye-images. The images can be tiled and multi-resolution for faster and more efficient loading and memory-management. Videos can be also used as source for the panoramic images.

- Different interactive Viewing Projections (e.g. a Little Planet View) – allows exploring and viewing the panoramic-images in new interesting ways.
- Almost No Limitations, use images as high-resolution as possible and load as many panoramic-images as you want.

### Screenshot:

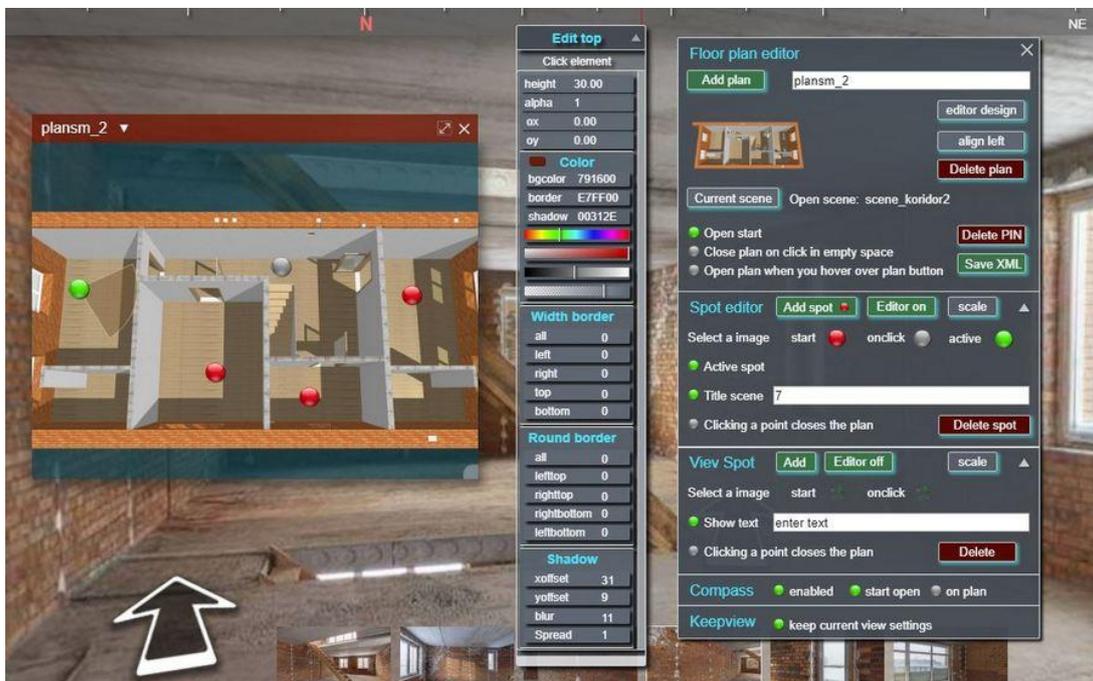


Figure 16 Krpano

Documentation: <https://krpano.com/docu/xml/>

Examples: <https://krpano.com/examples/>

## 3.4 ForgeJs

Website: <http://forgejs.org/#home>

**Type:** Framework for Immersive, Interactive Media-Driven Experiences

**Description:** A powerful open-source framework that brings immersive media-driven experiences to life.

### Features:

- ForgeJS is a JavaScript framework to build immersive experience for the web. It uses a descriptive approach to declare what will compose your experience in a json configuration file. The experience will be organized into scenes which display a 360 media, 3D object, classic HTML content and play sounds.
- History management handles the browser history so you can use your browser back and forward button to navigate through scenes, each scene is like a new web page for your browser. This way, each of your scenes have a unique URL and you can access a scene directly with its URL.

- Internationalization helps you to deliver a multilingual experience. So, you can localize strings and different kind of assets.
- The framework provides different ways to display your 360 media. You have the classic rectilinear view, but also the little planet and what we called the GoPro view that is a mix between the rectilinear and the little planet view.

**Screenshot:**

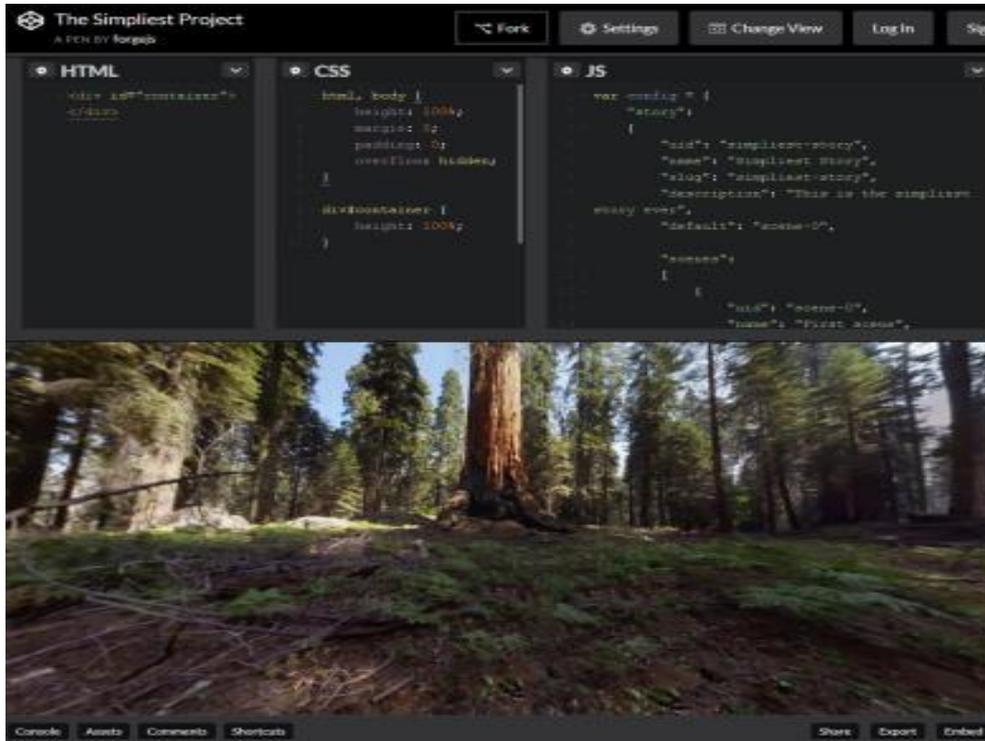


Figure 17 ForgeJs

**Examples:** <http://forgejs.org/samples>

**Documentation:** <http://forgejs.org/documentation>

**Tutorials:** <http://forgejs.org/tutorials>

### 3.5 GuriVR

**Website:** <https://gurivr.com/>

**Type:** Virtual Reality Interactive Experiences

**Description:** Describe your VR experience and the editor will do the rest.

**Features:**

- GuriVR is a free, open source project created to allow anyone to make Virtual Reality experiences with the lowest possible learning curve.
- Guri provides a quick and easy online editor that creates virtual reality from your words.
- Guri even makes it possible to create a 360 panorama that works in the browser and with headsets like the Google Cardboard in seconds.

**Screenshot:**



Figure 18 GuriVR

**Guide/Tutorial/Examples:** <https://gurivr.com/guide>

### 3.6 H5P

**Website:** <https://h5p.org/>

**Type:** Reality / Virtual Reality / Media Editors

**Description:** Create share and reuse interactive HTML5 content in your browser

#### Features:

- H5P makes it easy to create, share and reuse HTML5 content and applications. It empowers users to create rich and interactive web experiences more efficiently.
- Its content is responsive and mobile friendly, which means that users will experience the same rich, interactive content on computers, smartphones and tablets alike.
- H5P enables existing CMSs and LMSs to create richer content. With H5P, authors may create and edit interactive videos, presentations, games, advertisements and more. Content may be imported and exported.
- H5P is a completely free and open technology, licensed with the MIT license. Demos/downloads, tutorials and documentation are all available for users.

#### Screenshot:

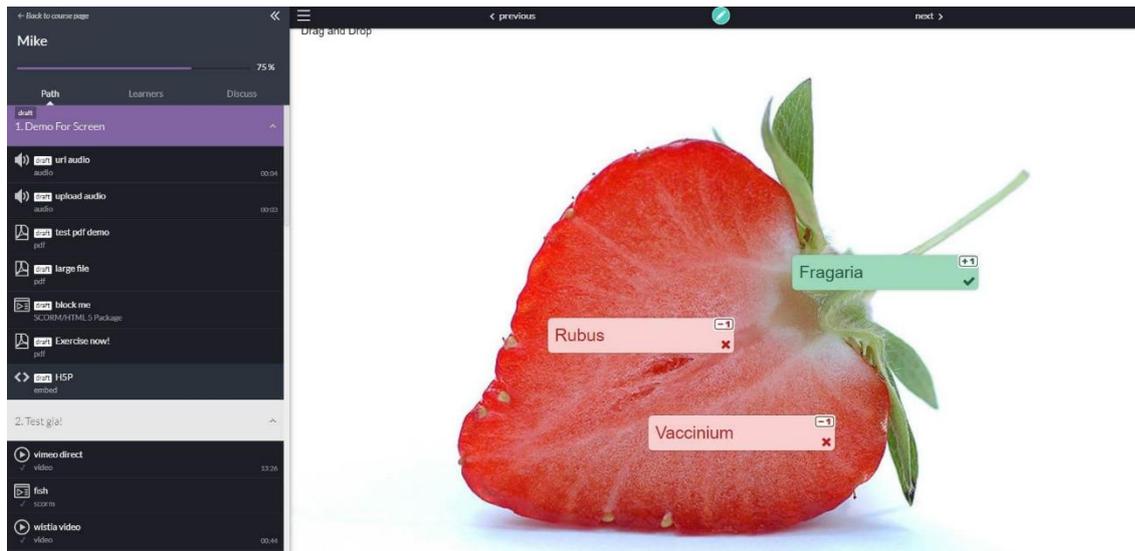


Figure 19 H2P

**Online Tool:** <https://h5p.org/content-types-and-applications>

**Tutorial:** <https://h5p.org/documentation/for-authors/tutorials>

**Example:** <https://h5p.org/content-types-and-applications>

## 4. Virtual Worlds (3D) and Game Engines

3D Virtual worlds are described as online computer-generated environments in which many users, either in remote or in physical locations can interact with each other in real time. More precisely, a virtual world is a computer-based online community environment that is designed and shared by individuals so that they can interact in a custom-built, simulated world. Users interact with each other in this simulated world using text-based, two-dimensional or three-dimensional graphical models called avatars. (technopedia) This may happen for the purposes of work or play. Virtual worlds constitute a subset of virtual reality applications, a more general term that refers to computer-generated simulations of three-dimensional objects or environments with seemingly real, direct, or physical user interaction.



Game engine is described as a software development environment, also named as “game architecture” or “game framework,” with specialized settings that have the ability to optimize and simplify the creation of video games through different programming languages. A game engine can include either 2D or even 3D graphics depending on what is compatible to import formats, such as real-world activities and artificial intelligence that immediately respond to the player’s actions automatically, including sound engines, sound effects, animation engines, and other features.



Figure 21 Game Engine Illustration

## 4.1 Open Simulator

Website: [http://opensimulator.org/wiki/Main\\_Page](http://opensimulator.org/wiki/Main_Page)

**Type: Multi-platform for multi-user 3D Interactive Virtual Environments**

Description: An open source multi-platform, multi-user 3D application server. It can be used to create a virtual environment (or world) which can be accessed through a variety of clients, on multiple protocols.

Features:

- Supports online, multi-user 3D environments as small as 1 simulator or as large as thousands of simulators.
- Supports 3D virtual spaces of variable size.
- Supports multiple clients and protocols – access the same world at the same time via multiple protocols.
- Supports real-time, simulator side, Physics Simulation.
- Supports clients that create 3D content in real time.
- Supports inworld scripting using LSL/OSSL.

- Provides unlimited ability to customize virtual world applications through the use of scene modules.

**Screenshot:**



Figure 22 Open Simulator

Documentation (With Setup instructions): [http://opensimulator.org/wiki/User\\_Documentation](http://opensimulator.org/wiki/User_Documentation)

## 4.2 OpenSpace3D

Website: <https://www.openspace3d.com/>

**Type:** Multi-platform for multi-user 3D Interactive Virtual Environments

**Description:** A free and open-source platform, designed to create virtual and augmented-reality applications or games. If you are a 3D artist, a designer, a lab researcher, or just someone with a lot of passion and curiosity, you don't need software development skills to use our platform.

**Features:**

- Create Augmented Reality Applications for computer, tablets and mobiles
- Create HTC Vive, Oculus and Google Cardboard applications
- Full scene editor, import and place your 3D models from more than 40 supported file formats
- Visual programming – PlugITs System. Create full applications by assembling functions without programming
- OpenSpace3D includes a full 3D models library for your projects, provided by the community
- Export all the assets with animations and shaders from your favorite modeler

## Screenshot:

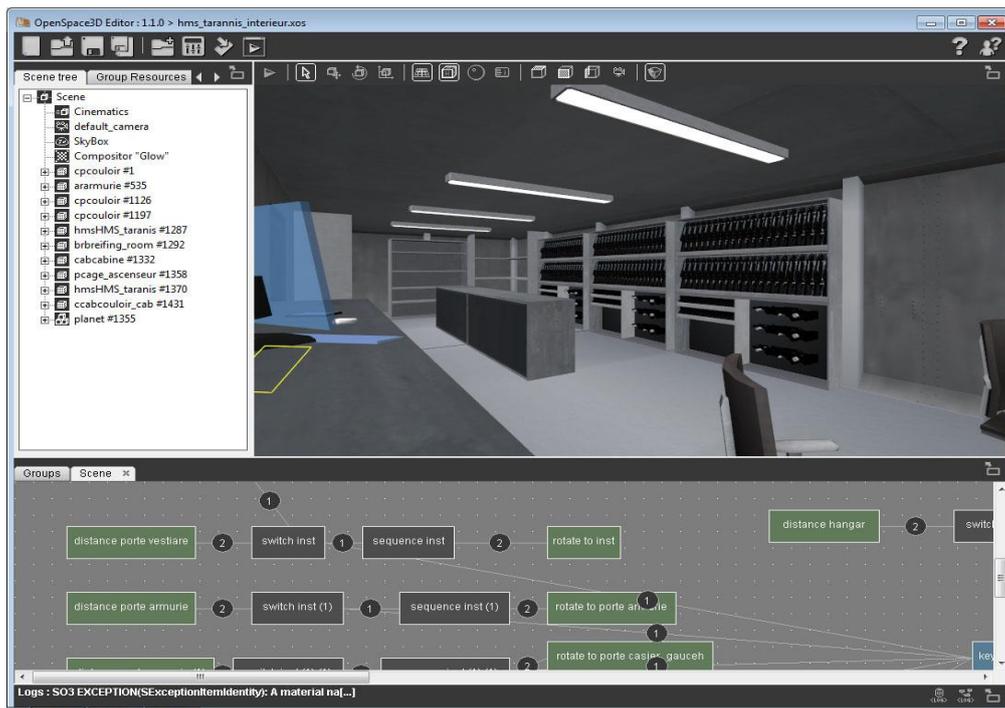


Figure 23 Open Space 3D

**Documentation:** <https://www.openspace3d.com/documentation/en/index.html>

**Tutorials:** <https://www.youtube.com/playlist?list=PLA1DCE4660F4D8764>

## 4.3 Quest

**Website:** <http://textadventures.co.uk/quest>

**Type:** Interactive, Non-Linear, Story Games

**Description:** Quest lets you make interactive story games. Text adventure games like Zork and The Hitchhiker's Guide to the Galaxy. Gamebooks like the Choose Your Own Adventure and Fighting Fantasy books. You don't need to know how to program. All you need is a story to tell. Your game can be played anywhere. In a web browser, downloaded to a PC, or turned into an app.

### Features:

- Quest can be used via web browser, or for Windows users, it can be downloaded in a free desktop version as it is an open source software.
- Quest is a powerful game platform. There is a fully featured scripting language behind the scenes, in which the user can dip in and out of as required. The user can use variables and functions, and encapsulate functionality using object types to share scripts between objects. Additionally someone can create and share libraries of advanced functionality.
- Quest can be used in any language: Create games in English, French, German, Spanish, Dutch, Italian, Portuguese, Romanian, even Esperanto.

## Screenshot:

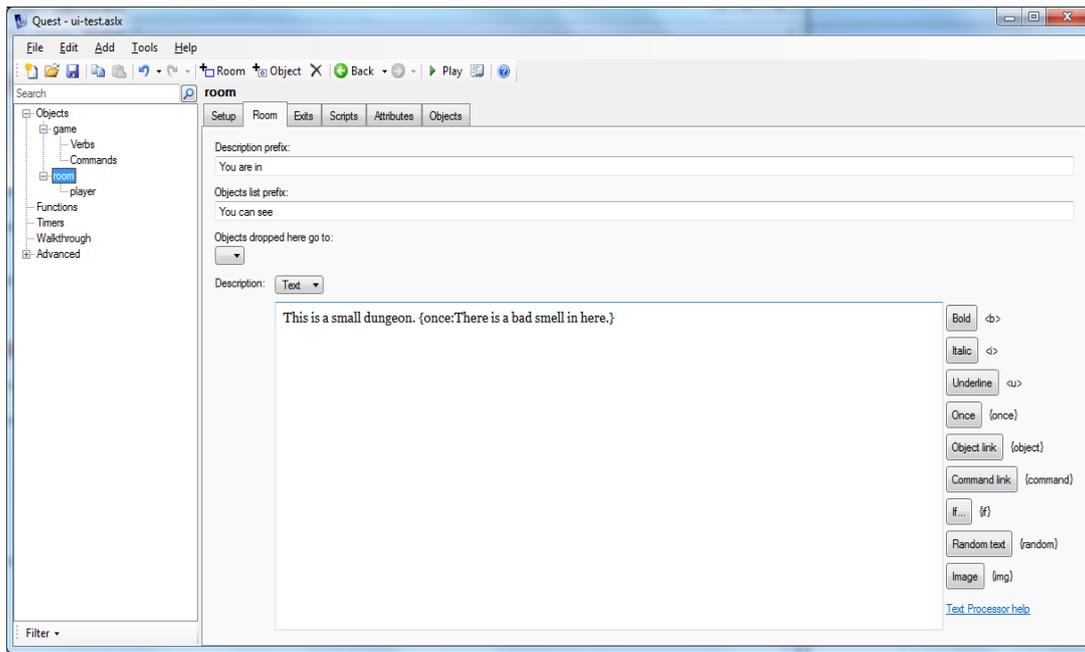


Figure 24 Quest

**Video:** <https://youtu.be/7vliOU4rSX4>

**Tutorial:** <http://docs.textadventures.co.uk/quest/tutorial/index.html>

**Documentation:** <http://docs.textadventures.co.uk/quest/>

## 5. Conclusions: Open Source Tools Desk Research

The desk research conducted by Frederick University in the context of the OLMedu project shed light on the existing open source simulation tools. The aim of this report is to present the outcomes of the research which has a two-fold aim:

- i) to identify, list and evaluate existing open source simulation tools in terms of their applicability to be used for the design of learning scenarios for education management and
- ii) to examine the degree of technical complexity involved in the use of such open source simulation tools, since that could render these tools unusable since high-end ICT knowledge and programming skills may be required by teachers in education management.

In fact, this analysis provided a clear set of user and system requirements that such a software tool needs to offer to HES in ME. The findings reveal that there are four main categories-types of open source simulation tools with various examples for each category. The first category of animation tools consists of Storytelling, the second one is the AR/VR, third category expanded in this report is the 3D Virtual Worlds, and the last one is the Games category. All of the above-mentioned types can be used in a simulation environment and its interactive nature is considered vital for the creation of the scenarios. This report contributed to the design and development of an appropriate tool as part of IO3.A2.

### Annex 1 Scenario Example from GrantXpert



Microsoft PowerPoint  
Presentation

## IO3.A2 Design and Development of a Simulation Tool

### 6. The OLMedu Toolkit

#### 6.1 Overview

The OLMedu Toolkit will be composed from at least one open-source tool identified in the desk research performed in this work and the web tool that is developed as part of the OLMedu technical development activities.

The newly developed tool will provide the capability to simulate education management scenarios that enable educators to teach important principles to their students. The goal is to provide through the use of the developed online tool to simulate and replicate the experience in the best way possible, giving the feeling of real presence just like it is done in the classroom.

These interactive and immersive simulations will enable teachers to turn students into the main actors in education management scenarios, which are represented as stories and allow decision making. This enables the students to cultivate invaluable skills that can prepare them in dealing with more real-life complex management scenarios in the workforce. The idea in these simulation-based scenarios is to combine the power of digital storytelling, project-based learning and immersive experiences offered by this tool in order to allow teachers to create education management scenarios that enable the students to make connections between the concepts taught in class and the real world.

The newly developed tool will enable the teacher to choose the type of media that they would like to use to create the education management scenario. The educator will have to assess his/her capability to create the scenario using the preferred media type. This means the educator will have to choose between using the following types of media:

1. **Static Images - 2D Image-Based Interactive Story:** These static images will form the background for each scene of the digital storytelling scenario, will be created by the educators and used to create their digital education management stories.

The above will allow the educator to create 2D image-based interactive education management stories. The following screenshots show two example scenes of an interactive story created using such a media type for another learning domain as an Android application by Frederick University<sup>1</sup>.

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<sup>1</sup> Dream Fighters: <https://play.google.com/store/apps/details?id=com.mdl.dreamcrushers>

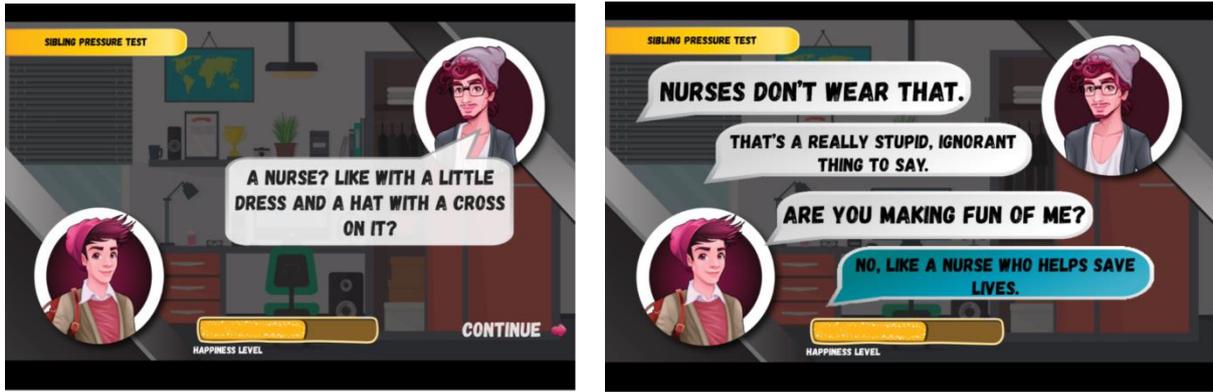


Figure 25 Example - 2D Image-Based Interactive Story

2. **Videos - 2D Interactive Videos:** Each video will provide part of the flow of the digital story in terms of the management scenario, and will be created by the teachers. The tool will enable the user to upload and edit the video by adding/overlying interactions at specific time instances of the video timeline.

The above will allow the educator to create 2D interactive video stories that resemble different scenarios. The following screenshot and link provide a similar experience although the learning scenario in this case is linear and involves answering e.g., multiple choice questions, but this example does not enable decision making that alters the flow of the story.

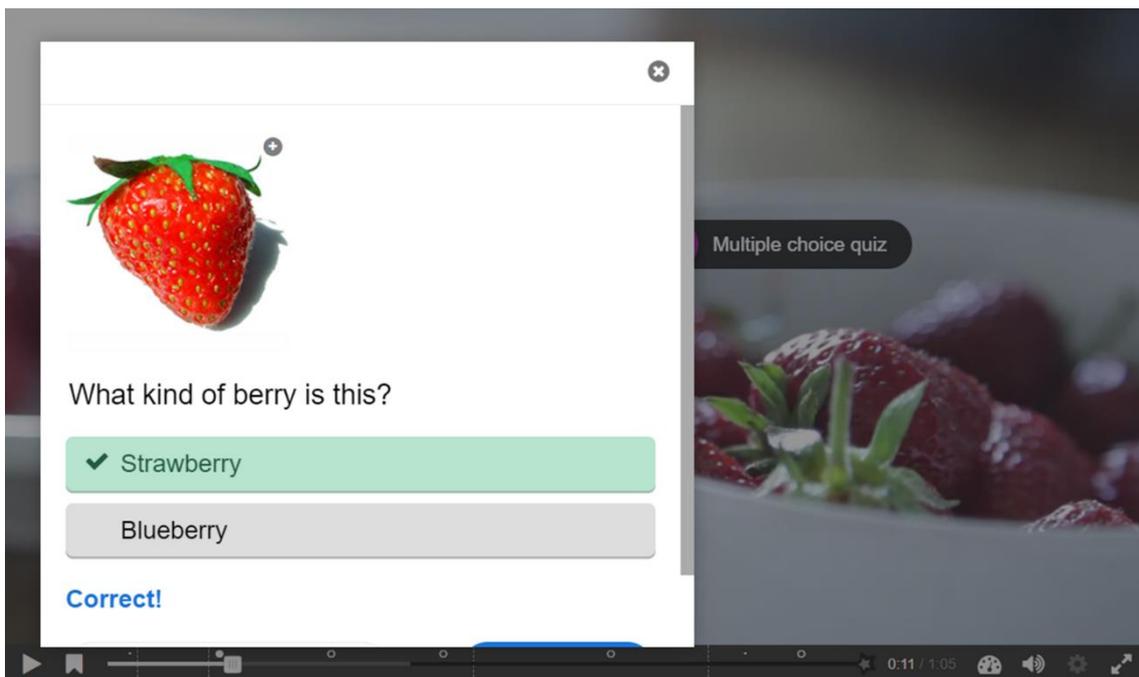


Figure 26 Example - 2D Interactive Video Storytelling

Source: <https://h5p.org/h5p/embed/617>

3. **Interactive Images – 360 degrees Interactive Panorama:** Instead of static images the educators will create/take 360 degrees interactive panorama images that form the background for each scene of the digital storytelling scenario. The teachers will be able to add interaction points that enable students to make decisions and accordingly load a different 360 panorama image based on the decision.

The above provides a higher degree of immersion and experience to the students, which are able to execute the education scenario using a browser-based player or using inexpensive Cardboard - Google VR to increase immersion thus enabling the students to make connections between the concepts taught in class and the real world.

4. **Interactive Videos - 360 degrees Videos:** The interactive 360 degrees videos will be created by the educators and will be uploaded and edited using the tool. The teachers will be able to add interaction points that enable students to make decisions and accordingly load a different 360 video based on the decision.

The above enables to simulate complex training education management scenarios, while at the same time the educators will offer the capability to the students to have a more immersive experience since they can execute the scenario using a browser-based player or using inexpensive Cardboard - Google VR to increase immersion and provide a comparable real-world experience.

Finally, the tool will allow the teacher to use different media types from the above for different scenes.

## 6.2 Education Management Scenarios

This section presents examples of education management scenarios defined by project partners in the OLMedu project, which serve as input for the user and requirement analysis and the definition of the functionality as presented in the Low-Fidelity prototype in Section 6.3.

### Scenario 1 - TVG

- **Topic/Title:** Conflict Management
- **Learning Goal:** Showcase how a virtual coaching experience on employees can help in conflict resolutions between colleagues.
- **Basic Description:** The learning outcome of this scenario is to guide employees about conflict resolution. The scenario begins as follows. George works very hard as a project officer and feels the one member of the team is not working hard as the rest of the team, this is causing conflict among the team. George decides to talk about the other members of the team about the misconduct. This causes tension and conflict among the employees. The Project Officer is sitting in the staff room, during lunch time and begins to speak ill of Matt's conduct in his absence with the other team members. The other team members fail to notice that Matt was about to enter the staff room and overhear the conversation. Then, two different options appear on the video and the person who is viewing the video can make his own personal choice as a part of his training. Based on his own selection a video appears with the respective answer and a storyline following his previous response begins. For instance, in this video Matt decides to enter the staff room. The employee does not choose to ignore the stressful situation. In the continuation of the video, we can see the employee is having a productive discussion with the Project Officer who is called once again to choose (virtually) what he would do in such a situation. Based once again on Matt's answer, different videos are downloaded and continue the story. In the end of this demonstrational video the the previously angry employee, the rest of the team and the Project Officer seems to be relaxed and calmed down and both the PO and employee have successfully completed the course by choosing the most appropriate options. Then, a hotspot appears on his screen in which he is informed that he managed to pass the test with success, and he can make the selection to restart or exit the course.

## Scenario 2 - TVG

- **Topic/Title:** Teamwork
- **Learning Goal:** Showcase how a virtual coaching experience on employees can help in strengthening teamwork.
- **Basic Description:** The learning outcome of this scenario is to guide employees about strengthening teamwork. The scenario begins as follows. Mary did not receive the promotion she felt she deserved. She decides to deliberately instigate a work slow-down which in turn casts the supervisor and the rest of the rest of team in a bad light. Mary is sitting at her desk, and repeatedly checks her personal phone, not worrying about the emails she is receiving and refusing to support their colleagues in some deliverables. All the employees seem to be very stressed. Then, two different options appear on the video and the person who is viewing the video can make his own personal choice as a part of his training. Based on his own selection a video appears with the respective answer and a storyline following his previous response begins. For instance, in this video the Supervisor decides to call the upset employee and the rest of the team into his office and does not choose to ignore the stressful situation and the lack of cooperation between employees. In the continuation of the video, we can see Mary is having a productive discussion with the Supervisor and the rest of the team. Based once again on Mary's answers different videos are downloaded and continue the story. In the end of this demonstrational video the previously angry employees seem to be relaxed and calm and cooperative. The team has successfully completed the course by choosing the most appropriate options. Then, a hotspot appears on his screen in which he is informed that he managed to pass the test with success, and he can make the selection to restart or exit the course.

## Scenario 3 - GX

- **Topic/Title:** Decision making skill in Management
- **Learning Goal:** Learners take the role of a manager in a business company and are exposed to different situations for which they need to make critical decisions. Decision making is an important management skill, among others, that ME students need to develop and enhance through their studies. In real life, the core function of the management is to make decisions on business operations and growth.
- **Additional information:** A **decision** is a choice made from available alternatives. **Decision making** is the process of identifying problems and opportunities and then resolving them. **Management decisions** typically fall into one of the two categories: programmed and non-programmed. Programmed decisions are made in response to a situation that has occurred often enough to enable managers to develop decision rules that can be applied in the future. Non-programmed decisions are often related to strategic planning because uncertainty is great, and decisions are complex.
- **Basic Description:** The general scenario is applied in an interactive choice-driven storytelling tool. The user (learner) gets introduced at the beginning in his/her new role, that of a manager (or CEO) in a specific new business company, an online start-up (e.g., online styling platform). Following the introduction to this new role and a short description of what the company is about, the user gets informed about different situations and everyday operations that do exist in the company; examples are: (1) decision making in human resources, (2) in production, (3) in client servicing, (4) in marketing. For the purposes of this task, we will develop only two scenarios: (1) decision making in human resources, and (2) in production. The user starts with choosing one of the above-mentioned situations with which s/he needs to deal with, in order to secure the successful operation of the company. Based on the choice of the user, the scene (background) changes, as well as the story options to follow. So, depending on the users'

choice, a different story evolves, with different options each time provided to the user. Based on the user's choices at each stage, each of the two scenarios has a different finale, providing feedback to the user on how his/her decisions have affected (positively or negatively) the company's operations and growth.

**Sub-Scenario #1: Human resources:** The user is being informed about the need to expand the company's capacity by hiring the right resources. The company is an online start-up (e.g., online styling platform). S/he needs to make decisions for the profile and number of people that must be employed in the company. Different options are given to the user. For instance, (i) people who are experienced and adept in their fields such as software development, marketing, operations, procurement, and logistics, but require a high salary, (ii) people not so much experienced but require a lower salary, (iii) a mixture of people with different qualifications and experience. Then, the user is required to decide whether the employees will work on the premises exclusively, at home or a combination of both options. The user should recall from the introduction provided at the beginning of the activity that the business is an online start-up, therefore, the best choice would be not to have to hire employees who work on the premises exclusively. This option will reduce the operations costs of the company, in contrast to the option in which all employees work exclusively at the company's premises. Also, s/he needs to choose and shortlist talented location-independent workers capable of delivering the required technical support and services online. S/he needs to ensure an optimal mix of on-site and remote workers, so as to easily carry out the functions in a cost-effective way. Emails and chat communications as well as video interactions can keep the team spirit going. This will also give you the flexibility of hiring talent that might be scattered over different geographic locations and can come together digitally to create path-breaking solutions. On the other hand, the option of having all employees working remotely from home, might lead to other problems that will affect the company's growth and operation e.g., limited communication, limited control. An indicative flow of steps is given in the figure below. Not all options have been developed, just one of those and incomplete. At each step (or at the very end of the story), the user gets feedback based on the decisions made. Then, s/he can start from the beginning, choosing this time different options.

**Sub-Scenario #2: Production:** The user is being informed about the need secure that as the business expands and demand grows, s/he must increase the production capacity of the company. So, the user is required to decide how much capacity installation is required to meet demand effectively; different options should be provided here, leading to a different pathway. Also, the user is asked to identify the right equipment for the purpose and the workforce to run the production processes of the company. Again, different options should be provided here, leading to a different pathway. The user's decisions must be guided by the fact that the ultimate aim is to increase production sustainably so that there is a flexibility of scaling up or down without incurring a high cost.

## Scenario 3 - UPatras

- **Topic/Title:** Strategic Management – Decision Making
- **Learning Goal:** To be able to decide on the most appropriate strategy based on macro-environmental factors
- **Basic Description:**
- The learning outcome of this scenario is to guide learners on strategic management decision making process. The scenario steps are the following:

### **STEP1:** Introduction/company data

Learners are Managers in a leading car rental company in Greece which is also globally active in 180 countries with more than 11.000 car rental stations, serving more than ten million customers annually. The company has a wide network of 80 car rental stations, a modern fleet that exceeds 38,000 vehicles

and 500 specialized employees and is active in the Car Rental sector, as well as in the Leasing and Used Car Sales sectors.

**STEP2: DATA-macro factor**

**Climate change** is one of the most important environmental issues of our time. Climate change is caused by the increase in concentrations of greenhouse gases (GHGs) in the atmosphere. These increases are primarily due to human activities and industry development

The European Commission's regulatory plan calls for a zero footprint by 2035 and an intermediate stage of reducing emissions from passenger cars and trucks by 65% by 2030.

**STEP3: Determination of 2 factors of influence (options from 4 – 5 factors)**

**Factors of influence by the 2030 horizon:**

- Concentration of greenhouse gases (GHGs) –rising /falling
- National Government intervention (low/high)
- National GDP changes (up/down)
- Income equality declined/ rising
- National population growing and aging

**STEP4:** We offer learners the above scenarios

1. Rising Greenhouse gases GHGs (with no measures) Rising GDP	2. Rising Greenhouse gases GHGs (with no measures) Falling GDP
3. Falling Greenhouse gases (GHGs) (with strict measures) Rising GDP	4. Falling Greenhouse gases (GHGs) (with strict measures) Falling GDP

**All possible combinations of factors have to be shown to learners based on their decision of 2 factors.**

**STEP 5: Selection of the predominant scenario**

**Based on the followings, the Scenario #3 and # 4 are predominant, with #4 even more likely for Greece due to the high energy cost. But we can present both of them correct with slightly different strategic decisions**

- **Rising GHGs:** This was associated with scenarios having a growing, [post-industrial economy](#) with [globalization](#), mostly with low government intervention and generally high levels of competition. Income equality declined within nations, but there was no clear pattern in social equity or international income equality.
- **Falling GHGs:** In some of these scenarios, [GDP](#) rose. Other scenarios showed economic activity limited at an [ecologically](#) sustainable level. Scenarios with falling emissions had a high level of government intervention in the economy. The majority of scenarios showed increased social equity and income equality within and among nations.

**STEP 6: Indicative strategic decisions - investments that the company must make today**

- Fleet renewal in cars or engines
- Investment in electronic cars
- Strategic partnerships for electronic invoicing, archiving and automated data entry
- Strategic partnerships for e-commerce and marketing
- Provision of car sharing services

**STEP 7: Indicative outcomes**

- Bankruptcy
- Dominance as a leader
- Increased expenditures in the beginning which then lead to increased profit
- Increase in sales
- Decrease of emissions

## Scenario 4 - UPatras

**Scenario**

- **Topic/Title:** Strategic Management – Decision Making
- **Learning Goal:** To be able to decide on the most appropriate strategy based on micro-environmental factors
- **Basic Description:**
- The learning outcome of this scenario is to guide learners on strategic management decision making process. The scenario steps are the following:

**STEP1:** Introduction/company data

Learners are Managers in a cooperative company that produces dairy products which sells to local dairy industries and various shops and supermarkets in the country.

**STEP2: DATA-micro factor**

The dairy industry consists of a small number of large companies and a large number of medium and small companies operating mainly locally. The industry presents a high concentration index and as such is characterized as oligopolistic. The main distribution channel of the dairy is the supermarket chains.

**STEP3: Determination of 2 factors of influence (options from 4 – 5 factors)**

**Factors of influence:**

**STEP4:** We offer learners the above scenarios

1. Increased negotiating power of distribution channels Higher need for marketing investments	2. Increased negotiating power of distribution channels Lower need for marketing investments
3. Decreased negotiating power of distribution channels Higher need for marketing investments	4. Decreased negotiating power of distribution channels Lower need for marketing investments

**STEP 5: Selection of the predominant scenario**

**Based on the followings, the Scenario #1 is the predominant.**

- **Increased negotiating power of distribution channels:** The relatively small number of supermarkets in relation to the quantities of dairy products they sell increases their negotiating power against the dairy companies. Supermarkets play a significant role in the dairy products pricing and promotion.

#### **STEP 6: Indicative strategic decisions - investments that the company must make today**

- Investment in marketing
- Investment in distribution channels for distributing products directly to consumers (i.e. network of stores, Dairy Vending Machines).
- Investment in new production machines
- Strategic partnerships for distribution

#### **STEP 7: Indicative outcomes**

- Bankruptcy
- Dominance as a leader
- Increased expenditures in the beginning which then lead to increased profit
- Increase in sales
- Consumers are able to find products of the Greek land at extremely competitive prices

### 6.3 Low-Fidelity Prototype

The following provides a Low-Fidelity prototype on how the tool to be developed may look like and at the same time how it can be used by the teachers to build complex education management scenarios. The low-fidelity prototype was designed and demonstrated to Higher Education Staff in education management and to consortium partners in order to receive feedback that supported the development of the OLMedu 360 degrees virtual reality training scenarios.

1. The teacher will be able initially to select and create a new scenario as shown in the following screenshot.

- Click the plus ('+') sign to add a new scenario
- Type name and a small description of the scenario
- Once finished, click the Done button



Figure 27 Low- Fidelity Prototype

2. The educator will be able to select from a list of available templates that will be provided as shown in the following screenshot, in order to support the definition of the education management scenario.

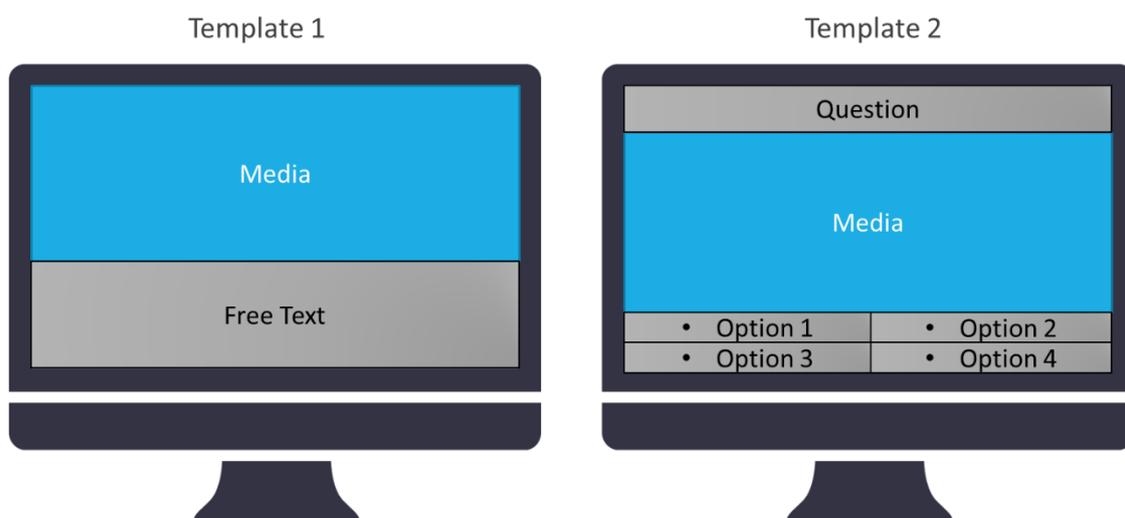


Figure 28 Template 1 & 2

3. After selecting a template, the teacher can create a new scene by completing the relevant information, by uploading the required media type, adding interaction points (e.g., on the 2D OLMedu IO3 Toolbox for developing on-line simulations in management education 38

image, at specific times in the video) and connecting the scene or its different options to the resulting scenes.

The following screenshot shows a simple template (Template 1) that does not include any options/interaction points:

- Click the plus ('+') sign to add a new scene
- Type name of the scene
- Type the text you want to be displayed in the scene
- Upload the Media you want to have as background in the scene  
Media:
  - 2D image
  - 360 Panorama
  - 2D Video
  - 360 Video
- Add link to a scene (Select an already created scene from dropdown menu to create the link between 2 scenes)
- Once finished, click the Done button



Figure 29 Template 1

The following screenshot shows another possible template (Template 2) that enables to type the name of the scene and upload the media type required.

- Click the plus ('+') sign to add a new scene
- Type name of the scene
- Upload the Media you want to have as background in the scene  
Media:
  - 2D image
  - 360 Panorama
  - 2D Video
  - 360 Video

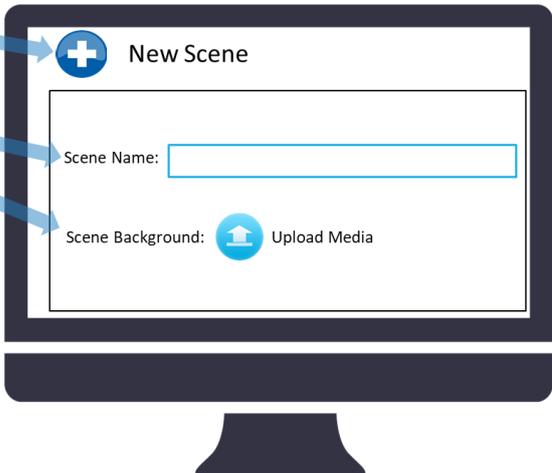


Figure 30 Template 2

The teacher can then scroll down on the current screen of the tool to complete the remaining information for the current template, such as the text of the question, the options to add and connecting each option to the appropriate scene.

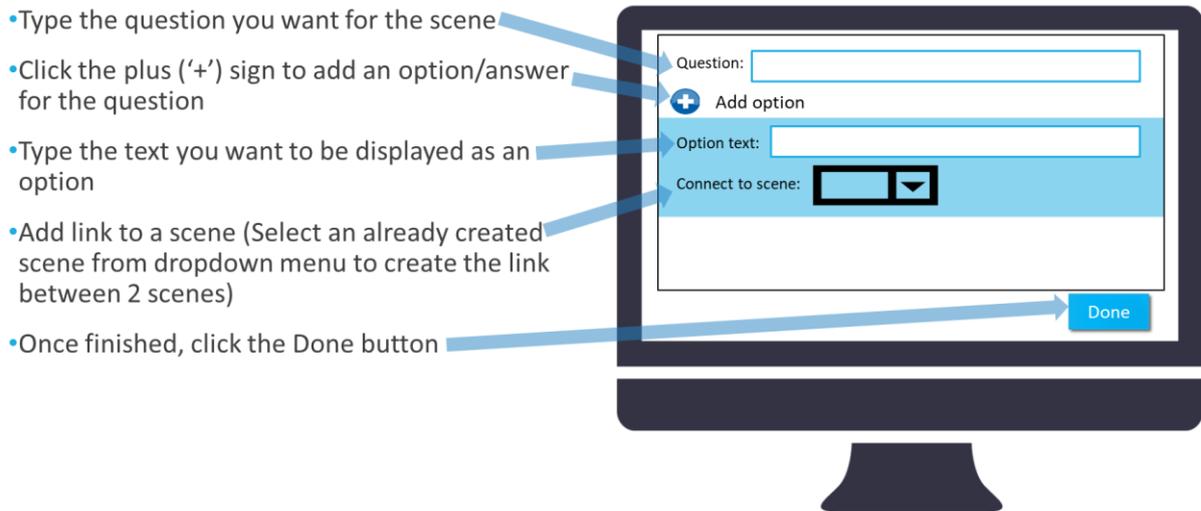


Figure 31 Template Example

The above are two examples of templates that will be provided by the tool, and not all templates are introduced here.

The final output of the tool will be represented as follows (based on the example actions performed in the previous points above) and will enable the simulation of the education management scenario.

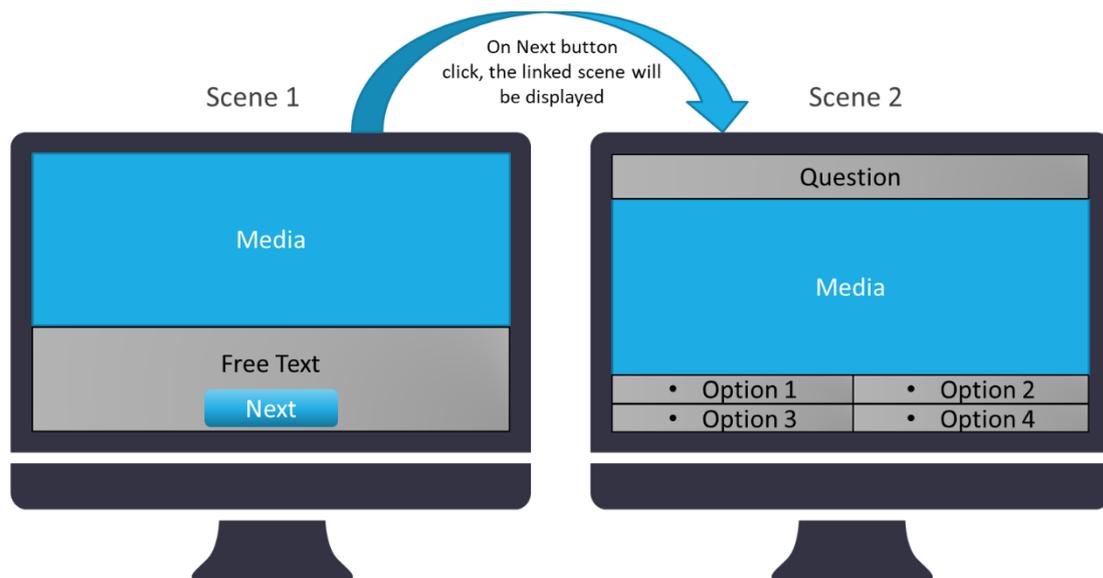


Figure 32 2 scenes

The Low-Fidelity prototype provides an example realization of the requirements and the functionality of the tool to be developed. Finally, the development of the management scenario developed by GX using the developed tool is presented in Annex 1.

## 6.4 Education Scenario Definition

On the basis of the analysis and the definition of the user and system requirements for an education management tool, as these were captured in IO3.A1 the design and development of an innovative simulation tool took place in this activity by FredU. In fact, education management scenarios provided the main use cases that served the user interface design, including the different scenes, the flow of scenes, the team characters, the question and response types, the ways of interaction within the

scenario's environment, etc. The partners created their own online management education scenarios and prepared a flowchart to make it easier to understand the process. All partners reviewed and provided feedback.

## 6.5. Decision making skill in Management

Organisations: GrantExpert and Frederick University

**Learning Goal:** Learners take the role of a manager in a company and are exposed to different situations for which they need to make critical decisions. Decision making is an important management skill, among others, that ME students need to develop and enhance through their studies. In real life, the core function of the management is to make decisions on business operations and growth.

**Additional information:** A decision is a choice made from available alternatives. Decision making is the process of identifying problems and opportunities and then resolving them. Management decisions typically fall into one of the two categories: programmed and non-programmed. Programmed decisions are made in response to a situation that has occurred often enough to enable managers to develop decision rules that can be applied in the future. Non-programmed decisions are often related to strategic planning because uncertainty is great, and decisions are complex.

**Basic Description:** The general scenario is applied in an interactive choice-driven storytelling tool. The user (learner) gets introduced at the beginning in his/her new role, that of a manager (or CEO) in a specific new business company, an online start-up (e.g., online styling platform). Following the introduction to this new role and a short description of what the company is about, the user gets informed about different situations and everyday operations that do exist in the company; examples are: (1) decision making in human resources, (2) in production, (3) in client servicing, (4) in marketing. For the purposes of this task, we will develop only two scenarios: (1) decision making in human resources, and (2) in production. The user starts with choosing one of the above-mentioned situations with which s/he needs to deal with, in order to secure the successful operation of the company. Based on the choice of the user, the scene (background) changes, as well as the story options to follow. So, depending on the users' choice, a different story evolves, with different options each time provided to the user. Based on the user's choices at each stage, each of the two scenarios has a different finale, providing feedback to the user on how his/her decisions have affected (positively or negatively) the company's operations and growth.

**Basic Description:** The general scenario is applied in an interactive choice-driven storytelling tool. The user (learner) gets introduced at the beginning in his/her new role, that of a manager in a specific new business company, an online start-up (e.g., online styling platform). Following the introduction to this new role and a short description of what the company is about, the user gets informed about different situations and everyday operations that do exist in the company; examples are: (1) decision making in human resources, (2) in production, (3) in client servicing, (4) in marketing. For the purposes of this task, we will develop only two scenarios: (1) decision making in human resources, and (2) in production. The user starts with choosing one of the above-mentioned situations with which s/he needs to deal with, in order to secure the successful operation of the company. Based on the choice of the user, the scene (background) changes, as well as the story options to follow. So, depending on the users' choice, a different story evolves, with different options each time provided to the user. Based on the user's choices at each stage, each of the two scenarios has a different finale, providing feedback to the user on how his/her decisions have affected (positively or negatively) the company's operations and growth.

**Scenario #1: Human resources:** The HR manager is being informed about the need to expand the company's capacity by hiring the right resources. The company is an online start-up (e.g., online styling

platform). S/he needs to make decisions for the profile and number of people that must be employed in the company. Different options are given to the user. For instance, (i) people who are experienced and adept in their fields such as software development, marketing, operations, procurement, and logistics, but require a high salary, (ii) people not so much experienced but require a lower salary, (iii) a mixture of people with different qualifications and experience. While making this decision, the user is prompted to consider that talented location-independent workers capable of delivering the required technical support and services online should be shortlisted, so as to serve the company's main services. After having decided on the type of employees (experiences, novices, mixed) to be employed, then, the user is required to decide whether the employees will work on the premises exclusively, at home or a combination of both options. The user should recall from the introduction provided at the beginning of the activity that the business is an online start-up, therefore, the best choice would be not to have to hire employees who work on the premises exclusively. This option will reduce the operations costs of the company, in contrast to the option in which all employees work exclusively at the company's premises. The user also needs to ensure an optimal mix of on-site and remote workers, so as to easily carry out the functions in a cost-effective way. Emails and chat communications as well as video interactions can keep the team spirit going. This will also give you the flexibility of hiring talent that might be scattered over different geographic locations and can come together digitally to create path-breaking solutions. On the other hand, the option of having all employees working remotely from home, might lead to other problems that will affect the company's growth and operation e.g., limited communication, limited control. An indicative flow of steps is given in the figure below. Not all options have been developed, just one of those and incomplete. At each step (or at the very end of the story), the user gets feedback based on the decisions made. Then, s/he can start from the beginning, choosing this time different options.

## 6.6. Narrative Script – Decision making skill in Management

Narrative Script has been developed for this example:

### Scene 1:

In an office, with a desk and a chair and a computer screen.

Characters:

- CEO
- HR manager

The HR manager is sitting in his office, suddenly the phone rings and he is being informed through the phone that the CEO of the company wants to come to his office.

The CEO says that there is a necessity to hire more people. The CEO explains the need to expand the company's capacity by hiring the right resources. The company is an online start-up (e.g., online styling platform). S/he needs to make decisions for the profile and number of people that must be employed in the company

Phone ringing:

*HR Manager:* Yes, it is okay, the CEO can come in, I don't have any meetings at the moment.

CEO coming inside the office:

*CEO:* Hi Lucie, I have been informed from the research and design department of our company that there is a need to hire one person in this front-end developer position since it is a new department and we have to expand. As you know our company is an online start-up with online styling platforms, therefore you need to hire the most suitable person for the vacancy that we will open. You have to make a decision for the profile and number of people that must be employed in the company. Please run a job position opening and you are free to hire the person that meets your standards. I am sure

you have different options. You have three weeks to find the best person for the job. Have a nice day  
Lucie!

*HR Manager: Thank you Chris, I will start searching immediately for the best candidates. Enjoy your day!*

## Scene 2:

Characters:

- candidate 1
- candidate 2
- candidate 3
- HR manager
- CEO

The HR Manager is sitting in his office, and then *he is doing a first screening. He is holding different CVS. He is looking in the different profiles of the people to employ. Then the candidates start coming in. Knock on the door.*

*HR Manager: Hello, come in.*

Candidate 1: Hello, my name is John, nice to meet you. I am here for the position of [software developer]. I have 16 years of experience in this position. Thank you for taking the time to meet with me today. I was so excited when a friend of mine told me this position was open!

*Manager: What makes you a suitable candidate for this job?*

*Candidate 1: Judging from the information I have gathered about your company; your company has a strong work system and you need organized employees to manage day-to-day operations. My Work experience shows that I have a history of success in organizing and communicating with employees. I look forward to using my skills to benefit the organization.*

*HR Manager: Are you comfortable working remotely?"*

*Candidate 1: Not really, I would rather be at the company's premises to have a full view of the company and the other colleagues. I work better with others.*

*HR Manager: What are your greatest strengths?*

Candidate: "I have always been a born leader. I also regularly hone my management skills through 360 reviews and candid meetings with the team, and I know that continuing to develop my leadership skills is the goal of my next position. "

Then John is leaving then the next candidate is coming in.

*HR Manager: Hi Jack. Thank you for being here today. This is Lucie, Pleased to meet you.*

*Candidate 2: Hi, Lucie. Nice to meet you too.*

*HR Manager: Tell me about yourself.*

*Candidate 2: I am an excellent team member. I like to collaborate and contribute as much as possible during the project. If I finish my job and have free time, I will ask my colleagues if I can do something for them. I always try to take the time to answer any questions, especially questions from new team members. I believe that teamwork and collaboration can help create better and more efficient results.*

*Manager: What is your motivation?*

*Candidate 2:* One of my biggest motivations is the end-user experience. In my current role as a front-end developer, I know how many details can improve the product. I want to make sure that each button is in the best position, that the drop-down menu is correct, and that each page can be enlarged. Receiving positive feedback from clients or clients motivates me to do my best.

*Manager:* What is your experience?

*Candidate 2 :* I have some experience in this field and completed some tasks in this area but not much I would say.

Jack is leaving and a third candidate comes in.

*HR Manager:* Hello, Daniella, welcome , nice to meet you. I would like to begin our conversation with some questions. Actually please tell me why you want this job?

*Candidate 3:* Hello, Nice to meet you too. I've researched the job, and found that my skills and interests really fit the role. I'm good at planning and organizing, have great attention to detail and would like to learn new skills. I think I'd be a great match for your company.

*HR Manager:* Have you ever had to deal with being in a team with people you don't get on with?

*Candidate3:* I worked with a girl who annoyed me, so we argued quite a lot. But I just told her to leave me alone so now we don't speak to each other unless we have to.

*HR Manager:* Do you prefer working from home (remotely) or working at the company's premises?

*Candidate 3:* I do not like working at the company since I am a lone wolf who concentrates better at home so I would rather not come to the company at all. I work independently.

### **Scene 3:**

The experienced HR Manager is thinking about all the three candidates and he is trying to make a selection. Whom should he hire?

OLMEdu Toolkit Hiring scenario can be found in the following link:

<https://mdl.frederick.ac.cy/olmedu/Display/Index/27>

The preview of this scenario is publicly available at the OLMEdu tool.

The following flowchart describes in a diagrammatic way the basic logic and workflow of the Decision-making skill in Management.

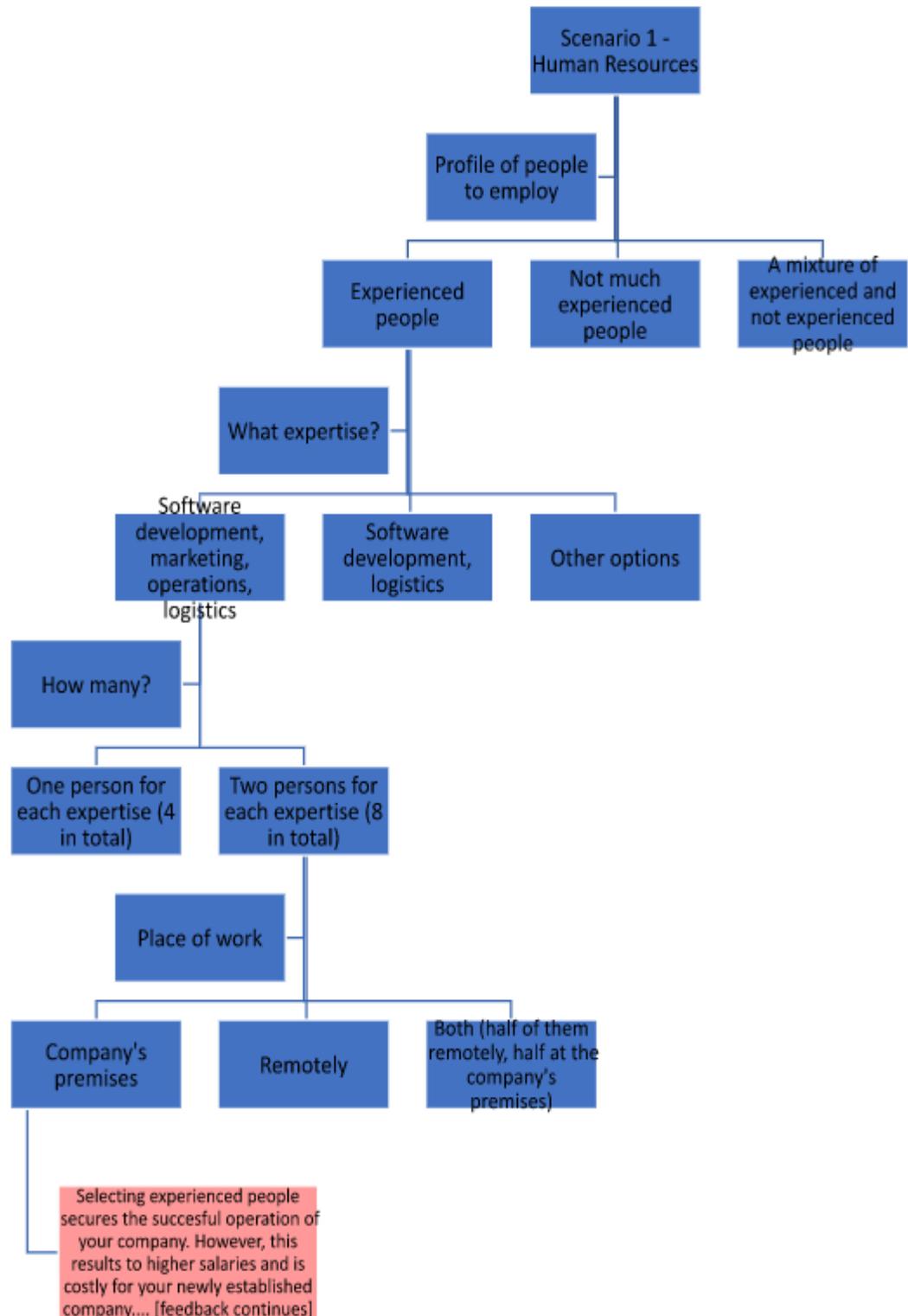


Figure 33 Decision making skill in Management – Flowchart Example by GX and FredU

## IO3.A3 Toolbox Integration

### 7. The OLMedu Tool

1. The newly developed OLMedu Tool is integrated with the OLMedu web platform and can be found here: <https://platform.olmedu.eu/>. The following section presents a tutorial on the usage of the OLMedu tool. **Home Page** (Fig.1): The user can see the already made scenarios, and also create a new one.

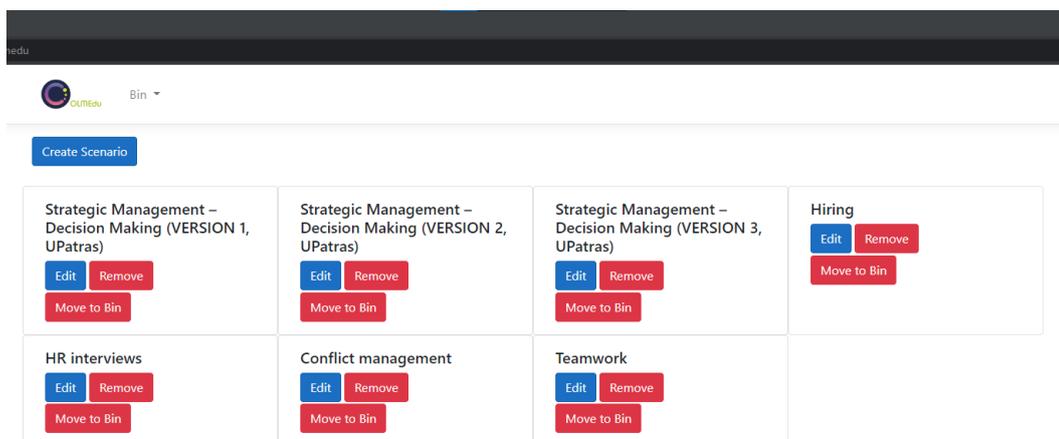


Figure 34: Home Page

2. **Create New Scenario:** After clicking the Create Scenario button in the Home Page, the following page (Fig. 2) will be displayed. In order to create a new scenario, the user needs to enter the scenario name in the indicated text area and click Create Scenario to save it.

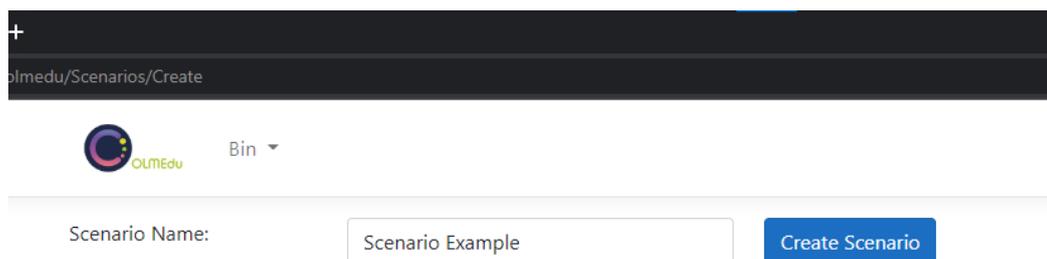
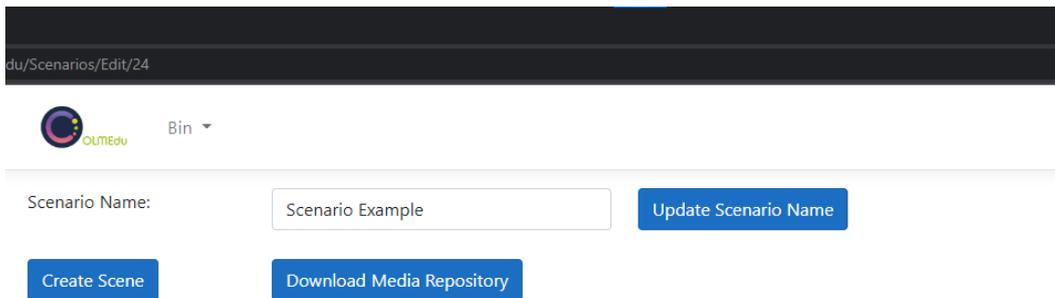


Figure 35: Create a scenario

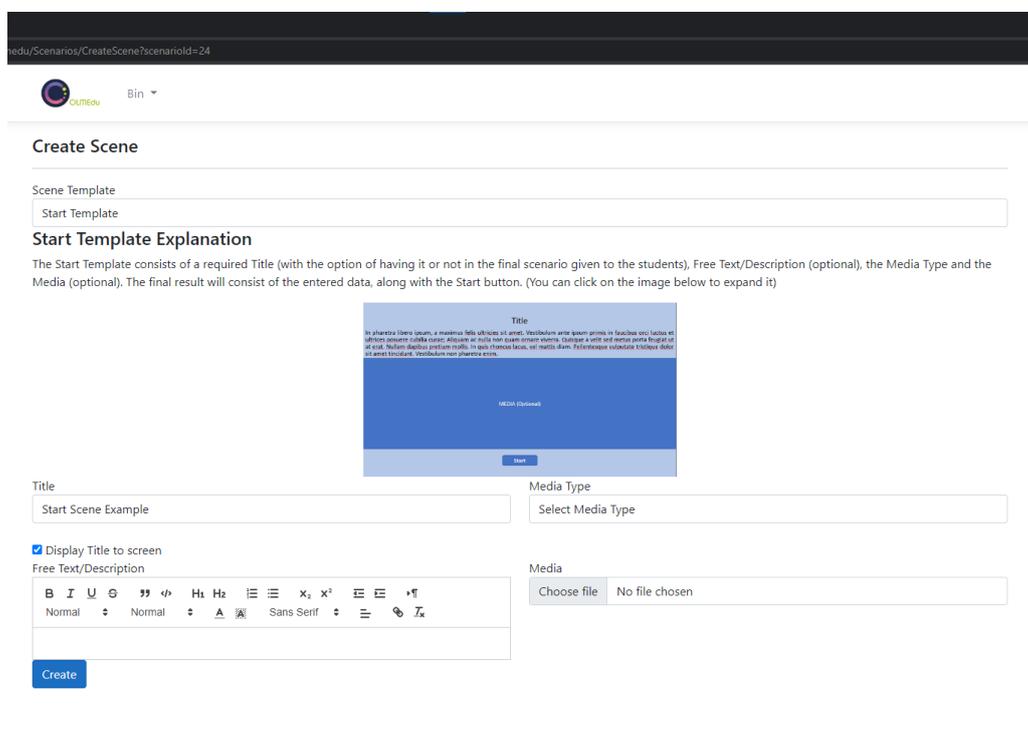
3. **Scenario Overview Page** (Fig. 3): After creating the scenario, the Scenario Overview page is displayed. In this page, the user can modify and save the scenario name. Additionally, the Media Repository Folder can be downloaded, including material in different forms (2D images, 2D videos, 360 panorama images and 360 videos). Finally, clicking the Create Scene button, the user can create scenes under the scenario. The newly created scenes are going to be displayed on this page.



## No Scenes Found For Selected Scenario

### 4. Create Start Scene:

- a. In order to create the initial scene of the scenario, the user needs to select the Start Template option from the Scene Template dropdown on top of the page.
- b. Then the page will add the fields needed (Fig. 4).
- c. A title must be entered, in order to identify the scene.
- d. If the title needs to be displayed when running the scenario, then the checkbox below the title text area needs to be checked.
- e. The description of the scene can be entered in the FreeText/Description text editor.
- f. In order to add a media file to the scene, first the type of the media must be chosen from the Media Type dropdown and then Choose the file from the computer used.



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## 5. Create Simple Scene:

- In order to create a simple scene, the user needs to select the Simple Template option from the Scene Template dropdown on top of the page.
- Then the page will add the fields needed (Fig. 5).
- A title must be entered, in order to identify the scene.
- If the title needs to be displayed when running the scenario, then the checkbox below the title text area needs to be checked.
- The description of the scene can be entered in the FreeText/Description text editor.
- In order to add a media file to the scene, first the type of the media must be chosen from the Media Type dropdown and then Choose the file from the computer used.

OLMEdu/Scenarios/CreateScene?scenarioId=24

OLMEdu Bin

### Create Scene

Scene Template  
Simple Template

#### Simple Template Explanation

The Simple Template consists of a required Title (with the option of having it or not in the final scenario given to the students), Free Text/Description (optional), the Media Type and the Media (optional). The final result will consist of the entered data, along with the Next button. (You can click on the image below to expand it)

**Title**  
The Simple Template consists of a required Title (with the option of having it or not in the final scenario given to the students), Free Text/Description (optional), the Media Type and the Media (optional). The final result will consist of the entered data, along with the Next button. (You can click on the image below to expand it)

Media Type  
Select Media Type

Display Title to screen

Free Text/Description

**Media**  
Choose file No file chosen

Create

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## 6. Create Scene With Question and four (4) Options:

- In order to create a scene with 4 options, where one must be chosen, the user needs to select the 4-Options Template option from the Scene Template dropdown on top of the page.
- Then the page will add the fields needed (Fig. 6).
- A title must be entered, in order to identify the scene.
- If the title needs to be displayed when running the scenario, then the checkbox below the title text area needs to be checked.
- The description of the scene can be entered in the FreeText/Description text editor.
- In order to add a media file to the scene, first the type of the media must be chosen from the Media Type dropdown and then Choose the file from the computer used.

- g. Then the 4 options must be entered. The first 2 options are required.

**7. Create Scene With Question and six (6) Options:**

- a. In order to create a scene with 6 options, where two must be chosen, the user needs to select the 6-Options Template option from the Scene Template dropdown on top of the page.
- b. Then the page will add the fields needed (Fig. 7).
- c. A title must be entered, in order to identify the scene.
- d. If the title needs to be displayed when running the scenario, then the checkbox below the title text area needs to be checked.
- e. The description of the scene can be entered in the FreeText/Description text editor.
- f. In order to add a media file to the scene, first the type of the media must be chosen from the Media Type dropdown and then Choose the file from the computer used.
- g. Then the 6 options must be entered. The first 4 options are required.



Bin

## Create Scene

Scene Template

6-Options Template (2 options must be selected)

### 6-Options Template Explanation

The 6-Options Template consists of a required Title (with the option of having it or not in the final scenario given to the students), Free Text/Description (optional), the Media Type, the Media (optional), and 6 options (The first four are required). The students will be able to select two answers strictly. The final result will consist of the entered data, along with the Next button. (You can click on the image below to expand it)

Free Text/Description

Free Text/Description



Title/Question

6 Options Template Example

Media Type

Select Media Type

Display Title to screen

Free Text/Description

**B I U** **H1 H2**  $x_2$   $x^2$

Normal

Normal

Sans Serif

Normal

Media

Choose file

No file chosen

### Options

Option 1

Option 2

Option 3

Option 4

Option 5

Option 6

Create

## 8. Create Retry or Wrong Answer Scene:

- In order to create a retry/wrong answer scene, the user needs to select the Retry/Wrong Answer Template option from the Scene Template dropdown on top of the page. This template can be used for giving feedback on a wrong answered question from a previous scene.
- Then the page will add the fields needed (Fig. 8).
- A title must be entered, in order to identify the scene.
- If the title needs to be displayed when running the scenario, then the checkbox below the title text area needs to be checked.
- The description of the scene can be entered in the FreeText/Description text editor.
- In order to add a media file to the scene, first the type of the media must be chosen from the Media Type dropdown and then Choose the file from the computer used.

edu/Scenarios/CreateScene?scenarioId=24

OLMEdu Bin

### Create Scene

Scene Template  
Retry/Wrong Answer Template

#### Retry/Wrong Answer Template Explanation

The Retry/Wrong Answer Template consists of a required Title (with the option of having it or not in the final scenario given to the students), Free Text/Description (optional), the Media Type and the Media (optional). The final result will consist of the entered data, along with the Retry button. (You can click on the image below to expand it)

Title

Media (Optional)

Retry

Title/Question  
Retry Template Example

Media Type  
Select Media Type

Display Title to screen

Free Text/Description

Media  
Choose file No file chosen

Create

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## 9. Create Finish Scene:

- In order to create a finish scene, the user needs to select the Retry/Wrong Answer Template option from the Scene Template dropdown on top of the page.
- Then the page will add the fields needed (Fig. 9).
- A title must be entered, in order to identify the scene.
- If the title needs to be displayed when running the scenario, then the checkbox below the title text area needs to be checked.
- The description of the scene can be entered in the FreeText/Description text editor.
- In order to add a media file to the scene, first the type of the media must be chosen from the Media Type dropdown and then Choose the file from the computer used.

edu/Scenarios/CreateScene?scenarioId=24

OLMEdu Bin

### Create Scene

Scene Template  
Finish Template

#### Finish Template Explanation

The Finish Template consists of a required Title (with the option of having it or not in the final scenario given to the students), Free Text/Description (optional), the Media Type and the Media (optional). The final result will consist of the entered data, without having a button, since this scene is the last one of the final scenario. (You can click on the image below to expand it)

Title  
Finish Template Example

Media Type  
Select Media Type

Display Title to screen

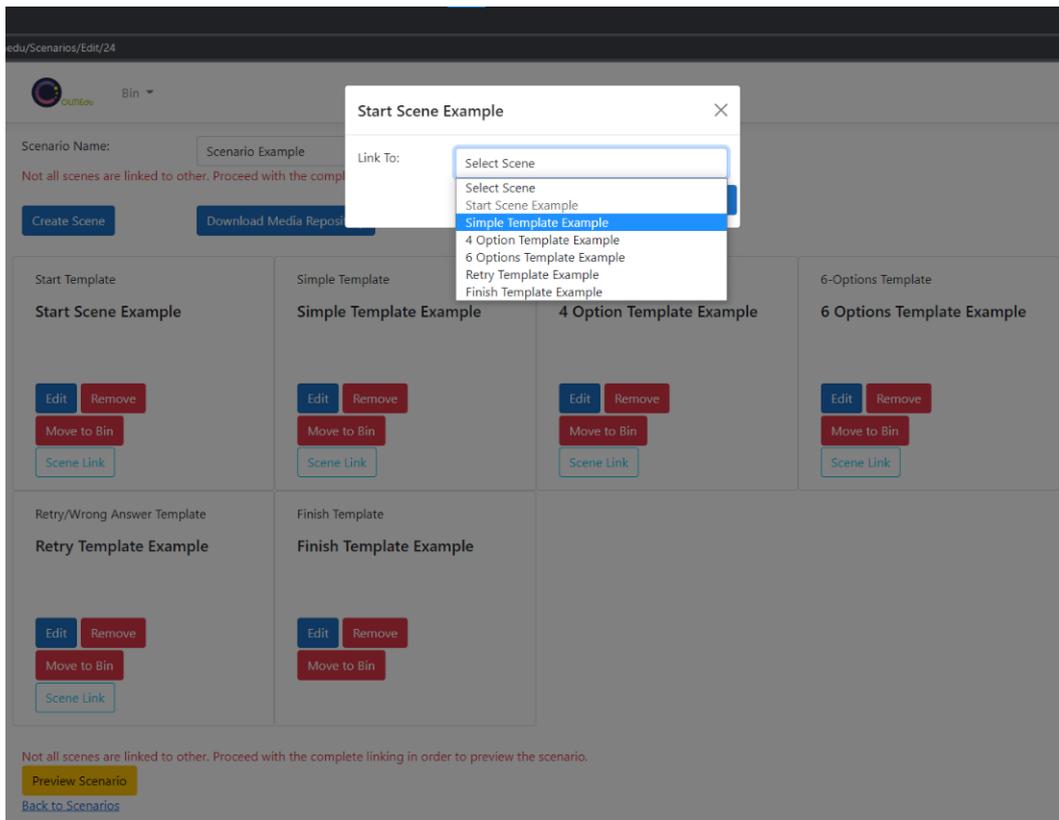
Free Text/Description

Normal Normal Sans Serif

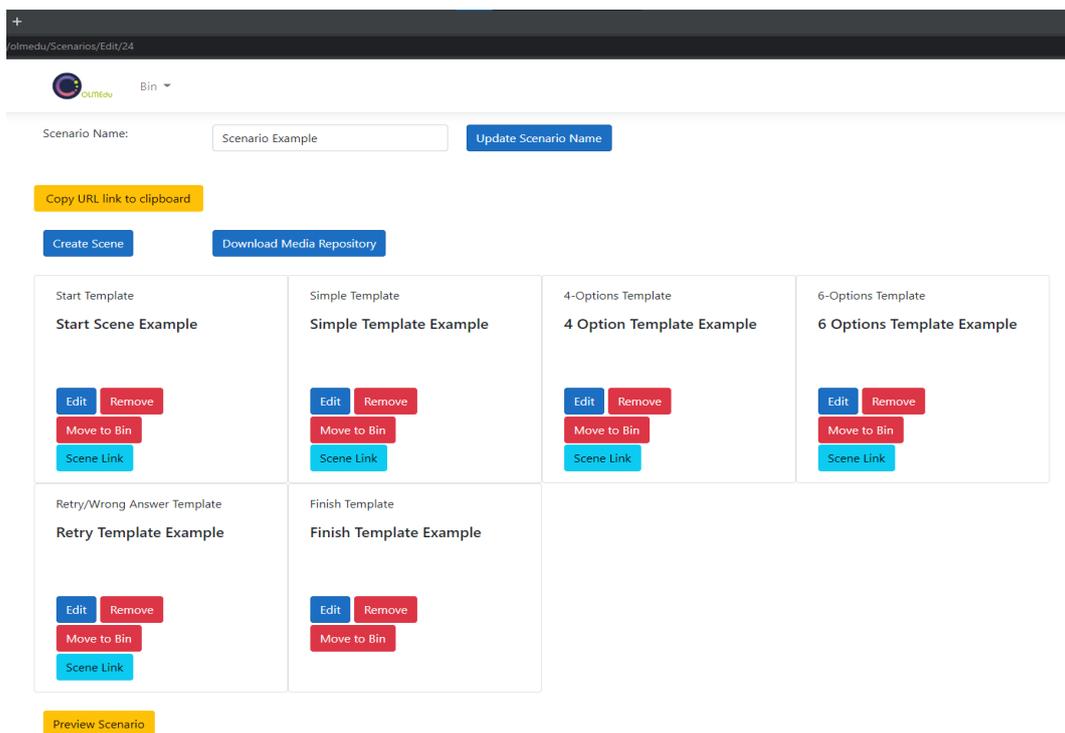
Media  
Choose file No file chosen

Create

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10. As soon as the user finishes creating the scenes for the scenario, they can view them in the Scenario Overview Page (fig. 10). In order to modify a scene, the Edit button of the scene can be clicked.



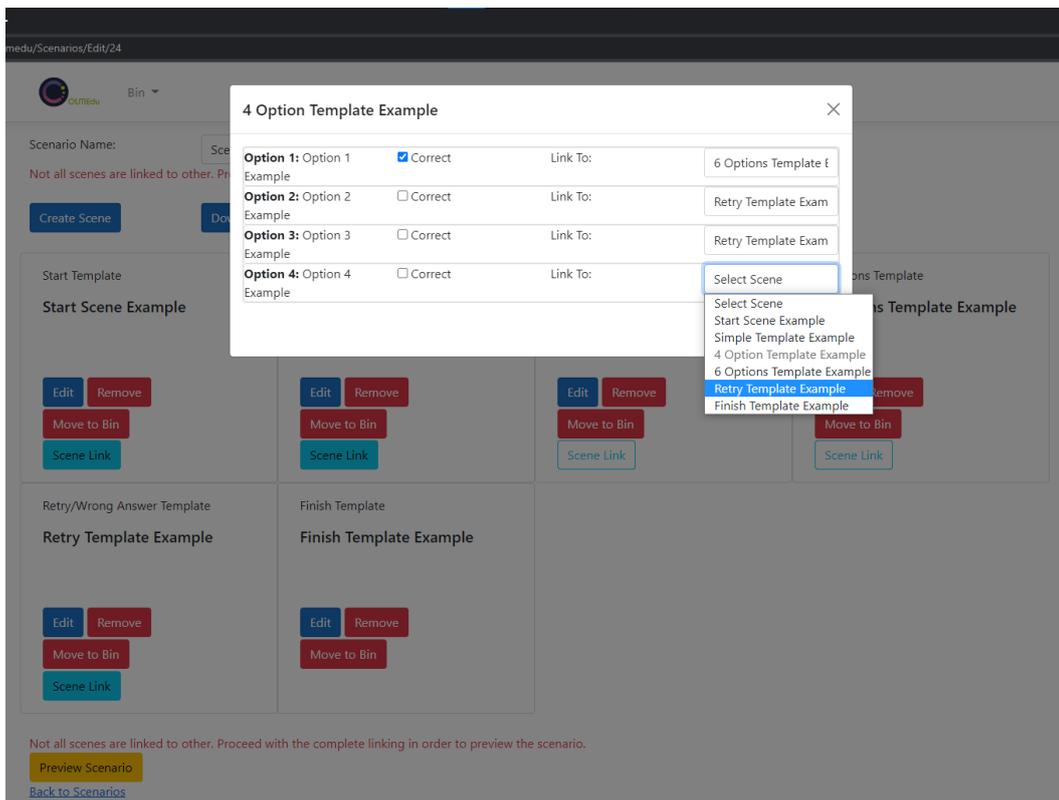
## 11. Linking the Start Scene:

- In order to create a link from the start scene, that is which scene is going to be displayed after the selected scene, the user needs to click on the Scene Link button under the scene.
- A pop up window is going to be displayed and the user is required to select the next scene to be linked (Fig.11).
- After the selection, the Save Changes button needs to be clicked, in order to save the link.

Note: For Start Template, Simple Template and Retry/Wrong Answer Template scenes, the links are added using the same process.

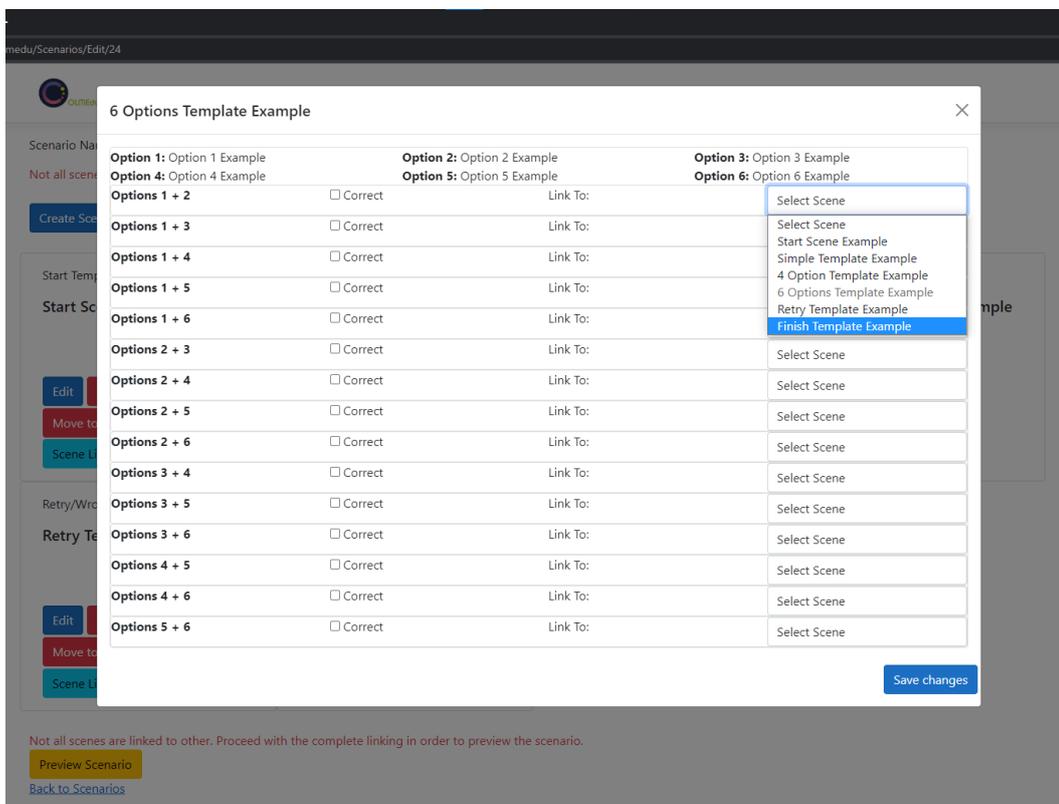
## 12. Linking a 4-Options Template scene:

- In order to create links from a 4-Options Template scene, the user needs to click on the Scene Link button under the scene.
- A pop up window is going to be displayed and the user is required to select the next scene to be linked for each option available, and selecting which is the correct one (Fig.12).
- After the selection, the Save Changes button needs to be clicked, in order to save the links.



### 13. Linking a 6-Options Template scene:

- In order to create links from a 6-Options Template scene, the user needs to click on the Scene Link button under the scene.
- A pop up window is going to be displayed and the user is required to select the next scene to be linked for each pair of options available, and selecting which pair is the correct one (Fig.13).
- After the selection, the Save Changes button needs to be clicked, in order to save the links.



14. **Previewing the scenario:** After the user creates all the links required for the scenario, the Preview Scenario can be clicked (Fig. 14), in order to run the scenario and verify its flow.

15. **Getting the URL link of the scenario:** In order to give the URL link of the scenario to the students, the user needs to click the Copy URL link to clipboard button (Fig. 14) and the URL is going to be saved on the clipboard.

Scenario Name:  [Update Scenario Name](#)

[Copy URL link to clipboard](#)

[Create Scene](#) [Download Media Repository](#)

<p>Start Template</p> <p><b>Start Scene Example</b></p> <p><a href="#">Edit</a> <a href="#">Remove</a></p> <p><a href="#">Move to Bin</a></p> <p><a href="#">Scene Link</a></p>	<p>Simple Template</p> <p><b>Simple Template Example</b></p> <p><a href="#">Edit</a> <a href="#">Remove</a></p> <p><a href="#">Move to Bin</a></p> <p><a href="#">Scene Link</a></p>	<p>4-Options Template</p> <p><b>4 Option Template Example</b></p> <p><a href="#">Edit</a> <a href="#">Remove</a></p> <p><a href="#">Move to Bin</a></p> <p><a href="#">Scene Link</a></p>	<p>6-Options Template</p> <p><b>6 Options Template Example</b></p> <p><a href="#">Edit</a> <a href="#">Remove</a></p> <p><a href="#">Move to Bin</a></p> <p><a href="#">Scene Link</a></p>
<p>Retry/Wrong Answer Template</p> <p><b>Retry Template Example</b></p> <p><a href="#">Edit</a> <a href="#">Remove</a></p> <p><a href="#">Move to Bin</a></p> <p><a href="#">Scene Link</a></p>	<p>Finish Template</p> <p><b>Finish Template Example</b></p> <p><a href="#">Edit</a> <a href="#">Remove</a></p> <p><a href="#">Move to Bin</a></p>		

[Preview Scenario](#)

## IO3.A4 Piloting Use of the Toolbox

### 8. Protocol for the OLMedu Piloting

Step 1 is to say a few words about the OLMedu Toolbox

*“The toolbox is expected to support the acquisition of skills needed to HES, and will provide them the capability to define and develop simulation-based interactive ME scenarios. It will provide them the necessary ICT knowledge and skills to use such advanced digital tools in order to enhance the learning experience of their students, by applying experienced-based learning scenarios that enable the students to cultivate problem solving and analytical skills. The results of IO3 together with the results of IO2, will enable HES in ME to shift from the traditional learning model to one that builds learning communities within the digital world, thus enhancing at the same time their students’ learning experience.”*

**General Step:** Project presentation (PPT) or short speech introduction of the project - not more than 5 minutes. Presentation can be found in the IO3.A4 folder on the GDrive.

⇒ <https://docs.google.com/presentation/d/1sS7vFaa22kfPbDexHeNk2K9Qh2y2ibuh/e/dit#slide=id.p1>

#### **Here are the necessary steps to create your own scenario prior to using the OLMedu Newly developed Tool**

**Step 1:** Go through the video tutorials

Link can be found here:

<https://drive.google.com/drive/folders/1LNDeOcqNrxTPs3RUnPmKgTpRPet5tLvP>

**Step 2:** Brainstorm and think about your ideal management scenario

**Step 3:** Visit the OLMedu Tool and navigate through it

Link can be found here: <https://mdl.frederick.ac.cy/Olmedu>

**Step 4:** Design your own scenario

**Step 5:** Fill in the User Experience Questionnaire (UEQ) and evaluate the Tool

Link can be found here: <https://forms.gle/TNZCcgPjedfXnckL7>

#### **Here are the necessary steps to create your own scenario prior to using the OLMedu Open-Source Tool (H5P)**

**Step 1:** Go through the H5P

Link can be found here: <https://h5p.org/>

#### **H5P - Actions of Use**

1. Navigate to: <https://h5p.org/>
2. Click on Create free account (top right corner).
3. Fill up your information and click the Create new account button at the end of the form.
4. Login (if not already logged in) and navigate to My account (top right corner).
5. Under Quick Links, click on the Try out H5P button.
6. The H5P tool playground is available for use.
7. For interactive presentations, click on Course Presentation.
8. The Tutorial Button can be clicked for the interactive presentation Tutorial  
(Alternatively: <https://h5p.org/tutorial-course-presentation>)
9. The Example Button can be clicked to view an interactive presentation  
(Alternatively: <https://h5p.org/presentation>)

**Step 2:** Brainstorm and think about the topic you would like to create an interactive presentation for. WE

**Step 3:** Visit the OLMedu Open-Source Tool (H5P) and navigate through it

Link can be found here: <https://h5p.org/>

**Step 4:** Design your own scenario

**Step 5:** Fill in the User Experience Questionnaire (UEQ) and evaluate the Tool

Link can be found here: <https://forms.gle/wpdtVN267i5z1izq7>

## 9. Results of the Pilot Testing in partner countries

OLMEdu partners have defined the evaluation process that was followed during the use of the toolbox for executing the pilots. This evaluation process has provided the framework of evaluation and aimed to identify and record the issues and difficulties faced by HES in the preparation of the simulations. In fact, this piloting activity included the definition of two education management scenarios/simulations through the use of the toolbox. These scenarios were developed by 6 HES, 2 from each country from the participating universities TV, UPatras, HOU and FredU, and GX. Frederick University prepared two questionnaires addressed to the Olmedu Tool and the H5P Tool accordingly. Below the answers from the participants can provide adequate feedback for the adaptation of the tool. The OLMEdu questionnaire included 16 questions and the H5P questionnaire included 14 questions.

**Specifically, the results from the OLMEdu Tool pilot tests can be seen below:**

### Question 1: What is your profile?

Profile

6 responses

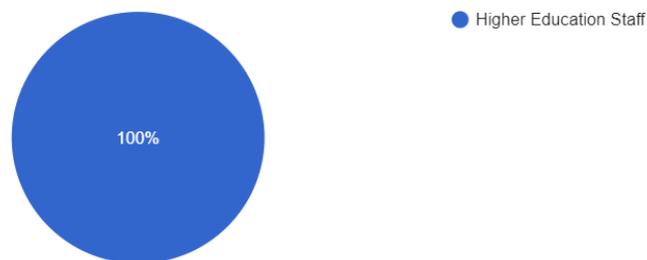


Figure 48 Profile of the participants

Regarding the professional experience of the respondents in the sample taken by the three countries, the results showed that all the participants are working as higher education staff. Therefore, they all had adequate experience and could provide accurate results because of their professionalism.

### Question 2: Where do you come from?

Country

6 responses

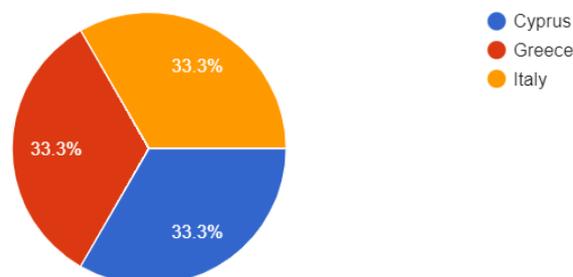
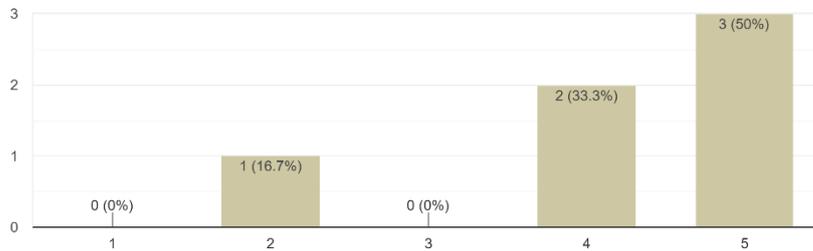


Figure 49 Origin of the participants

In this first comparison we can see in detail that the responders are equally from the two countries, two from each country, Italy, Cyprus and Greece.

### **Question 3: How friendly is this tool for the users?**

Overall, how friendly is this tool for the users?  
6 responses

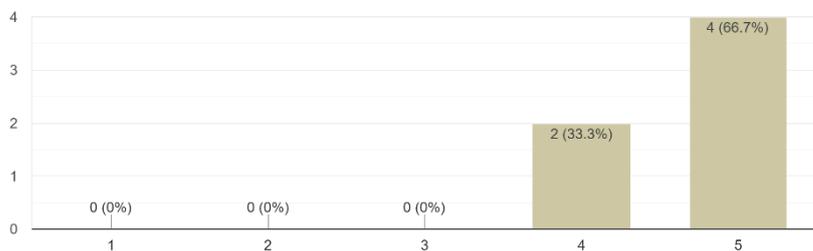


*Figure 50 Friendliness of the Tool*

Regarding the friendliness of the tool for the users, the majority of the respondents replied that the participants find the tool very friendly. The 33,3% find it friendly and easy to use while only one responder disagreed with the usability of the OLMedu tool.

### **Question 4: How helpful are the instructions provided by the tool?**

How helpful are the instructions provided by the tool?  
6 responses

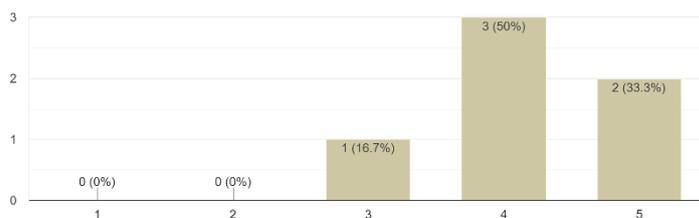


*Figure 51 Usefulness of the instructions of the tool*

The instructions provided by the tool are very helpful and easy to understand since almost all of the pilot participants rated this question with a 5 which means that the instructions were clear.

### **Question 5: How helpful are the examples provided by the tool?**

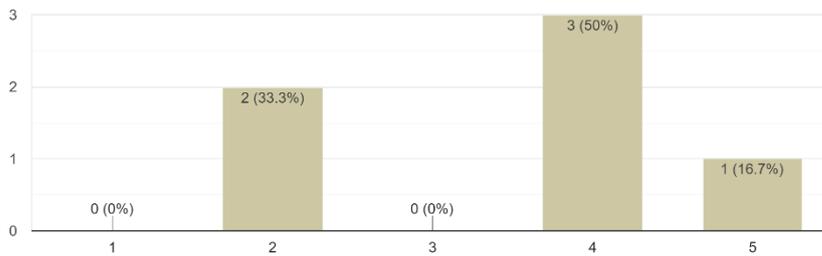
How helpful are the examples provided by the tool?  
6 responses



Maybe we need to create more scenarios and increase the number of examples we have as a guide in the platform. The results as it can be seen from the chart above show that the examples could be clearer.

**Question 6: Does this tool demand less time than preparing the same educational material by hand?**

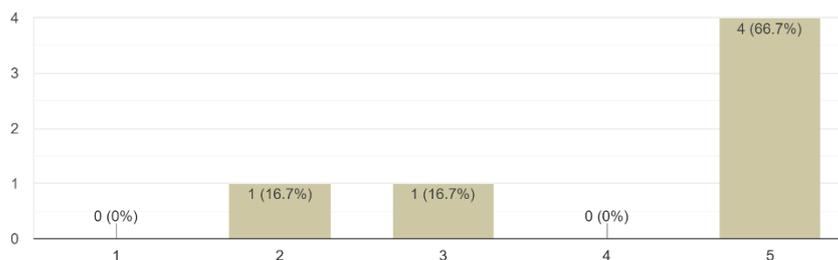
Does this tool demand less time than preparing the same educational material by hand?  
6 responses



If we consider that the 5 stands for less time and 2 stands for more time then the tool might need more time than preparing the material by hand but for sure this process is more interactive.

**Question 7: Is there an adequate number of specific features in the toolbox to apply for your educational material?**

Is there an adequate number of specific features in the toolbox to apply for your educational material?  
6 responses



Actually 66.7% of the responders has stated that there are adequate number of features in the toolbox that will help the HES create educational material.

**Question 8: Is there an adequate number of specific templates in the toolbox to apply for your educational material?**

Is there an adequate number of specific templates in the toolbox to apply for your educational material?

6 responses

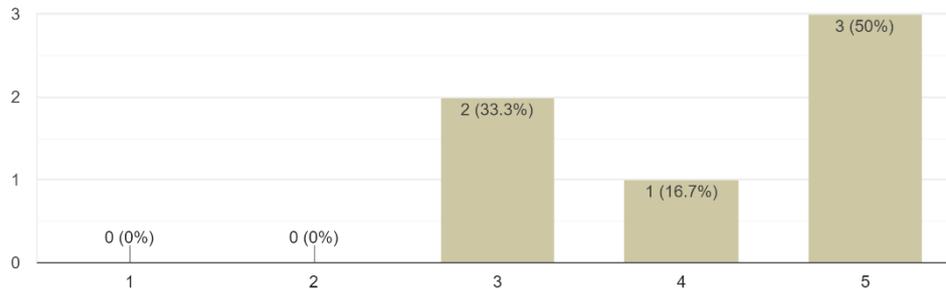


Figure 55 Adequacy of Templates

Based on the feedback we received there are adequate templates in the toolbox.

**Question 9: Does the tool make the management education more attractive for your students?**

Does the tool make the management education more attractive for your students?

6 responses

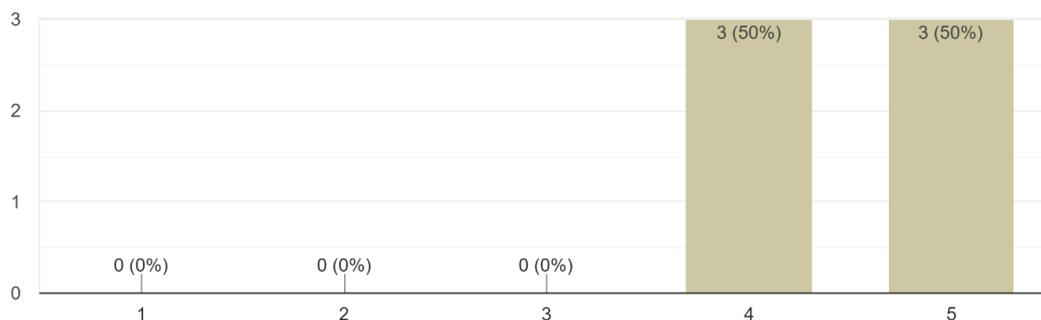


Figure 56 Attractiveness for the students

This section of the survey proved that in the three countries, participants believe that it is highly likely that the tool is going to be extremely attractive for the students and in this way their teaching can become more interesting. Encouraging digital learning is important.

**Question 10: What kind of additional features or templates would you like to be added to the current toolbox?**

Below the answers we received:

- "I would like to have the option to add a URL that would redirect students to youtube videos or other online material."
- "The tool would be better if some more templates were available. Also, some more advanced features need to be added, so that the teacher is able to include complex scenario cases demanding more options or decisions. With the current templates and features available, great effort is needed to think about how to construct an activity with many

options that will require to go back and forward multiple times. It is very time-consuming and perhaps discouraging for some activities that can be more easily made by hand.”

- “Adding some videos or active URLs to enrich the content could be useful.”

**Question 11: Does the tool correspond to your expectations in terms of creating your educational material?**

Does the tool correspond to your expectations in terms of creating your educational material?

6 responses

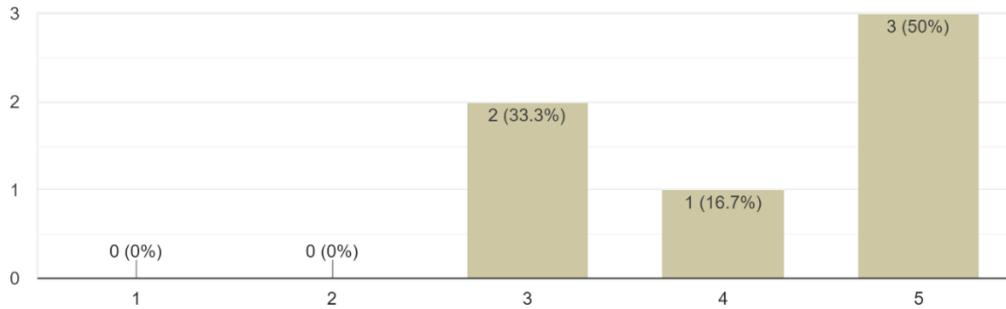


Figure 57 Met expectations

The tool actually corresponds to their expectations of HES in terms of preparing their own teaching material.

**Question 12: Does the tool correspond to your expectations about supporting your teaching in management education?**

Does the tool correspond to your expectations about supporting your teaching in management education?

6 responses

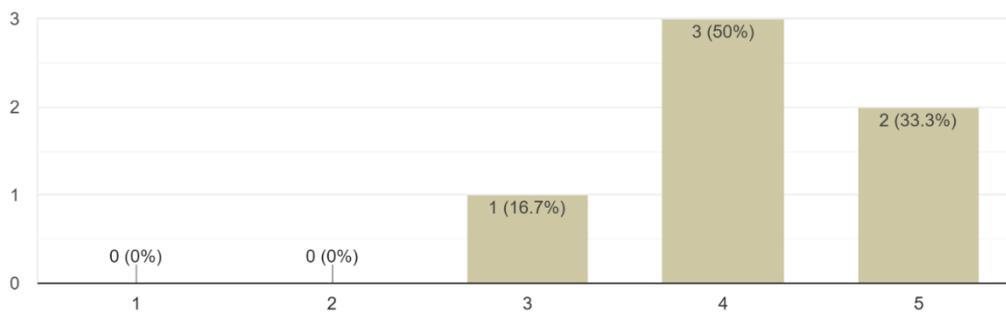


Figure 58 Expectations for teaching in management education

By designing new tools and teaching methods for the higher education staff that correspond to their expectations, teaching becomes more fun and it can perhaps increase the youngsters’ soft/hard skills and knowledge.

**Question 13: How often do you plan to use this tool for teaching in management education?**

How often do you plan to use this tool for teaching in management education?

6 responses

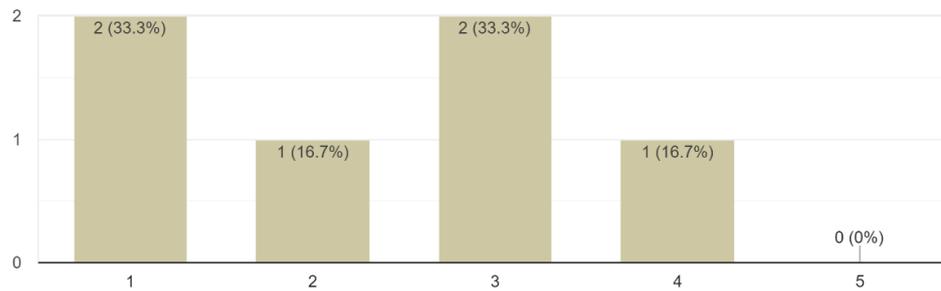


Figure 59 Future usage of the tool

This interactive tool that has the ability to create scenarios can be used by the staff once or twice per semester (33.3%) and in only some of the classes (33,3%). Using the OLMEDU tool is included in their upcoming plans.

**Question 14: Overall, how do you evaluate this tool in term of enhancing your teaching in management education?**

Overall, how do you evaluate this tool in term of enhancing your teaching in management education?

6 responses

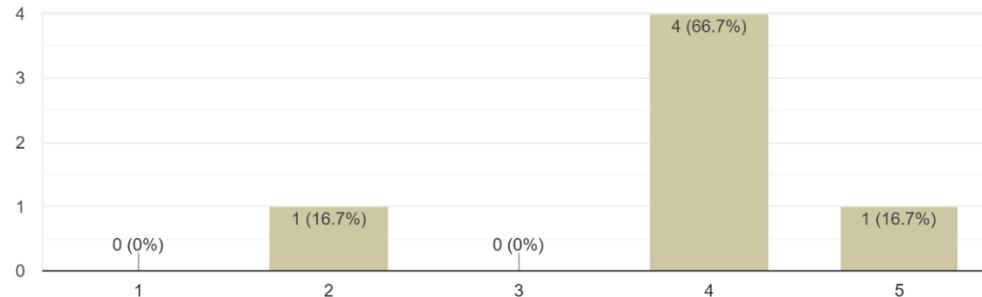


Figure 60 Overall evaluation of the tool

When comparing this essential part of the questionnaire we come up to the conclusion that for the majority of the participants, this tool can be very motivating.

**Question 15: Do you think that the outcome of using the tool will be attractive for your students?**

Do you think that the outcome of using the tool will be attractive for your students?

6 responses

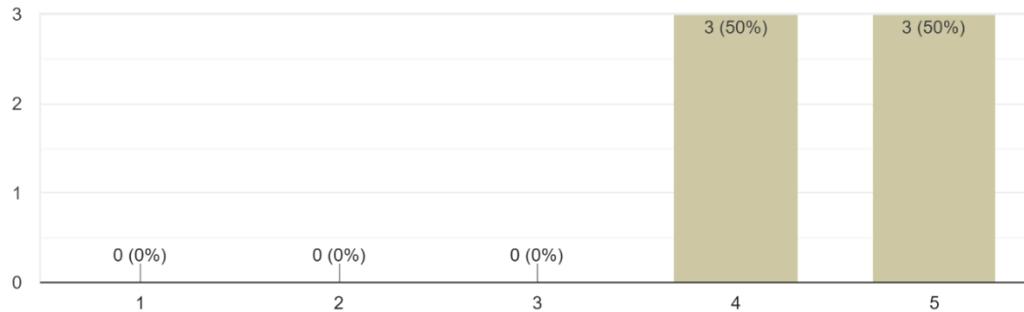


Figure 61 Attractiveness of the Tool

50% of the responders feel that the tool might seem very attractive for the students and the rest 50% believe that the students can find it attractive.

**Question 16: Do you have any Comments / Suggestions?**

- “This would be a great and easy to use tool for marketing classes and could provide diversity in the way we present short cases and scenarios.”
- “The tool does not seem to be user-friendly, at least not at the level I expected. It has to take less time to produce the outcome. It has to win the battle against the preparation of an activity by hand or any other tool. For example, a simple PowerPoint is the easiest solution for the teacher despite not providing the special features available at the tool. Also, the instructions given are quite descriptive, but they can be improved by providing an example of how to construct a complex activity or scenario case. The instructions have to show the potential user-teacher how to take advantage of the tool and save time, and get a more attractive result for students. I think it is not supportive for activities with multiple pathways, or it is difficult to handle it that way.”
- “Providing some more examples would be nice. It would very helpful to have examples from the field of Management education.”

The results from the H5P Tool pilot test can be seen below:

**Question 1: How friendly is the H5P tool for the users?**

Overall, how friendly is the H5P tool for the users?

6 responses

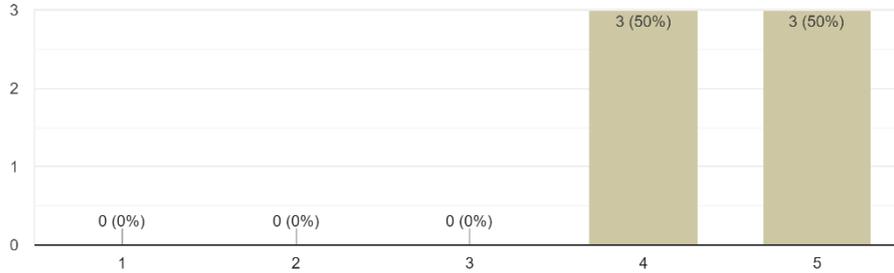


Figure 62 Friendliness of H5P Tool

In this first answer we can see that the charts clearly demonstrate the high level of satisfaction for the H5P tool for the purposes of the OLMedu project and any other activities.

**Question 2: How helpful are the instructions provided by the H5P tool?**

How helpful are the instructions provided by the H5P tool?

6 responses

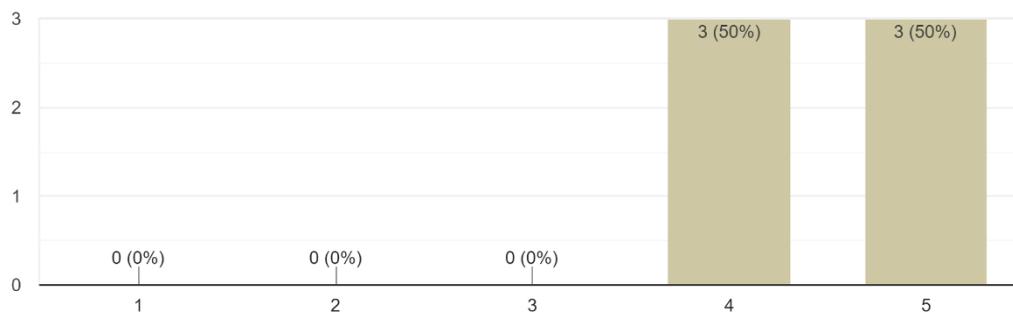


Figure 63 Usability of the H5P Tool

The instructions proved to be extremely helpful by the HES who found it easy to work with.

**Question 2: How helpful are the examples provided by the H5P tool?**

How helpful are the examples provided by the the H5P tool?

6 responses

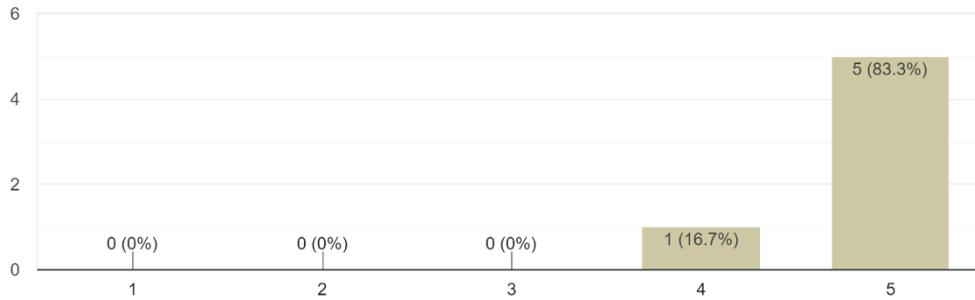


Figure 64 Usefulness of the examples

The examples provided by the H5P tool are more than enough since 5/6 from the responders, (83,3%) stated that they are adequate.

**Question 3: Does the H5P tool demand less time than preparing the same educational material by hand?**

Does the H5P tool demand less time than preparing the same educational material by hand?

6 responses

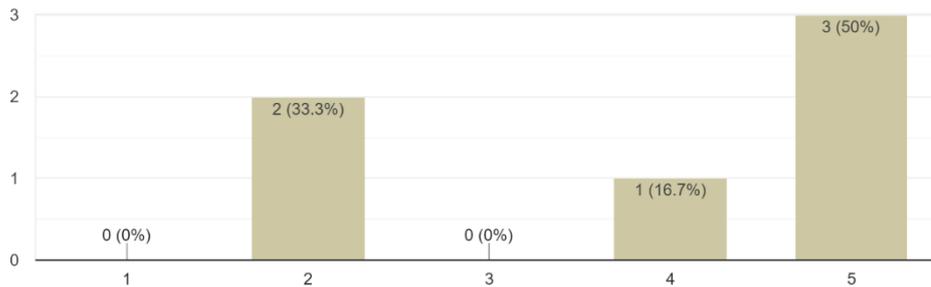


Figure 65 Time needed for H5P Tool

When analyzing the time needed to prepare the material by hand or through the H5P tool we come up to the conclusion that HES replies do not have consensus. It is important to highlight that the overall picture of the above results shows that the replies are distributed unequally. However, 50% of the responders believe that it takes less time.

**Question 4: Is there an adequate number of specific features in the H5P tool to apply to your educational material?**

Is there an adequate number of specific features in the the H5P tool to apply for your educational material?

6 responses

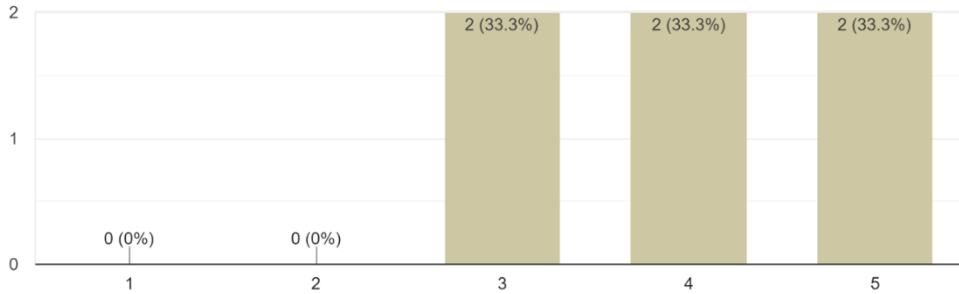


Figure 66 Adequacy of features in H5P Tool

Based on the responses from HES in Cyprus, Italy and Greece there are adequate features in the H5P Tool. The answers are distributed equally among the three higher rates, (33,3%).

**Question 5: Is there an adequate number of specific templates in the H5P tool to apply for your educational material?**

Is there an adequate number of specific templates in the H5P tool to apply for your educational material?

6 responses

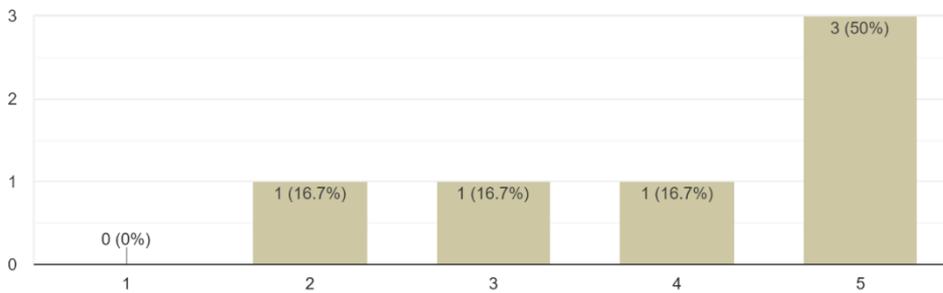


Figure 67 Adequacy of templates in H5P Tool

The research shows that 50% of the responders find the templates adequate but still there are other 3 responders who believe that there should be more templates in a smaller or bigger degree.

**Question 6: Does the H5P tool make the management education more attractive for your students?**

Does the H5P tool make the management education more attractive for your students?

6 responses

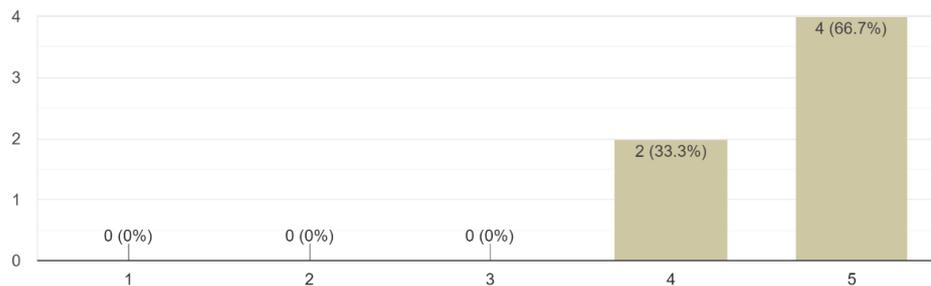


Figure 68 Attractiveness for the students

For sure the H5P Tool makes the management education easier more fun and more attractive for the students. The results clearly show that HES would like to

**Question 7: What kind of additional features or templates would you like see for the H5P tool?**

The responders in this question stated the following:

- links to papers articles
- if it could be a bit more user friendly
- It seems to be a very useful tool providing many options. I think all necessary features and templates are available for any kind of activity.
- There are some Content Types which are not available without signing up, for example the KewAr Code. It has free trial only for 30 days.
- Nothing more, the features are adequate.

**Question 8: Does the H5P tool correspond to your expectations in terms of creating your educational material?**

Does the H5P tool correspond to your expectations in terms of creating your educational material?

6 responses

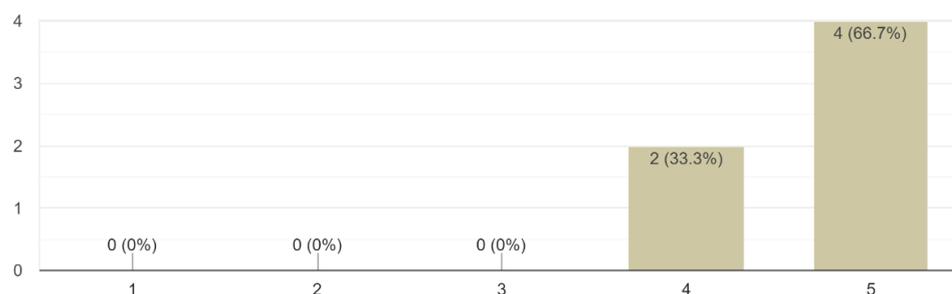


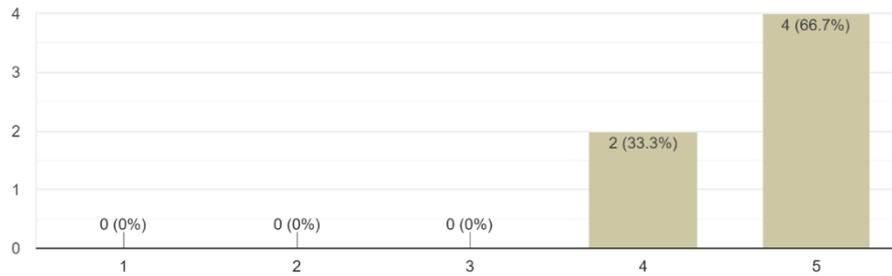
Figure 69 Expectations from H5P Tool

Satisfaction levels are quite high as well in this question, 66,7% are delightful since their expectations are met.

**Question 9: Does the H5P tool correspond to your expectations about supporting your teaching in management education?**

Does the H5P tool correspond to your expectations about supporting your teaching in management education?

6 responses



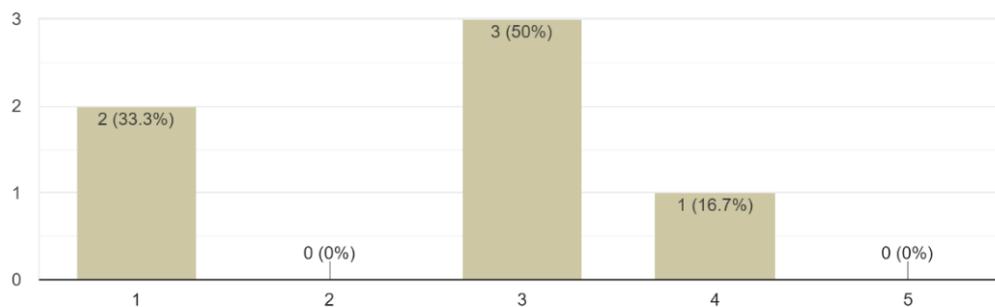
*Figure 70 Expectations for teaching in management education*

The H5P tool corresponds in a high degree to the HES teaching expectations in supporting them.

**Question 10: How often do you plan to use the H5P tool for teaching in management education?**

How often do you plan to use the H5P tool for teaching in management education?

6 responses



*Figure 71 Future Usage of the H5P Tool*

In this question the results show a disproportionality in the answers since they are distributed unequally. The 33,3% are planning to make use of the H5P tool once or twice per semester, 50% stands somewhere in the middle and the rest 16,7% is going to use it in almost most of his lessons.

**Question 11: Overall, how do you evaluate the H5P tool in term of enhancing your teaching in management education?**

Overall, how do you evaluate the H5P tool in term of enhancing your teaching in management education?

6 responses

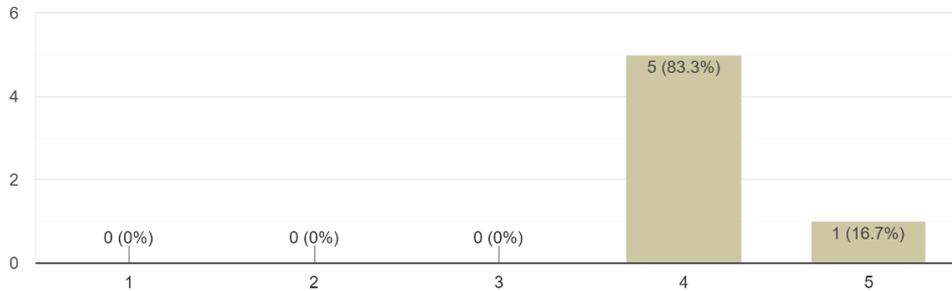


Figure 72 Evaluation of H5P Tool in teaching management education

When comparing this essential part of the questionnaire we come up to the conclusion that for the majority of the organizations, it is crucial to find interactive tools like H5P that can empower their teaching. Not surprisingly the 83,3% find the tool very motivating and user friendly.

**Question 12: Do you think that the outcome of using the H5P tool will be attractive for your students?**

Do you think that the outcome of using the H5P tool will be attractive for your students?

6 responses

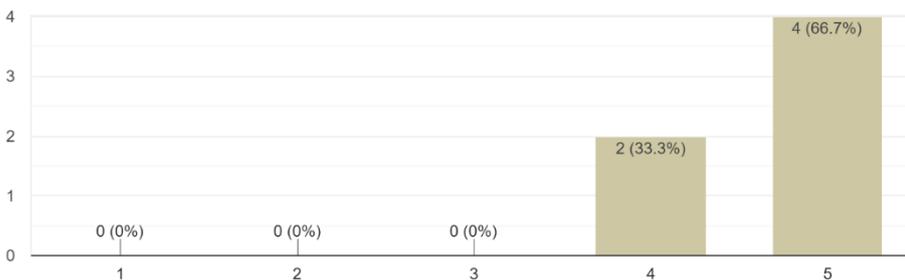


Figure 73 Outcome of H5P Tool for students

The majority of the sample believe that the H5P tool, managed to create an enabling, attractive environment for their students. In terms of attraction for personal learning (66,8%) find it encouraging.

**Question 13: Do you have any comments / suggestions?**

The responders have the following suggestions.

- "Branching Scenario is definitely a template I will use in my teaching and the example given is quite descriptive. I also liked the feature to add URL or even videos playing directly in the presentation/activity."
- "It is not clear how to share the content with the students or I did not manage to find any instructions."

## IO3.A5 Translations and Adaptations of the Toolbox

The adaptations and fixes in respect to the toolbox evaluation performed in IO3.A4 by FredU, in order to deliver the final version of the toolbox. In addition, as part of this activity the toolbox, where applicable, and learning resources were translated in Greek by HOU and UPatras and in Italian by TV, respectively. The tool can now be found in the above-mentioned languages.

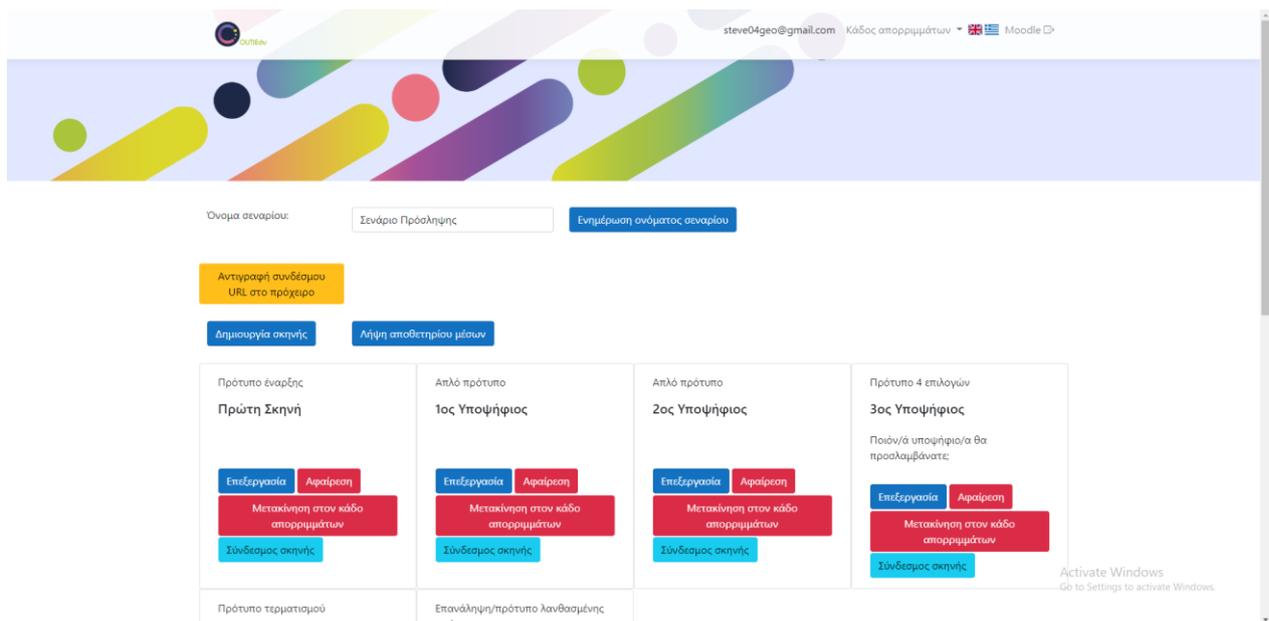


Figure 74 Greek Version of OLMedu Tool

## 7. Conclusions: The OLMedu Toolkit

Pilot testing for the evaluation of project results were held in all countries participating in the OLMedu project. In Cyprus, the pilot validation of the OLMedu toolkit took place in Nicosia, on behalf of FredU and GrantXpert. In Greece the pilot tests were organized in Patras, by UPatras and HOU, while in Italy the pilots have been coordinated by TV. Attendees were introduced to the goals, objectives, and results of the OLMedu project, achieved over a period of 18 months. The participants exchanged ideas and experiences on the topics of the project and its results. The pilot was attended by Higher Education Staff in Management Education with an interest and professional link with remote teaching, wishing to understand and potentially benefit from the OLMedu toolkit for tackling the existing problems regarding their teaching experience. The questionnaires given following the pilot testing evaluated the OLMedu tool and the results of the piloting and the evaluation of the open source tool H5P. The charts above and the results clearly show that overall satisfaction level for the OLMedu toolkit is high for both tools. The suggested methodology and practices used in the pilot testing proved to be extremely efficient. The applied methodology followed the guidelines of the Protocol Plan. The participants were satisfied with the presentations prior to the pilot testing that gave them a brief overview of the project. Following the introduction, the explanation of the module's topics, and all other results of the OLMedu project, each participant got acquainted and tried the OLMedu Toolkit and answered the OLMedu , H5P Validation Questionnaire. At the end of the presentation, the participants had some additional comments, that showed that they were pleased with the newly developed toolkit. All participants filled in the questionnaire and the results of the questionnaire replies are very satisfactory.

The strong point of the whole pilot was the demonstration of OLMedu tool which attracted highly the interest of the participants. The most attractive part of the tool is the friendliness and easy accessibility as well as the high user experience. The participants stated in the questionnaire that it is highly likely to use and recommend this OLMedu tool to other HES. The vast majority of the participants of the pilots answered that there are adequate number of features in the toolbox that will help the HES create educational material. Based on the feedback we received, the OLMedu is ease of use and 66,7% of the participants believe that there are adequate templates in the toolbox. The tool meets their needs and expectations in preparing their own teaching material. Overall, 83.4% are satisfied with the tool and teaching becomes more interactive and it can perhaps increase the youngsters' soft/hard skills and knowledge. As for HES, it is easy to follow through and understand what is required, while all of the participants, assume that this tool would be very attractive for the students.

Similarly, most of the participants showed an overall appreciation for the H5P tool, mostly rating with a high number of all the questions. All the responders believe that there is a high level of satisfaction for the H5P tool for the purposes of the OLMedu project and any other activities. However, In the question “What kind of additional features or templates would you like see for the H5P tool?” an interesting reply we received in the questionnaire is this: “There are some Content Types which are not available without signing up, for example the KewAr Code. It has free trial only for 30 days.” Most of the participants verbally agreed that the H5P Tool is extremely useful and easy to understand. Additionally, the vast majority of the participants stated that the instructions are proved to be extremely helpful by the HES who found it easy to work with and there are adequate examples, (83,3%). For sure the H5P Tool makes the management education easier, more fun and more attractive for the students as assumed by HES. When comparing this essential part of the questionnaire we come up to the conclusion that for the majority of the organizations, it is crucial to find interactive tools like H5P that can empower their teaching. Not surprisingly the 83,3% find the tool very motivating for the students.

The participants of the pilots got excited with the idea that there a personalized scenario can be created for everyone who is going through the OLMedu Toolkit. The innovation of this project lies in the idea that the participants can have clear guidance and direction on the most useful tools that support teaching based on their personal preferences, ideas, and expertise and this can be achieved with the use of the OLMedu Toolkit.

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