Basic Health and Safety skills on Works at Height through Serious Games

IO3- Guide for trainers: pedagogical use and technological exploitation of Upp_Games

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UPP GAMES

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1.INTRODUCTION

This project aims to tackle Health and Safety risks on works at height using an innovative educational approach through the development of serious games through an app for mobile devices. This innovative training method will allow to train about knowledge, skills and competences learning on occupational risk prevention associated to works at height.

The roadmap which establishes the standards and necessary steps to recognize the content of the proposed traineeship (developed in EQF terms) according to the European standards.

The learning outcomes selected for the mini games follow the principles of EQF recommendations and they deal with:

1. Working safely at heights.
2. Wear proper personal protective equipment.
3. To safely work by collective protection.
4. Falling of objects.
5. Safety signs.

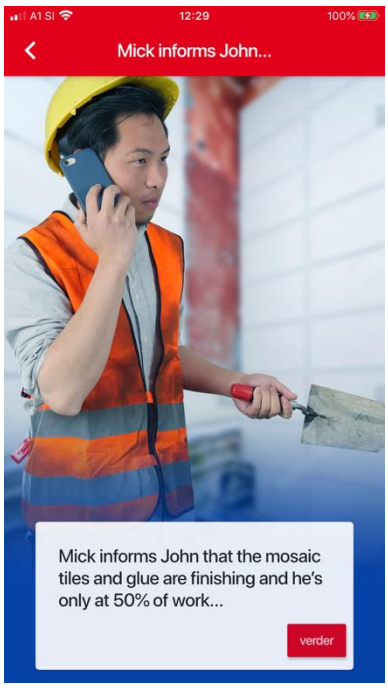
2. PURPOSE OF THE GAMES- PEDAGOGICAL FRAMEWORK

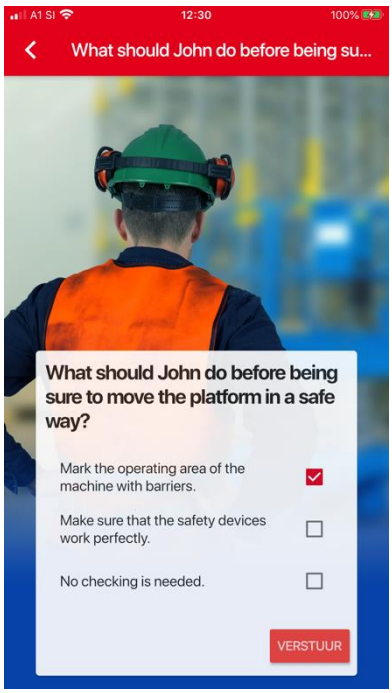
The main purpose of the game is to motivate to safe behaviors by analyzing the possible obstacles to safety and establishing a system which awards the correct behaviors.

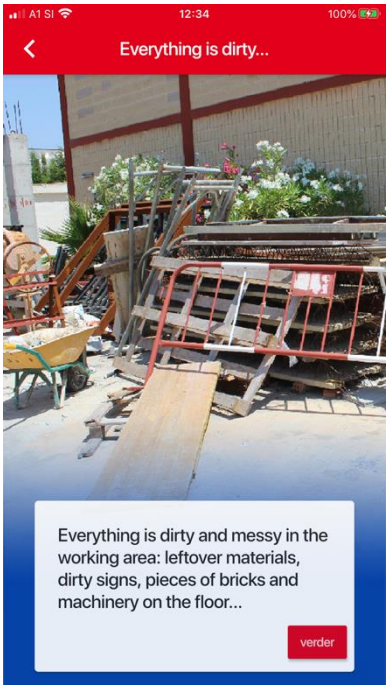
For this reason, Upp_Games App will provide a total of 15 minigames embedded in 6 short interactive stories (or levels). The overarching narrative follows the main character: John, who works at a building site. During the game, the player makes choices (in the role of John) that affect the course of the story. In this way, the player is forced to think about safety when working at height and is thus encouraged to reflect on his or her own behaviour.

The game uses 'feedback loops' to teach the player safety knowledge. This means that not only does the player receive feedback when he or she makes a wrong decision, but after receiving the feedback the player has to rethink the situation and can make a new choice. This means that there are no 'wrong' answers: even if a player makes the wrong choice, he or she will gain some new knowledge.

The 6 levels are represented by floors and after successfully completing a minigame on a floor, a player will receive the award. The award is a part of a building. The more minigames the player completes the more beautiful and complete the building will become.







3. OVERVIEW LEARNING OUTCOMES PER LEVEL

Ground Floor (level 1)	
Working safely at heights	Prevent hazardous situation when working in any place where a person could fall a distance liable to cause personal injury.
	Knowledge Knowing about the different dangers present in the building site. Being familiar with how to use work access equipment safely.
	Skills Assessing the most important hazard in the building site to implement the suitable preventive measures. Identifying the places on the building site according to the sign identification. Assessing the most suitable preventive measures that helps to avoid the risk or to reduce the potential injury in case if accident (including escape routes). Learning about potential risks in the building site.
	Competences Remember that you are the only responsible of your own safety.
Falling of objects	Prevent eventualities related to occupational risks in the surroundings, facilities and conditions of the designated work(s) in the areas with potential falling o flying objects.
	Knowledge Knowing the warning indicator and signs regarding to the falling objects. Distinguishing the risks generated by each characteristics of the area of work (potential of falling objects, storage on high level).

	Skills Paying attention to the potential hazards. Choosing the appropriate action to avoid the risks that cause objects to drop and potentially injury people (e.g. storage, connection).
	Competences Recognizing the most warning signs regarding to the falling of objects. Highlighting the value of carrying out of correct procedure to install the collective protection systems depending the potential hazards. Being aware of the surroundings whenever the worker is on the building site.
Safety signs	Prevent occupational accidents related to the occupational risks in the surroundings, the facilities and conditions in the building site.
	Knowledge Knowing about the nature of the meaning of signs in the building site. Identifying the basic potential hazard in building site.
	Skills Paying attention and respecting the significance of the safety signs on site. Learning on the link between the risk and the specific safety signs.
	Competences Being aware about significance of the safety signs on site to warn concerning the present risks. Reorganizing the signification of interdiction signs according to the specific safety signs.

First Floor (level 2)	
Working safely at heights	Prevent hazardous situation when working in any place where a person could fall a distance liable to cause personal injury.
	Knowledge Knowing about the different dangers present in the building site. Being familiar with how to use work access equipment safely. Being familiar with of to use scaffold
	Skills Assessing the most important hazard in the building site to implement the suitable preventive measures. Evaluation if a scaffold is according to regulations Assessing the most suitable preventive measures that helps to avoid the risk or to reduce the potential injury in case if accident Learning about potential risks in the building site.
	Competences Remember that you are the only responsible of your own safety.
Falling of objects	Prevent eventualities related to occupational risks in the surroundings, facilities and conditions of the designated work(s) in the areas with potential falling o flying objects
	Knowledge Distinguishing the risks generated by each characteristics of the area of work (potential of falling objects, storage on high level).
	Skills Paying attention to the potential hazards. Choosing the appropriate action to avoid the risks that cause fall of people
	Competences Recognizing the most warning signs regarding to the falling of objects. Highlighting the value of carrying out of correct procedure to install the collective protection systems depending the potential hazards.

	Being aware of the surroundings whenever the worker is on the building
Safety signs	Prevent occupational accidents related to the occupational risks in the surroundings, the facilities and conditions in the building site.
	Knowledge Knowing about the nature of the meaning of signs in the building site. Identifying the basic potential hazard in building site
	Skills Paying attention and respecting the significance of the safety signs on site. Learning on the link between the risk and the specific safety signs.
	Competences Being aware about significance of the safety signs on site to warn concerning the present risks. Reorganizing the signification of interdiction signs according to the specific safety signs.

Second Floor (level 3)	
Working safely at heights	Prevent hazardous situation when working in any place where a person could fall a distance liable to cause personal injury.
	Knowledge Knowing about the different dangers present in the building site. Being familiar with how to use work access equipment safely. Knowing how to work at heights and use work access equipment safely: regular inspection, check for broken, damaged or missing components, responsible use, consideration of adverse weather conditions, proper training Identifying the different dangers: falling tools, falling equipment, falling materials, persons falling from height (injuries to themselves and others); Identifying the proper PPE to be used
	Skills Use different types of access equipment safely.

	Assess the most important hazards and preventive measures in the building site to implement the most suitable ones Identifying the places on the building site according to the sign identification. Perform inspections for the equipment to be used.
	Competences The learner will have the necessary knowledge and skills to: o Recognize the hierarchy of controls, identify the different types of equipment that may be available to safely perform a variety of tasks at heights o Recognize the use and maintenance of the different types of personal fall protection equipment that is needed to safely work at heights on work access equipment and platforms. o Increase the awareness of needing additional workplace specific and/or equipment specific information, instruction or training. o Understand the importance of being responsible of the own safety as well as security of others.
Falling of objects	Prevent eventualities related to occupational risks in the surroundings, facilities and conditions of the designated work(s) in the areas with potential falling o flying objects.
	Knowledge Know the warning indicator and signs regarding to the falling objects. Visually identify the correct PPE for entrance in the area with potential falling or flying objects. Select the proper fall protection equipment. Choose the appropriate action to avoid the risks that cause objects to drop and potentially injury people (e.g. storage, connection, etc.).
	Skills Paying attention to the potential hazards (i.e. not to stay under suspended load). Acting and reacting in relation to the identified risk regarding to the falling of objects. Using the specific protective equipment to avoid injuries caused by falling objects.

	Competences Recognize the most common warning indicator and signs, PPEs and risks regarding to the falling of objects. Understand the importance of being responsible of the own safety as well as security of others in regard to the falling objects. Being aware of the surroundings whenever the worker is on the building site.
Safety signs	Prevent occupational accidents related to the occupational risks in the surroundings, the facilities and conditions in the building site
	Knowledge Knowing about the nature of the meaning of signs in the building site. Differentiating the specific sign that must be placed on site. Identifying the basic potential hazard in building site.
	Skills Paying attention and respecting the significance of the safety signs on site. Learning on the link between the risk and the specific safety signs. Assessing the specific sign that must be placed on site to warn concerning the present risks.
	Competences Increase the awareness to respect the indicative nature of the sign. Be aware about significance of the safety signs on site.

Third Floor (level 4)	
Working safely at heights	Prevent hazardous situation when working in any place where a person could fall a distance liable to cause personal injury.
	Knowledge Knowing about the different dangers present in the building site Knowing about the importance of a proper physical and mental condition. Assessing the most important hazard in the building site to implement the suitable preventive measures
	Skills Identifying possible dangers
	Competences Assessing the most suitable preventive measures that helps to avoid the risk or to reduce the potential injury in case of an accident (including escape routes
Falling of objects	Distinguishing the risks generated by each characteristics of the area of work (potential of falling objects, storage on high level).
	Knowledge Prepare and secure the working area by a security worker and/or warning signs/barrier tape
	Skills Being familiar with how to use work access equipment safely
	Competences Assessing the most important hazard in the building site to implement the suitable preventive measures

Fourth Floor (level 5)	
Working safely at heights	Prevent hazardous situation when working in any place where a person could fall a distance liable to cause personal injury.
	Knowledge Knowing about the different dangers present in the building site. Being familiar with how to use work access equipment safely.

	Skills Assessing the most important hazard in the building site to implement the suitable preventive measures. Identifying the places on the building site according to the sign identification. Assessing the most suitable preventive measures that helps to avoid the risk or to reduce the potential injury in case if accident.
	Competences Understanding the importance of being responsible of the own safety as well as security of others. Recognizing the hierarchy of controls, identify the different type of equipment that may be available to safely perform a variety of tasks. Recognizing the use and maintain the different types of personal fall protection equipment that is needed to safely work at height on work access equipment and platforms.
Wear proper personal protective equipment (PPE)	Making learners able to identify the need for personal protective equipment (PPE) in construction site, choosing the correct equipment and proper maintain it.
	Knowledge Knowing the different PPE and the most suitable to wear according to the specific circumstances / risks assessment and the legislation covering use of PPE. Knowing the different characteristic and proper maintenance of the following PPE: head, eye and ear protection, face / dust masks, breathing apparatus, high visibility clothing, safety footwear, gloves, harnesses.
	Skills Identifying the different types of PPE used in the specific workplace. Selecting the correct PPE to prevent exposure and personal injury according to the specific risk. Wearing PPE properly. Storing and maintaining PPE properly.
	Competences Understanding the legislation regarding the use of PPE. Stating the importance of using the correct PPE.

	Recognizing common safety hazards where PPE is required and associating the correct PPE according to the specific circumstances / risk assessment. Identifying the requirements and limitation for PPE. Making proper maintaining and storage of PPE and stating the importance of checking and reporting damage PPE. Paying attention to the safety signs on site and to the site managers' instructions.
Safety signs	Preventing occupational accidents related to the occupational hazards in the surroundings, the facilities and conditions of the building site
	Knowledge Knowing the significance of the safety signs on site. Knowing about the signification of the signs, its indicative nature. Knowing the sign to warn concerning the present risks.
	Skills Paying attention and respecting the significance of the safety signs on the site. Learning the link between the risk and the specific safety signs.
	Competences Increasing the awareness of the dangerous situation on the building sites. Being aware about significance of the safety signs on site to warn concerning the present risks. Increasing the awareness to respect the indicative nature of the sign.

Roof (level 6)	
Working safely at heights	Prevent hazardous situation when working in any place where a person could fall a distance liable to cause personal injury.
	Knowledge Knowing about the different dangers present in the building site. Being familiar with how to use work access equipment safely.
	Skills Assessing the most important hazard in the building site to implement the suitable preventive measures. Identifying the places on the building site according to the sign identification. Assessing the most suitable preventive measures that helps to avoid the risk or to reduce the potential injury in case if accident (including escape routes). Learning about potential risks in the building site. Being able to remind work colleagues to follow required safety rules.
	Competences Remember that you are the only responsible of your own safety. Being able to recognize not appropriate work behaviour of work colleagues (not following required safety rules).
Safety signs	Prevent occupational accidents related to the occupational risks in the surroundings, the facilities and conditions in the building site
	Knowledge Knowing about the nature of the meaning of signs in the building site. Identifying the basic potential hazard in building site.
	Skills Paying attention and respecting the significance of the safety signs on site. Learning on the link between the risk and the specific safety signs.

	Competences Being aware about significance of the safety signs on site to warn concerning the present risks.
Wear proper personal protective equipment	Making learners able to identify the need for personal protective equipment (PPE) in construction site, choosing the correct equipment and proper maintain it.
	Knowledge Knowing about the nature of the meaning of signs in the building site. Identifying the basic potential safety hazards in a building site. Select/Identified the right PPE and clothing to be used and its proper condition.
	Skills Paying attention and respecting the significance of the safety signs on site. Learning on the link between the risk and the specific safety signs. Recognizing not appropriate condition of PPE Put on PPE correctly.
	Competences Being aware about significance of the safety signs on site to warn concerning the present risks.
To safely work by collective protection	Making learners able to identify the need for collective protective equipment in construction site, choosing the correct equipment and proper maintain it.
	Knowledge Identifying the basic potential hazard in building site. Select/Identified the right PPE if it has to be used and its proper condition.
	Skills Paying attention and respecting the significance of the safety signs on site. Learning on the link between the risk and the specific safety signs. Being able to assess if a flat roof might lack any collective safety protection (freestanding fragile roof covers and that roof light can be fragile since they are

	not meant as walking on) and behave properly when working.
	Competences Being aware about significance of the safety signs on site to warn concerning the present risks. Being aware if there is a complete or limited collective safety protection/measures.

The main target groups to which the game addresses are:
-VET trainers and trainees.
-Construction workers.
-Migrants, low-skilled and young workers
-H&S experts.

4.INSTRUCTION FOR DOWNLOADING

Upp_Games App is available for both Android and iOS mobile devices.
Scan the following QR code with your device to go to the Apple IOS (only the English version).

Apple iOS

Or follow the instructions below

Apple iOS

1. Click on the App Store icon on your device.
2. Click on 'Search' (right bottom corner).
3. Enter 'Upp Games' in the search field and click on 'Enter'
4. Click on the grey 'Download' button next to the app icon.
5. Once the game has downloaded, click the app icon to start the game.

You can click directly on this link
https://itunes.apple.com/WebObjects/MZStore.woa/wa/viewSoftware?id=1489575805

Android

1. Click on the Google Playstore icon on your device
2. Enter 'Upp Games' in the search field and click on 'Enter'
3. Click on the green 'Install' button.
4. Once the game has downloaded, click the app icon to start the game.

5. INSTRUCTION FOR PLAYING

Upp_Games could be played in classroom with the supervision of the teacher / trainer, at home or in groups.
We provide some suggestions and some ideas for using the App.

Suggestions:

When they should use the game during the lesson:
- including game time as a designated activity in your lesson plan,
- before the lesson to get student attention to the lesson's topic
- after the lesson as reflection tool or test

How to play:
- Individual.
- In couples / groups.
- Create a situation (like roleplaying)

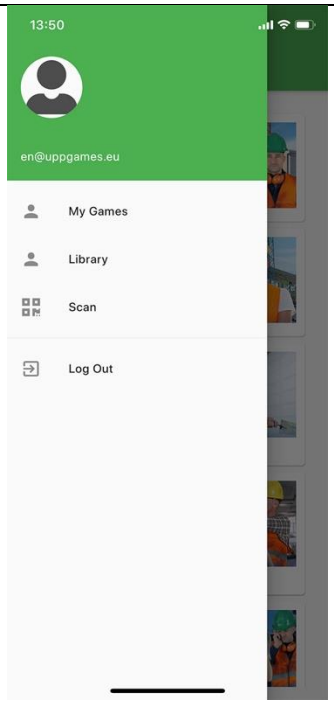
Separate access to the individual levels

As described in chapter 3, the individual levels deal with different learning objectives. Although it is recommended that the levels are played in ascending order, it is possible to choose an appropriate path as a teacher or player. This makes it possible to play parts of the game and thus focus on certain learning objectives (as a teacher, choose the learning objectives, and corresponding levels, that correspond to the material you want to cover in the lesson).

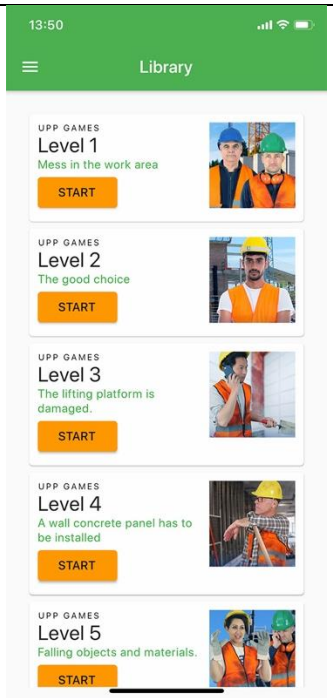
Alternatively, as an instructor you could also let the student make a choice (choose 3 levels to play) and then discuss the individual experiences of the students.

The choice to make the levels accessible separately, however, has the consequence that a player, if he wants to play the whole game, always has to select the next level from the main menu after completing a level.

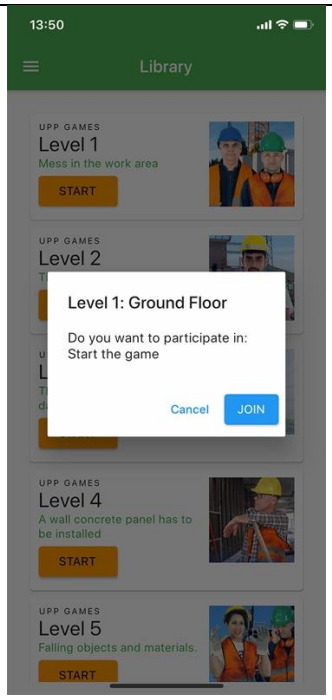
Navigation Instruction



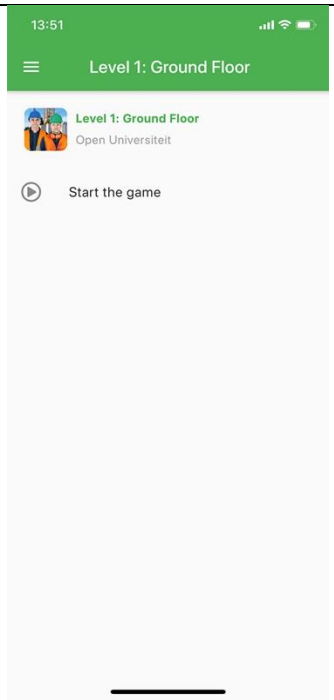
1. After login, open the menu and click 'Library'.



2. Click on the level you want to play.

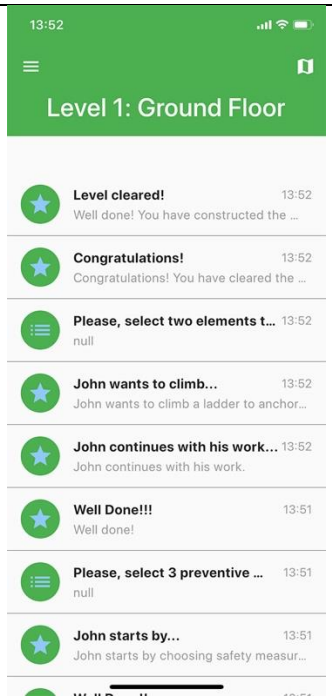


3. Click 'Join'.



4. Click 'Start the game'. The game will now start.

5. At the end of the level, click the 'Back' arrow in the top left corner.



6. You wil now be able to open the main menu. Start with step 1.

Lesson idea 1: Standard Classroom Setup as start of "Health & Safety" lesson series

Duration: 1 to 1,5 hours
In a standard setup the Upp_Games app can be used as an introduction to a series of existing lessons about health and safety. By asking the students to play a game instead of the usual lecture, you aim to get their interest in the topic. This lesson idea consists of 6 steps:

1- Ask the students to get their mobile phones and install the app. Assist then if necessary.
2- Ask them to play the game for about 15 to 25 minutes. In this timeframe they should be able to at least complete the first 3 floors.
3- When time is up, ask them if anybody has an idea about the topic and aim of the game?
4- Discuss (in plenary) the students experience with the app. Important here is that the app functions as a topic starter. Aim is to get the students thinking about and reflecting on their own safety behaviour when working at height.
5- Try to engage them by sharing their own experiences. Ask them for instance:
   1. *What did you think about the game?*
   2. *How far did you get?*
   3. *What was difficult/easy? And why?*
   4. *Did you learn anything? And what?*
   5. *Did you ever encounter a similar situation in your own working experience? What did you do?*
   6. *Do you have an example from your own experience of a different scenario?*
   7. *What do you think about working at height? Do you always use all safety measures? Why or why not?*
   8. *Have you ever seen any safety plan on the construction site of a multistorey building? have you understand its content and instructions?*
   9. Have your heard how many fatal deaths occur annually in our country in construction sector?
   10. Who guides (is responsible) and who controls internally and externally health and safety on the construction site?

6- Close the lesson by telling the students that "health and safety" will be the topic of the following lessons.

Lesson idea 2: Upp_Games for flipping the classroom

Duration: 2 hours at school, 1-hour homework
With flipping the classroom, you can change the way you spend your time at school and at home. The classroom knowledge transfer is replaced by videos, serious games other forms of online instruction and practicing at the student's home (for instance as homework). Reflection on the material, extra explanation and for deepening the material then takes place at school.

The purposed setup for using Upp_Games for flipping the classroom consists of 3 phases:

Phase 1: Make a joint start
If you start with a new subject, make a joint start first. Introduce the working at height safety subject to your students and make students curious, so that they feel like (independently) further learning. Choose a way that suits you. Do an experiment, a form of play, tell a story or choose an interactive activity together. The aim of this phase is to arouse interest in the subject. At the end of the lesson ask students to download and install the Upp_Games app on their own device.

Phase 2: Students work independently with the Upp_Games app
In this phase, the students continue to acquire knowledge in their own time. This is the instructional phase that would normally take place in the classroom. Ask students to play the game individually or in pairs at home.

Phase 4: Return to class together
In this phase, use the time together to take the students one step further. Using your expertise and the interaction between students. Discuss (in plenary) the students experience with the app. You can also use the learning outcomes per level to check if students understand the topic of each level. Try to engage them by sharing their own experiences. Ask them for instance:

1. *What do you think about the game?*
2. *Did you manage to complete the game?*
3. *What was the main topic of the game?*
4. *What was difficult/easy? And why?*
5. *Did you learn anything? And what?*
6. *Did you ever encounter a similar situation in your own working experience? What did you do?*
7. *Do you have an example from your own experience of a different scenario?*
8. *What do you think about working at height? Do you always use all safety measures? Why or why not?*
9. *Have you ever seen any safety plan on the construction site of a multistorey building? have you understand its content and instructions?*
10. *Have your heard how many fatal deaths occurs annually in our country in construction sector?*
11. *Who guides (is responsible) and who controls internally and externally health and safety on the construction site?*

Important here is that the app functions as a topic starter. Aim is to get the students thinking about and reflecting on their own safety behaviour when working at height.

Lesson idea 3: playing in teams

Duration: 2 - 3 hours
Divide the class in group of 3 or 4 students. Each group is a "team" like in construction site:

1- The teacher shows the game in the smart board.
2- Students are asked to solve the different games as a group.

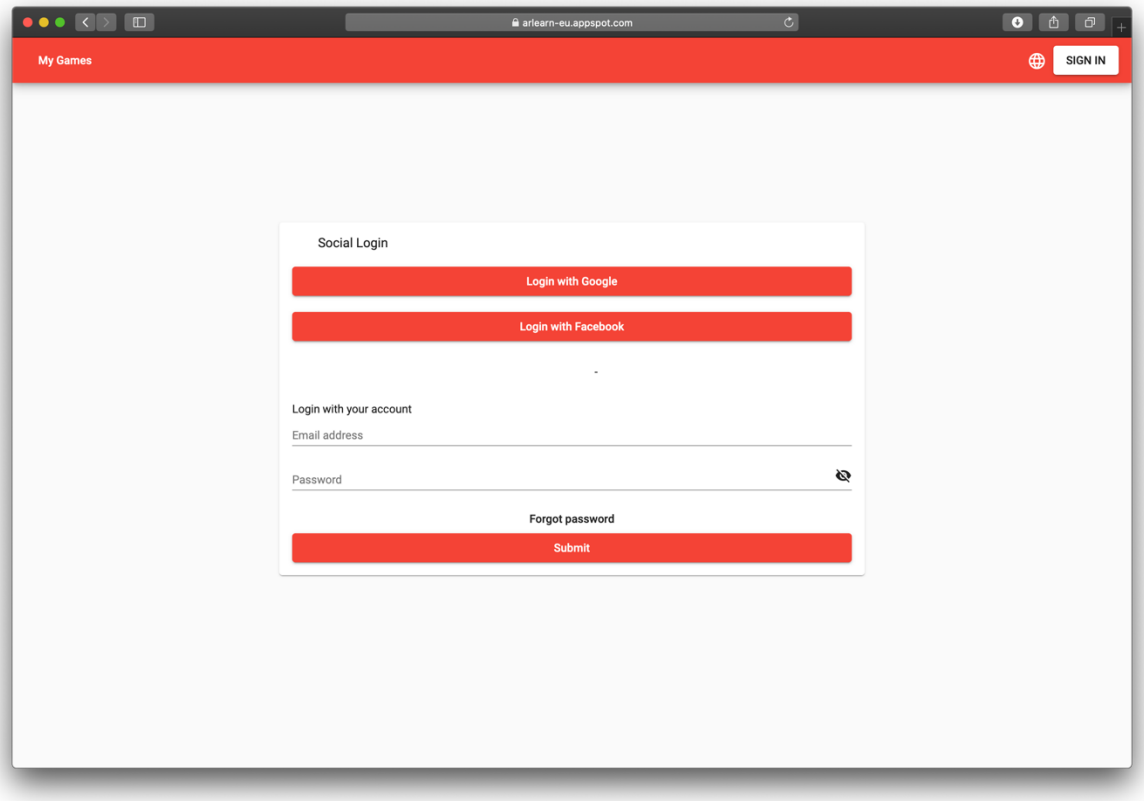
3- They can discuss the right answer within the group and when they think they have the right answer the group leader raises his/her hand.
4- The teacher checks the answer with the App (which is shown in the smart board).
5- If the answer is correct, the classroom will go on with the game.
6- If it's not correct another group is allowed to try the right answer.
7- The teacher takes note of the points got from each team (5 points when the answer is correct at first attempt, 3 point at second attempt, etc.).
8- At the end of the game session the winning team is asked to bring similar practical examples (experienced in workshop or construction site) related to the different situations of the game.

In this way the whole classroom will be involved in the game and the students can share and discuss their knowledge and skills on the different dealt subjects.

6. ASSESSMENT METHODS

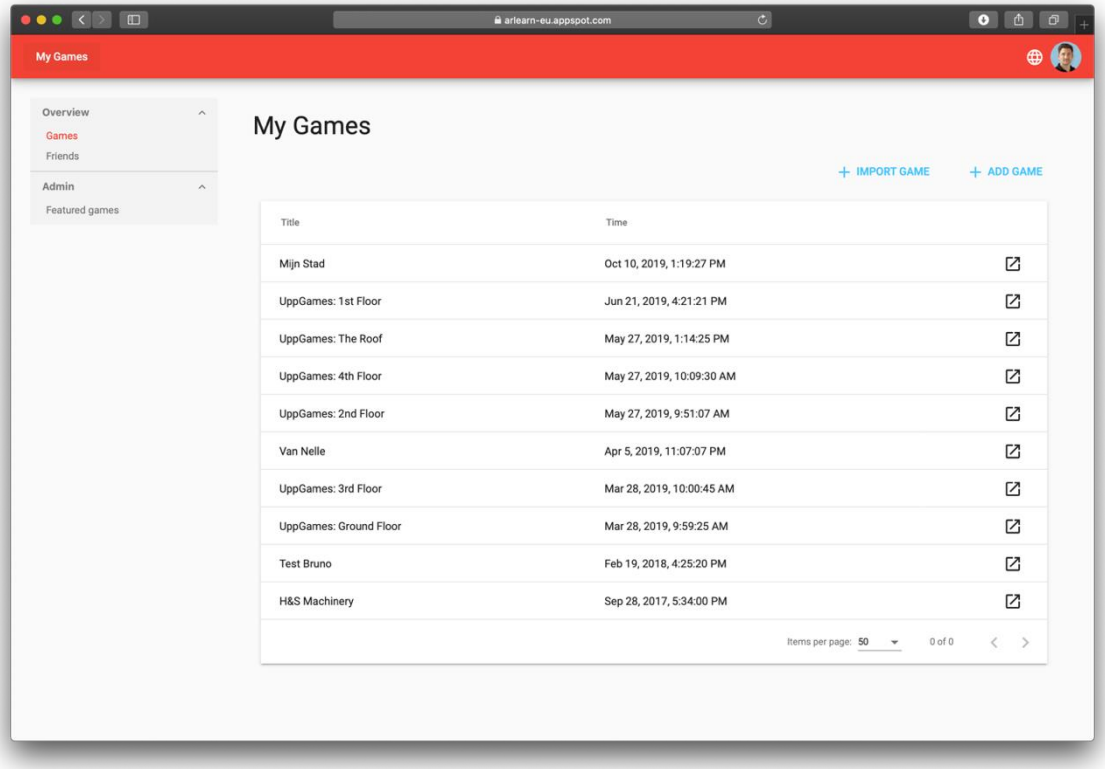
The progress data are collected inside the game itself.
After each game session a common discussion in the classroom should take place to reflect on the safety issues of the session.
Quiz and presentation on paper – file for final discussion

7. HOW TO MAKE YOUR OWN GAME



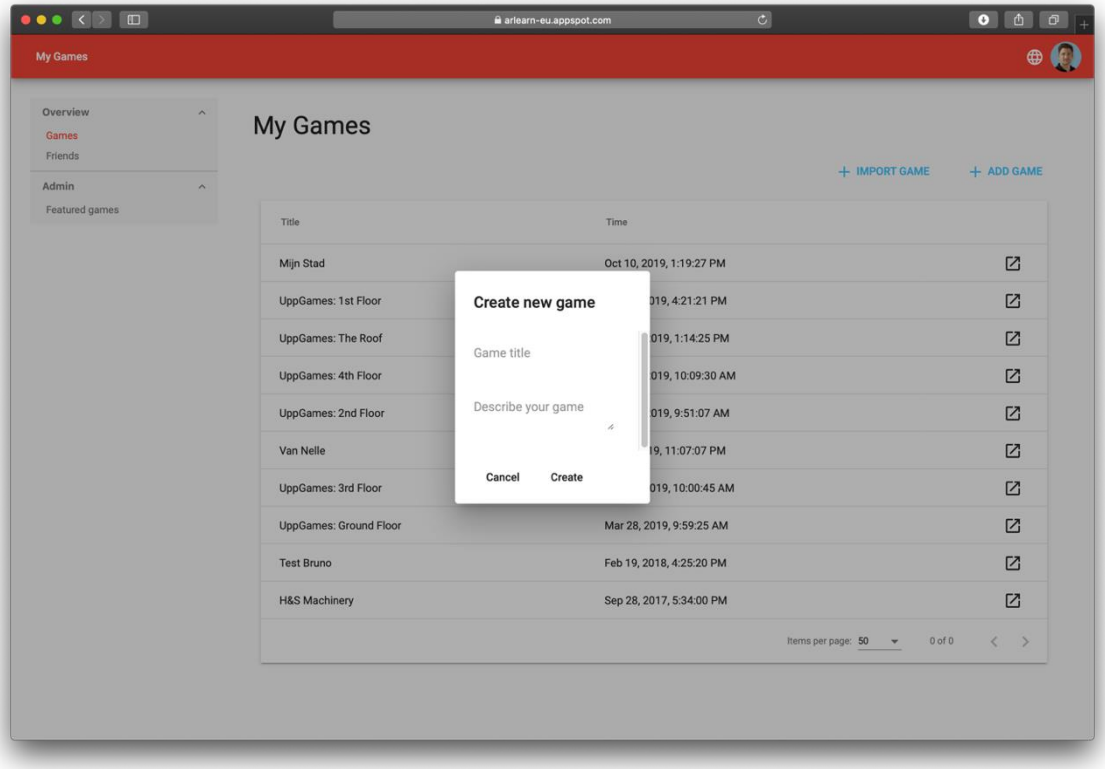
Step 1

Navigate to https://arlearn-eu.appspot.com/#/login and login with a Google account.



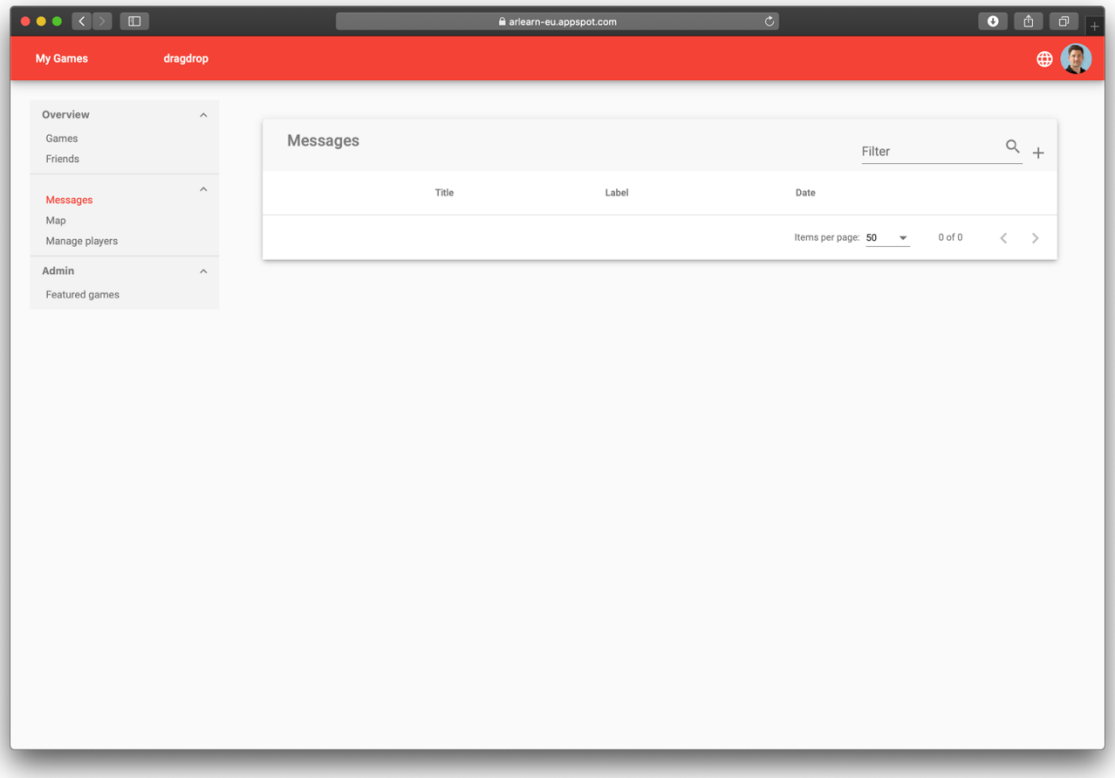
Step 2

Click on 'ADD GAME'.



STEP 3

Give your game a name and add a description. Then click on 'Create'.

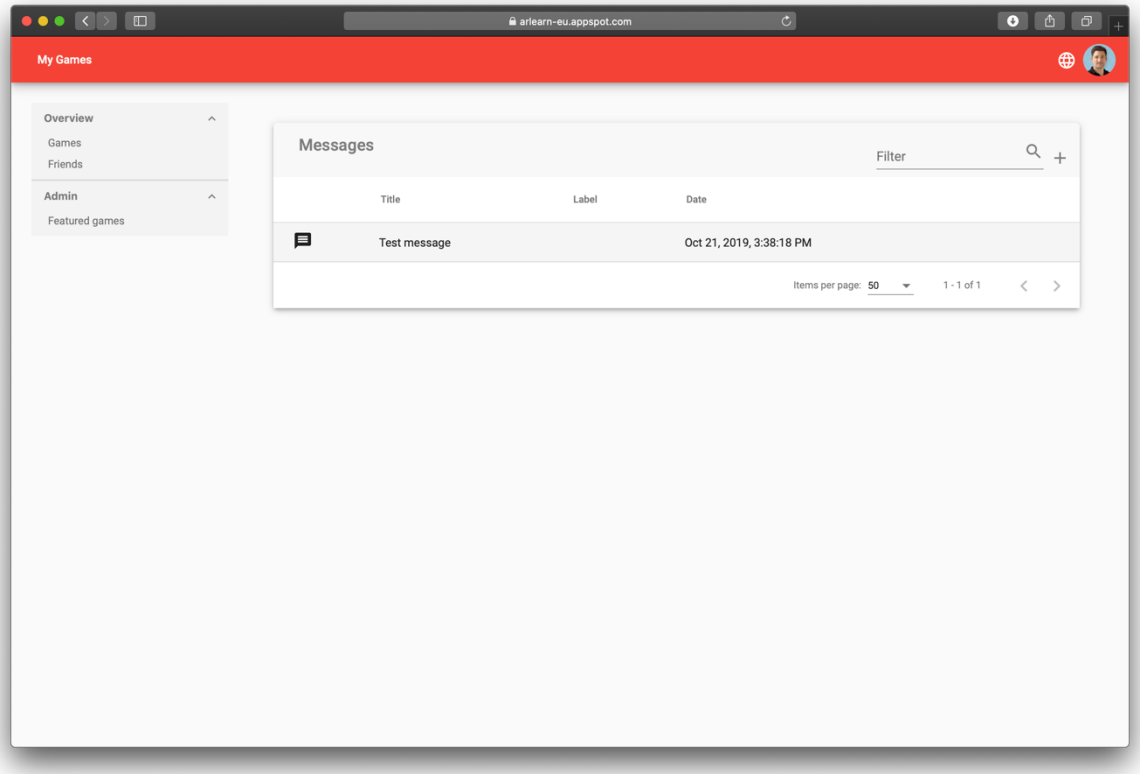


Step 4

Now you can step-by-step and screens (messages).

You can use:

- Multiple Choice questions
- Single Choice Questions
- Multiple Choice Image questions
- Single Choice Image Questions
- Video messages
- Audio messages
- Text screens
- QR code scanner screens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My Games
Overview
Games
Friends
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Featured games
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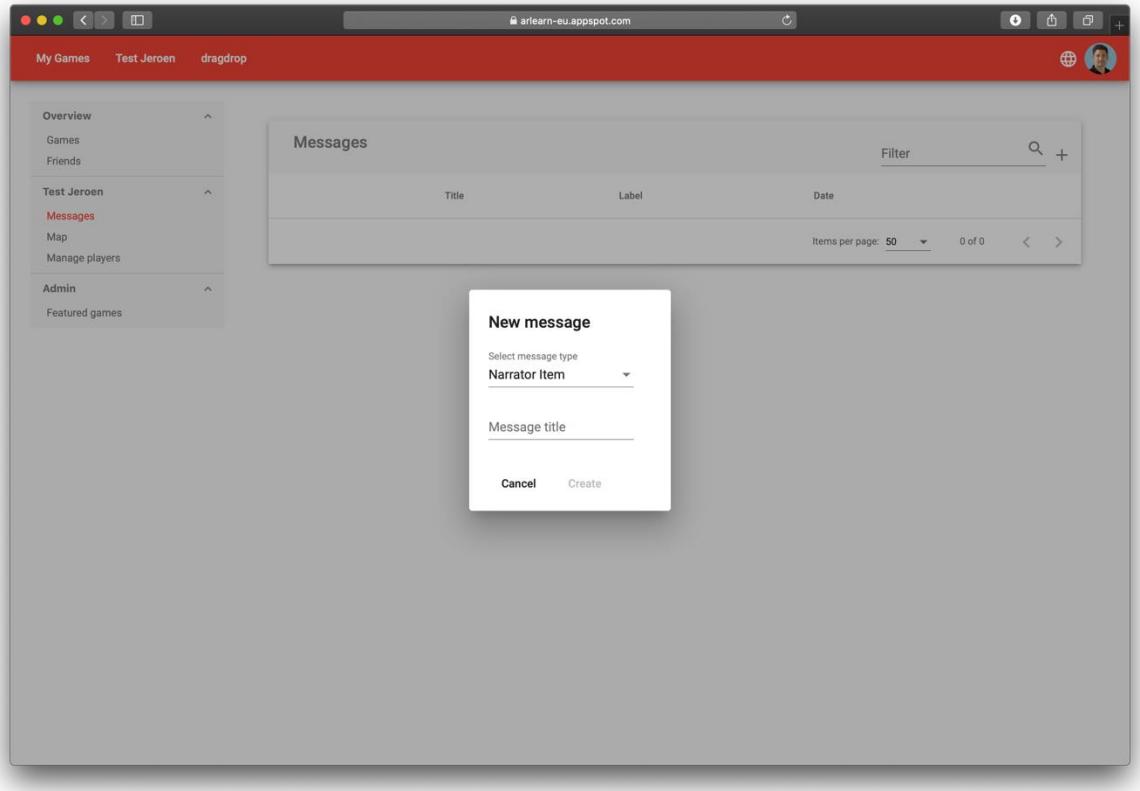
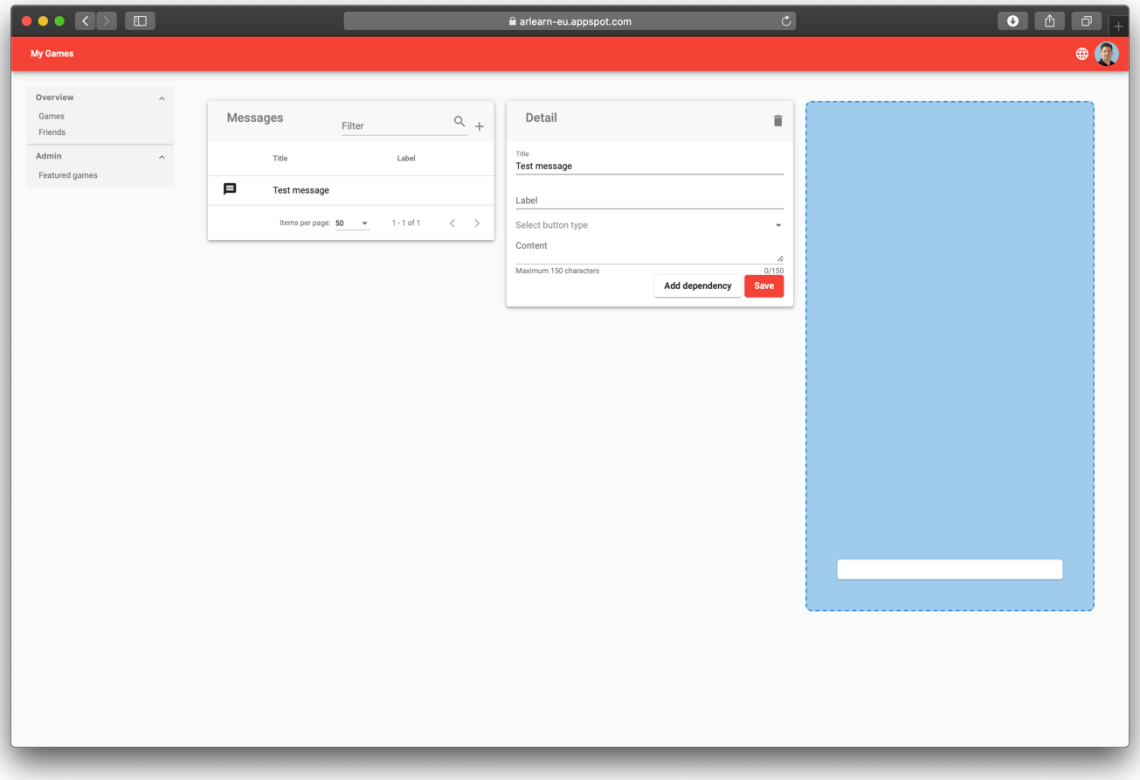
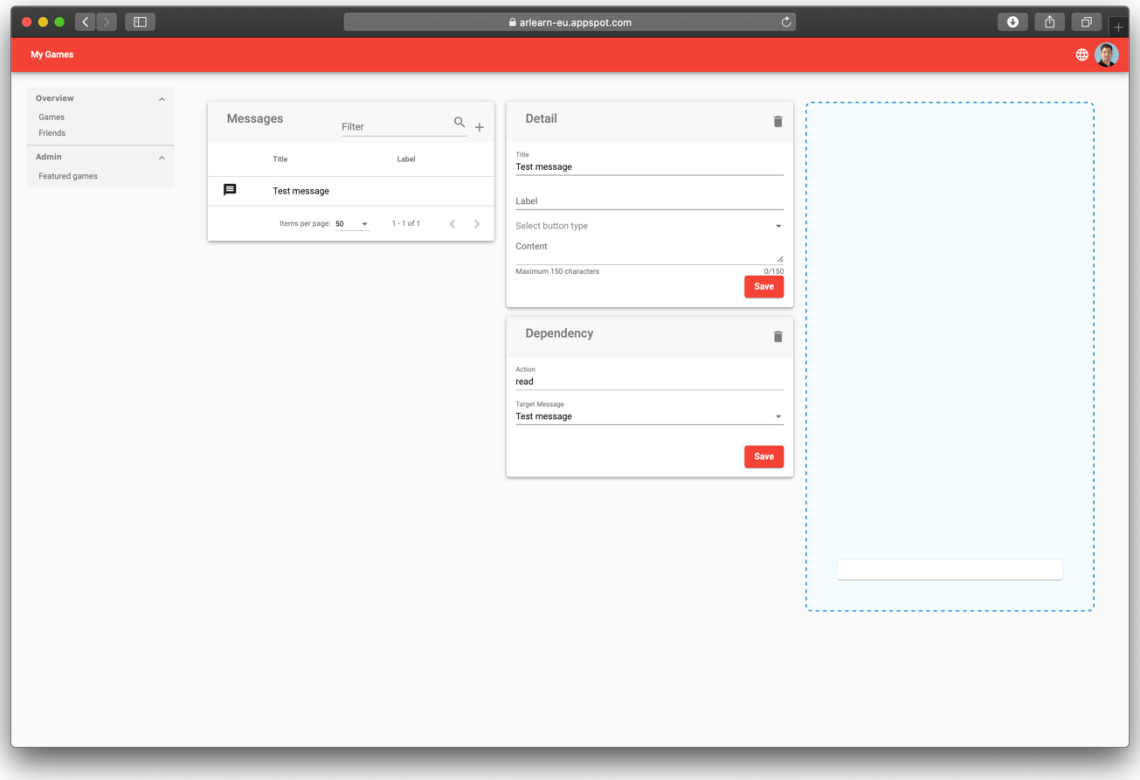
Items per page: 50
1 - 1 of 1

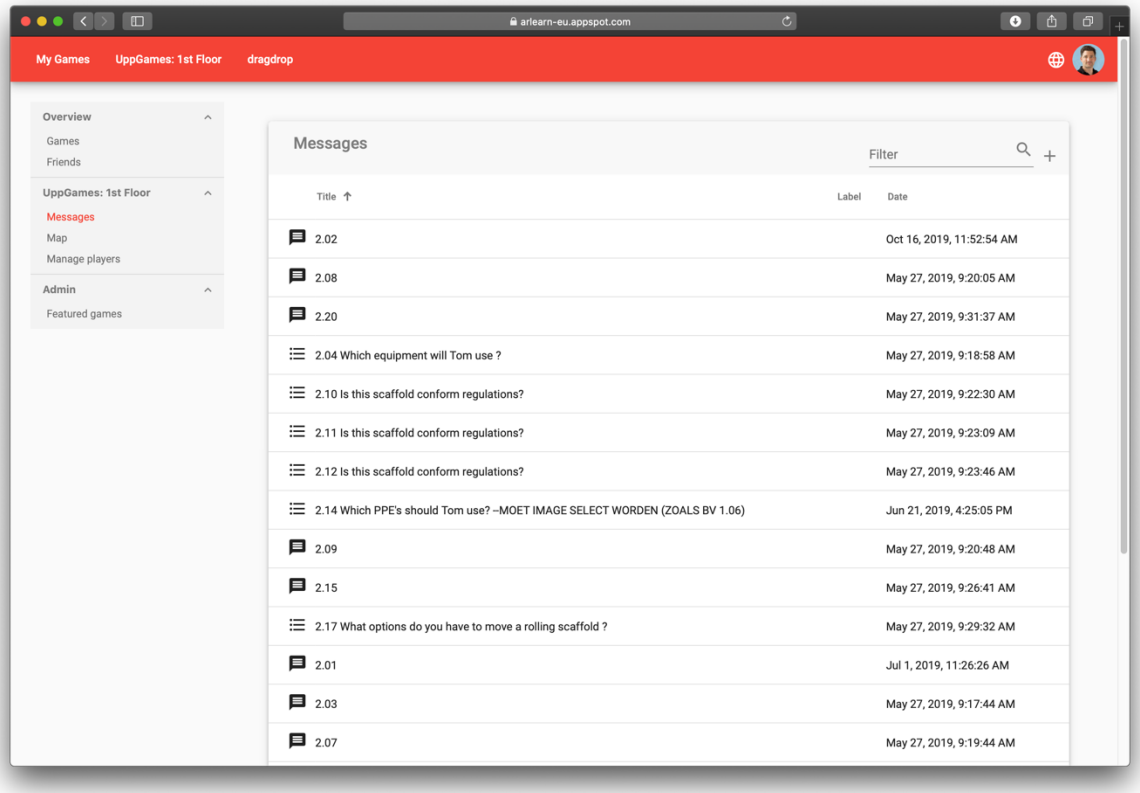

arlearn-eu.appspot.com
My Games
Test Jeroen
dragdrop
Overview
Games
Friends
Test Jeroen
Messages
Map
Manage players
Admin
Featured games
Messages
Filter
Title
Label
Date
Items per page: 50
0 of 0
New message
Select message type
Narrator Item
Message title
Cancel
Create


arlearn-eu.appspot.com
My Games
Overview
Games
Friends
Admin
Featured games
Messages
Filter
Title
Label
Test message
Items per page: 50
1 - 1 of 1
Detail
Title
Test message
Label
Select button type
Content
Maximum 150 characters
0/150
Add dependency
Save


arlearn-eu.appspot.com
My Games
Overview
Games
Friends
Admin
Featured games
Messages
Filter
Title
Label
Test message
Items per page: 50
1 - 1 of 1
Detail
Title
Test message
Label
Select button type
Content
Maximum 150 characters
0/150
Save
Dependency
Action
read
Target Message
Test message
Save

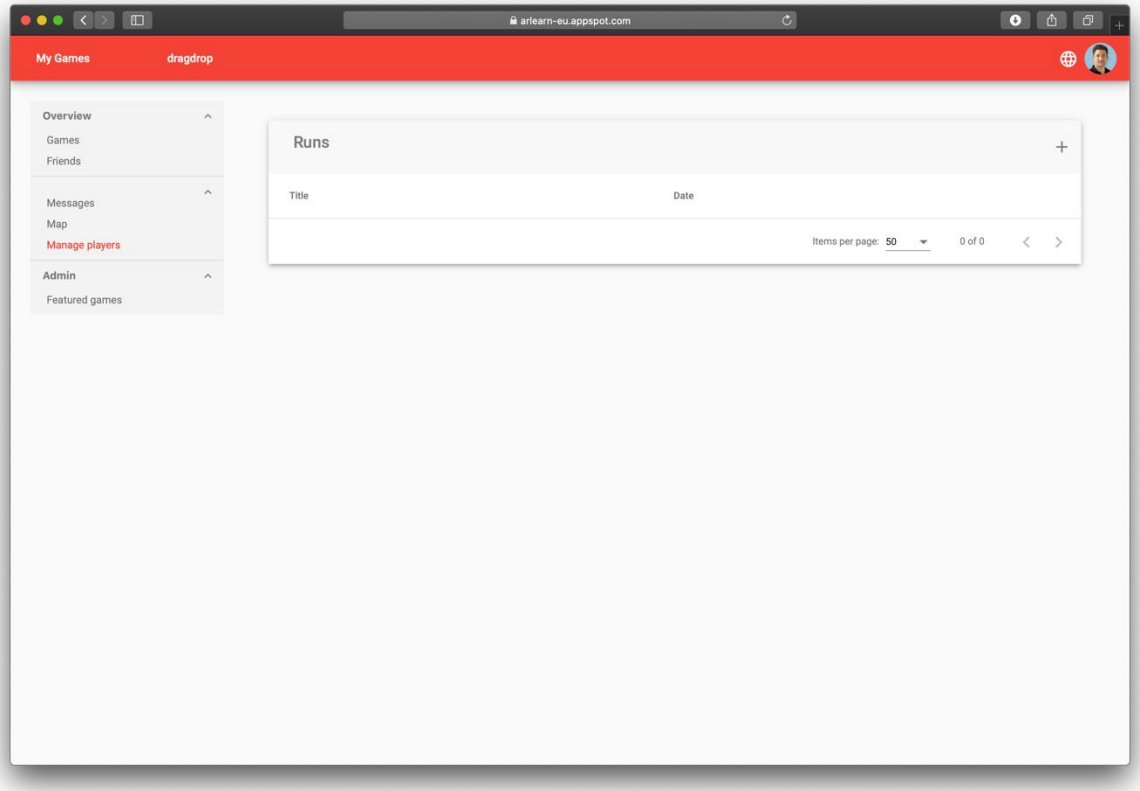
Step 5

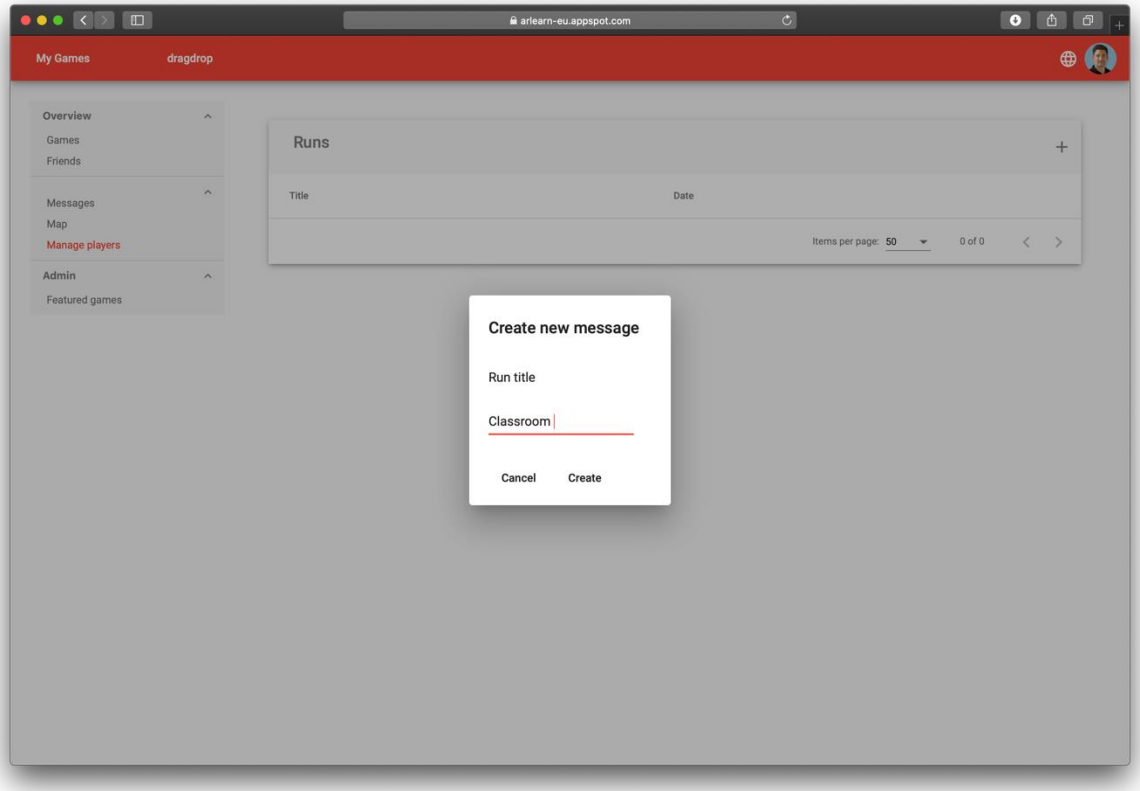
Add text, images and videos to each message.



Step 6

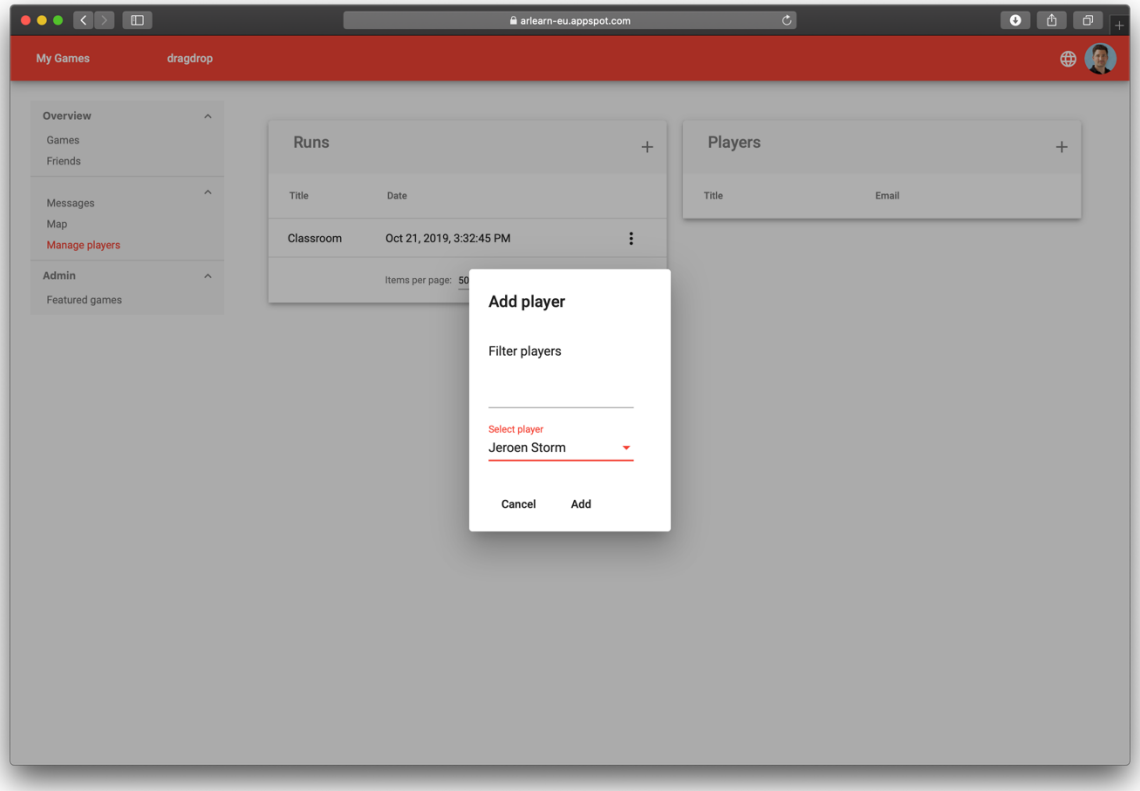
Once all screens and messages are added you will need to link them to each other. Click inside each message on “Add Dependency” and choose the parameters for the message to appear.


arlearn-eu.appspot.com
My Games
dragdrop
Overview
Games
Friends
Messages
Map
Manage players
Admin
Featured games
Runs
Title
Date
Items per page: 50
0 of 0


arlearn-eu.appspot.com
My Games
dragdrop
Overview
Games
Friends
Messages
Map
Manage players
Admin
Featured games
Runs
Title
Date
Items per page: 50
0 of 0
Create new message
Run title
Classroom
Cancel
Create

Step 7

Then, create a run (in other words, publish your game). Click on "manage Players', then on the + button and name your publication (for instance 'classroom') and click "Add'.



Step 8

Finally, add your students (or players) to the game. N.B. to add a player you have to invite them first (click Friends in the left menu and send invitations).

Your game is now ready to play!

Leader:

FUNDACIÓN LABORAL DE LA CONSTRUCCIÓN
Spain

Partners:

INSTITUT DE FORMATION SECTORIEL DU BÂTIMENT Luxembourg

OPEN UNIVERSITEIT NEDERLAND
Netherlands

WESTDEUTSCHER HANDWERKSKAMMERTAG
Germany

SCUOLA COSTRUZIONI VICENZA ANDREA PALLADIO
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CHAMBER OF CONSTRUCTION AND BUILDING MATERIALS INDUSTRY OF SLOVENIA
Slovenia

http://www.fundacionlaboral.org/en/projects/training/training-tools/upp-games-2017-2019-erasmus-program