



User Guide for openUp2U tools and learning platform



<https://up2university.eu/>

openUp2U is delivered by the EU-funded Up2U project. The innovation action leading to these results has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 732049 - Up2U

INTRODUCTION

This user guide takes you through the steps to use the four tools included in the openUp2U online learning platform.

Please note that openUp2U is a trimmed-down version of Up2U, and is offered on a best effort basis. The EU-funded Up2U project's main objective is to bring innovation to schools by piloting teaching and learning technologies and pedagogical approaches that empower teachers and students to develop digital skills required by the 21st-century internet society.

The tools that openUp2U provides are open-source, interoperable and GDPR-compliant, making them free to use, easily integrated with other learning management systems, and allowing users not to worry about collecting consent data.

openUp2U tools

Moodle - serving as the base learning management system

eduMEET - a tool for online meetings

CERNBox - a file sync and share system

SWAN/Jupyter Notebook - to produce digital notebooks and share documents.

Moodle User Guide for the openUp2U Learning Platform

What is covered?

About the openUp2U learning platform

Create a course

Teacher's menu options

Course management options

Adding course content

Managing course topics

About the openUp2U learning platform

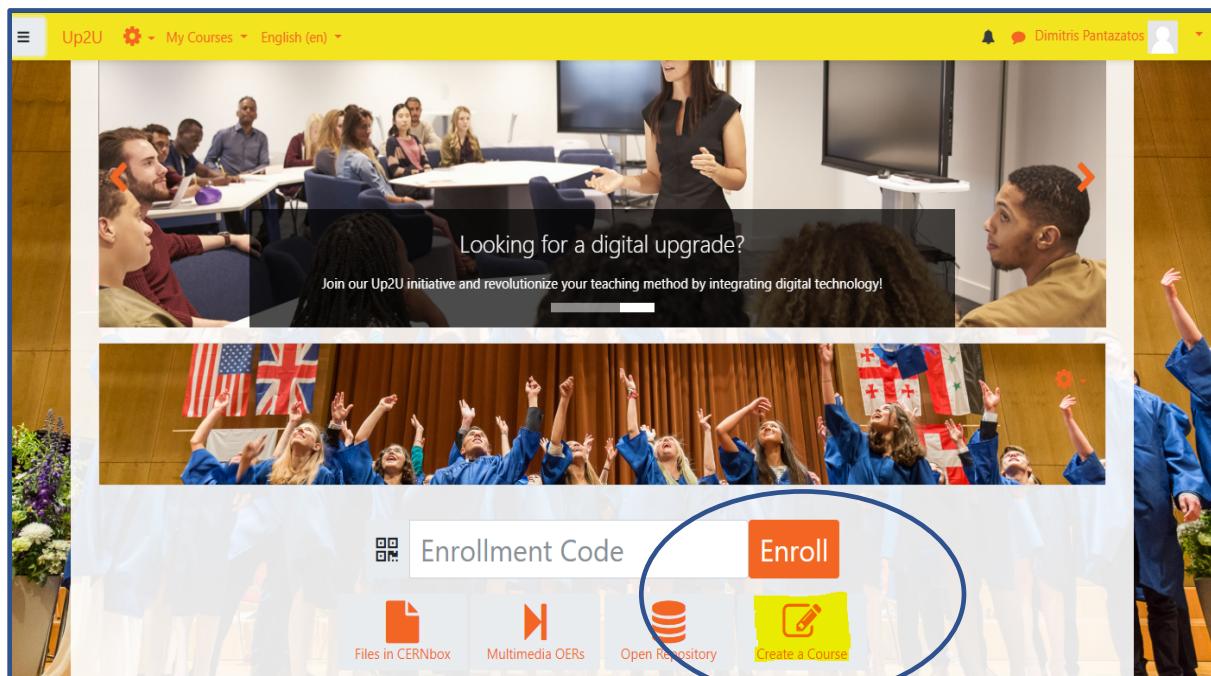
The openUp2U learning platform is here: <https://open.up2university.eu/>

The learning platform is based on Moodle (<https://moodle.org/>).

An email account (or Facebook / Twitter profile) is required to connect to the platform.

Create a course

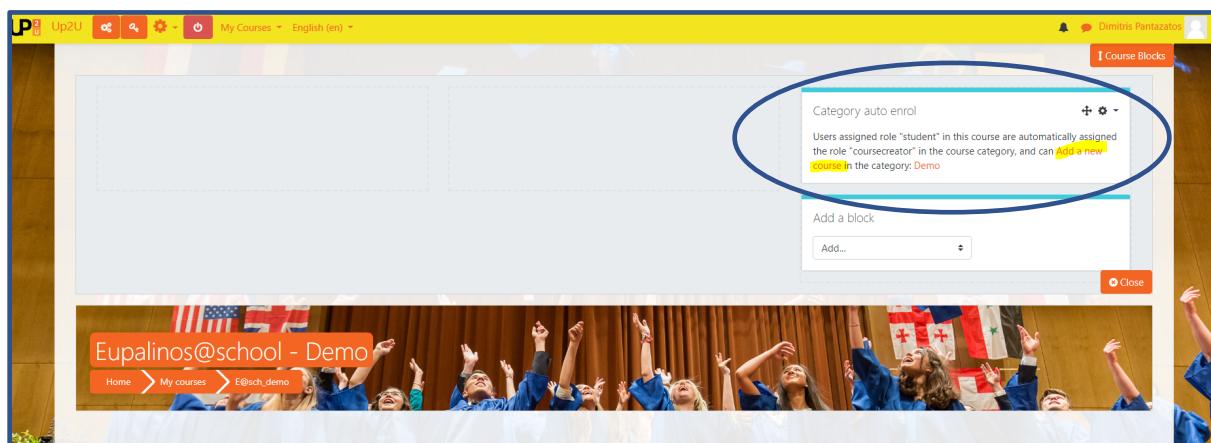
There are two options for initiating the creation of a course:



The screenshot shows the Up2U platform interface. At the top, there's a yellow header bar with the Up2U logo, a search icon, a gear icon, "My Courses", "English (en)", and a user profile for "Dimitris Pantazatos". Below the header is a large banner featuring a group of people in a classroom setting. The banner text reads: "Looking for a digital upgrade? Join our Up2U initiative and revolutionize your teaching method by integrating digital technology!" Below the banner is another image of students in graduation gowns raising their hands. At the bottom of the screen, there's a navigation bar with icons for "Enrollment Code", "Files in CERNbox", "Multimedia OERs", "Open Repository", and a red "Enroll" button. To the right of the "Enroll" button is a yellow "Create a Course" button with a pencil icon. A blue oval highlights the "Create a Course" button.

Option 1 for course creation

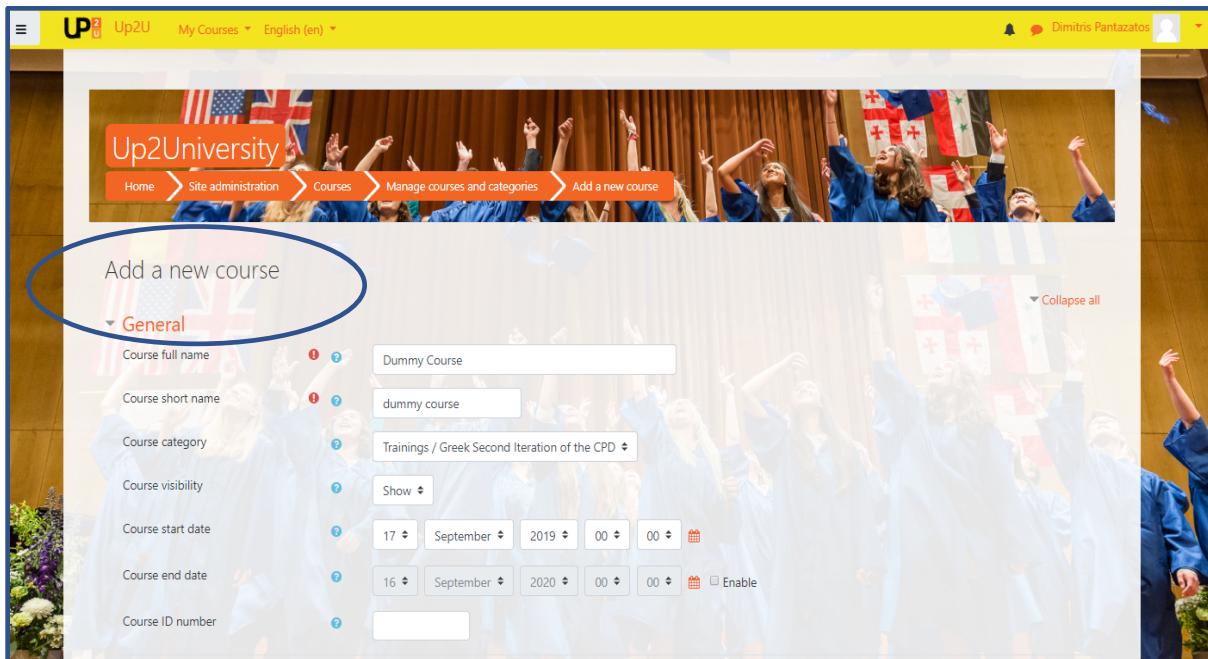
OR



The screenshot shows the Up2U platform interface. At the top, there's a yellow header bar with the Up2U logo, a search icon, a gear icon, "My Courses", "English (en)", and a user profile for "Dimitris Pantazatos". Below the header is a "Course Blocks" section. A blue oval highlights a modal dialog box titled "Category auto enrol". The dialog box contains the text: "Users assigned role "student" in this course are automatically assigned the role "coursecreator" in the course category, and can [add a new course](#) in the category: Demo". Below the dialog is a "Add a block" button with a dropdown menu. At the bottom of the screen, there's a navigation bar with icons for "Home", "My courses", and "E@sch demo".

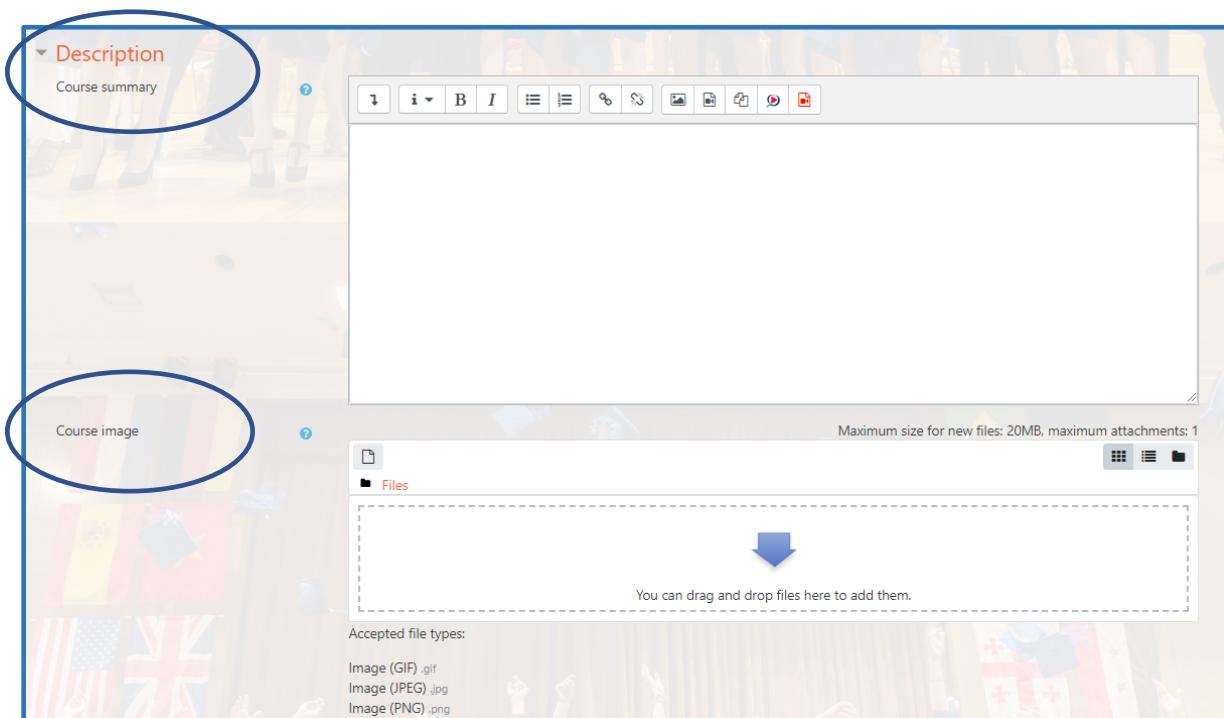
Option 2 for course creation

Then follow these steps:



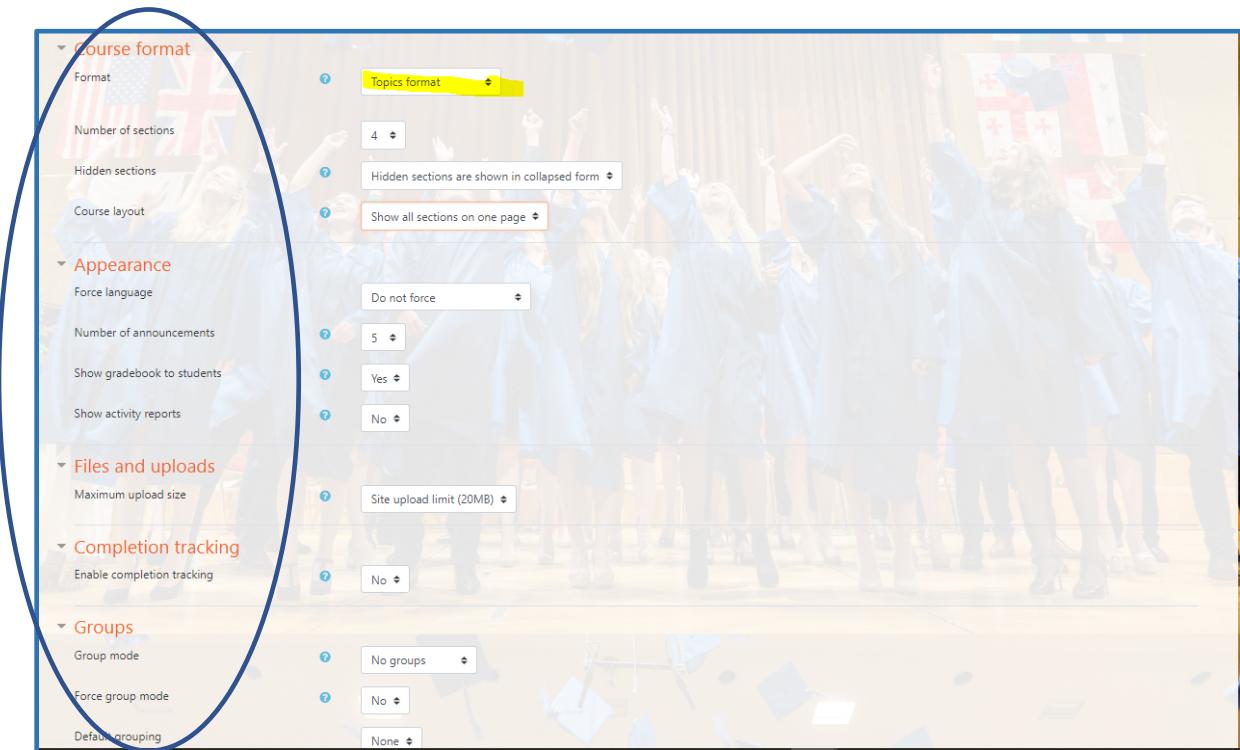
The screenshot shows the Up2University website interface. At the top, there's a yellow header bar with the logo 'Up2U Up2University', 'My Courses', 'English (en)', and a user profile for 'Dimitris Pantazatos'. Below the header, a breadcrumb navigation path is visible: Home > Site administration > Courses > Manage courses and categories > Add a new course. The main content area has a background image of graduates in caps and gowns. A blue oval highlights the 'General' section, which contains fields for Course full name ('Dummy Course'), Course short name ('dummy course'), Course category ('Trainings / Greek Second Iteration of the CPD'), Course visibility ('Show'), Course start date ('17 September 2019 00:00'), Course end date ('16 September 2020 00:00'), and Course ID number (''). There's also a 'Collapse all' link.

Step 1: Add a new course



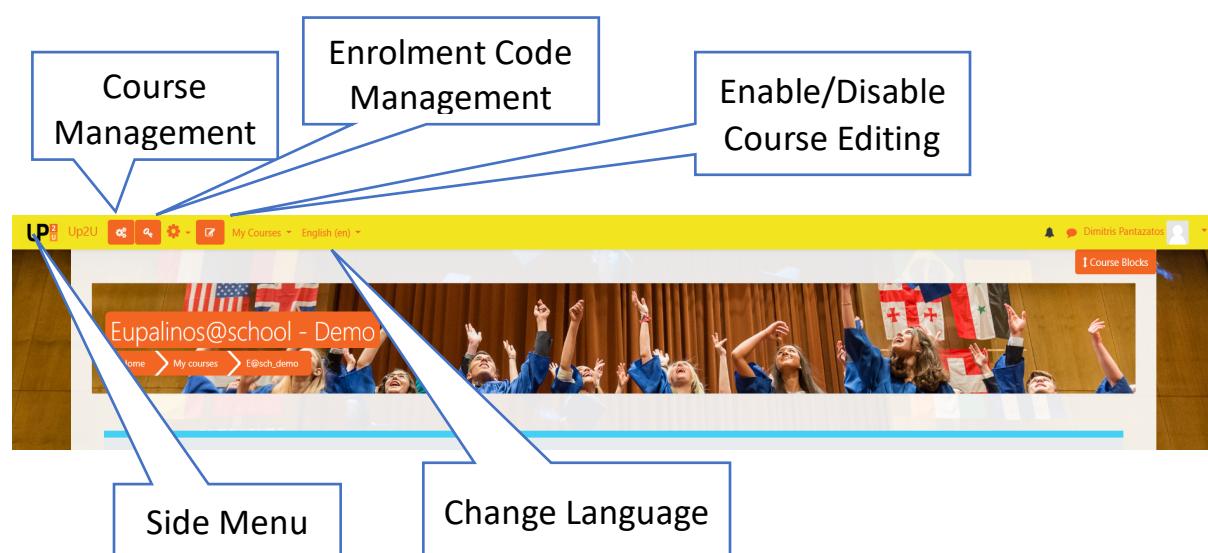
This screenshot shows the 'Description' tab of the course creation form. It includes a 'Course summary' field with a rich text editor toolbar above it. A blue oval highlights this area. Below it is a 'Course image' field, also highlighted with a blue oval. The 'Course image' field features a file upload interface with a 'Files' folder icon, a large dashed rectangular area for dropping files, and a blue arrow pointing down into it. Text below the dashed area says 'You can drag and drop files here to add them.' At the bottom, it specifies 'Accepted file types: Image (GIF) .gif, Image (JPEG) .jpg, Image (PNG) .png'. The background of the entire interface is a blurred image of graduates.

Step 2: Add a course description and image



Step 3: Define the course parameters

Teacher's menu options



Course management options

Options for course management include:

- Participants: participants' list
- Groups: users' group creation
- Edit Course Settings: basic course settings (title, etc.)
- View Activity Report: the number of views for each activity and resource
- Course Completion: shows if a course has been completed
- Enrolment Codes: shows participant enrolment type

The screenshot shows the Moodle course management sidebar menu. It includes sections for Activities, Question Bank, Course Settings, User Links, and Badges.

- Activities**: View All Activities in Course
 - Forums
 - Resources
- Question Bank**: Create and organize quiz questions
 - Question bank
 - Question category
 - Import
 - Export
- Course Settings**: Manage your entire course
 - Edit course settings
 - Edit course completion settings
 - Competencies
 - Course administration
 - Reset
 - Backup
 - Restore
 - Import
 - Recycle bin
 - Filter settings
 - Event monitoring
- User Links**: Manage your students
 - Enrollment codes
 - Gradebook setup
 - Participants
 - Groups
 - Enrolment methods
 - Activity completion
 - Course completion
 - Logs
 - View live logs
 - View course participation report
 - View activity report
- Badges**: Award your students
 - Manage badges
 - Add a new badge

Options for course management

Participants:

No filters applied

Search keyword or select filter ▼

Number of participants: 32

First name All A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Surname All A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

1 2 »

Select First name / Surname Email address

Last access to Roles Groups course Status

List of participants

Groups:

The benefits of using Groups include:

- Browse by 'Assignment' across all relevant groups
- Turn an individual assignment into a group assignment
- Turn a whole classroom activity into a smaller group activity: e.g. in Forums, Wikis, Databases, Glossaries
- Differentiate the educational material according to the group profile

Create a Group by following these steps:

1. Go to **Course management**
2. Select **Groups**
3. Click on the **Create group** button
4. Define the **Group name** and click on **Save changes**
5. Select the group you created and click on the **Add/Remove users** button
6. Select the names of the users you want to add to the group and then click on the **Add** button
7. When done, click on the **Back to the groups** button

Define the Group settings for a course:

Course format

Appearance

Files and uploads

Completion tracking

Groups

Group mode ? Separate groups ▾

Force group mode ? No ▾

Default grouping Training Groups ▾

Role renaming ?

Tags

Save and display Cancel

Edit course settings

Eupalinos@school - Demo

Home > My courses > E@sch_demo > Edit settings

General

Course full name: Eupalinos@school - Demo

Course short name: E@sch_demo

Course category: Demo

Course visibility: Show

Course start date: 27 February 2019 00:00

Course end date: 17 March 2020 15:53

Course ID number:

Expand all

Edit the course settings

Activity report

Eupalinos@school - Demo

Home > My courses > E@sch_demo > Reports > Activity report

Filter

Computed from logs since Friday, 13 April 2018, 5:26 PM.

Activity	Views	Related blog entries	Last access
UP2U Promotional Video	9 views by 3 users	-	Thursday, 18 July 2019, 3:07 PM (243 days 1 hour)

About this Course

Announcements	24 views by 8 users	-	Sunday, 24 November 2019, 1:38 PM (114 days 2 hours)
About Eupalinos' Tunnel	22 views by 5 users	-	Tuesday, 7 January 2020, 3:15 PM (70 days)

1.The Quest for Water

The Quest for Water	26 views by 8 users	-	Monday, 10 February 2020, 9:11 AM (36 days 6 hours)
The Quest for Water	33 views by 11 users	-	Monday, 2 March 2020, 4:15 PM (14 days 23 hours)

Add a block

Set parameters for the Activity report

Enrolment codes

The screenshot shows the 'Easy enrollments' section of the Up2U platform. It includes fields for 'Enabled' (set to Yes), 'Enrollment Begins' (March 17, 2020), and 'Enrollment Ends' (March 16, 2020). A checkbox labeled 'Enable' is shown next to the ends date. Below this, under 'Enrollment codes', there is a text input field containing 'gs59sd' and a button to 'Regenerate Codes'. At the bottom are 'Save changes' and 'Cancel' buttons.

Annotations:

- 'Enable enrolment' points to the 'Enabled' dropdown.
- 'Enable/disable when enrolment starts/ends' points to the 'Enable' checkbox.
- 'Enrolment code' points to the text input field 'gs59sd'.
- 'Create new code' points to the 'Regenerate Codes' button.
- 'Save changes' points to the 'Save changes' button at the bottom.

An enrolment code is generated automatically. Teachers must give this code to students so they can log into the assigned course.

The screenshot shows the Up2U platform with a banner about university readiness. Below it is a large image of students in graduation gowns. In the foreground, a red box highlights an enrollment code '3y48x9' in a text input field, with an 'Enroll' button next to it. Below the code are four icons: 'Files in CERNbox', 'Multimedia OERs', 'Open Repository', and 'Create a Course'.

Annotation:

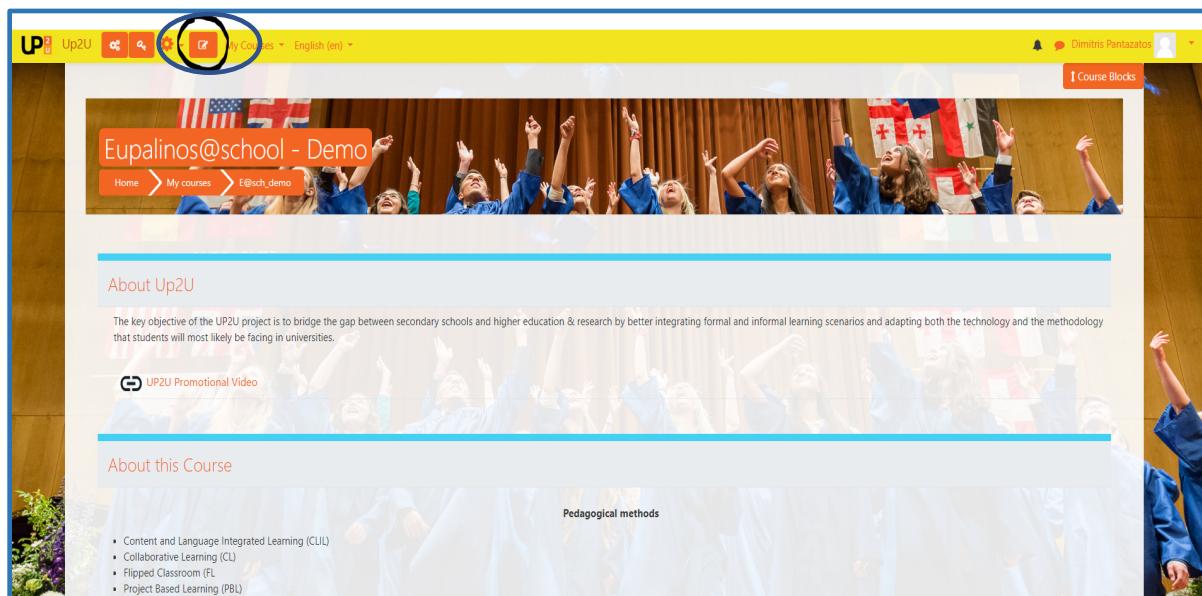
- A blue oval encircles the '3y48x9' code and the 'Enroll' button.

Text at the bottom:

"Next Generation Digital Learning Environment Up2U makes available a specific Next Generation Digital Learning Environment (NGDLE) that integrates the formal and informal learning spaces for secondary school students and teachers who wish to develop and enhance their teaching and learning skills up to the university standards."

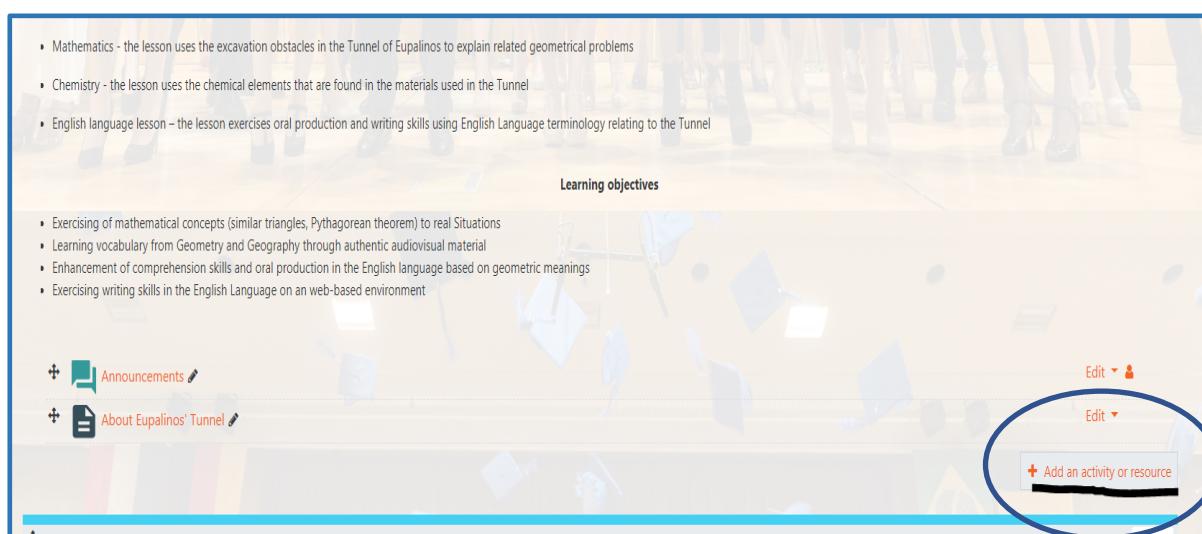
Adding course content

Step 1: Enable ‘Edit’ Option



The screenshot shows a web browser window for the Up2U platform. At the top, there is a navigation bar with icons for user profile, course selection, and search. A red circle highlights the 'Edit' icon, which is located next to the course name 'Eupalinos@school - Demo'. Below the navigation, there is a banner with the course name and a photo of students. Underneath, there are sections for 'About Up2U' and 'About this Course'. The 'About this Course' section includes a list of pedagogical methods: Content and Language Integrated Learning (CLIL), Collaborative Learning (CL), Flipped Classroom (FL), and Project-Based Learning (PBL). The background of the page features a blurred image of students in a classroom setting.

Step 2: To add a new activity or resource, click on the field below:



The screenshot shows a course content page for 'About Eupalinos' Tunnel'. It lists learning objectives and activities. At the bottom right, there is a large blue oval highlighting a button labeled '+ Add an activity or resource'. Above this button, there is an 'Edit' button with a dropdown arrow. On the left side, there are links for 'Announcements' and 'About Eupalinos' Tunnel'. The background features a blurred image of geometric shapes and mathematical concepts.

Step 3: Select a resource or activity from the panel on the left; press the ‘Add’ button to add this content to your course. (Yellow highlight marks some of the tools offered by the standard Up2U platform.)

The screenshot shows the UP2U platform's interface. On the left, there is a sidebar titled 'UP2U' containing several sections:

- ACTIVITIES**: A list of ten items, each with an icon and a name:
 - Assignment
 - Chat
 - External tool
 - Feedback
 - Forum
 - Lesson
 - Quiz
 - SelCont Lectures
 - Survey
 - Virtual programming lab

Some items in the sidebar are highlighted with yellow boxes: 'KnockPlop', 'Interactive Content', 'SelCont Lectures', and 'Virtual programming lab'. The main central area has a placeholder text: "Select an activity or resource to view its help. Double-click on an activity or resource name to quickly add it."

Add hyperlinks:

The screenshot shows a resource editor window for 'The Quest for Water'.

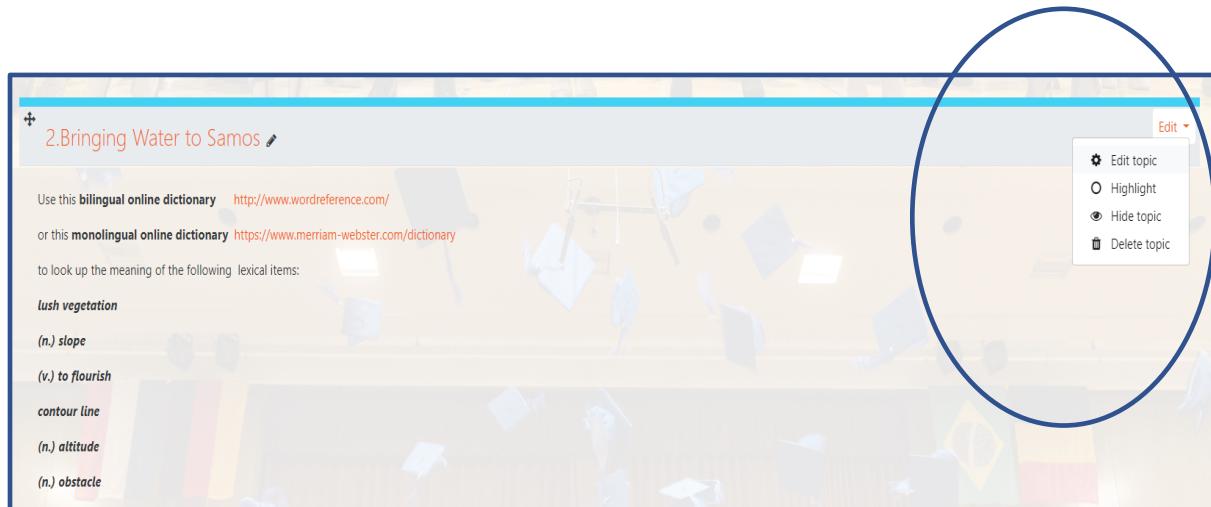
General section:

- Name**: The Quest for Water
- External URL**: <https://www.youtube.com/watch?v=WpPMayH1ZZE&feature> (This field is circled in blue.)
- Description**: Watch this short video.
 - What are the names of two ancient Greeks that are mentioned in the video?

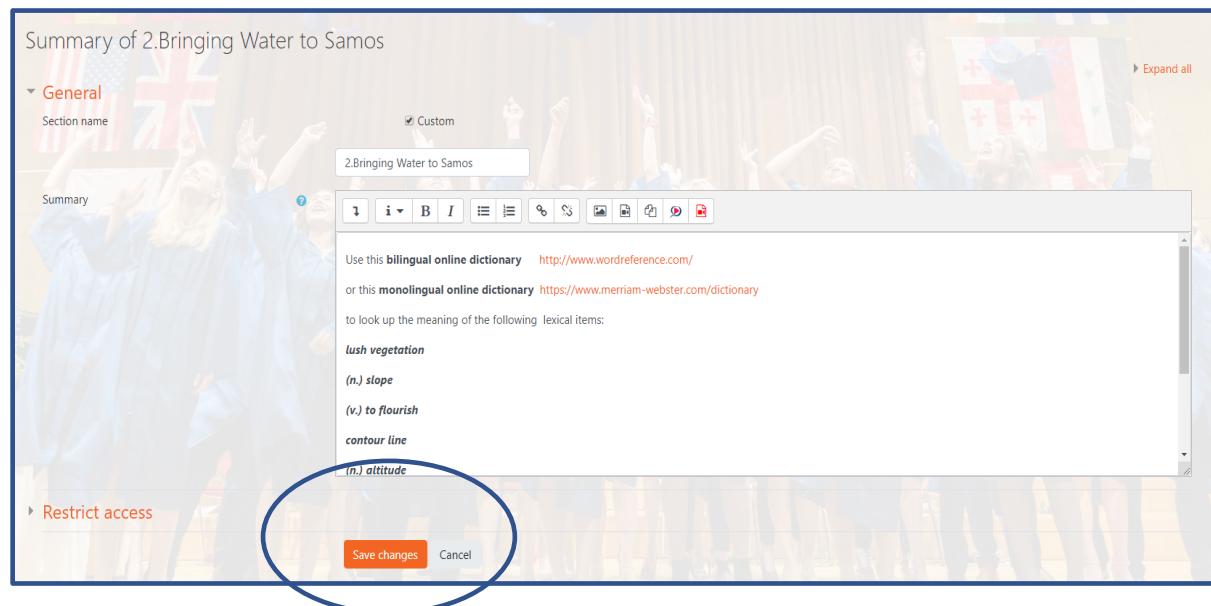
Display description on course page

Managing course topics

Step 1: Click on the 'Edit' field, as shown in the following image:



Step 2: Click on the 'Edit Topic' field from the dropdown list to be able to edit the topic summary. Click 'Save changes'.



If you want to 'hide' a topic, select the 'Hide Topic' option as shown by the yellow highlight:

The screenshot shows a digital workspace interface. At the top, there is a header bar with a plus sign icon and the text "2.Bringing Water to Samos". On the right side of the header, there is an "Edit" button. Below the header, there is a message encouraging the user to use a bilingual or monolingual online dictionary. The main area contains several words listed with their definitions: "lush vegetation", "(n.) slope", "(v.) to flourish", "contour line", and "(n.) altitude". In the top right corner of the workspace, a context menu is displayed with the following options: "Edit topic" (radio button), "Highlight" (radio button), "Hide topic" (radio button, which is highlighted with a yellow background), and "Delete topic". A blue oval has been drawn around the "Hide topic" option to draw attention to it.

eduMEET User Guide for the openUp2U Learning Platform

What is covered?

About eduMEET for openUp2U

Information for Teachers / meeting creators

- Before you start
- How to start a meeting
- How to invite participants
- During a meeting – managing settings and options

Information for Students / meeting participants

- Before you start
- How to join a meeting
- During a meeting

About eduMEET for openUp2U

eduMEET is an interactive, Web-based videoconferencing platform, supporting distance learning. eduMEET has been developed by the international community of research and education networks for the research and education community.

eduMEET is part of the standard Up2U learning platform as well as the trimmed-down openUp2U platform.

Information for Teachers / meeting creators

Before you start

Important note! Before you start or join a meeting, check that you are using a supported Web browser.

Please use only the newest versions of the web browsers!

WebRTC technology is relatively new; it is still undergoing development and standardisation. As it uses web browser technology, each stage of its development is done for a particular version of a web browser; therefore, it is important that only the latest versions of web browsers are used.

Supported web browsers (in the newest versions):



- *Chrome - full support (recommended)*
- *Firefox - full support (recommended)*

Other web browsers:

- Opera - limited support (e.g. screen sharing is not available)
- Edge - limited support (e.g. screen sharing is not available)
- Safari - very limited support (not recommended)

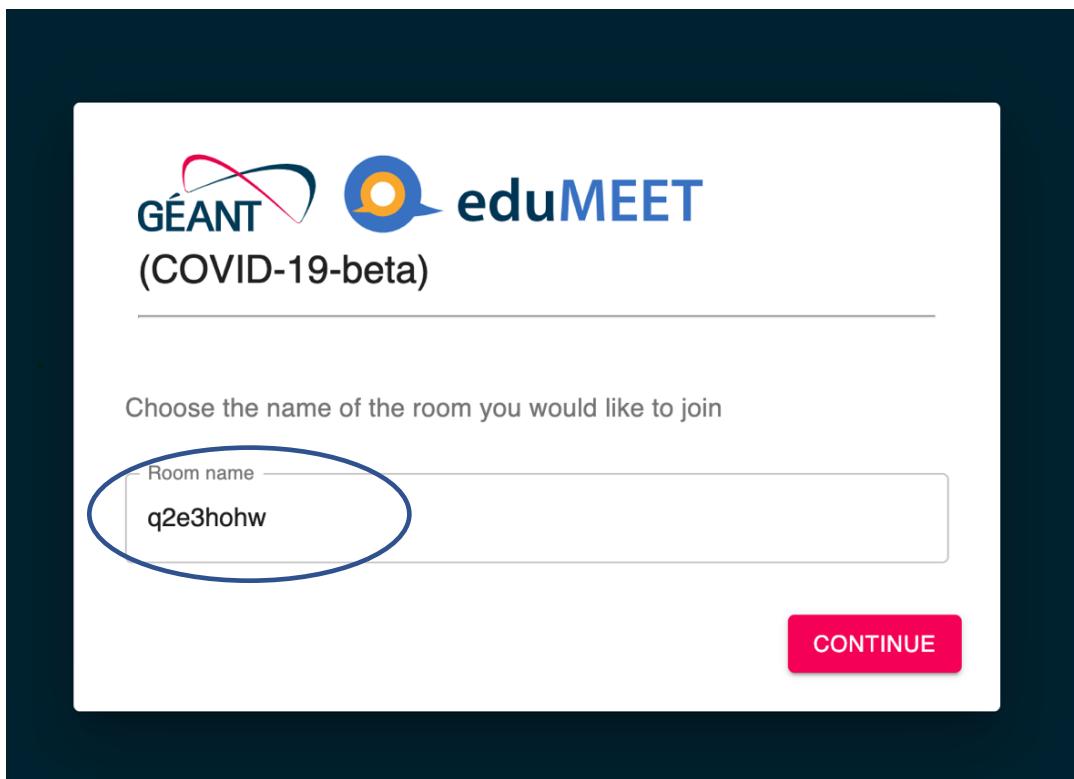
Overall IOS based devices (especially the older ones) may cause various problems. Once you have checked and established that you have the latest version of Chrome or Firefox you can start.

How to start a meeting

Go to <https://edumeet.geant.org>

You will see the main screen of the eduMEET service where a randomly generated room name is visible.

We recommend that you use this randomly-generated room name instead of creating your own room name; this will minimise the chances of other people using the same room name and accidentally joining your call.

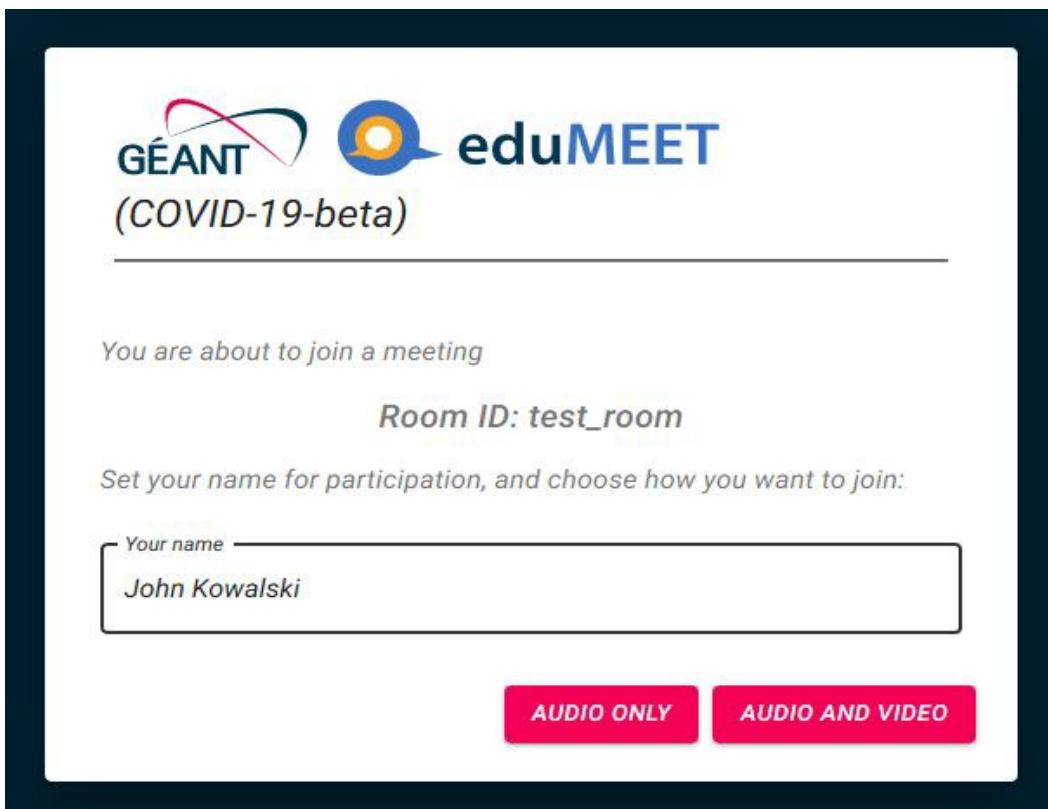


Click 'Continue'.

On the following screen enter your name and select audio and video options to use when you are in the meeting room:

AUDIO ONLY-your camera will be switched off by default and your video stream will not be sent. You will be able to manually switch on your camera during the call.

AUDIO AND VIDEO - your audio and video streams will be active by default. You will be able to manually switch off your camera or mic during the call.



Once you have made your selection, pop-up(s) will appear, asking if you allow eduMEET to use your microphone/camera.

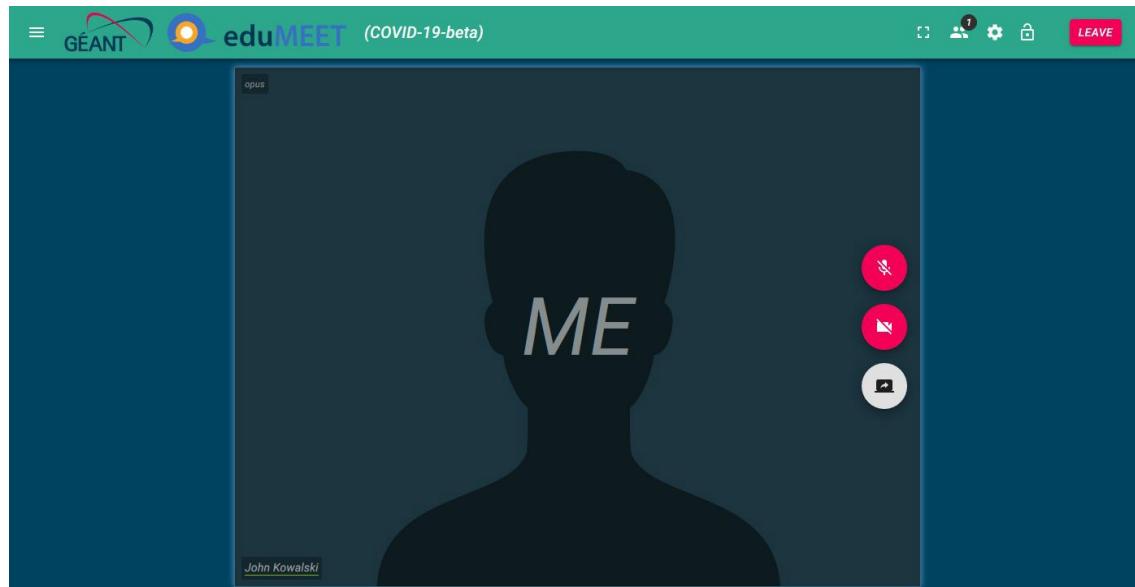
Click 'Allow'.

How to invite participants

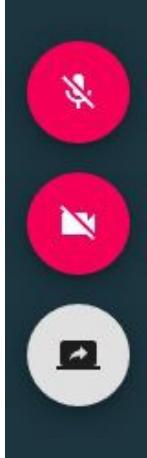
To allow participants to join the meeting room, copy the URL that appears in the browser, e.g. <https://edumeet.geant.org/q2e3hohw> and paste it into an invitation message.

During a meeting – managing settings and options

TIP: Remember to mute your Mic while you are not talking. Simply use the “m” key or space bar, or click on the Mic icon in your video window.



On screen menu (participants window)

	<ul style="list-style-type: none">• Mute your microphone (shortcut: 'm' key or 'Space bar') Each participant must mute their own microphone – it is not currently possible for the host to mute everyone.• Mute your video - Each participant must turn their own camera on/off – it is not currently possible for the host to do this for everyone.• Screen sharing - *To Start screen sharing click the icon then select what you wish to share and then click 'Share' (Chrome) / 'Allow' (Firefox) *To Stop screen sharing – if you are already sharing your screen, click the green screen share icon. *To cancel screen sharing before you complete the action - If you decide not to share your screen but have already clicked the start screen sharing icon, please note that there are differences between browsers.<ul style="list-style-type: none">- In Chrome you can simply 'Cancel'; you will see a red error message appear (see below), but this will cause no problem to continue with the meeting.- In Firefox, if you click 'Don't allow', the same red error message will appear, but then screen sharing will be disabled for the duration of the meeting and an error message will appear each time you try to share a screen. Click the icon next to the URL to unlock the option again.
---	---

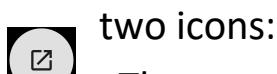


Screen sharing error message – cancelling screen share before you complete the action

✖ An error occurred while accessing your screen

Viewing shared screens

When a screen is shared a new panel will open within eduMEET to display the shared screen. If participants move their cursor over this panel they will see



two icons:

The square with the arrow – this will open the shared screen in a separate browser window which can be enlarged for detailed viewing.

The four corners icon – this will enlarge the shared screen within the current eduMEET browser window.

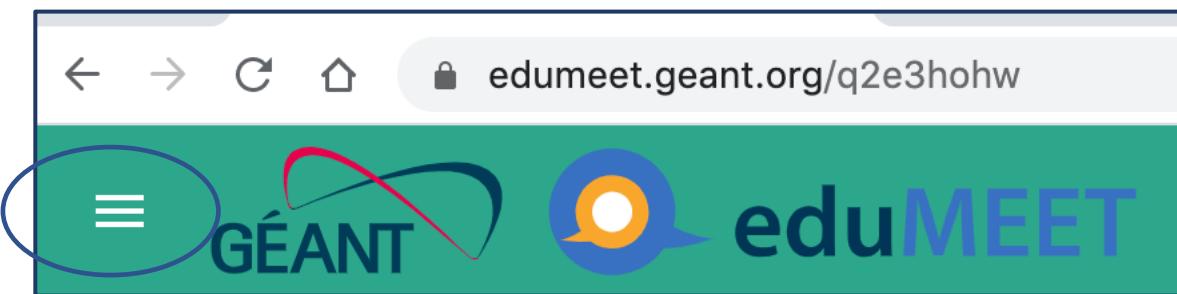
Quick Actions buttons (*Top right corner*)



From the left, these buttons allow you to:

	Enter fullscreen
	<p>'Show participants' – used mainly to open a tab with a list of participants from the menu. This also gives access to the following options:</p> <ul style="list-style-type: none">• 'Chat' – for text messages to all the participants• 'File Sharing' – to upload files• 'Participants' – to see names and status of everyone in the call. <p>(The same options can be accessed from Main Menu section – see below.)</p>
	Show settings
	Lock / Unlock the room
	Leave the meeting

Main menu section (Top left corner)



This provides a direct route to the same functions that are also found behind the ‘Show Participants’ icon described above: Chat, File sharing, and Participants.

- **CHAT**

Type into the bar at the bottom of the white screen and click the arrow to send your message into the area above. Private chat is not possible – all messages are visible to all participants.

- **FILE SHARING**

To upload a file, click the ‘Share File’ button, select a file from your computer, then click ‘Open’. You will see the file appear in the white area in the eduMEET screen.

The screenshot shows a user interface for file sharing. At the top, there are three tabs: CHAT, FILE SHARING (which is selected), and PARTICIPANTS. Below the tabs is a button labeled SHARE FILE. In the main area, there is a message from a participant named 'Me' who has shared a file. The file name is 'Creative thinking links.docx'. A blue oval highlights the file name. To the right of the file name is a 'DOWNLOAD' button.

NOTE: it is not possible to drag and drop files into this white space; if you do this you may need to re-join the meeting.

Participants can click 'Download' to save shared files on their own computer devices.

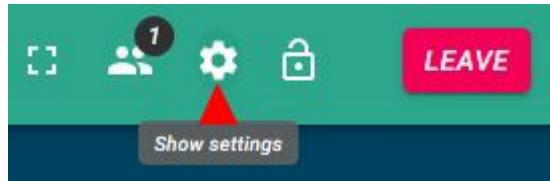
- PARTICIPANTS

All participants in the call are displayed in the list here.

- 'Active' - participants currently visible in the web browser window.
- 'Passive' - participants in the meeting but not visible at the moment in the browser (related to 'Number of visible videos' – see below).

NOTE: The visibility of participants in the browser is voice activated, so if a "passive" participant speaks, his/her video will appear in the main window.

Settings



The 'Show settings' button allows you to:

- Select/change the camera and microphone devices being used
- Change the video resolution
- Change the room layout
 - 'Democratic view' – all visible participant / shared screen display panels are of equal size
 - 'Filmstrip view' – the person sharing their screen or talking is displayed more prominently. This is only recommended for meetings with one main speaker.
- Set maximum number of visible participants
- Set visibility of the bar across the top of the eduMEET screen – if 'Permanent top bar' is not clicked, the bar will disappear after a few seconds of inactivity.

Information for Students / meeting participants

Before you start

Important note! Before you start or join a meeting, check that you are using a supported Web browser.

Please use only the newest versions of the web browsers!

WebRTC technology is relatively new; it is still undergoing development and standardisation. As it uses web browser technology, each stage of its development is done for a particular version of a web browser; therefore, it is important that only the latest versions of web browsers are used.

Supported web browsers (in the newest versions):



- *Chrome - full support (recommended)*



- *Firefox - full support (recommended)*

Other web browsers:

- Opera - limited support (e.g. screen sharing is not available)
- Edge - limited support (e.g. screen sharing is not available)
- Safari - very limited support (not recommended)

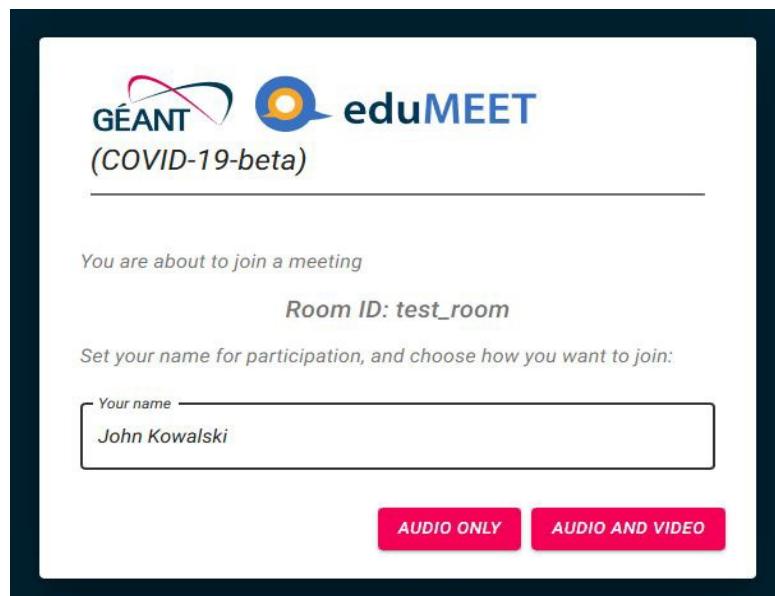
Overall IOS based devices (especially the older ones) may cause various problems.

Once you have checked and established that you have the latest version of Chrome or Firefox you can start.

How to join a meeting

Click on the link that you will find in your meeting invitation message (e. g. <https://edumeet.geant.org/okdcmffx>)

You will see a screen like this:



Type your name in the box to replace the word “Guest” (where ‘John Kowalski’ is written in this example image) and select audio and video options to join the meeting:

AUDIO ONLY- your camera will be switched off by default and your video stream will not be sent. You will be able to manually switch on your camera during the call.

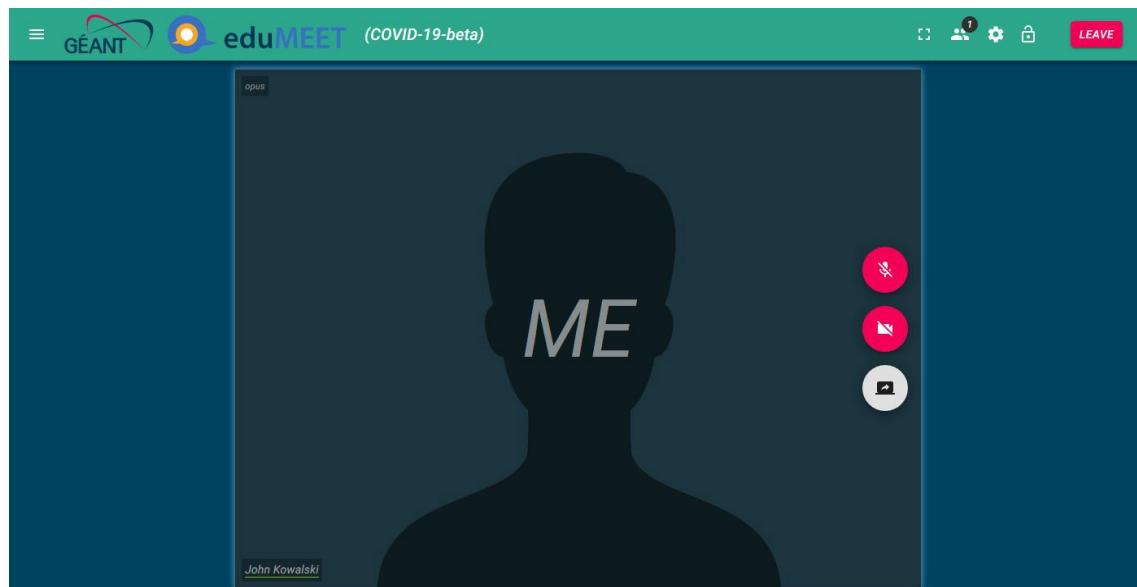
AUDIO AND VIDEO- your audio and video streams will be active by default. You will be able to manually switch off your camera or mic during the call.

Once you have made your selection, pop-up(s) will appear, asking if you allow eduMEET to use your microphone/camera.

Click ‘Allow’.

During a meeting

Mute your Mic while you are not talking. Simply use the “m” key or space bar or click on the Mic icon in your Video window.



On screen menu (participants window)

	<ul style="list-style-type: none">• Mute your microphone (shortcut: 'm' key or 'Space bar') Each participant must mute their own microphone – it is not currently possible for the host to mute everyone.• Mute your video - Each participant must turn their own camera on/off – it is not currently possible for the host to do this for everyone.
--	---

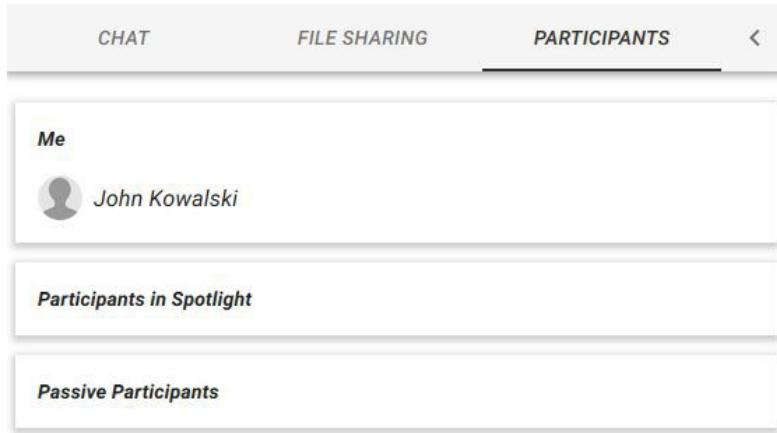
Viewing shared screens

When a screen is shared by the presenter, a new panel will open within eduMEET to display the shared screen. If participants move their cursor over this panel they will see two icons:

- The square with the arrow – this will open the shared screen in a separate browser window which can be enlarged for detailed viewing.
- The four corners icon – this will enlarge the shared screen within the current eduMEET browser window.

Main menu section (Top left corner)





- **CHAT**

Type into the bar at the bottom of the white screen and click the arrow to send your message in the area above. Private chatting is not possible – all messages are visible to all participants.

- **FILE SHARING**

Click ‘Download’ to save any shared files that are visible in the white area. If you need to upload a file, click the ‘Share File’ button, select a file from your computer, then click ‘Open’.

CERNBox User Guide for the openUp2U Learning Platform

What is covered?

About CERNBox

Advantages of using CERNBox in educational practice

How to access CERNBox

How to install CERNBox on your computer

How to copy files to your account

About CERNBox

CERNBox is the cloud-based storage, synchronisation, and sharing service developed at CERN, the European Organisation for Nuclear Research.

It enables users to:

- Access files via the Web interface
- Have files synchronised on personal desktop computers or laptops via the CERNBox client
- Share single documents or entire folders with colleagues and friends.

CERNBox is also accessible from mobile devices using the CERNBox mobile application, which is available for Android and iOS. The mobile application features the ability to automatically upload pictures and videos captured with the on-board camera to the cloud.

CERNBox is implemented on top of Owncloud -- an open-source sync and share software layer.

Advantages of using CERNBox in educational practice

CERNBox provides an easy way to keep files safe and accessible everywhere, by storing them in the cloud; it also makes it easy for teachers and students to share files and collaborate..

CERNBox provides a plugin for Moodle, allowing teachers to easily import their documents into a course.

Its integration with Moodle and SWAN makes CERNBox the core of a learning integrated solution in a modern school.

How to access CERNBox

CERNBox can be accessed either through its web interface <https://cernbox.up2university.eu> or by syncing files directly from your devices.

How to install CERNBox on your computer

Download the Owncloud Desktop Client for your system using <https://owncloud.org/download/#owncloud-desktop-client>

Open the installer and follow the prompts. When asked to provide the URL of the server, skip this step and end the configuration.

Open the Sync client and go to the Settings.

Click to add an account. Use:

<https://cernbox.up2university.eu/cernbox/desktop> as the URL.

This will open CERNBox in your browser allowing you to give permissions to the sync client.

You will have to login via Up2U to access CERNBox.

How to copy files to your account

You can copy files to your account in two ways:

- If you have the sync client installed, put the files inside the folder that was created when you configured your account.
- If you want to use the web interface, just drag and drop the files inside the files view.

If you want to know more about CERNBox, please refer to relevant documentation.

SWAN User Guide for the openUp2U Learning Platform

What is covered?

About SWAN

Advantages of using CERNBox in educational practice

Advantages of using SWAN in educational practice

Starting SWAN and creating my first project

Creating and editing a notebook

About SWAN

SWAN (Service for Web based ANalysis) is a platform to perform rich interactive data analysis and experimentation in the cloud.

SWAN allows users to write and run scientific code with only a web browser, leveraging the widely-adopted Jupyter notebooks interface. The user text, code and execution results can be combined inside a single notebook, which, together with data, lives entirely in the cloud.

SWAN, therefore, makes it easier to produce and share results and scientific code, access scientific software and produce tutorials and demonstrations. Furthermore, it is also a powerful tool for non-scientific data analytics and a very friendly way to introduce students (and their teachers) to code, since it hides all the installation and configuration complexities.

Advantages of using SWAN in educational practice

Programming is everywhere nowadays, and having some knowledge in this area can prove very useful for future university students and

future workers. SWAN can also nurture students' curiosity by providing a more interactive experience than a plain old static document.

SWAN lowers the entry barrier into programming by providing a ready-to-use system, with powerful languages and libraries - already installed and configured. By using the notebook interface, users write code as if they were writing a document in a word processing software, which should be a familiar interface to them. It also allows the teachers to produce documents with contextual information, interleaved with the code, making it easier to follow and understand.

The interactivity and rich media integration also allow students to learn code by trial and error, with immediate visible results.

For this reason, SWAN is central to many of CERN's education activities.

Every year, more than one hundred university students visit CERN to learn and work in physics-related projects. During this time, they attend courses that include practical exercises. These exercises usually consist of notebooks - a script with unfinished coding blocks that the students have to follow and complete. The code that the students are required to complete produces tables, interactive plots and 2d/3d images.

Starting SWAN and creating my first project

Have you already visited CERNBox at least once? If not, the first step is to create your storage space so that SWAN can use it. To do this access <https://cernbox.up2university.eu>.

When you first open SWAN, you have to select some configurations (i.e. which software packages, and versions, to use). If you don't have

a specific need, just leave the default configuration and click “Start my session”. The environment will be created for you.

Then you will be in the Projects view. If it’s your first time using SWAN, this page should be empty.

A project in SWAN is a special type of folder that you can use as a container for your work on a given topic: notebooks, input/output files, other subfolders, etc.

In the Projects tab, you can create a folder by clicking on the + button. You will be asked to name a project and, if you do not provide a name, a default one will be chosen.

Once the project is successfully created, you will be automatically redirected inside the folder so that you can start adding content to it.

Creating and editing a notebook

After creating or browsing a project, you can add content to it.

One of the most important types of content you can add to a project is a notebook.

Notebooks are documents that contain live code, equations, visualisations and narrative text. You can even run the code to produce rich interactive content, like plots and graphics.

SWAN allows you to create notebooks in four different languages: Python (2 or 3, depending on the software stack chosen during the session configuration), C++, R and Octave. Python is a good language to start with.

To know more, please read about Jupyter, the notebook interface used by SWAN.

In order to create a notebook, click on the + button from inside a project or a regular folder. A list will then appear with the available languages. Once you select one, the notebook interface will open in a new tab.

A notebook is a sequence of cells that can be markdown of two main types:

- text/markdown - which is a way of writing formatted text (to learn more [click here](#))
- code - where you can write the code in the language you have selected.

When inside a cell, you can switch the type by clicking on the dropdown in the toolbar. Once you have written your text or code, you need to run the cell. Just click the Run button in the toolbar (between the arrow down and the stop buttons).

If the cell is text/markdown, its contents will be rendered. To edit, double click it.

If the cell is code, the code will be evaluated and the output will appear below. You can re-run it as many times as you want using the same cell; and if your code is wrong, correct it and run it again.