

USER GUIDE Using the eCraft2Learn Project Platform (The UUI)





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Overview

eCraft2Learn is an EU funded project centred around researching, designing, piloting and validating an ecosystem based on digital fabrication and making technologies for creating computer-supported artefacts.

You can learn more about the eCraft2Learn Project in Teacher Guide 1 Introducing eCraft2Learn which can be downloaded at: https://project.ecraft2learn.eu/introducing-ecraft2learn/

The 5 stage craft and project-based methodology of eCraft2Learn, requires digital tools that allows the learners to ideate, plan, create, program and share their work in a collaborative way. eCraft2Learn have selected a set of tools and implemented software that together provide a central place for learning and teaching through the 5 stage methodology. All of the software and tools, along with education resources to support students learning are accessible through a single platform, this is known as the Unified User Interface (UUI)

This guide has been created to introduce you to the Unified User Interface (UUI). The guide will take you through the following:

- The UUI interface
- Digital tools to support the five stage pedagogy Ideation, Planning, Creating, Programming and Sharing
- Additional project tools
- Education resources

Throughout the guide, you will be signposted to various other more detailed documentation from the eCraft2Learn academic research and project pilots. These documents provide a more detailed insight into how the eCraft2Learn ecosystem was developed and trialled along with the approach and outcomes from the project pilots. Follow the links in the guide to learn more.

You can access a comprehensive user manual for the UUI in Project Report D4.5 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2019/01/D4.5-User-manual-for-program-ming-of-computer-supported-artefacts-with-integrated-debugger-and-3d-modelling-simula-tion-and-printing-%E2%80%93-the-unified-user-interface-approach.pdf</u>

Further support around how the digital tools support the ecraft2learn pedagogy and training for the key digital tools in the user interface are available in Project Report D3.4 Sections 2.3 and 3.2-3.6 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2018/05/eCraft-</u> <u>2Learn_D3.4_M16_Manual-of-Craft-and-Project-based-Learning-STEAM-Training-for-Teach-</u> <u>ers.pdf</u>



Introduction to the UUI

The digital platform is accessible using Google Chrome browser for full functionality.

The digital platform can be accessed using any type of mobile device (tablet/smartphone), laptops (Linux, Windows, Mac IOs) and Raspberry Pi microcomputers. The digital platform has two interfaces: the unified user interface (UUI) for students and the learning analytics interface (LA) for teachers. The login procedure to the interfaces is as described below.

LOGIN PROCEDURE

1. The teacher goes to the Teacher Interface URL and creates a new session ID https://ecraft2learn.github.io/learning-analytics/

For more information about the Teachers Interface, check Guide 8: https://project.ecraft2learn.eu/wp-content/uploads/2019/02/Guide-8-_-Using-the-eCraft2Learnteachers-interface-and-learning-analytics-tools_.pdf



2. The system will provide a session ID that the students then can use when logging into the UUI (students' interface)

Creating a new session ID is needed whenever the teacher wants to start a new project with their class.

3. Once a session ID has been generated, the students' groups can use it to login into the students' interface through the following URL: https://ecraft2learn.github.io/uui/

Login to eCraft2Learn	
Username:	
Enter your name, nickname, or user name.	×
Pilot Site:	
Not at a pilot site	
Or Enter session id:	
Login	

Note: In the login page make sure that the students understand the importance of using the same user name for subsequent logins. This helps the data analytics and debugging systems to give a better feedback to the user.

When logged in, on the top right corner if the UUI the name of the user is presented alongside a small progress bar. The progress bar presents the learners progress through the ongoing project or assignment. This value is calculated by the data analytics tool. Clicking on the username opens up a small window that allows the user to logout of UUI and close their session.



THE UUI INTERFACE

The UUI interface, organises the different digital tools available as a series of tiles that can be interacted with.



The tools that support the eCraft2Learn five stage pedagogy are organised in the centre of the interface, as tiles in their respective stages; Imagine (Ideation), Plan, Create, Program and Share.

Additional tools are available in the tiles along the bottom of the interface and the Education Resources are available via the link in the top right corner of the interface.

Note: The large tiles on UUI represent the tools that are directly incorporated into eCraft2Learn environment, while the small tiles, although useful for the project work, are not directly part of the system.

INTERACTING WITH THE TILES

There are 3 different ways to interact with a tile: hovering the mouse over a tile, clicking a tile and clicking the question mark on top of the tile.

Hovering a mouse over a tile shows a short description of that tile on it. This activates a short description text about that tool.



Clicking the question mark on top-right corner of a tile, opens a small dialog which explains that tool in more detail. The text might contain links that you can follow to learn more about a tool.

Chanl		6
Snap:		
Snap! is a big brot complex. It is doc	ther of Scratch. It can do much more than Scratch umented here.	but <mark>is a</mark> bit more
Most importantly 1. the ability	it has enabled the eCraft2Learn project to add nev to use speech input and output	v blocks. These include
2. image reco	ognition by connecting to AI cloud services (free A	PI keys required)
3. the ability	to read and write the digital pins of a Raspberry Pi	or an Arduino
connected	to a Raspberry Pi. Note that this requires the runn	ing of a local server on
the Raspbe	erry Pi. This has already been performed if you are	using an eCraft2Learn
SD card on	n a Raspberry Pi.	
Get A.I. Blocks	A.I. Blocks Guide	
For controlling Are Snap4Arduino whi	duinos beyond simple digital sensors and actuator ich adds many new blocks for programming Ardui	s we recommend nos.
Click here to run S	nap! now.	

Clicking a tile will do one of the following:

- Opens the tool in a new window inside eCraft2Learn UUI.
- Opens the tool in a new browser window/tab.
- Shows a description on how to launch the tool from the main operating system.

LAUNCHING A TOOL IN A UUI WINDOW

Due to technical limitations, at the moment only some tools are launched in this way. They are: Tinkercad, Snap!, Snap4Arduino, Thingiverse, 3D Slash, and eCraft2Learn's custom Ideation and Planning tools. Launching a tool inside a UUI window allows you to access other tools directly from the UUI without the need to move between different operating system windows or browser tabs.



It is possible to close, maximize and minimize the window, using the three command buttons on the top right corner of the window. When minimising a window, the contents of the window and your project stay active and a small icon representing that tool is added to the active tools panel at the bottom as shown below.



You can learn more about the UUI interface and how to interact with it in Project Report D4.5 Section 2 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2019/01/D4.5-Us-er-manual-for-programming-of-computer-supported-artefacts-with-integrated-debug-ger-and-3d-modelling-simulation-and-printing-%E2%80%93-the-unified-user-interface-ap-proach.pdf</u>

MANAGING THE UUI

The UUI can be managed through the teacher interface, here you can set up a unique session id for each project and/or group of students. You can also choose which tools/tiles will be displayed in the UUI for each session, effectively restricting students access to tools that you do not want them to interact with.

You can learn more about the Teacher Interface in Teacher Guide 8 Using the eCraft2Learn teachers interface and learning analytics tools at: <u>https://project.ecraft2learn.eu/us-ing-ecraft2learn-teachers-interface-learning-analytics-tools/</u>

You can also view a video demonstration of the teacher interface functionality at: https://www.youtube.com/watch?v=OsZl09t7z_Q&t=114s

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Ideation tools

The UUI provides two bespoke tools to assist students in ideation for their projects. These are arranged as tiles in the "Imagine" area of the UUI interface.

ECRAFT SEARCH



The eCraft Search tool can be used to search for different ideas and topics to give the learner a better overview of related projects.



In order to search for a topic, you can click on the search button on the top right corner of the window. This opens up a text box that allows you to type your desired keywords.

The example below shows the results for searching "6 legged robot".



It should be noted that the search tool uses extra limiting keywords in the background to narrow down the results into related and safe material. It is also possible (in the teacher interface) for the teacher to add extra keywords to this list to guide the students to a specific subset of the results. The learner is not aware of the fact that there are keywords that direct search. This functionality provides additional possibilities to customize the interface.

INSPIRATORIUM



The Inspiratorium tool provides a visual search interface to browse the projects published on instructables.com. While the native instructables. com search is text-based and filters the project titles and descriptions, the Inspiratorium search displays the 100 most popular keywords as colourful bubbles. As a user clicks on bubbles, the search results narrow down to only those projects that are assigned all selected keywords. The search results are presented as a project list, ordered by popularity.



Selected keywords are coloured orange (music and jewellery in the example shown), possible additional keywords are coloured yellow, and keywords that were not assigned to any of the projects that match the previous selection are coloured grey (Figure 9). This immediate visual response has a playful element and stimulates users' creativity by showing unexpected combinations (e.g. "music, jewellery, furniture") and speeds up the exploration of Instructables projects.

The Inspiratorium then displays a list of the projects tagged to the selected keywords, with links to their corresponding Instructable page.

You can learn more about the Inspiratorium and how to use it in Project Report D4.5 Section 3.2 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2019/01/D4.5-Us-</u> <u>er-manual-for-programming-of-computer-supported-artefacts-with-integrated-debug-</u> <u>ger-and-3d-modelling-simulation-and-printing-%E2%80%93-the-unified-user-interface-ap-</u> <u>proach.pdf</u>

Planning tools

The planning tools in the UUI serve two different purposes:

- 1. Allowing the students to analyse the problem and create sketches that show their design for the artefact that they want to create
- 2. Allowing the students to break down the project into smaller pieces and assign each to a group member. This also allows them to track the progress of their work.

The eCraft Plan tool is developed to serve the first goal as it allows the learners to draw sketches related to their project work. eCraft TODO and Trello are tools that serve the second goal and allow the learners to plan the course of the project. These are arranged as tiles in the "Plan" area of the UUI interface.

ECRAFT PLAN



eCraft Plan is a sketching tool that provides tools for drawing different shapes and items. These include freehand drawing tools, erasor, text tool, shapes tool and image import functionality.



You can learn more about the eCraft Plan tool and how to use it in Project Report D4.5 Section 4.1 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2019/01/D4.5-Us-</u> <u>er-manual-for-programming-of-computer-supported-artefacts-with-integrated-debug-</u> <u>ger-and-3d-modelling-simulation-and-printing-%E2%80%93-the-unified-user-interface-ap-</u> <u>proach.pdf</u>

ECRAFT TODO



eCraft TODO is a simple task organization tool that allows the learners to define different tasks within a project, set due dates for them and assign it to a specific member of the team. It can also categorize the tasks into pending, in progress and completed status.

	in regress	Completed	Add a task
3D Print the shell Due 31/07/2018 @Alex:			Title
			Description
se lile sheli_z			Due Date (dd/mm/yyyy)
			Assigned to who
			Autitask

You can learn more about the eCraft Plan tool and how to use it in Project Report D4.5 Section 4.2 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2019/01/D4.5-Us-</u> <u>er-manual-for-programming-of-computer-supported-artefacts-with-integrated-debug-</u> <u>ger-and-3d-modelling-simulation-and-printing-%E2%80%93-the-unified-user-interface-ap-</u> <u>proach.pdf</u>

TRELLO



Trello is a well-known task management tool that provides similar functionality as eCraft TODO. It categorizes the task groups into different "boards". Each board contains several groups (To do, Doing and Done) and allows for adding new groups as well.



Trello also supports creating different teams and sharing amongst team members. Using Trello requires user login, which means before using this tool you will need to create an account there and login to that account before using it through UUI.

Trello help documents can be found here: <u>https://help.trello.com/</u>

Creating tools

At the create stage, the different parts that comprise the artefact are designed, assembled and brought together. This stage may include hand-crafting, wiring the Arduino board and making the necessary sensor connections and Computer-Aided Designs (CADs). When referring to hand-crafting, we are referring to a creative process that involves a variety of work for creating useful and decorative objects which are made by hand or by using simple tools. Hand-crafting has an important place in the eCraft2Learn projects.

The create tools in the UUI are included to support the students in designing and creating their 3D models and electronic circuits. These will complement and enhance the hand crafted elements of the group projects. The create tools include Tinkercad and Beetleblocks for 3D modelling, Tinkercad circuits for electronics simulation an integrated 3D modelling and slicing tool and Cura slicing software. These are arranged as tiles in the "Create" area of the UUI interface.

TINKERCAD



Tinkercad is a simple 3D CAD program to use and is based around building up a design by using 3D shapes from a library and combining them (by adding or subtracting shapes) to build your model.

3D models that are created in Tinkercad can be downloaded as STL files, which can be sliced and prepared for 3D printing using one of the eCraft2Learn slicing tools.



You can learn more about how Tinkercad operates in Project Report D4.5 Section 5.1 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2019/01/D4.5-User-manual-for-pro-gramming-of-computer-supported-artefacts-with-integrated-debugger-and-3d-model-ling-simulation-and-printing-%E2%80%93-the-unified-user-interface-approach.pdf</u>

You can also access a practical tutorial and activity to help you to learn Tinkercad in Project Report D3.4 Section 3.7.4 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2018/05/</u> <u>eCraft2Learn_D3.4_M16_Manual-of-Craft-and-Project-based-Learning-STEAM-Training-for-</u> <u>Teachers.pdf</u>

BEETLEBLOCKS



Beetle Blocks is a graphical blocks-based programming environment for 3D design and fabrication. It allows students to program a design in 3D using Snap! programming blocks.

3D models that are created ivn Tinkercad can be downloaded as STL files, which can be sliced and prepared for 3D printing using one of the eCraft2Learn slicing tools.



You can learn more about how Tinkercad operates in Project Report D4.5 Section 5.2 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2019/01/D4.5-User-manual-for-pro-</u> <u>gramming-of-computer-supported-artefacts-with-integrated-debugger-and-3d-model-</u> <u>ling-simulation-and-printing-%E2%80%93-the-unified-user-interface-approach.pdf</u>

You can also access a practical tutorial and activity to help you to learn Tinkercad in Project Report D3.4 Section 3.7.5 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2018/05/</u> <u>eCraft2Learn_D3.4_M16_Manual-of-Craft-and-Project-based-Learning-STEAM-Training-for-</u> <u>Teachers.pdf</u>

TINKERCAD CIRCUITS



In addition to designing 3D models, Tinkercad can also be used for simulating different electronic elements and microcontrollers (Arduino Uno R3 and ATtiny).

This is a useful tool tool for designing circuits prior to physically making them as the circuit design can be simulated and easily edited until a working circuit design has been developed.



You can learn more about how Tinkercad operates in Project Report D4.5 Section 6.1 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2019/01/D4.5-User-manual-for-pro-gramming-of-computer-supported-artefacts-with-integrated-debugger-and-3d-model-ling-simulation-and-printing-%E2%80%93-the-unified-user-interface-approach.pdf</u>

3D MODELLING AND SLICING TOOL



Within the UUI, it is possible to create printable web-based 3D models through eCraft2Learn's 3D modelling and slicing app. The tool allows users to add basic 3D shapes and modify them. The possible modifications include modifying the shape, the size and the rotation of the shape. The tool allows users to generate STL and GCODE files, which are supported by the 3D printers.

The slicing of a GCODE files can be done in the browser or on the server, if the host computer is not powerful enough to slice the model. Later, the generated GCODE file can be imported to the 3D printer through a USB stick or an SD card.



CURA SLICING SOFTWARE



The Ultimaker slicing software Cura is desktop software so will need to be downloaded and installed onto the 3D printing station PC.



Clicking on the Cura tile will open up an information window, which contains a link to access the Cura download along with links to the Cura Quick Start Guide and the Cura Video Tutorials.

Cura

Cura is a program that reads in 3D models and prepares them for printing. If it is not installed on your computer it can be downloaded for free. While there are Windows, Mac, and Linux versions there are problems running it on Raspberry Pis. A Raspberry Pi can be configured to access Cura running on another computer in the local area network. Contact your local tech support if you have any questions or problems.

Below is a collection of short videos explaining how to use Cura. Full documentation is available here.

- 1. Introduction to Cura (2 minutes 32 seconds)
- 2. View Manipulation (53 seconds)
- 3. Print Preparation (5 minutes 52 seconds)
- 4. Multiple Models (1 minute 34 seconds)
- 5. Layers View (3 minutes 38 seconds)
- 6. Infill (2 minutes 28 seconds)
- 7. Layer Heights (3 minutes 24 seconds)
- 8. Build Plate Adhesion (5 minutes 22 seconds)
- 9. Custom Options (1 minute 51 seconds)
- 10. Support 1 (3 minutes 5 seconds)
- 11. Support 2 (4 minutes 47 seconds)
- 12. Support 3 (3 minutes 11 seconds)
- 13. 2D to 3D (3 minutes 11 seconds)

You can learn more about how to slice a 3D model in Project Report D4.5 Section 8.3 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2019/01/D4.5-User-manual-for-pro-</u> gramming-of-computer-supported-artefacts-with-integrated-debugger-and-3d-modelling-simulation-and-printing-%E2%80%93-the-unified-user-interface-approach.pdf

Programming tools

eCraft2Learn projects involve designing and making artefacts that do something. They might turn on and off lights, motors, sounds, and more. The behaviour of the artefacts may be influenced by sensor readings that measure sound, light, heat, pressure, and much more. The program stage is where the students design, implement, and test programs that run their DIY electronics.

The eCraft2LEarn UUI provides an interface to many different programming tools, these are Snap!, Snap4Arduino, Ardublocks, Scratch4RaspberryPi, Scratch4Arduino, MIT App Inventor, Pocket Code, NetsBlox, and Arduino IDE. These are arranged as tiles in the "Program" area of the UUI interface.

Of these, the main programming tools recommended by eCraft2Learn are Snap! and Snap4Arduino.

SNAP!



Snap! is a block-based programming language. Different sets of blocks are arranged in different groups in the panel to the left of the editor. You can create your program by dragging and dropping the blocks to the centre of the editor.



You can learn more about the Snap! blocks in the Snap! User manual at: http://snap.berkeley.edu/SnapManual.pdf

AI PROGRAMMING IN SNAP!

eCraft2Learn have added new blocks to Snap! that provide you with cloud-based A.I. services. This allows students to build artefacts that rely upon AI cloud services and machine learning, enabling them to build artefacts that respond to voice commands, generate speech, recognise images, and more. A complete user guide for AI is available in the Education Resources in the UUI.

You can learn more about how to obtain and set the API keys for AI in Project Report D4.5 Section 7.1.4 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2019/01/D4.5-Us-er-manual-for-programming-of-computer-supported-artefacts-with-integrated-debug-ger-and-3d-modelling-simulation-and-printing-%E2%80%93-the-unified-user-interface-ap-proach.pdf</u>

You can also access further information and examples for using AI services in Project Report D3.4 Section 3.5.2 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2018/05/eCraft-2Learn_D3.4_M16_Manual-of-Craft-and-Project-based-Learning-STEAM-Training-for-Teachers.pdf</u>

SNAP4ARDUINO



Snap4Arduino is a variant of Snap! extended to provide the ability to control an Arduino interactively and to generate a script that is compiled and run independently on the Arduino.

Similarly to Snap!, in Snap4Arduino different sets of blocks are arranged in a library of different groups, collected in the top left panel of the editor and represented by clickable buttons of different colours. Once a group is chosen, you can add commands to your program by dragging and dropping the blocks from the left bottom panel to the centre of the editor.



You can learn more about how to program using Snap4Arduino, including how to connect and communicate with an Arduino board in Project Report D4.5 Section 7.2 at: <u>https://</u> <u>project.ecraft2learn.eu/wp-content/uploads/2019/01/D4.5-User-manual-for-program-</u> <u>ming-of-computer-supported-artefacts-with-integrated-debugger-and-3d-modelling-simula-</u> <u>tion-and-printing-%E2%80%93-the-unified-user-interface-approach.pdf</u>

You can also access further information to help you to learn to use and connect Snap4Arduino in Project Report D3.4 Section 3.5 at: <u>https://project.ecraft2learn.eu/wp-content/</u><u>uploads/2018/05/eCraft2Learn_D3.4_M16_Manual-of-Craft-and-Project-based-Learning-</u><u>STEAM-Training-for-Teachers.pdf</u>

Sharing tools

The UUI provides two tools to assist students in ideation for their projects, the bespoke eCraft2Learn Sharing Tool and Thingiverse. These are arranged as tiles in the "Share" area of the UUI interface.

ECRAFT2LEARN SHARING TOOL



The Share my work tool allows the users/learners to share the work that they have created with the various tools available through the UUI. The sharing feature lets them share their work by either uploading it manually or by sharing a file that is already associated with a project in the UUI.

Done at antique			tearm	_	
129	1 Project	Stetus	Ours	Action	
🛆 🖬 30 model of a car	Car projetit	Persing authorization	3218-04-28		
Plan for 30 test	Car project	Authorization rejected	2018-06-25	1 -	
Sketch of Cal	Car project	Authorized	2018-06-26	Es.	
Text of 30 model for car	Car project	Pending authorization to strip sharing	2018-06-25	i.e.	
Tudo list for project	Car project	C Pending authorization	2018-06-26	14	al and
NS Note			90	ang to Sof Services	
Th	e table vie	ew of the students sh	ared files		

The sharing feature serves several goals:

- Providing the learner the opportunity to share their work with other learners.
- Providing the learner and overview of what other learners have achieved and shared.
- Allowing the learners to get an overview of their shared items and manage them.

You can learn more about the sharing tool and how to use it in Project Report D4.5 Section 9 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2019/01/D4.5-Us-</u> <u>er-manual-for-programming-of-computer-supported-artefacts-with-integrated-debug-</u> <u>ger-and-3d-modelling-simulation-and-printing-%E2%80%93-the-unified-user-interface-ap-</u> <u>proach.pdf</u>

THINGIVERSE



Thingiverse is an online platform dedicated to the sharing of 3D printing files. With over a million different shared project, this platform offers a great amount of inspiration for students, as well as an easy way to share their creation. The platform encourages people to publish under the Creative Common licence in order to allow everyone to take a project and modify it, making this a perfect platform for learning and sharing.



You can learn how to use Thingiverse to share 3D models in Project Report D3.4 Section 3.6 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2018/05/eCraft2Learn_D3.4_M16_</u> <u>Manual-of-Craft-and-Project-based-Learning-STEAM-Training-for-Teachers.pdf</u>

Additional project tools

PROJECTS



The project tile in the UUI provides the learners with a link to create a new project alongside a list of previous projects for the group. Users can simple click on "Create New Project" and provide a project name in a new dialog or click on one of the previous projects to activate it.

You can learn more about the Projects tool and how to use it in Project Report D4.4 Section 2.9.1 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2019/02/D4.4_The-uni-fied-user-interface-A-software-solution-for-3D-design-programming-and-making-computer-supported-artefacts.pdf</u>

ACHIEVEMENTS



Self-assessment and self-reflection may play an important part in the learning process. In order to provide the learners and teachers with tools to support this process, an approach to foster personalised learning through the use of badges during the eCraft2Learn activities is implemented. The Achievements tool provides a mechanism for students self-evaluation and following teacher review awards badges to recognise the student's achievements in different areas.



You can learn more about the Achievements tool and how to use it in Project Report D4.4 Section 2.8 at: <u>https://project.ecraft2learn.eu/wp-content/up-</u> <u>loads/2019/02/D4.4_The-unified-user-interface-A-soft-</u> <u>ware-solution-for-3D-design-programming-and-mak-</u> <u>ing-computer-supported-artefacts.pdf</u>

COMMENTING

The commenting tool is included as an integral part of the Sharing tool and is designed for enabling students to provide some feedback on peers' work as well as their own - with this module student can give feedback and do peer review. This is an important aspect of sharing as identified during the piloting activities. The module was designed in collaboration with teachers. For example, the five-point rating scale feedback widget to be used as comments was suggested by teachers:

This looks smashing, awesome job
Cooking really good, excellent job

The Commenting module can be found under the action menu in the Sharing tool.

You can learn more about the Commenting tool and how to use it in Project Report D4.4 Section 2.11 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2019/02/D4.4_</u> <u>The-unified-user-interface-A-software-solution-for-3D-design-programming-and-mak-</u> <u>ing-computer-supported-artefacts.pdf</u>

Education Resources

The UUI has been designed and developed to assist the teacher in achieving the role of a coach by putting forward open educational resources (OERs) to facilitate students' independent work. They work as a strong scaffold for students to explore the apps available in the UUI in each phase of their project. Hence, the OERs work hand in hand with the other tools offered by the UUI to give the most suitable and appropriate learning resources for students to develop their projects with autonomy.

ACCESSING THE EDUCATION RESOURCES

In order to access the OERs from the UUI, the user must click on the Educational Resources tab, which is located on the upper right side of the homepage of the UUI.



When this tab is opened, a list of the resources appear on the right side of the UUI homepage, grouped by the type of content. The resources are grouped into: Electronic Devices, 3D Printing, A.I. (Artificial Intelligence), Communities, Troubleshooting, Worksheets and Teacher and Student Uploads. There is also a search available to help you to find specific resources. When one main group is selected, the menu is expanded to show individual resources in that group. Only one group of resources is visible at a time.





When a resource is selected, it opens in a window, where the user can view the resource, download a copy, minimise and click on links within the resource which takes them to further information available on the internet.



You can learn more about the resources and how to interact with them in Project Report D3.4 Section 2.2 at: <u>https://project.ecraft2learn.eu/wp-content/uploads/2018/05/eCraft-2Learn_D3.4_M16_Manual-of-Craft-and-Project-based-Learning-STEAM-Training-for-Teach-ers.pdf</u>

You can also view a video demonstration of the education resources functionality at: <u>https://youtu.be/zu630uZLTuU</u>



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