

# UCL Digital Outreach: A new approach to Outreach and Widening Participation

**Transforming Outreach and Widening Participation via  
Virtual Reality and Intelligent AI Digital Twins**

**Accessible via PC or Meta Quest 2/3**

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# UCL School of Pharmacy Digital Outreach

UCL School of Pharmacy Digital Outreach is a unique online digital space designed to make Outreach and Widening Participation for future scientists simpler and easier in an increasingly digital world.

As a digital twin of a real-life facilities, Digital Outreach enables school pupils from anywhere in the world to visit UCL School of Pharmacy and interact with Staff and students using digitised facilities and headsets, the same way they would in real life despite being hundreds or thousands of miles apart. Simply putting on a set of virtual reality goggles allows them to meet UCL Scientists and their digital avatars and find out more about studying at UCL, to see experiments in real time and to receive training on high end equipment despite not having the physical version in front of them.



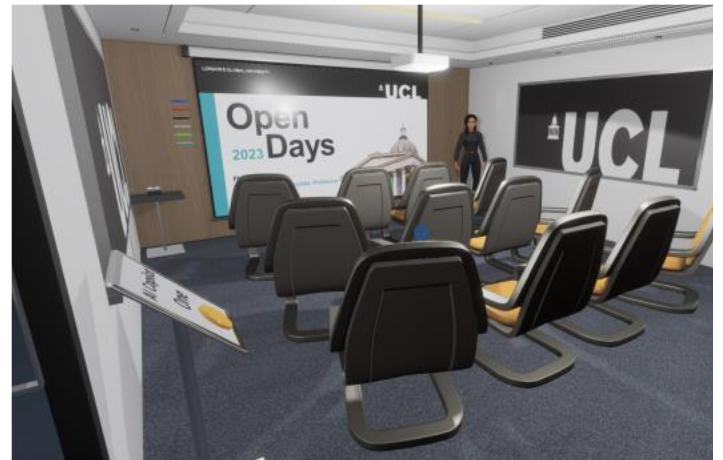
**Figure 1**

Whilst touring the Digital Outreach facilities, pupils can also meet AI avatars of postgraduate scientists and discuss the role research plays in the development on new medicines.

# UCL Digital Outreach: virtual environments

UCL Digital Outreach is arranged across five different environments/rooms to illustrate both the teaching and research that goes on at UCL.

## 1) Entry Room:



**Figure 2**

In the entrance room, users can meet two AI avatar staff members and find out about UCL School of Pharmacy and how students are taught at UCL School of Pharmacy.

2) Undergraduate laboratories:



**Figure 3**

Within the undergraduate environment, users can see a digital twin representation of the undergraduate laboratories at UCL School of Pharmacy, covering the two main areas of undergraduate practical's in Pharmaceutics and Pharmaceutical and Biological Chemistry.



### 3) Greenlight Pharmacy:



**Figure 4**

Within the Greenlight Pharmacy environment, users can visit the award winning Greenlight Pharmacy and speak to avatars of Pharmacists to find out more about the real life work of Pharmacists as well as explore the training space that is available as part of the undergraduate degree program.

#### 4) UCL Research laboratories:



**Figure 5**

Within the 4th environment, users can visit and speak to AI avatars of the PhD students in the Hilton laboratory, discussing their research and career pathways. As part of this zone, users can visit the cutting-edge facilities of the Molecular Pharmacy wing at UCL and see where final year project students work at UCL and how research is carried out. Users are also able to interact with research equipment in ways that would simply be impossible to do in real life.

5) UCL School of Pharmacy Digital Centre:



Figure 6



# Software access

Both the UCL Digital Outreach MetaQuest 2/3 Virtual Reality and PC software versions are hosted on Sidequest allowing for updates to the software and easy user access. Clicking on the red button enables users to download either the PC version of the software or sideload the Android/ Quest2/3 version (as long as the headset is set for developer mode). Users will need to install Sidequest on their PCs prior to downloading the software.



Figure 7

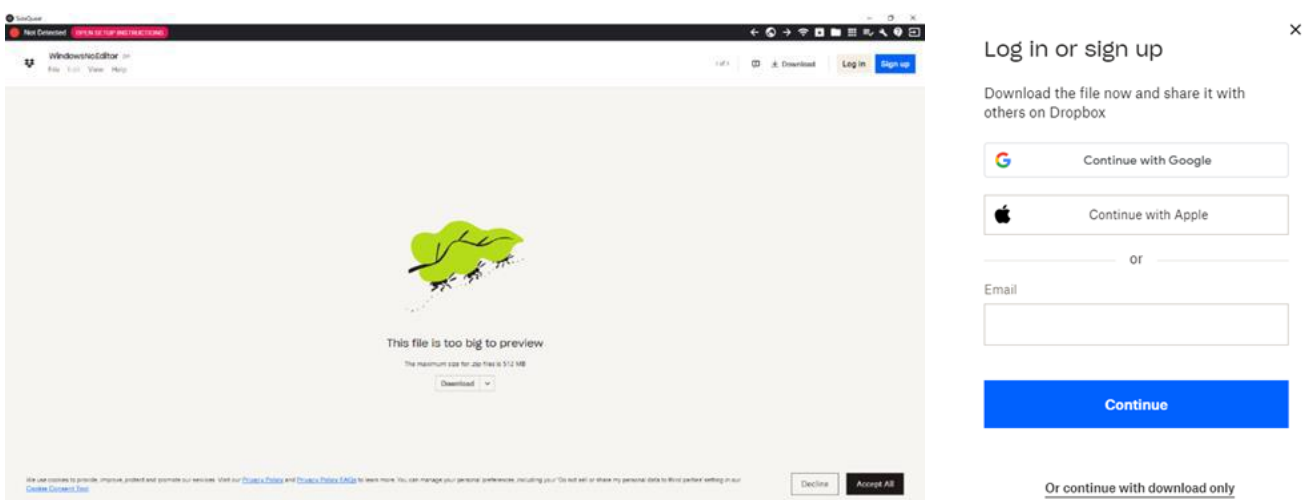
# Software access: PC

Users need to navigate to the PCVR version that is available on the Sidequest Software and select **DOWNLOAD APP(PCVR)**.



**Figure 8**

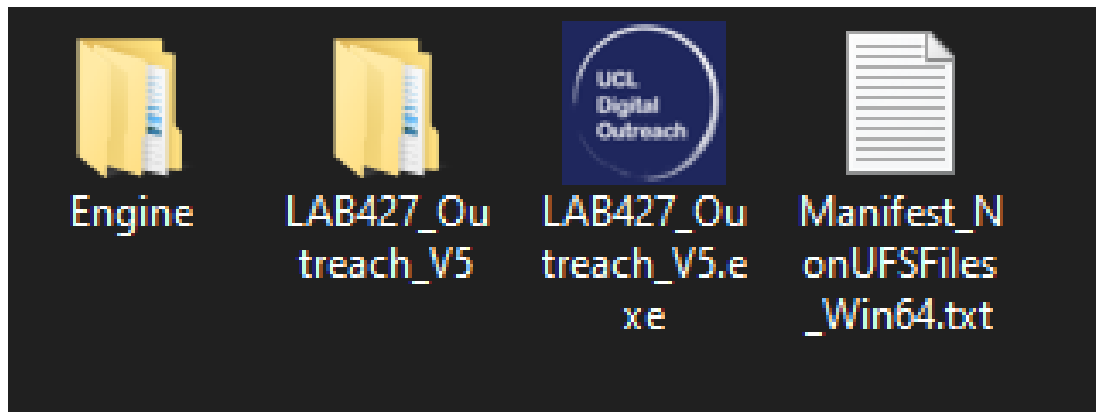
This will prompt the download of the PC version of the software (approx. 4 GB). At the screen, users should click on the **DOWNLOAD** button.



**Figure 9**

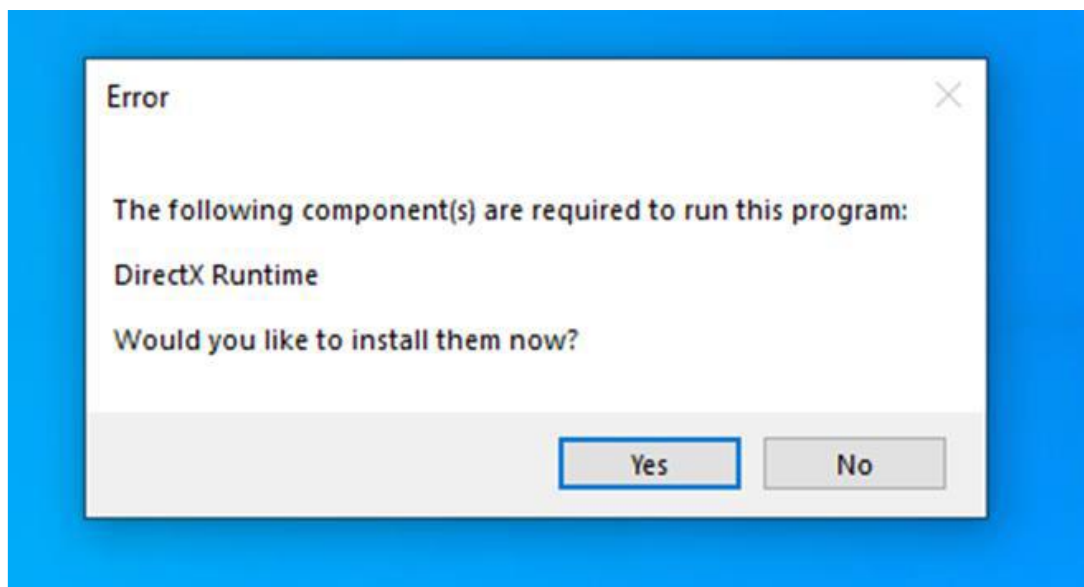
Users that have Dropbox can sign in or simply follow to the **Or continue with download only** link as shown above.

Once downloaded, the PC version needs to be unzipped and then the application can be accessed by double clicking on the LAB427\_Outreach\_V1 icon.



**Figure 10**

On running the software the first time, it may prompt you to install some pre-requisites – DirectX Runtime – these are needed for the VR software and so you need to follow the on-screen prompts (Figure 10).



**Figure 11**

# Software: Logging in via PC

Once the software has loaded, the user is directed to the loading screen. Registered users need to enter their e-mail and password either via the keyboard on their machines or use the mouse with the keyboard on the screen. If this is the first time a user has accessed the software, they will need to register first.

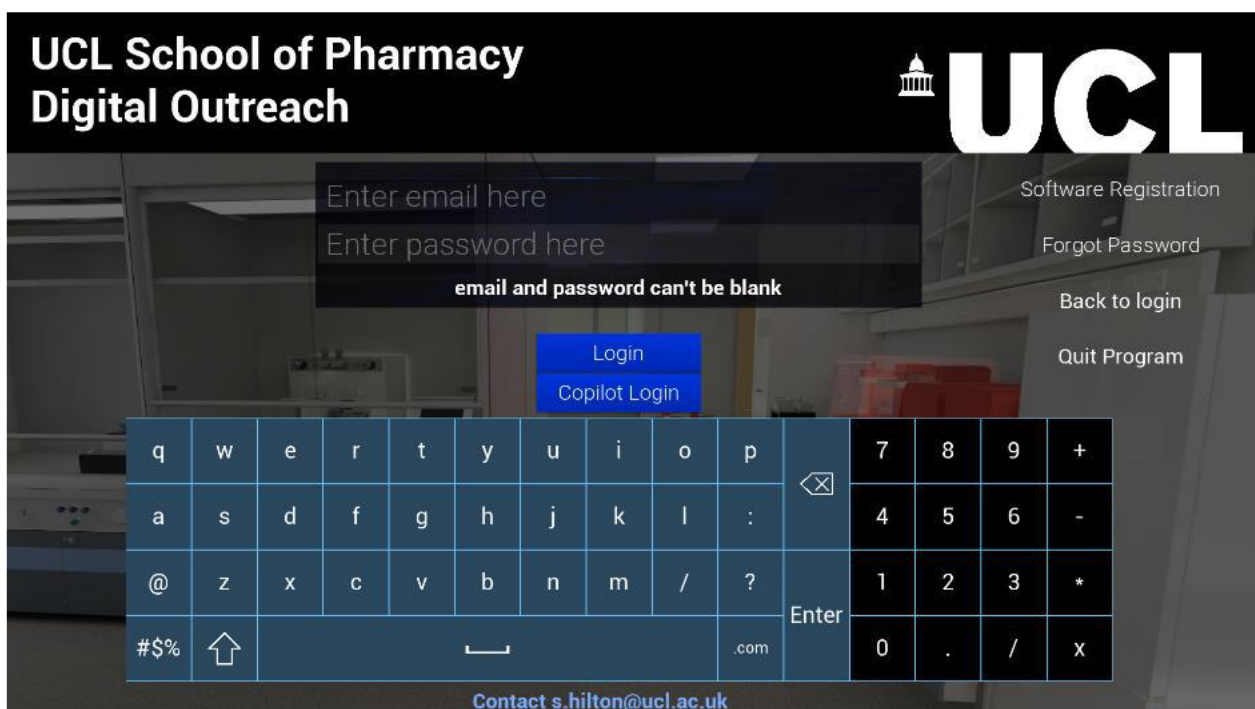


Figure 12

# Software: Email registration

To register an email address on the server to access the software, the user needs to click on the Software Registration text on the login Screen. Once on the Software registration screen, enter an email, password, and username (no spaces) by clicking on the keys on the keyboard on the screen with the mouse or from the users keyboard. Click on each box for entry with the mouse and then click on the keyboard letters or PC keyboard to add the data. Once each line is finished, simply click on the next line to enter the data for that line.

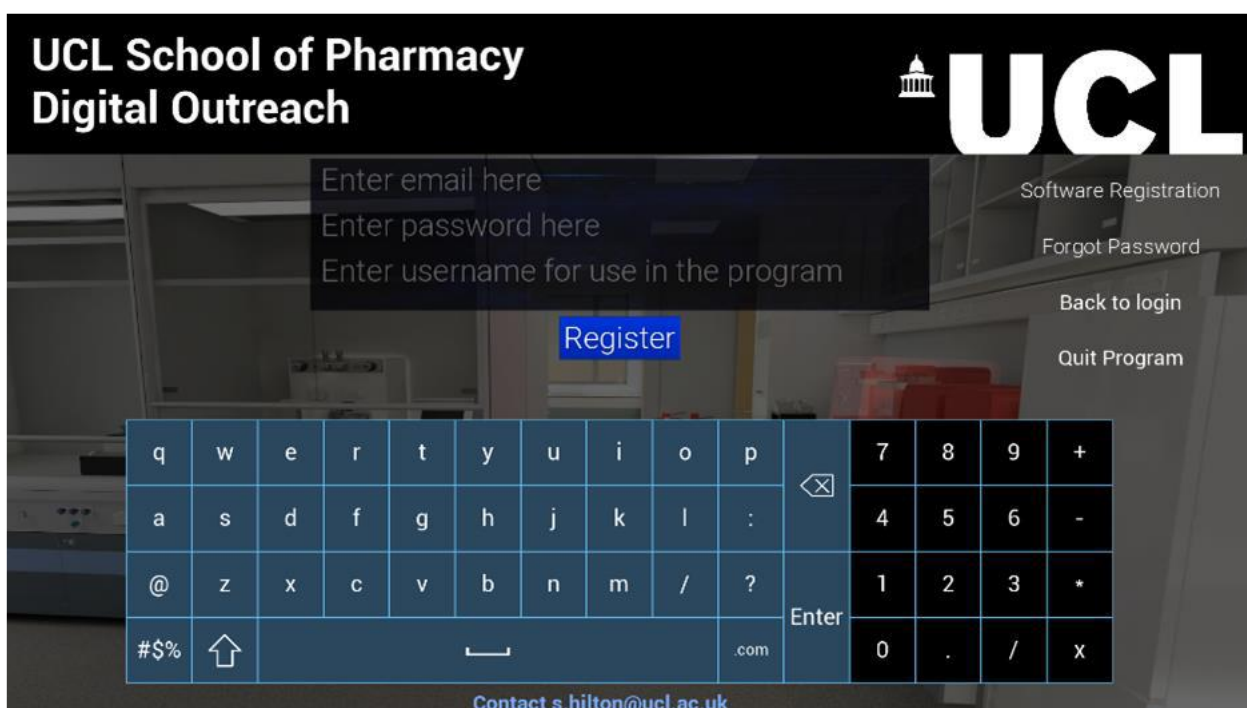
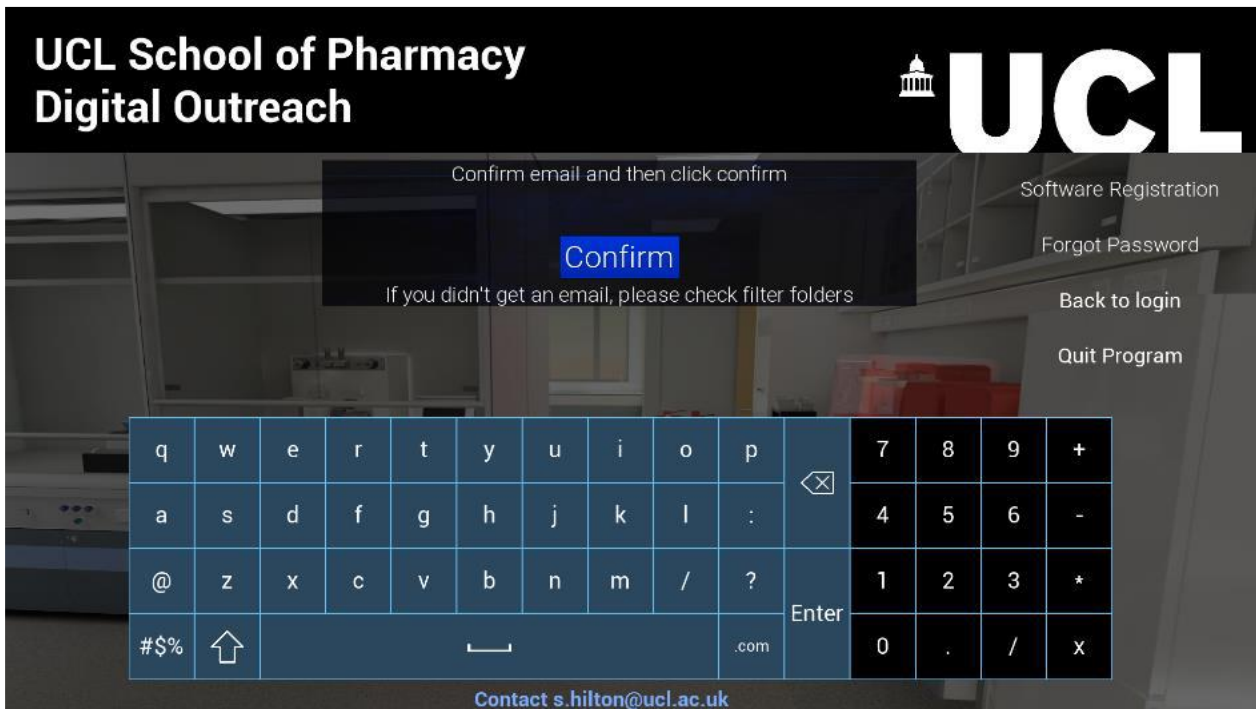


Figure 13

Once you have entered your user data, click on the **REGISTER** button and the screen will then change to the confirmation window and a confirmation email will be sent to the address you sent (may go to junk mail, so please check). Please click on the registration link to confirm your email address and then click on the confirm button to ensure your email is verified in the software.



**NOTE: You cannot leave this window or close the software until you have confirmed your email. Once you have confirmed your email in your email software, you can then click on the CONFIRM button and go back to the LOGIN SCREEN.**



**Figure 14**

# User Controls: Accessing the server for multi-user access

Once the user has passed the loading screen, they enter in front of the multi-user connection. Simply clicking on start followed by host (if hosting) or the server (top left of the screen) will enable easy access to meetings with other users.

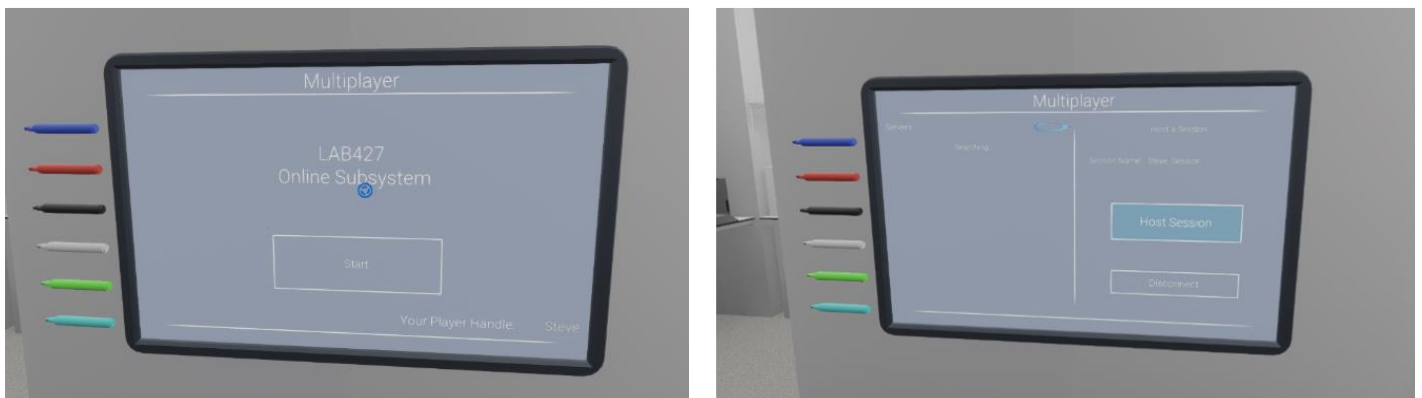


Figure 15

## User Controls: navigation

Once loaded, the user can navigate around the environments by using the **WSAD** keys on the keyboard and moving the mouse for the viewpoint. To open and close doors, simply click on the handle when it glows, allowing easy movement into the next rooms.



Figure 16

## User controls: object interaction

To interact with objects on the PC, simply click and hold with the mouse for pickup and release to let go. In the LAB427 centre, some objects have gravity enabled, so will behave in the same way as in real life and drop to the floor.

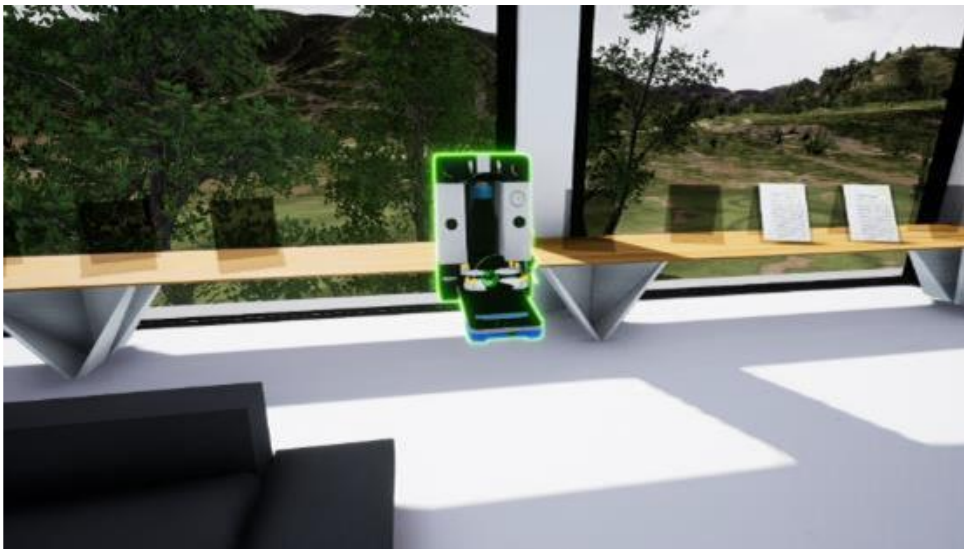
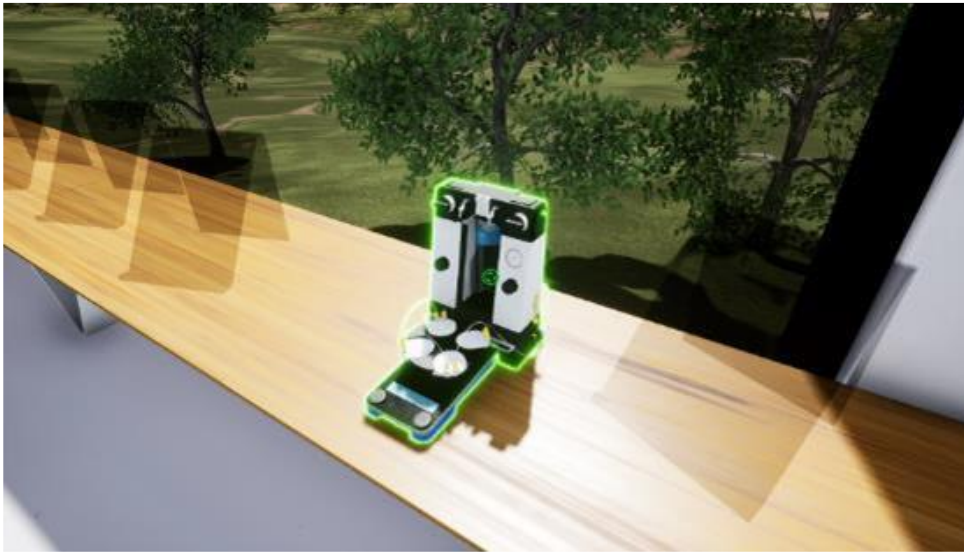


Figure 17

# User controls: PC software

The PC version of the software is controlled by the keyboard and mouse as shown below. Users can navigate around the virtual building via the W,S,A,D keys on the keyboard and the mouse controls the users viewpoint and allows for interaction with objects.

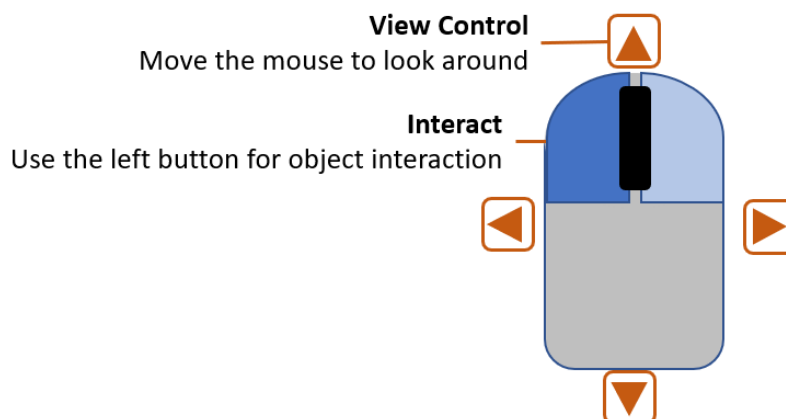
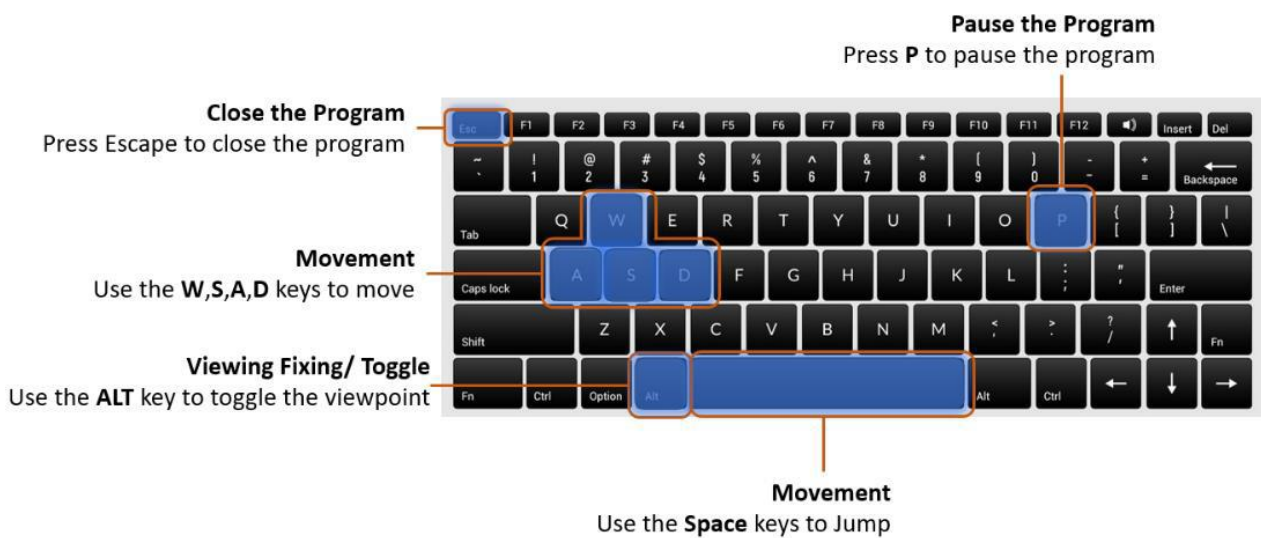


Figure 18



# Launching the LAB427\_V1 training app on the Quest

Once you have powered ON the Oculus Quest 2/3 headset and put on the device, you should see the Quest Home room (Fig. 19, A). To open the LAB427\_Outreach application:

1. Raise your right hand holding the controller and Click on Oculus circle button shown (B)
2. This will bring up the main menu bar (C).
3. Using your first finger (Fig 19, D) select the button with 9 dots (Fig. 19, C) on the main menu.
4. Once the Apps screen is opened, click on the menu in the upper right corner (Fig. 19, E).
5. Scroll to the end of the list and select Unknown Sources (Fig. 19, F).
6. Click on LAB427\_Outreach to open the app (Fig 19, G).

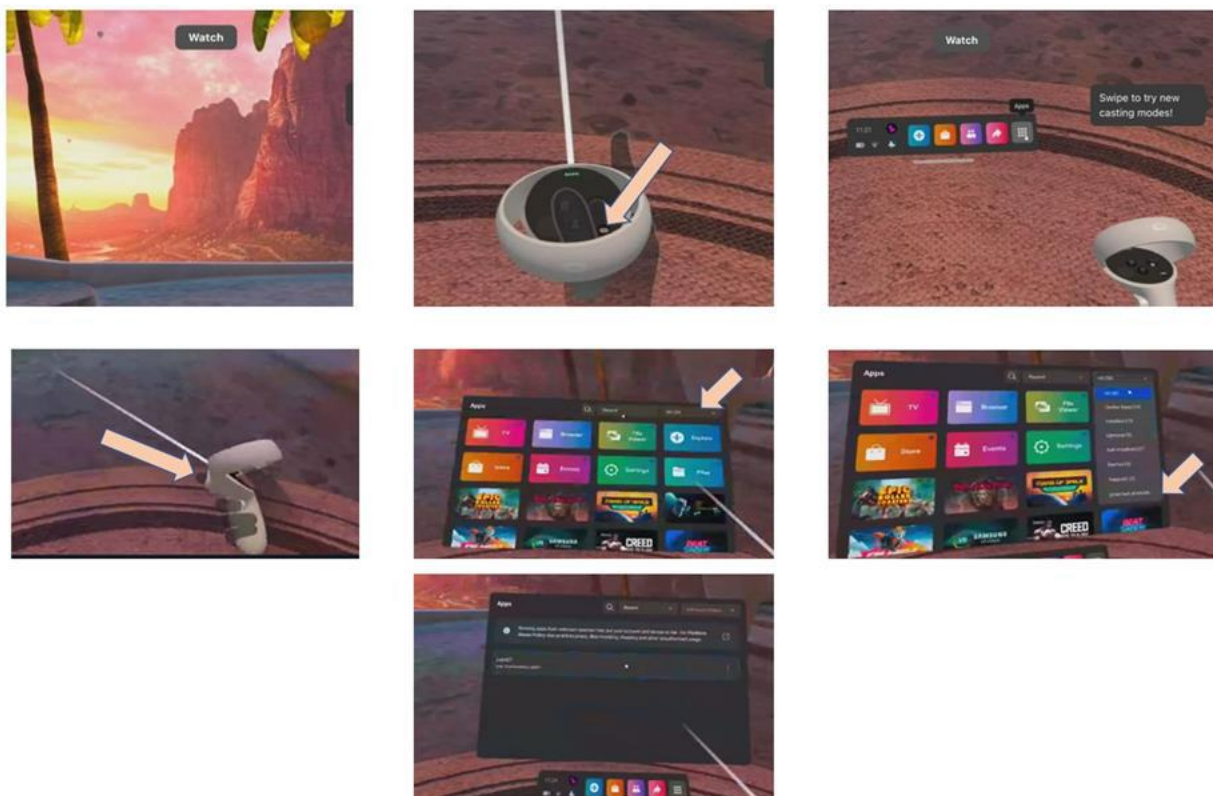


Figure 19

## Navigation within the app

You can use the Digital Outreach VR app in either a standing or seated position. To navigate around the room, you can physically walk and turn around, but it is preferable and much easier to use the teleportation feature, especially if you prefer to sit down. To teleport around the rooms, simply press the left-hand thumb-stick down, whereupon a blue circle will appear on the floor. Point where you want to go, “Click” and hold the Left-hand thumb-stick button forward then release it.

You can keep holding the thumb-stick button and point in different directions until you find a desirable spot you want to go to. Please note that:

- **Teal-coloured** teleportation indicates a valid teleportation location.
- **Red-coloured** teleportation indicates an invalid teleportation location.

Alternatively, you have free movement by pressing the joystick on the Right-hand controller.



Figure 20

# Object interaction within the app

To interact with objects within the software:

Simply point towards the object with your right hand, which will then glow blue if its interactable and click the select button to activate the object/ initiate movement of the object – doors etc (Fig. 20).

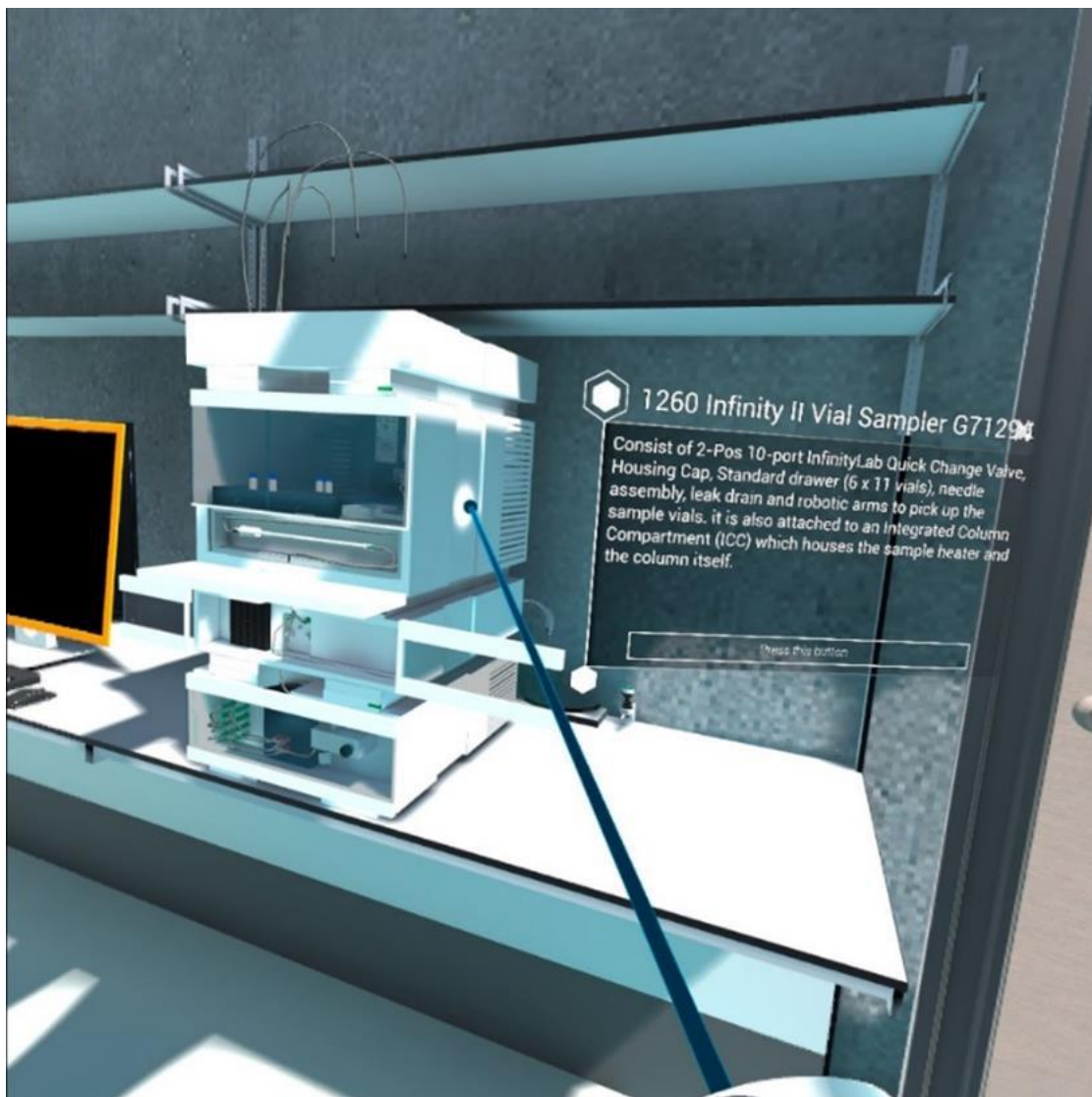


Figure 21

## Object interaction within the app – gripping/selecting

To pick up objects, simply squeeze and hold the Grip button and rotate your hand to turn it around and move it further or closer to you using the Right-hand joystick (Fig. 22).

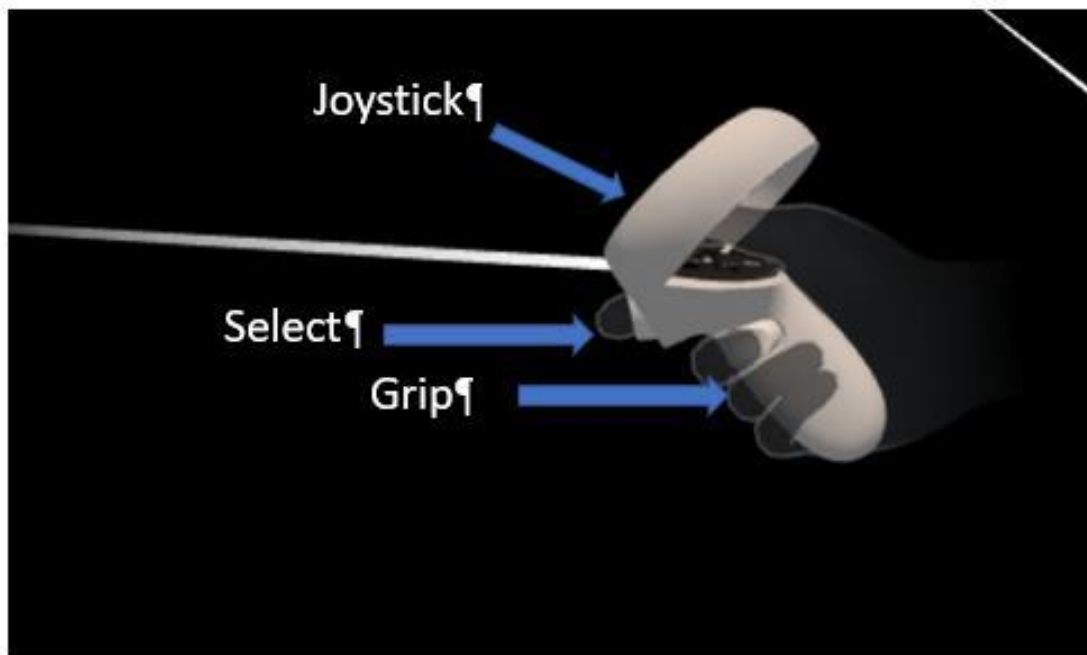


Figure 22

# Moving between digital environments

To move between digital environments. Users need to click on the panels on the walls – this opens up a wider panel allowing them to move to the different environments. Simply click on the START LEVEL to move to that room – this also transports others with you at the same time, so that all users are in the same room, assuming they are on multi-user mode.

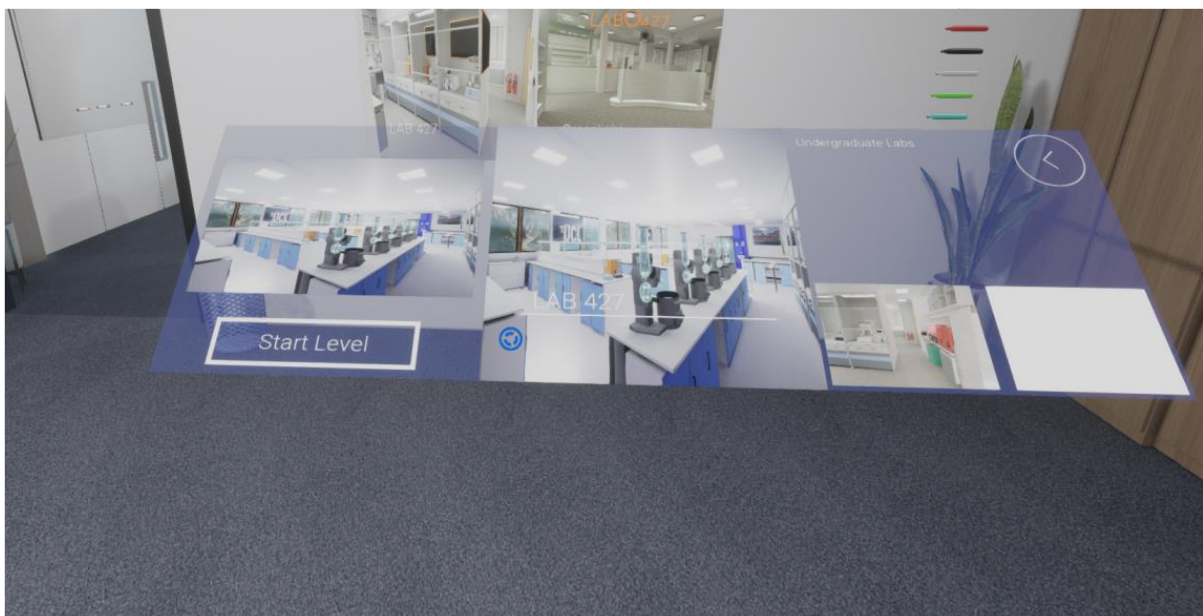
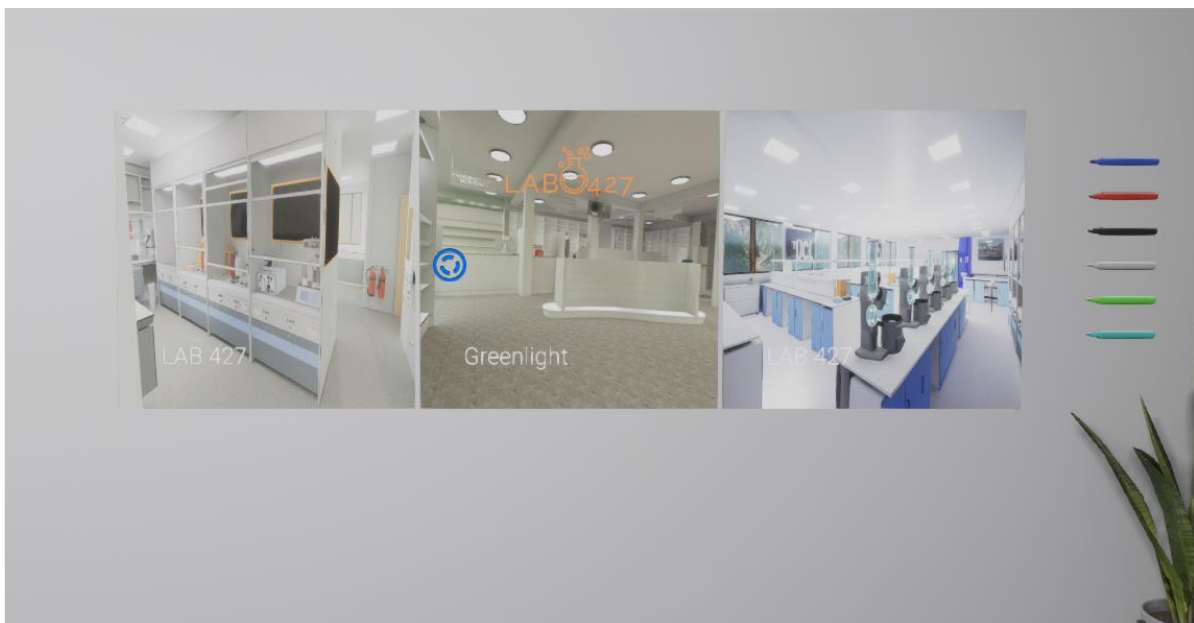


Figure 23



# Speaking to AI-based intelligent avatars in the app

To select and switch on an AI avatar, simply click on the orange buttons shown.



Figure 24

Once the AI avatar has loaded, look at the Avatar and press and hold **B** on the PC keyboard or **X** on the Quest 2/3 controller to talk to them. Once you have finished talking, simply let go and the Avatar will respond to your question.



Figure 25



Dr Stephen Hilton

## **UCL Digital Outreach: A new approach to Outreach and Widening Participation**

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