



Erasmus+

**D2.4**





**Final product creation**

**2020-1-CY01-KA226-VET-082750  
Remote Class System**



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<b>Abstract</b>	This document describes the Final product, after the feedback received from the pilots of the 2 <sup>nd</sup> prototype

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# Introduction

Classy is about a digital classroom in which the user can attend classes, have interactional meetings, seminars, play games or even get virtual tours in a 3D environment.

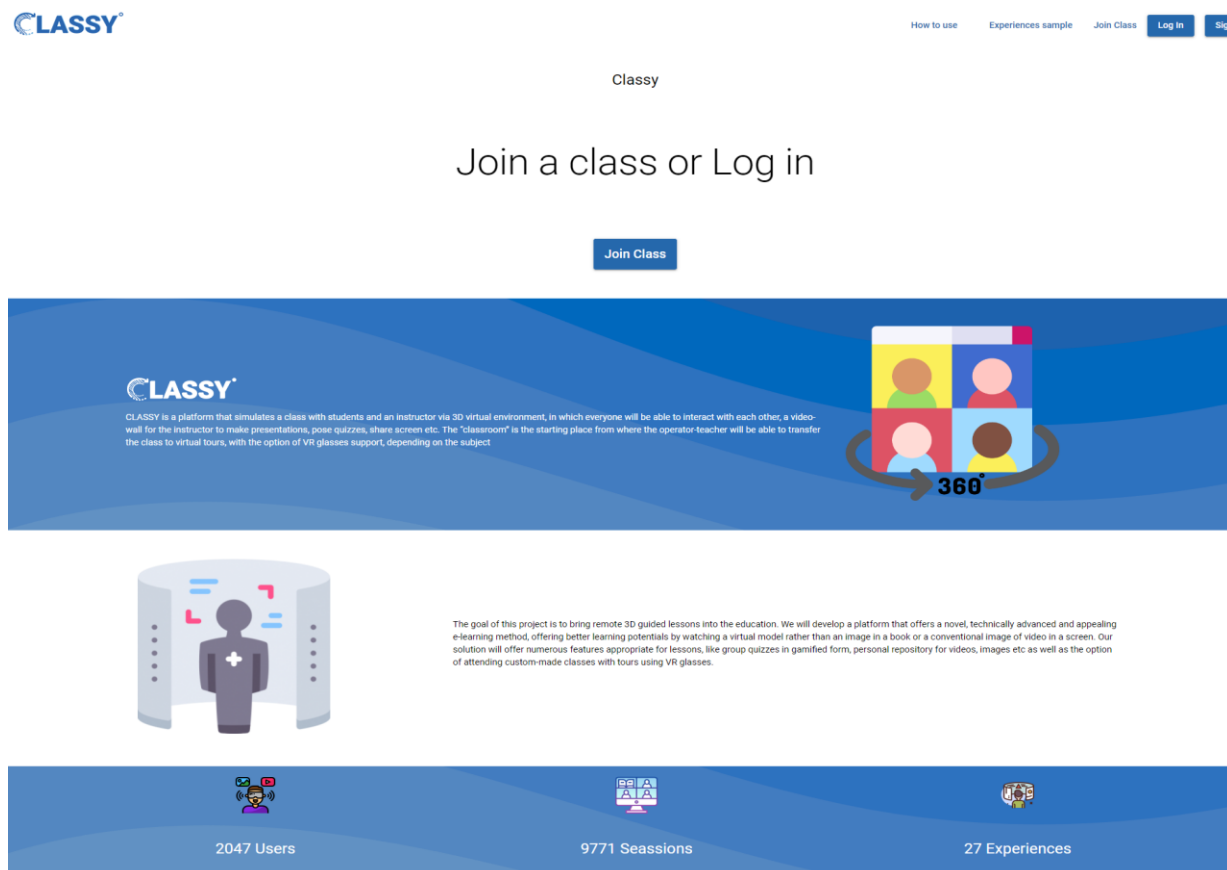
In this document we will present the creation of the final product. We will illustrate the final form of Classy with all its functions and capabilities.

# Final product

Final product is the complete application that delivers all the functionalities represented in the prototypes based on the contract agreement.

# Home page

This is the Classy homepage from which you can join a class or log in if you are a teacher. The **experience sample** and **how to use** buttons are there as shown in the picture and the user can navigate there to take a glimpse of the Classy.



- **Experience sample**

On the **experience sample** page the user can experience a demo of a Classy session, there is a demo with the environment of a Greek temple anyone can start and see in order to get an idea of how a class will be within Classy.



## Experiences



- **How to use**

On the **How to use** page there are guides on how Classy works, for both the teacher and the student.

An example of how the page looks is shown in the picture.



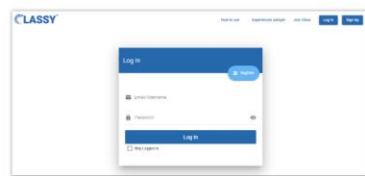
Welcome to Classy!!!

Guide for teachers

If you are a student a guide for you is further down.

[Scroll to students guide](#)

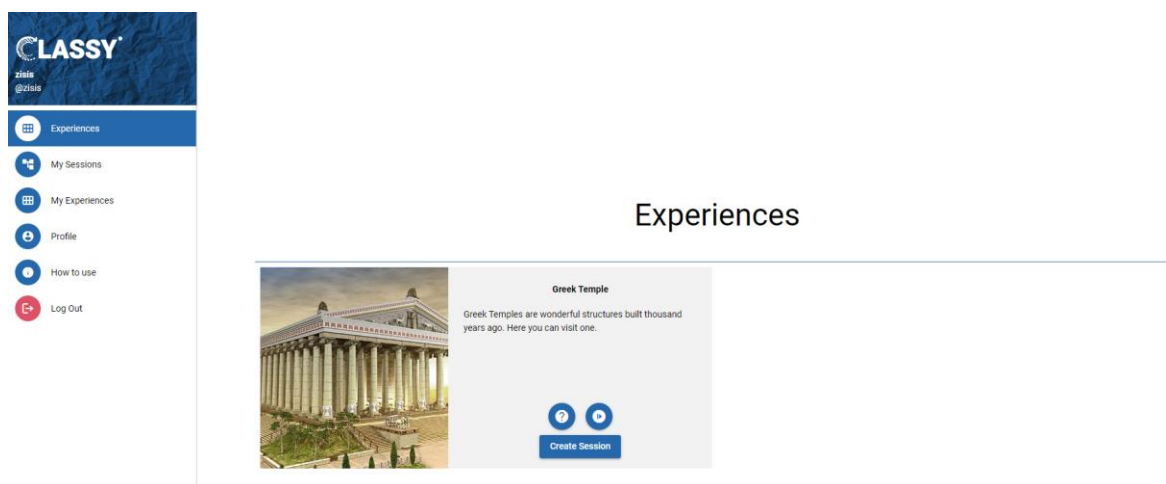
First you need to **Log in** with your credentials.



## New layout

The **How to use** page was added under the profile page to help the user get started with Classy.

Now the user does not need to log out to visit the **how to use** page, he can also visit it after logging in.



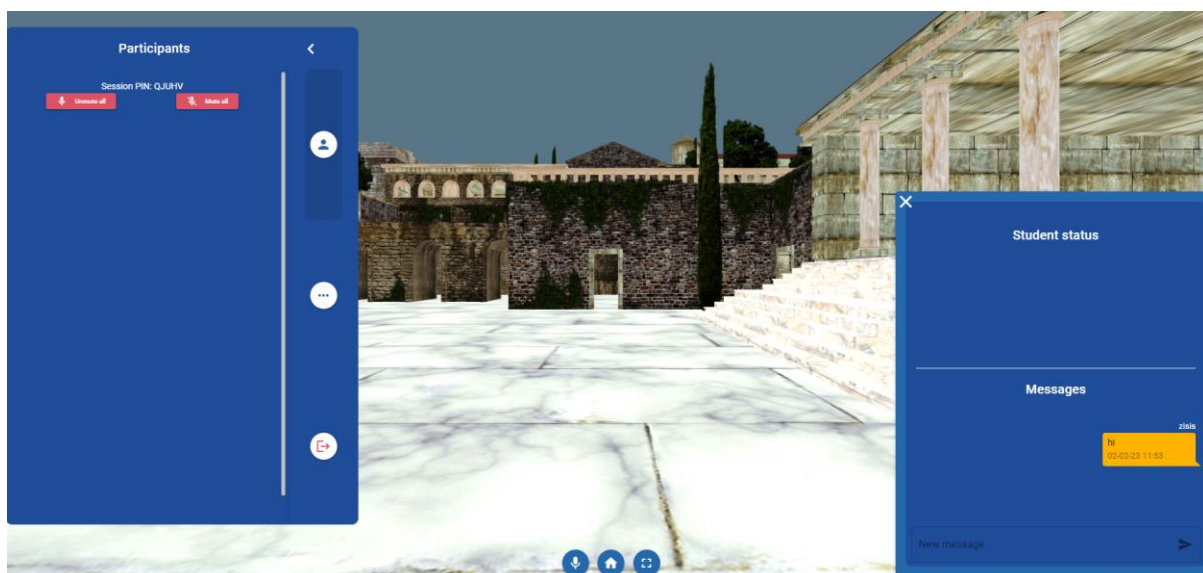
## Chat

Now in the live sessions we implemented the chat subsystem enabling the teacher and students to send messages thereby increasing the classroom interactivity between teacher and student by pressing the bottom right message button as shown in the picture.



- **Chat functionality**

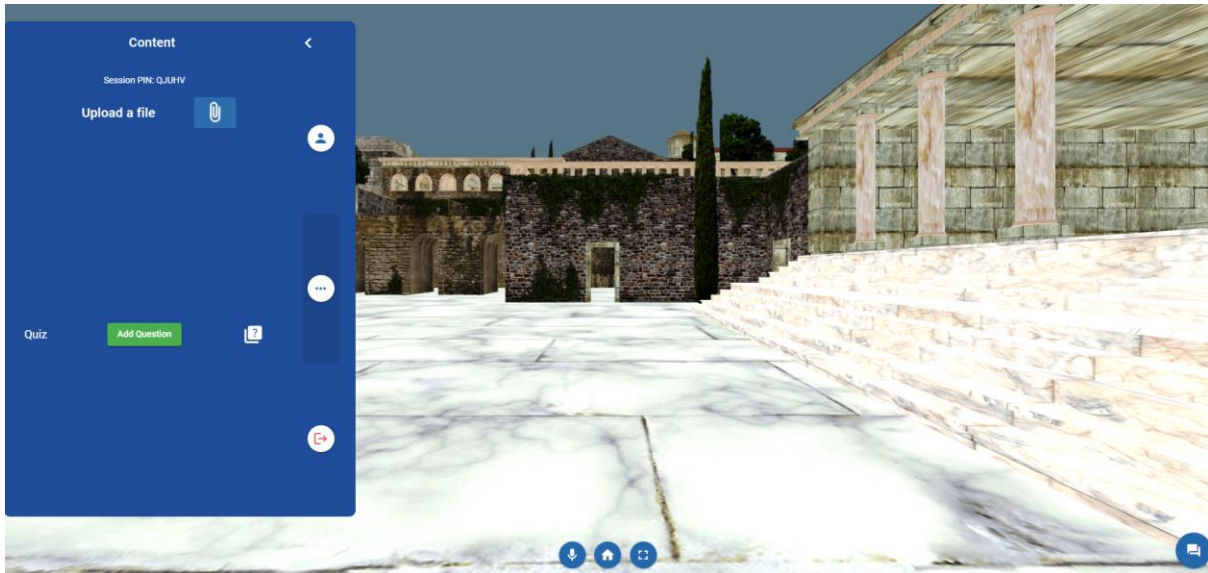
Upon pressing the message button a dialog box will pop up in the bottom right corner of the screen as shown in the picture, in this dialog box along with messages the user will be able to see the student status.



## File sharing

In the sidebar, in the middle tab which is the content tab, a file transfer subsystem was added there to be used in live sessions.

This feature enables the teacher to upload images and pdf files, this functionality is designed to give the teacher total control over what is displayed in the class and also what files will be shared in the class.



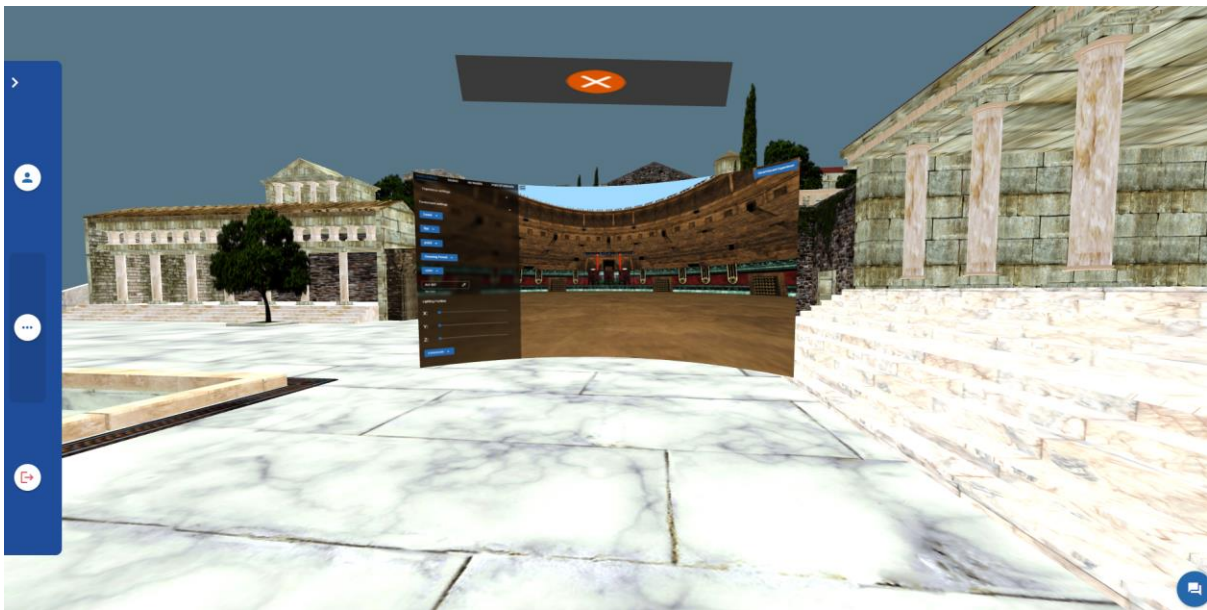


- **Example of an image demonstration**

Here is an example of how the image will be displayed apart from the **X** button that will only appear to the teachers screen.

The students will see the image as shown in the picture.

The user can hide the image by pressing the **X** button and unhide it if he/she wants, also the teacher has the option to completely remove from the session the images he/she has uploaded.



- **Example of pdf demonstration**

A pdf file will be shown the same way as the image. The only difference is that apart from the **X** button it will have **arrows** that will only appear on the teachers screen to be able to change pages.

Students will only see the page that the teacher wants.

Moreover, any pdf uploaded by the user can be removed, this helps the teacher to stay organized if there are multiple uploads in a session.



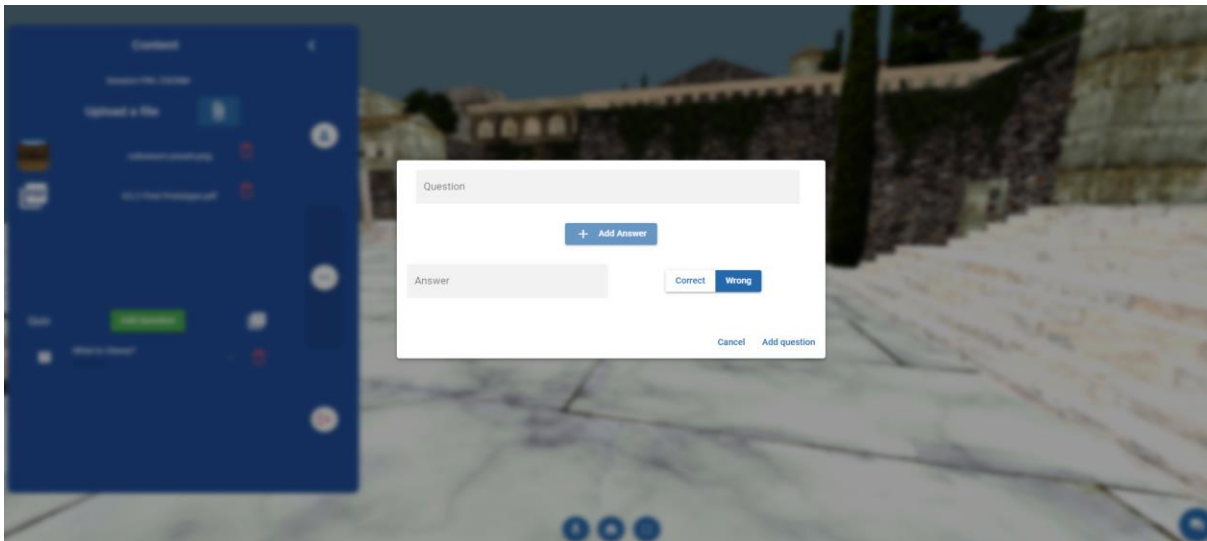
## Quiz

In the content tab the teacher will also have the option to create quizzes on the fly, all the answers from the quizzes will be stored on the database and the teacher will have access to them for further use as he/she sees fit.

As shown in the picture, the process of creating a quiz is very easy.

The teacher will fill the question input with the question he/she wants to ask and can add as many possible answers as he/she wants.

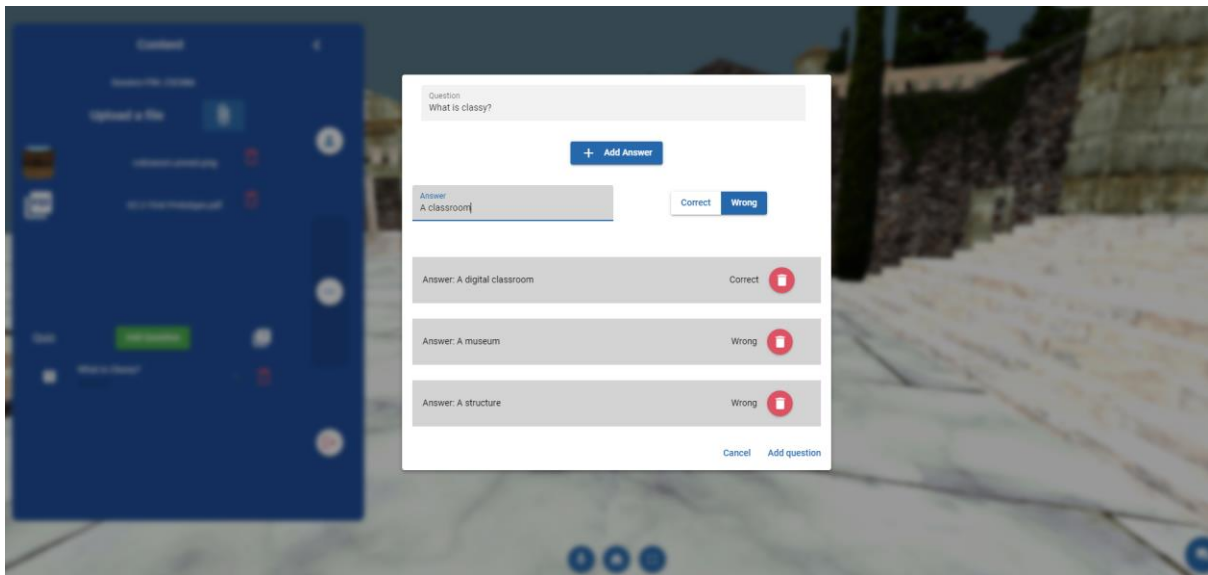
Furthermore there is the option to delete an already made question, this feature provides the user with the ability to make the quiz suitable for the session and also to stay organized if there are multiple questions.



- **Quiz creation example**

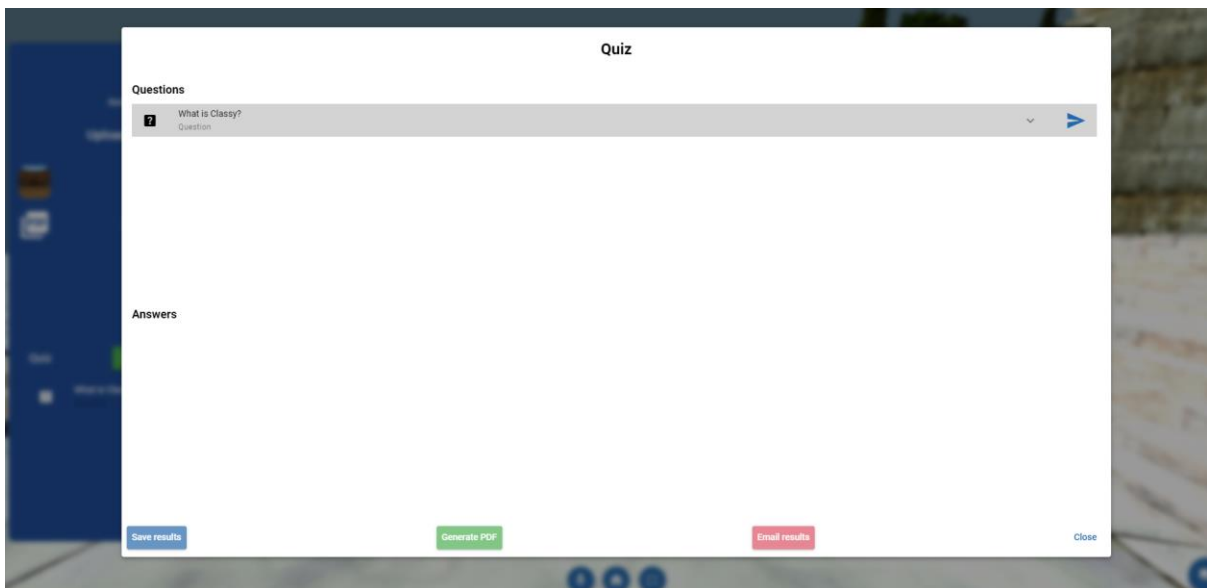
This example shows how to add a question and answers, you can add as many possible answers as you want by choosing which one is correct or wrong.

To add a second question after you have finished setting up the first one, you can start the same procedure again for the next one.



- **Quiz start example**

To start the quiz simply press the exclamation mark located next to the Add Question button and this dialog pop up as shown in the picture, after completing the quiz, you press the send button for the students to start answering, a button to save all the answers is shown at the bottom left of the dialog. Furthermore there are two more options, the user can generate a new pdf file with all the answers by pressing the Generate PDF button and lastly after he/she has generated the pdf he/she can send the results via email by pressing the Email results button.



## Backend

The backend for the final product includes all the subsystems we had created in the prototypes, but all the new additions made to create the final product in order for them to function we implemented some endpoints and socket endpoints.

- **What is an endpoint**

Simply put, an endpoint is one end of a communication channel. When an API interacts with another system, the touchpoints of this communication are considered endpoints.

APIs work using requests and responses. When an API requests information from a web application or web server, it will receive a response.

The place that APIs send requests and where the resource lives, is called an endpoint.

- **What is a socket endpoint**

A socket is one endpoint of a two-way communication link between two programs running on the network.

A socket is bound to a port number so that the TCP layer can identify the application that data is destined to be sent to.

An endpoint is a combination of an IP address and a specific point at the server.

## Endpoints and socket endpoints

- Chat

In order for the chat to work properly the sending messages and the incoming messages are client side functions.

A new message is an endpoint that communicates with the user and the server at the same time, meaning that the message that the user receives is added to the server and forwarded to the users.

In order for the application to be lighter, the server sends the messages to the users and they don't retrieve any content from the server.

They can read messages only when they are connected to the current session.



- upload image/pdf

When a file is uploaded is an endpoint which communicates with the server, if an image is uploaded the server stores it in a different folder for every session, if a pdf is uploaded it is stored in the session folder and it transformed into images in order to be able to be displayed in the 3D environment, lastly the data will be added to the server as a link in order for us to have access to them.

When an image or pdf is deleted then the necessary information is sent to the server (file and server entries), the server finds the corresponding data and permanently deletes them, this happens in order to not leave behind garbage data and the server is loaded without reason.

- Emoji reactions

The student status which displays the reactions of the students is a socket endpoint, which communicates between the teacher and the participants and allows them to show their status.

When the teacher clicks on a status, the status resets, this function is also a socket endpoint.

- Quiz

When the user adds a question with answers then the server checks in what session the question is made and adds it to the current session.

The teacher can send the questions to the students and they receive the possible answers by a socket endpoint.

In order for that to happen we needed to implement three socket endpoints, one from the student side when they send their answers, the server listens to all the participants and returns the data to the teacher, but they are not stored anywhere. A second socket endpoint is needed from the teacher side listening to the server and adding the answers to the 'answers' field. The third socket endpoint we need to save the results, sends all the answers to the server, which is looking for the current session, it checks the type of the data and saves the results in the current session.

To remove a question, an endpoint is implemented there which sends the required information to find the question in the correct session, then removes the question from the server while updating the teachers list.

If the user wants to send the results via email, another socket endpoint is required for this purpose, which makes the most of the

server settings by generating a link with a pdf that includes all the answers and sends it to his/her email.

## Conclusion

Classy brings immersive 3D guided lessons to education that offers thrilling educational experiences by interacting with a variety of virtual reality learning resources that allow teachers and students to create and launch unique educational resources in a convenient way.

At its final form Classy has tremendous capabilities; the user can create magnificent scenes using the powerful experience editor that Classy provides. The choices that the editor can give to the user are multiple and this can increase the creativity in order to produce various beautiful environments. From the SketchFab the teacher can import models to use in the creation of a new experience making the procedure a lot easier in creating new environments. Classy is very easy to use; saved experiences can be used as many times as you want and also can be edited again to meet different needs that may arise.

Students will love Classy because of the interactivity that it provides between student and teacher making the class more fun and interesting. Students can interact in real time with the teacher and other students using emoji to present their status and also they are able to send messages through our chat subsystem anytime during the session without interrupting the class via microphone.

Using the avatar to represent the teacher and student as opposed to using a camera that shows the face of users is a much better feature for online courses, research has shown that people can be freer and interact better with others without fear and shyness of having their faces in camera. This feature will make it easier for students to express themselves and ask questions more often if they do not understand something.

During the live sessions the teacher has absolute control of the class as he can choose to mute or unmute all the participants, show something to everyone, or someone in specific etc.

Another feature the Classy provides is the way that the teacher can demonstrate images and documents to the class; during the demonstration only the teacher can close or open images and documents, change pages, etc.

Furthermore, Classy gives to the teacher the option to create quizzes on the go, gathering the students' answers that can be presented in a generated pdf file or sent via email. This feature opens up a new way for exams to be held in online courses. It also gives the option to the teacher to create sudden tests in order to check what the students learned during the sessions.

Classy is a revolution to online teaching, online seminars and meetings, virtual tours and even in the way to play games. A detailed guide for both teachers and

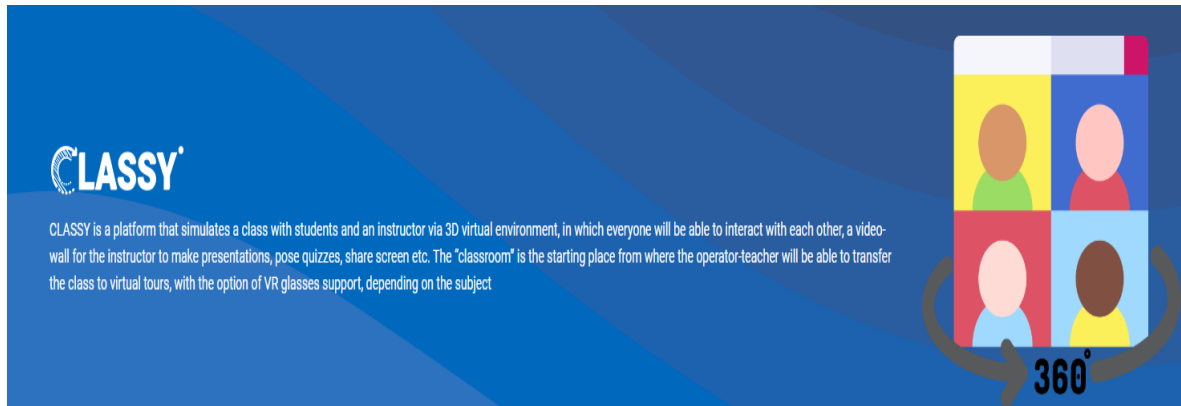




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students has already been created to help you get started using Classy and enjoy the new dynamic this platform can give to the new digital era in which we are currently in.



**CLASSY**

CLASSY is a platform that simulates a class with students and an instructor via 3D virtual environment, in which everyone will be able to interact with each other, a video-wall for the instructor to make presentations, pose quizzes, share screen etc. The "classroom" is the starting place from where the operator-teacher will be able to transfer the class to virtual tours, with the option of VR glasses support, depending on the subject

360°