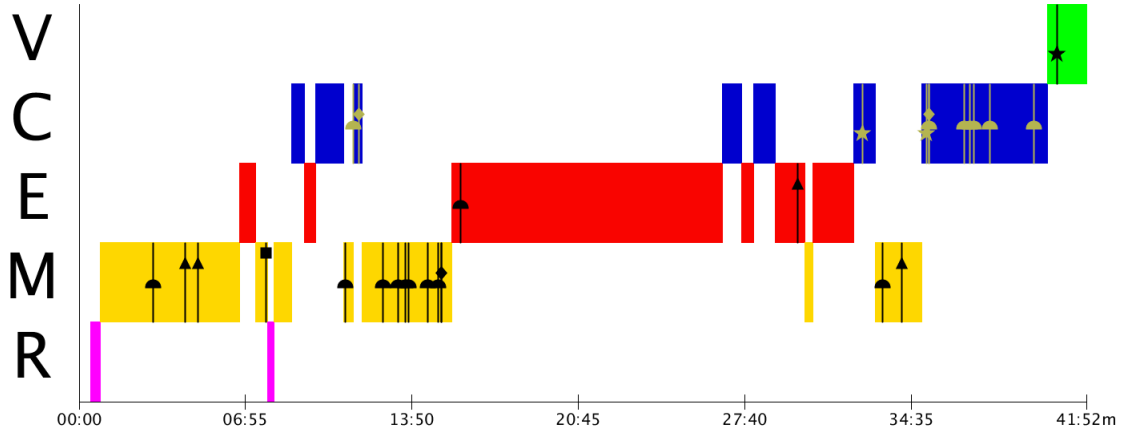
TaskTimeTracker Web Manual



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1. INTRODUCTION

The *TaskTimeTracker Web* application allows the creation, in real time, of diagrams that represent the timeline followed during the problem-solving process and the steps that compose it.

This tool is based on the *TaskTimeTracker* application, developed by M. Pla-Castells and I. García-Fernández[1], migrating its functionalities to a web platform and including new ones. The main features of this application are the following:

- Editing tasks
- Uploading multimedia content
- Adding comments

Below you can see how the application looks like and how to use its different functionalities.

[1] Marta Pla-Castells; Ignacio García-Fernández (2020) TaskTimeTracker: A tool for temporal analysis of the problem solving process. *Investigación en Entornos Tecnológicos en Educación Matemática*, No. 1, pp. 9–15. https://doi.org/10.7203/ietem.1.16280

2. OVERVIEW OF THE APPLICATION

The application consists of a single page that is divided into three modules, as follows (Figure 1).



Figure 1: Application overview

1. **"Multimedia" Module**: This module contains the media file to be uploaded and the controls for it. From here it is also possible to synchronise the media file with the MAD graph.
2. **"Information" Module**: This module contains the relevant information during a modelling session, as well as the necessary buttons to export or import a MAD graph.
3. **"Graph" Module**: This module contains the MAD graphic being generated and the graphic controls. It contains the buttons to customise the tasks, include comments, enter edit mode, and synchronise the MAD graph with the multimedia file.

To facilitate the indications in the following parts, the buttons that appear on the main page are named below (Figure 2).

1. **A** - Media's Time Control
2. **B** - Sincro Media: Synchronise media file with graph.
3. **C** - Load Media: Upload media file.
4. **D** - Task Selectors.
5. **E** - Edit Tasks: Customize tasks.
6. **F** - Add Annotation.
7. **G** - Edit Graph Mode.
8. **H** - Info Tab.
9. **I** - Annotation Tab.
10. **J** - Download Image.
11. **K** - Reload Graph.
12. **L** - Load File: Upload JSON.
13. **M** - Download File: Export JSON.
14. **N** - Graph's Time Control.
15. **Ñ** - Synchronise Graph: Synchronise network with media file.

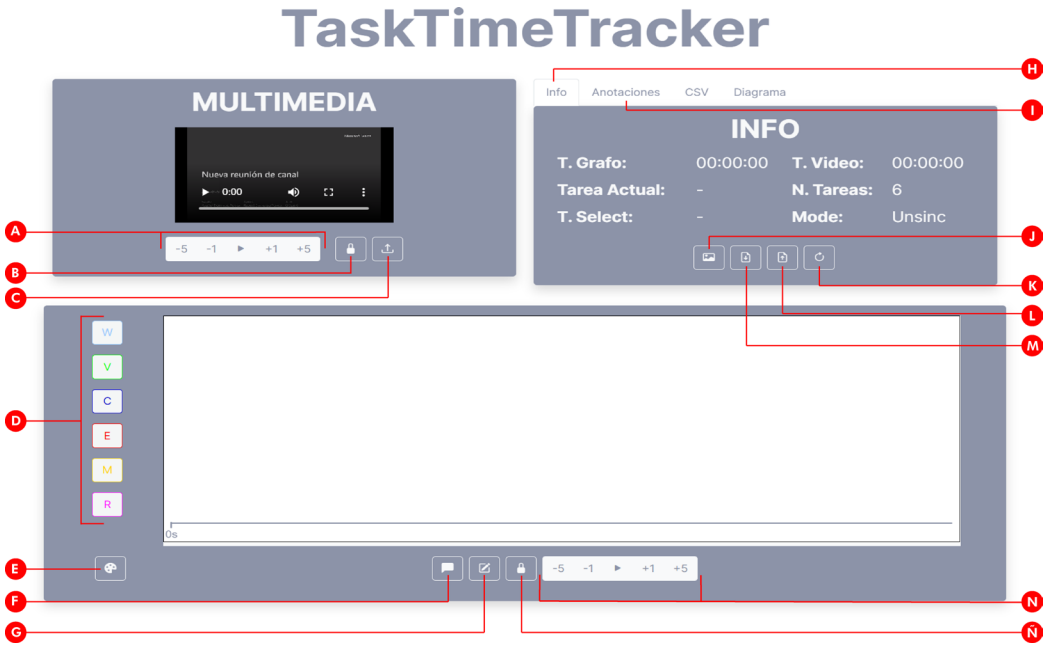

Figure 2: Button distribution

3. BASIC FUNCTIONS

3.1. UPLOADING MULTIMEDIA FILES

Click on the "Load Media" button (Figure 3). This will open a window that allows you to choose the file to be imported. It can have the following extensions: MOV, MP4 and MP3.

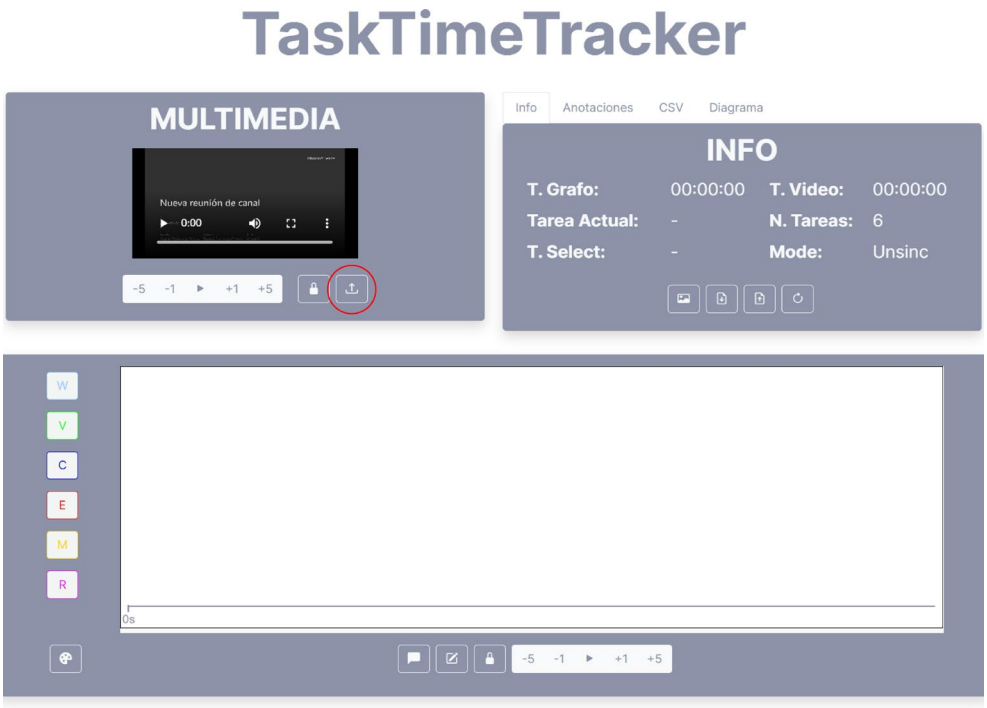

Figure 3: Button for uploading media files

Once the desired file has been selected, click on the "Open" button (Figure 4).

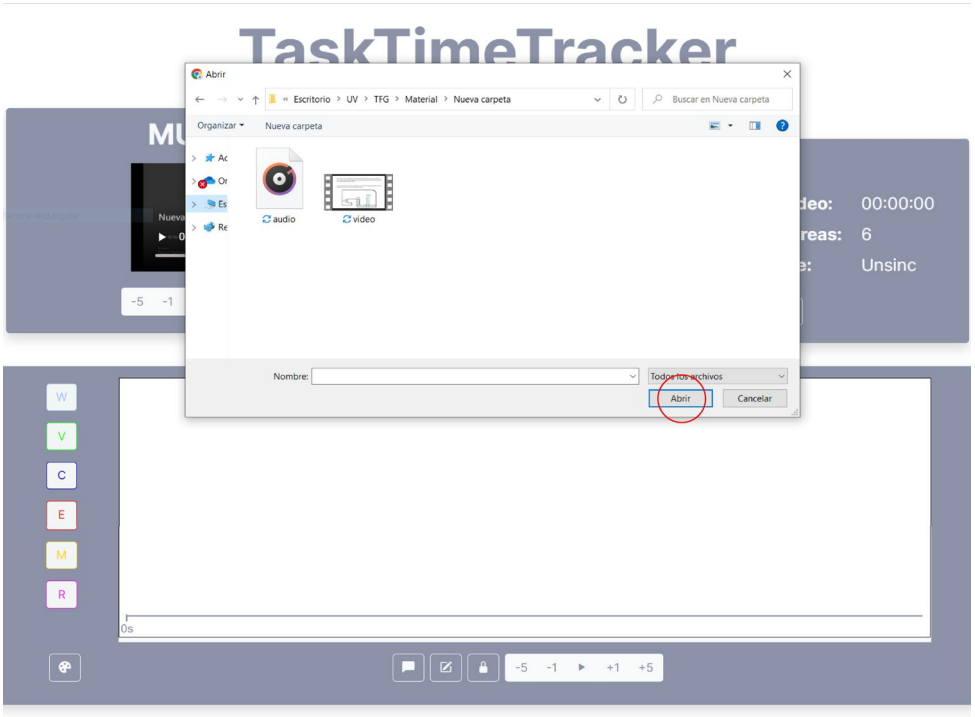

Figure 4: Confirm file to upload

3.2. START GRPAH AND TIME CONTROLS

To start the graph you must first have imported a media file. Once this has been done, the graph can be started in two different ways.

Firstly, you can start it using the keyboard, either by pressing the space bar or any of the keys that identify each of the tasks. Secondly, the graph can be started with the internal controls of the application, either through the central button of the "Graph's Time Control" panel, or with the "Task Selectors" (Figure 5).

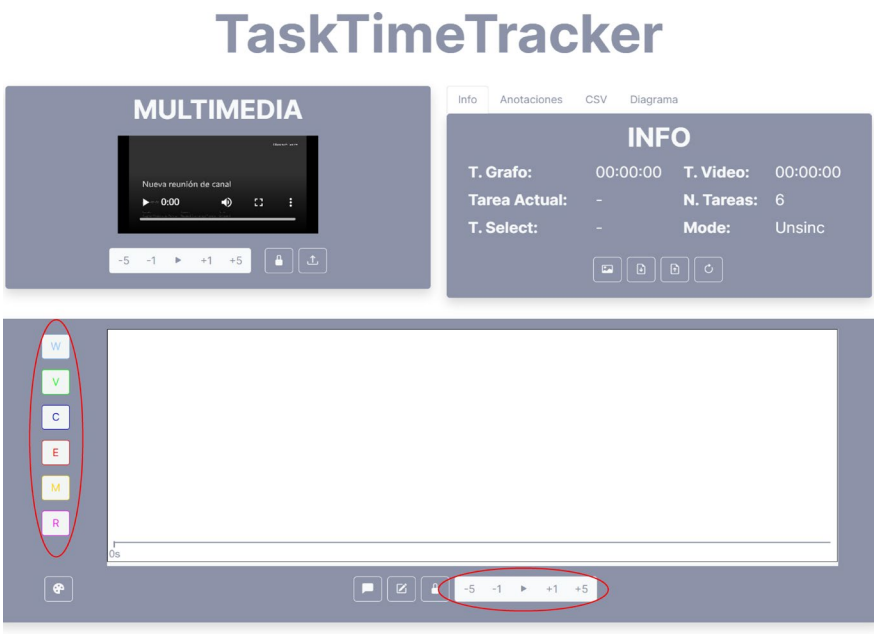

Figure 5: Buttons for selecting tasks and controlling the graph.

If you start the graph by selecting a task, either by keyboard or by using the buttons, it will start the graph. However, if you start it by using the space bar or the time controls, the graph will start with a blank space.

Once the graph is started, it is possible to stop the graph and move forward or backward in time, 1 and 5 seconds. These actions can be carried out in the following ways.

Action	Controls	Key
Start/Stop time	▶	Space bar
Forward 1 second	+1	Right arrow
Forward 5 seconds	+5	Up arrow
Backward 1 second	-1	Left arrow
Backward 5 seconds	-5	Down arrow

3.3. MULTIMEDIA TIME CONTROL

The "Media's Time Control" buttons (Figure 6) work in the same way as those described in the previous section for the graph.



Figure 6: Buttons to control the media file.

3.4. ADD, DELETE AND EDIT ANNOTATIONS

Click on the "Add Annotations" button (Figure 7).

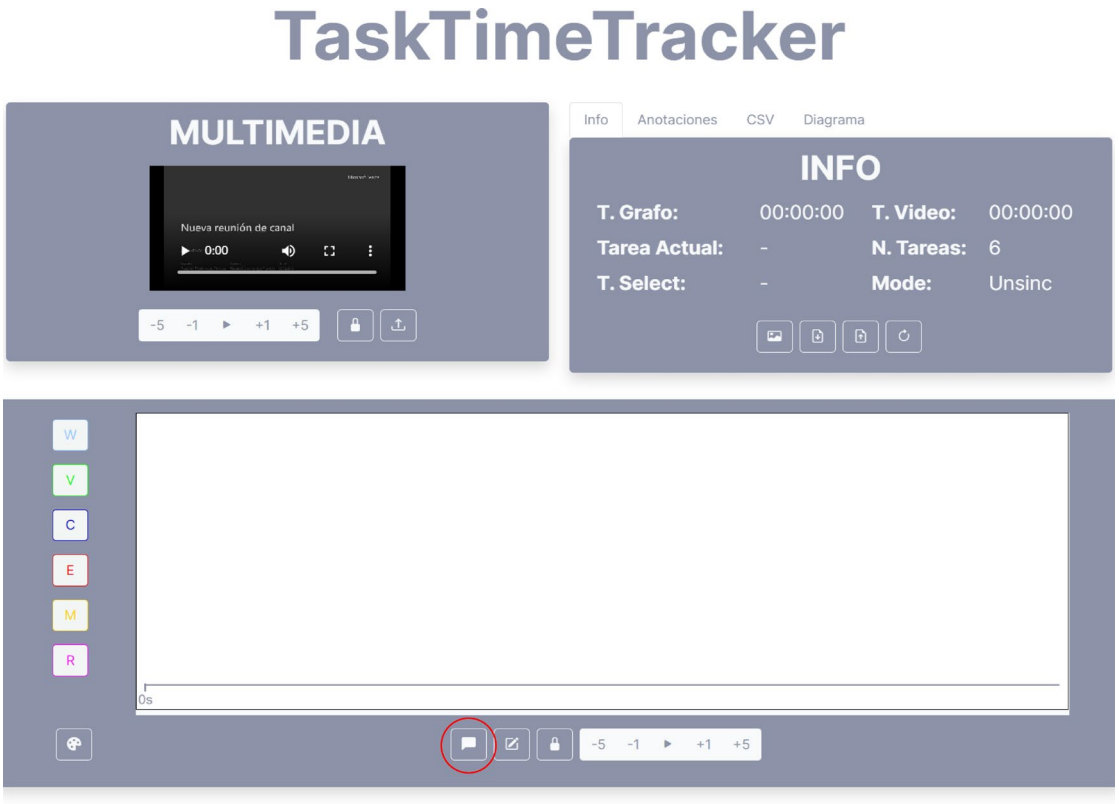

Figure 7: Button to open Annotation panel.

This will open a panel that will allow you to set the necessary parameters to create the annotation. These are: type, colour, temporary position, and content. Once selected, the only thing left to do is to click on the "Save changes" button (Figure 8).

By default, when an annotation is added, it will be placed at the current time, its colour will be black, its content will be empty and its type "Reading", but any of these fields can be modified both at the time of adding it and later.

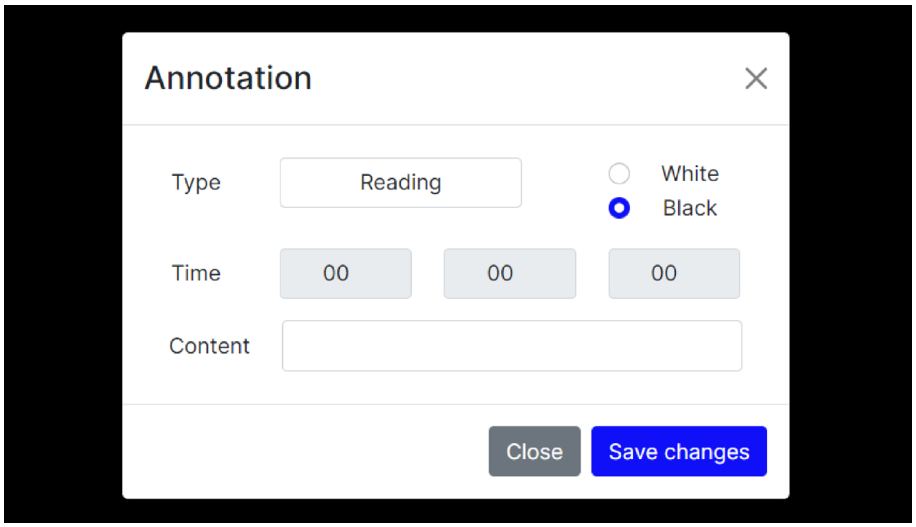

Figure 8: Annotation Panel.

To modify or delete an annotation, select the "Annotations" tab (Figure 9). This will show the list of annotations contained in the session, each one accompanied by a button to delete them and another one to edit them.

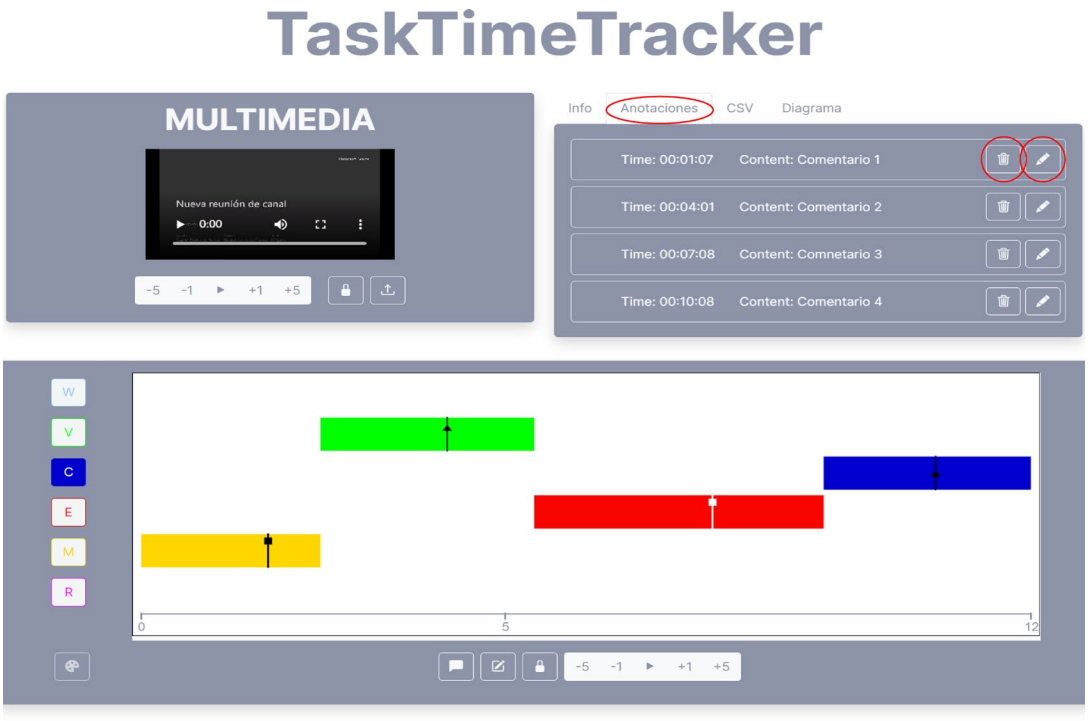

Figure 9: Annotation tab

3.5. EXPORT AND IMPORT GRAPHS

There are two options for exporting the graph generated in the session. The first is in the form of an image, to do so, click on the "Download Image" button (Figure 10).



Figure 10: Button to export the graph as PNG

Once clicked, simply enter the name under which you want to save the image and click the "Save Image" button (Figure 11). After this, a PNG file with the content of the graph will be downloaded.

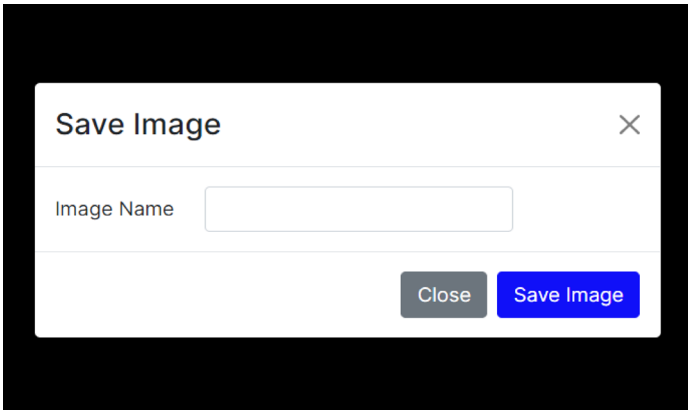

Figure 11: Image saving panel

The other way to export the graph is in JSON format, allowing all the session information to be saved. To do this, click on the "Download File" button (Figure 12).



Figure 12: Button to export the graph as JSON

Enter the name under which you want to save the file and click on the "Save data" button (Figure 13).

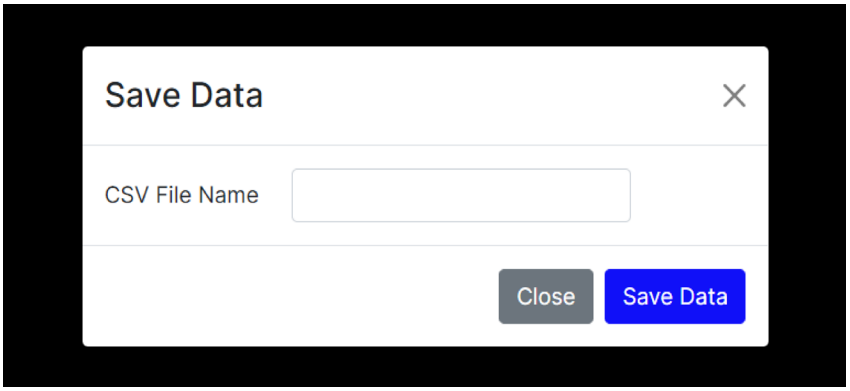

Figure 13: Panel to save data

It is also possible to import a JSON file that has been previously exported to review or continue a session. To do this, click on the "Load File" button (Figure 14), and select the JSON file you wish to import.



Figure 14: Button to import JSON file

4. ADVANCED FUNCTIONS

4.1. EDIT TASKS

By default, a modelling session begins with the 6 tasks: Reading, Making model, Estimating, Calculating, Validating and Writing. Each one is associated with the letters (R, M, E, C, V, W) and colours proposed in the MAD diagram[2]. However, it is possible to modify the name and colour of the tasks as well as delete them or add new ones. To do this, click on the "Edit Tasks" button (Figure 15).



Figure 15: Button to edit the task list.

This will open a window allowing us to choose between original Ärlebäck MAD graph model or a customised one (Figure 16).

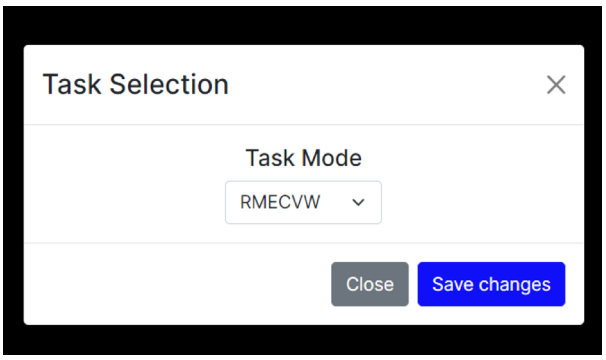

Figure 16: Task editing panel.

[2] Ärlebäck, J. B. (2009). On the use of realistic Fermi problems for introducing mathematical modelling in school. *The Mathematics Enthusiast*, *6*(3), 331-364.

If we select the customised one, we will see a list of the current tasks, with their name and colour, together with a button to delete them. By clicking on both the name and the colour we can modify them. In addition, at the bottom of the window there is a button that will allow us to add new tasks, up to a total of 12 (Figure 17).

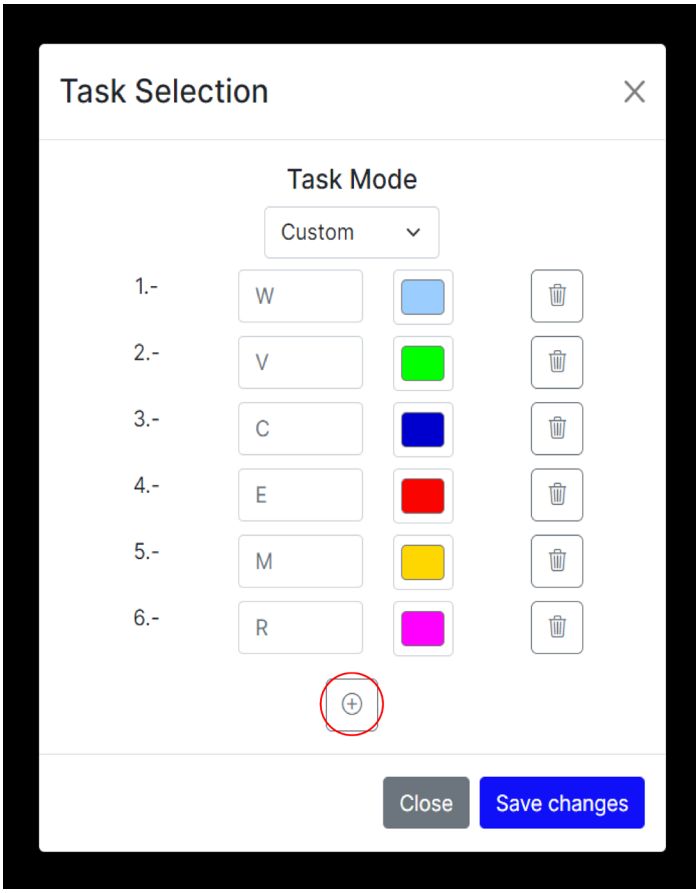

Figure 17: Button to add tasks

Once the desired changes have been made, simply click on the "Save changes" button.

4.2. SYNCHRONISED MODE

To synchronise the media content with the graph, there are two options. The first is to click the "Synchronise Media" button (Figure 18), which will move the time from the media file to the graph.



Figure 18: Button to synchronise media content with the graph

The other option is the opposite, to move the graph to the point in time where the multimedia content is located. To do this, click on the "Synchro Graph" button (Figure 19).



Figure 19: Button for synchronising the graph with multimedia content.

Once you press either of these two buttons, you will enter "Synchronised Mode", and the temporary controls of either part, graph, and media, will affect both.

This mode can be deactivated by pressing either of the two previously mentioned buttons again.

4.3. EDITION MODE

Edit mode allows you to go back in the graph timeline without deleting the parts left behind, as is the case outside this mode, and thus to add comments on past graph points in time.

To activate it, click on the "Edit Graph Mode" button (Figure 20).



Figure 20: Button to enter edit mode

This will cause a horizontal bar to appear, marking the extent of the graph, and a vertical line marking the moment in which the user is, in addition, in the "T.Select" section of the "Information" module, this moment will appear represented in time (Figure 21).

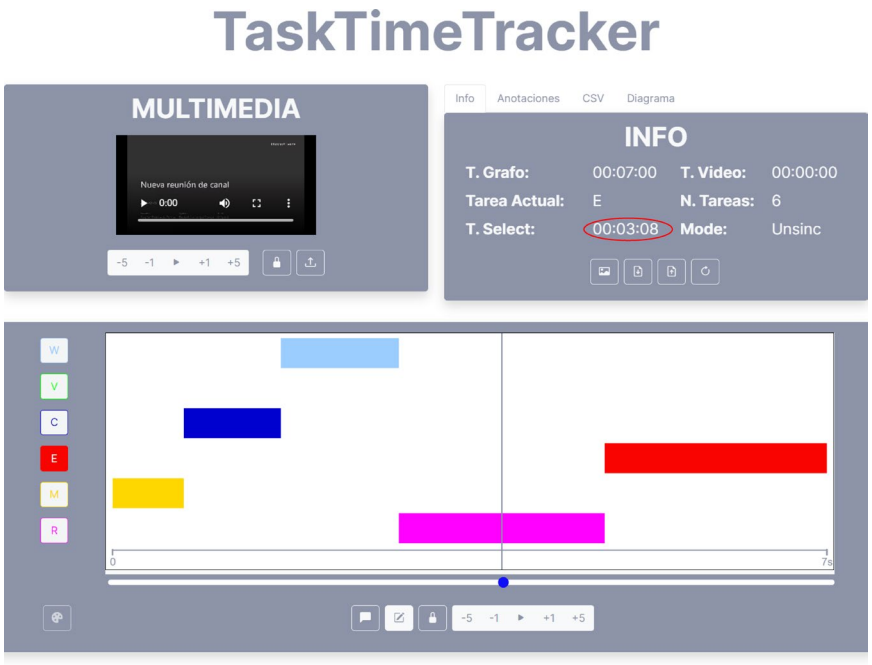

Figure 21: Edit mode time.

4.4. RESTARTING THE GRAPH

To reset the graph and start again, deleting all the information stored so far, simply press the "Reload Graph" button (Figure 22) and confirm by pressing "OK".



Figure 22: Button to restart the graph.