# eFESTO

# eLearning environment for disable learners[1]

# Test Document

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**Abstract - English**

In order to assure the whole availability of the eFESTO tools and capabilities some test plants were defined.
Preliminary tests were performed to verify the eFESTO portal and the communication, by mean of the SOAP protocol, between the portal and the LMS.
Specifically, the tests definition and execution involved strongly the innovative functionalities added to the LMS (Moodle):

1. the specific educational tools designed to meet the needs of deaf learners;
2. the module for remote control of measurement instrumentation.

For the tool imported from the LMS (such as chat, glossary, electronic documents) only the correctness of the link itself was tested considering these educational tools properly working and already tested.

**Sommario - Italiano**

Al fine di assicurare la completa disponibilità degli strumenti didattici presenti, sono stati definiti ed effettuati dei test funzionali sulla piattaforma eFESTO.
In primo luogo, alcuni test preliminari sono serviti a verificare la funzionalità del portale eFESTO e la comunicazione tra portale e LMS (tramite servizi web, protocollo SOAP) per quanto riguarda l'autenticazione e l'accesso ai contenuti.
Più nello specifico, una parte consistente della fase di test è stata dedicata alla verifica delle funzionalità innovative aggiunte al LMS:

1. gli strumenti didattici specifici per gli utenti sordi;
2. il modulo per il controllo remoto della strumentazione di misura.

Per quanto riguarda gli strumenti didattici importati dal LMS (come chat, glossario, documenti elettronici), è stato testato solo il corretto funzionamento dei link, considerando questi strumenti didattici presenti sul LMS propriamente funzionanti e già testati.

**Streszczenie - Polski**

W celu zapewnienia pełnej dostępności i możliwości używania narzędzi stworzonych w ramach projektu eFESTO, był dokonany techniczny test stworzonej platformy i jej elementów przez partnera technicznego-UNISANNIO jak i badanie platformy odbyło się w trakcie pilotaży, w celu zdefiniowania ewentualnych błędów i niedogodności oraz ich wyeliminowanie.

Wstępne badania zostały przeprowadzone w celu weryfikacji portalu eFESTO i komunikacji, w drodze protokołu SOAP, pomiędzy portalem i LMS (Systemem Zarządzania Platformą).

Pilotaż na grupie docelowej osób głuchych objął w szczególności zdefiniowanie systemu i jego innowacyjną funkcjonalność do LMS (Moodle);

1. specyficzne narzędzia edukacyjne stworzone w celu zaspokojenia potrzeb

osób niesłyszących;

2. moduł zdalnego sterowania przyrządów pomiarowych

Narzędzia importowane z Systemu Zarządzania Platformą LMS (takie jak czat, słowniczek, dokumenty elektroniczne) zostały jedynie przetestowane pod względem poprawności linka, biorąc pod uwagę fakt, iż te narzędzia edukacyjne działały wcześniej prawidłowo i zostały już zbadane.

## 1. eFESTO Platform: preliminary tests

These test cases want to verify general functionalities to enter the eFESTO platform and display courses and the educational resources.
The eFESTO portal have to provide every user with a specific home page with the assigned courses without access directly to Moodle (the LMS). The eFESTO portal imports through web services (SOAP protocol) the management utilities and the educational contents from the LMS without using the web interface of the LMS. The aim is to have the interface of the learning environment (eFESTO) with a very simple design enabling the deaf learner to get used to the system easily.

| Test on Login and Logout | | | |
|---|---|---|---|
| **Precondition**<br>1. Use Internet Explorer.<br>2. The operator disposes of the credential of at least three users registered to different courses. | | | |
| **Step #** | **Description** | **Expected Result** | **Comments** |
| **1.** | Go to www.efesto.unisannio.it. Insert correct Username and Password in the authentication box. | The login succeeds. The assigned courses are displayed. | |
| **2.** | Click on the *logout* button. | The logout succeeds. | |
| **3.** | Insert wrong Username and Password in the authentication box. | The login does not succeed. | |
| **4.** | Insert correct Username and Password in the authentication box. | The assigned courses are displayed. | |
| **5.** | Then select a course and verify the correct loading of the resource names. | The communication with the LMS works, the correct list of resource names is displayed. | |
| **6.** | Click on the *return to courses* link then *logout*. | The list of courses is displayed again and after the logout works. | |
| **7.** | Repeat from step 4. to 6. for the other accounts. | Correct behaviour. | |

## 2. Tests on the educational tools

The specifications taken in consideration for the development of the tests on the educational tools are:

- possibility to play and stop the video of sign language translation;
- switch between International Sign Language and National Sign Language only for English contents (theory and exercises);
- synchronization between text and video of sign language translation (for theoretical lessons of English courses and scientific topics).

| Test cases for English theoretical tools | | | |
|---|---|---|---|
| **Precondition**<br>1. Use Internet Explorer. | | | |
| **Step #** | **Description** | **Expected Result** | **Comments** |
| **1.** | Enter the platform as administrator. | All the learning objects in every language are displayed. | |
| **2.** | In the courses list select the first English lesson (Primary Level) and then the first theoretical content. | The learning object works correctly and the first web page of the contents is shown. | |
| **3.** | Start the video of sign language translation. | The video is synchronized with the text. | |
| **4.** | Check the synchronization between video and text. | The text becomes correctly red as the video plays. | |
| **5.** | Use the forward, rewind and pause button and check the synchronization. | The synchronization with the text works properly. | |
| **6.** | Switch from National Sign Language video to International Sign Language video (or vice-versa). | The new video sign translation is loaded correctly. | |
| **7.** | Repeat from step 3. to step 5. | Correct behaviour. | |
| **8.** | Go to the next page of the learning object (if the page is not the last one). | The click on the next page arrow works properly, the new page is loaded. | |
| **9.** | Repeat from step 1. to step 8. for every page of the learning object. | The behaviour is right in every page of the lesson. | |
| **10.** | At the last page of the learning object click on the previous page arrow and so on until the first page. | All the pages are properly loaded, the click on the previous page arrow works properly. | |

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| **11.** | Select the next English learning object (next level) and repeat from step 3. to 10.. | Correct behaviour. | |

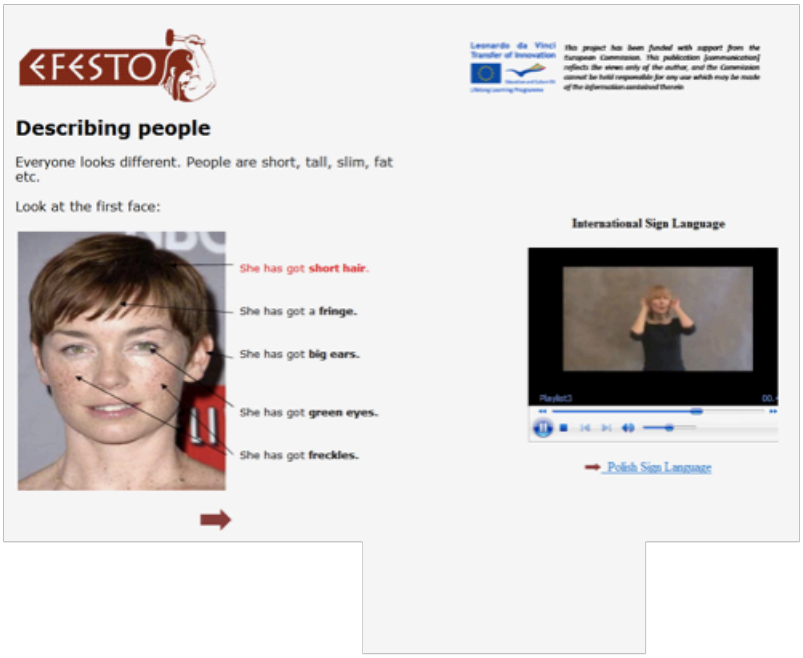


Fig. 1 English theoretical tool.

| Test cases for Scientific topics theoretical tools | | | |
|---|---|---|---|
| **Step #** | **Description** | **Expected Result** | **Comments** |
| **1.** | Enter the platform as administrator. | All the learning objects in every language are displayed. | |
| **2.** | In the courses list select the first lesson of Mathematic Primary Level and then the first theoretical content. | The learning object works correctly and the first web page of the contents is shown. | |
| **3.** | Start the video of sign language translation. | The video is synchronized with the text. | |
| **4.** | Check the synchronization between video and text. | The text becomes correctly red as the video plays. | |
| **5.** | Use the forward, rewind and pause button and check the synchronization. | The synchronization with the text works properly. | |
| **6.** | Go to the next page of the learning object (if the page is not the last one). | The click on the next page arrow works properly, the new page is loaded. | |

| | | | |
|---|---|---|---|
| **7.** | Repeat from step 1. to step 6. for every page of the learning object. | The behaviour is right in every page of the lesson. | |
| **8.** | At the last page of the learning object click on the previous page arrow and so on until the first page. | All the pages are properly loaded, the click on the previous page arrow works properly. | |
| **9.** | Select the next scientific learning object (next level or next course among Mathematic, Physics, Computer Science) and repeat from step 3. to 8.. | Correct behaviour. | |

## 3. Tests on the Interactive Exercises

The exercises which complete the theoretical part of each course are of different typology.

Multiple choice: the questions are displayed one by one with the sign language translation and the users have to click on the right answer.

True or False: there are some questions or phrases and the users have to write only F (False) or T (True).

Fill in the gaps: the users have to write one word or a phrase in the proper gaps. Depending on the difficulty of the exercise, the options can be given to the students (in a box in the text of the exercise) or the answer is completely free without the possibility to choose among different alternatives.

The specifications taken in consideration for the development of the tests on the interactive exercise are:

- switch between International Sign Language and National Sign Language, only for English exercises;
- results displayed to the student at the end of the exercise;
- some exercises have been specifically added to verify the students improvements then the results are stored in the grades book of the LMS giving to the teacher the possibility to check them.

Fig.2 An interactive exercise.

| Test cases for Interactive Exercises | | | |
|---|---|---|---|
| **Precondition**<br>1. The operator know the right answers for each exercise. | | | |
| **Step #** | **Description** | **Expected Result** | **Comments** |
| **1.** | Enter the platform as administrator. | All the learning objects in every language are displayed. | |
| **2.** | In the courses list select the first lesson (Primary Level) and then the first exercise. | The learning object works correctly and the first web page of the contents is shown. | |
| **3.** | Start the video of sign language translation. | The video works properly (rewind, pause and forward function). | |
| **4.** | Only for English exercises, switch from National Sign Language video to International Sign Language video (or vice-versa). | The new video sign translation is loaded correctly. | |
| **5.** | Repeat from step 3.. | Correct behaviour. | |
| **6.** | Reply correctly to all the questions and go on. | The obtained result is the maximum one. | |
| **7.** | Reload the exercise and reply wrongly to all the questions. | The obtained result is zero. | |
| **8.** | Repeat from step 1. to 7. for all the exercises of each course and level. | Correct behaviour. | |

In order to test the evaluation exercises, which store the results (in percentage) in the

LMS grades book it is necessary a further investigation for these specific exercises.

| Test cases for the Evaluation Exercises | | | |
|---|---|---|---|
| **Precondition**<br>1. The operator know the right answers for each exercise. | | | |
| **Step #** | **Description** | **Expected Result** | **Comments** |
| **1.** | Enter the platform as a student. | The courses, which the student is registered to, are shown. | |
| **2.** | In the courses list select the a course and then the evaluation exercise. | The student can perform the exercise and the vote is percentage is reported at the end. | |
| **3.** | Remember the vote, logout from the student account. | The page to insert the login is displayed. | |
| **4.** | Enter the platform as a teacher or administrator the go to the same exercise of step 2.. | The teacher (or administrator) can open the grades book interface. | |
| **5.** | Open the grades book. | The grade for the student in step 1. is the same remembered. | |
| **6.** | Repeat from step 1. to 5. for all the evaluation exercises of each course and level. | Correct behaviour. | |

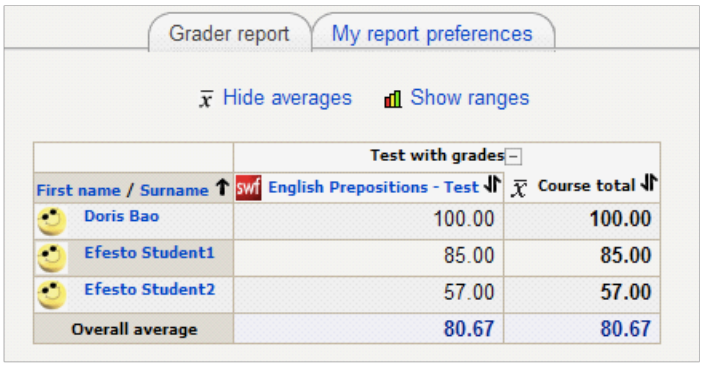


Fig. 3 Grades book: interface for the teacher.

## 4. Tests on the Experimental Activities

The users access to the experimental activities without specific software on client side (thin-client technology). It is a client-server architecture in which the application execution and data management is performed on the server.

Each experiment consists of a video tutorial with the sign language translation that introduces the remote activity on the actual instruments and gives the theoretical information to perform the experiment.

| Test cases on the video tutorial | | | |
|---|---|---|---|
| **Precondition**<br>1. Use Internet Explorer.<br>2. The LSs and MSs involved in the experiments are working correctly. | | | |
| **Step #** | **Description** | **Expected Result** | **Comments** |
| **1.** | Enter the platform. | The courses are shown. | |
| **2.** | In the courses list select the experimental activities. | The user can choose the video tutorial, the first video with the teacher in the laboratory starts with the synchronized subtitle. | |
| **3.** | Check pause, forward and rewind on the video. | All works properly, the synchronization remain. | |
| **4.** | The user can choose to start the sign language translation (of-line). | The video translation loads and starts properly. | |
| **5.** | Check pause, forward and rewind on the video translation. | All works properly. | |
| **6.** | Repeat from step 1. to 5. for all the experimental activities. | Correct behaviour. | |

Fig. 4 Video tutorial of a experimental activity.

The services delivered by the remote measurement laboratory module to the student are mainly the following:

- Performance of experiments in simulation from remote (the necessary software run on the server side, there are no needs on the user terminal).
- Experiment Control, this service allows the student to perform an experiment by controlling remotely one or more actual measurement instruments.

| Test cases on the experiments | | | |
|---|---|---|---|
| **Precondition**<br>1. Use Internet Explorer.<br>2. The LSs and MSs involved in the experiments are working correctly.<br>3. The operator knows the experiment and the expected results. | | | |
| **Step #** | **Description** | **Expected Result** | **Comments** |
| **1.** | Verify that all the instruments involved in the experiments are correctly plugged and working. | In the laboratory all the instruments and servers work properly and are reachable from remote. | |
| **2.** | Enter the platform. | The courses are shown. | |
| **3.** | In the courses list select the experimental activities. | The user can choose the experiment in simulation or on actual instruments. | |
| **4.** | Select an experiment, choose the resolution for the experiment visualization. | The experiment loads correctly, the graphical user interface is displayed. | |

| | | | |
|---|---|---|---|
| **5.** | The operator can perform a set of actions on the interface. | The actions are correctly communicate to the instruments (or the software reacts correctly if in simulation). | |
| **6.** | Repeat from step 1. to 4. for all the experimental activities. | Correct behaviour. | |

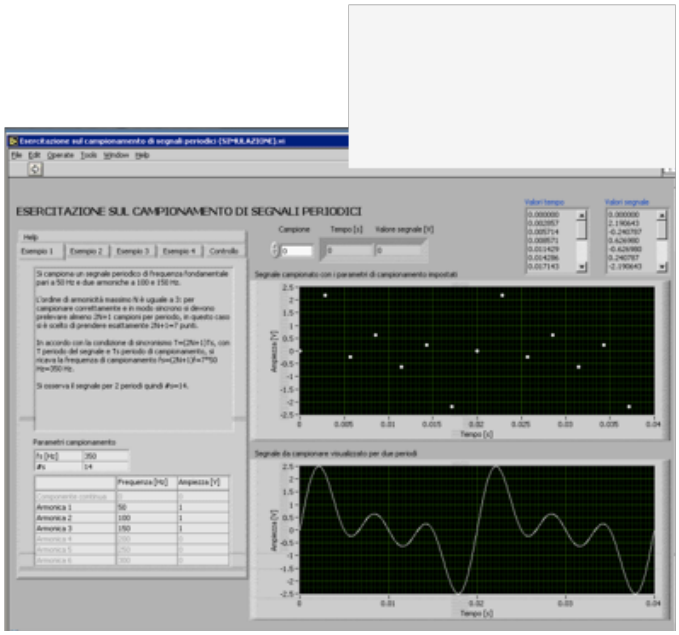


Fig. 5 Graphical User Interface of an experimental activity.

## 5. Tests on the education tools imported from the LMS

Traditional teaching tools used in the eFESTO platform are imported directly from the LMS. Then for Electronic document, Chat, glossary, etc only the right working of the link has to be checked.

| Test cases on the experiment | | | |
|---|---|---|---|
| **Precondition**<br>1. Use Internet Explorer.<br>2. The operator knows the organization of the courses and how to find the traditional educational tools. | | | |
| **Step #** | **Description** | **Expected Result** | **Comments** |
| **1.** | Enter the platform. | The courses are shown. | |
| **2.** | In the courses list select the first one. | The resources are loaded. | |
| **3.** | Select traditional tool (chat, or electronic documents, or glossary). | The link works properly and the tool can be used. | |

| | | | |
|---|---|---|---|
| **5.** | Repeat from step 1. to 3. for all the traditional tool. | Correct behaviour. | |