Requirements document

EIT digital MOOC dashboard and learning analytics tool

**Document status**

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| --- | --- | --- | --- |
| **Version** | **Date** | **Author(s)** | **Summary** |
| 0.1 | 24-08-2016 | Rianne Conijn | Creation document |
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## General description

### Main goal

The goal of the EIT digital MOOC dashboard and learning analytics tool is to aid the learning analytics based on the MOOC courses provided by EIT digital on the MOOC platform Coursera. The application should consist of a dashboard and an analysis tool. The dashboard should provide a graphical overview of the MOOCs developed by EIT digital, including the behavior of the students in these MOOCs. These graphical representations should aid teachers in improving their MOOC. Textual interpretations and recommendations should be added to guide the teacher in the improvement process of the course. The analysis tool should include data pre-processing and data export to aid learning analytics researchers in their analyses of the online behavioral data.

### Users

The EIT digital MOOC dashboard and learning analytics tool will be used by:

* **Teachers**: to get an overview of their course and students’ behavior in their course.
* **EIT digital data coordinator**: to get an overview of all EIT digital courses and students’ behavior in these courses.
* **Learning analytics researchers**: To aid learning analytics research.

### Definitions and abbreviations

MOOC = Massive open online course, a course provided online which is freely available for all types of learners.

Coursera = A (commercial) platform providing MOOCs. This platform is used for the EIT digital MOOCs.

Course item = A specific item in the MOOC, e.g. the Introduction video.

Course item type = A collection of items in the MOOC, from the same type, e.g. videos, quizzes, fora.

Learning analytics = Using data from learners and their environment in order to improve learning and teaching.

GUI = Graphical user interface.

## Requirements

### Functional requirements general (F.G)

#### Login

**F.G-A1.** Users who are granted access should be able to login with a username and password.

#### Import data

**F.G-B1**. Data should be imported from csv and html files made available by Coursera.

**F.G-B2**. The EIT digital data coordinator and learning analytics researchers should be able to import the new data per course in an existing course.

**F.G-B2**. The EIT digital data coordinator and learning analytics researchers should be able to import data per course from a new course.

**F.G-B3**. After a data import the dashboard and the analytics tool use the most recent data available from an import for all courses.

### Functional requirements dashboard (F.D)

#### Visualizations – overview dashboard all MOOCs

**F.D-A1.** The dashboard should give an overview of all EIT digital MOOCs, including: name MOOC, teacher MOOC, total amount of learners, total amount of learners passed, date last import.

**F.D-A2.** From the overview of all MOOCs, users should be able to navigate to a specific MOOC.

#### Visualizations – dashboard single MOOC

**F.D-B1.** The dashboard should give a (visual) overview of a single MOOC, including:

- **F.D-B1.1**. Dates of data export from Coursera (from/till)

- **F.D-B1.2**. An overview of the course characteristics (amount of weeks, videos, quizzes, etc.)

- **F.D-B1.3**. An overview of the amount of unique students following the course items over time (to indicate where/when students drop off).

- **F.D-B1.4.** An overview of the usage and key issues per specific course item type included in the course (video, quiz, peer-reviewed assignment, forum, resources).

- **F.D-B1.5.** From the overview per specific course item, users should be able to navigate to the specific course item types.

- (*FUTURE: more visualizations to be added*).

**F.D-B2.** The dashboard should give a (visual) overview of a every course item type included in the course (video, quiz, peer-reviewed assignment, forum, resources), including:

- **F.D-B2.1.** An overview of the amount of unique students following and total amount of uses of a course item of the specific course item type.

- **F.D-B2.2.** An overview of course items which need attention (e.g. because many students submitted an incorrect answer on a quiz question, a video was rewatched many times, etc.)

- **F.D-B2.3.** An overview of (approximated) time users have spent per course item.

- (*FUTURE: more visualizations to be added*).

#### Textual explanations, interpretations, and recommendations

**F.D-C1**. Textual explanations should be added to guide the users in what the visualizations mean, and how these can be interpreted.

**F.D-C2**.Textual recommendations should be shown to guide the users in improving the MOOC.

### Functional requirements analytics tool (F.A)

#### Select variables

**F.A-A1.** Users should be able to select variables for the export per student, including:

- Userid

- Courseid

- User information (timestamp user joined, country, region, profile language, browser language)

- Unique students per course item (started and finished)

- Total usage per course item (started and finished)

- Total time per course item

- Total usage per course item type (started and finished)

- Total time per course item type

- Practice quiz attempts

- Grades (peer-reviewed assignments, quizzes, MOOC)

- Quizzes passed/failed

- Peer-reviewed assignments reviewed

- Forum answers and posts

- (*FUTURE: more variables to be added*).

**F.A-A2**. Users should be able to select users for the export, based on logical operations on the variables stated in **F.A-A1**, e.g. “select all users where age>65 and unique\_videos\_watched>5” .

#### Export data

**F.A-B1**. The tool should allow export of the data for one ore multiple courses, based on the selection of the user.

**F.A-B2**. Exported data should be available in csv format.

**F.A-B3**. Data export should include all selected users in the rows (one row per unique course\*student combination) and all selected variables in the columns.

### Non-functional requirements (NF)

#### Access

**NF-A1**. For privacy and security purposes, the dashboard should be only accessible for users who are granted access by the data coordinator (i.e. EIT digital data coordinator, teachers of the MOOCs, learning analytics researchers).

**NF-A2**. The analysis tool should be only accessible for users who are granted access by the data coordinator (i.e. EIT digital data coordinator, learning analytics researchers).

#### Adaptability

**NF-B1**. Application should work under different kinds of browsers (at least: Chrome, Internet Explorer, Mozilla Firefox, Safari).

**NF-B2**. Application should have a proper layout in the different kinds of browsers

**NF-B3**. Lay-out should adapt to the different screen sizes, to maintain a proper layout.

**NF-B4**. (*FUTURE: application should work on mobile devices such as phones and tablets*)

#### Security

**NF-C1.** Users should be able to change their password.

**NF-C2.** Passwords should be encrypted within the database.

**NF-C3.** Database should be stored on a secure European server.

#### Privacy

**NF-D1.** Visualizations in the dashboard should include data of at least 5 students.

**NF-D2.** Data exports from the analysis tool should include data of at least 5 students per variable.

**NF-D3.** Data exports from the analysis tool should be anonymized as much as possible, i.e. does not include private information or information which could be traced back to one individual.

**NF-D4.** The application should comply with the most recent version of Coursera’s privacy policy: <https://www.coursera.org/about/privacy>.

#### Attractiveness

**NF-E1**. Textual information should not clutter the GUI.

**NF-E2.** GUI should give quick and clear overview of students behavior in a course.