Documentation

Design of the course

This paper aims at providing details on the design of the course. In the first section, we present the objectives with which the course was designed. In the second section, we describe how the course was implemented. In the third section, we give guidelines to create a course and to collect data on The Open University e-learning platform. Please note that we will refer to participants as students or learners interchangeably.

1. Presentation

a. Primary objective

The primary objective of the course was:

(*) to be accessible and open to anyone regardless their education background.

This was motivated by three main reasons: having the possibility to identify varied learner profiles, generalizing the results over different learner populations, and enabling a large diffusion of the course to collect data. Therefore, the content and the access of the course was made on a general purpose with relative choices on the topic and on the e-learning platform.

The only restriction we set for ethical concerns was on the use of the data of participants under 18. Even we ask consent of the participant to use of their anonymized data, we wanted our participants to be aged 18 or over and the course was not distributed under college/university.

b. Secondary objectives

Several objectives were met to comply with the primary one. These are the following:

(*) to involve participants in a learning process. This is crucial for the success of the course. To do so, we created the course with a training phase where we shared knowledge in a structured manner that the learner can explore and learn from and where the learner can self-evaluates their learning several times. The second phase is a testing phase where the learner takes the final exam.

(*) to present different format types and content types of the learning material. This is indeed necessary to identify different learner profiles to evaluate their strengths and weaknesses regarding these dimensions.

(*) to set a reasonable duration for the total learning experiment. The goal here was to put learners in the most equivalent conditions with a limited duration to capture their most natural way of learning, e.g., without extra time to study or external help.

(*) to put the course online. This was obviously needed to make the learning experiment accessible and open to anyone and to distribute it widely. Secondly, it was also important because we would like to allow tracking of non-declarative data, e.g., activity logs, to further process all the data conveniently.

2. Implementation

In this section, we now explain how we concretely built the course point by point.

a. Topic

The topic was a key question as it is directly related to the primary objective. It was indeed challenging to find a topic that is not specific to a particular level of education, regarding its learning difficulty, nor to a particular learner population with a common education background for instance. We prudently chose the brain as the main topic, its organization, its characteristics, and its functionalities, assuming that it is a general interest topic. We share basic and more detailed knowledge that anyone can handle without substantial prior knowledge. On the contrary, we select and present our learning material so that students with prior knowledge can learn different information than in class and that in the worst case this course serves as a revision. To take into account these situations in our analyses, the education background is asked from all participants in the questionnaire part of the learning experiment.

b. Structure

The structure of the course is related to the first secondary objective which is to involve participants in a learning process. As mentioned previously, the course was divided into two phases: a training phase where we shared knowledge in a structured manner that the learner can explore and learn from and where the learner can self-evaluates their learning several times, and a testing phase where the learner takes the final exam and obtains its final grade.

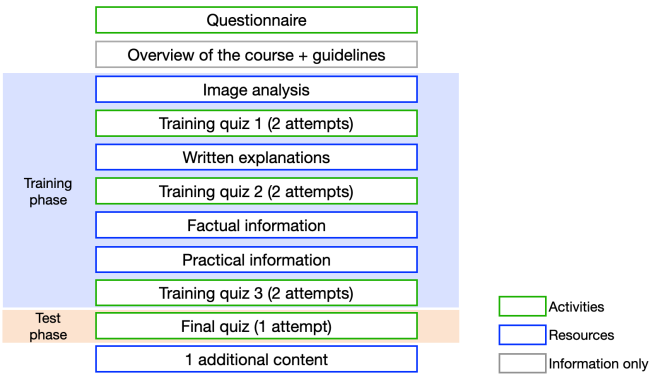


Figure 1: Structure of the course. Uniformly with e-learning platforms common vocabulary, we call *activity* any content where participants need to interact with the course (questionnaires, quizzes, etc.) and *resource* any content where participants only need to consult it (mostly learning material).

Moreover, the structure is also related to the second objective which is to present different format types and content types of the learning material. More precisely, the training phases was divided in four parts. Each part is about either one format type, among visual and written explanations, or one content type, among factual or practical information. Each part is composed by a learning material and a training quiz. This allows to evaluate learners' grades and by extension their strengths and weaknesses regarding these dimensions that is part of our analyses.

In addition to the course itself, we place a questionnaire and some guidelines at the beginning of the learning experiment. The questionnaire was designed to collect the data that cannot be automatically monitored such as demographic and personal information that participants have to declare.

c. Content

In this subsection, we present the content of the course that is structured around three sections which answer the following questions:

1. What does the brain look like? Which area corresponds to which function?
2. How does it interact with our body and our environment? How does it adapt to the experiences we have?
3. What are its characteristics? How can we benefit from its functioning?

The learning is guided by three training quizzes as self-evaluations and a final exam which is a final quiz.

Resource 1: To quickly grasp the organization and the composition of the brain to enable the understanding of Resource 2.

Quiz 1: Seeks to assess what has been retained and what has been understood or deduced (without the course explicitly sharing all answers) based on visual analyses.

Resource 2: To understand globally how the brain interacts with the body and the environment and how it changes when someone is learning.

Quiz 2: Same as Quiz 1 but based on reading comprehension.

Resource 3: To learn from some main characteristics of the brain on its evolution, shape and constitution.

Resource 4: To learn from the functioning cycle of the brain and sharing experience mechanisms.

Quiz 3: Same as Quiz 1 but based on either facts or practical information.

Final quiz: Same as Quiz 1 but based on every format type and every content type to give a global mark.

d. Grading

Each quiz is composed by half of the questions on memorizing information and the other half on deducing knowledge. It must be noted that academic data in this learning framework, e.g., the previous training quiz grades, are coherent with the final grade, also derived from a quiz, but consequently specific to this final evaluation material.

e. Duration

The duration of the course is related to the third secondary objective which is to set a reasonable duration for the total learning experiment. The duration of the whole learning experiment, including the course and the questionnaire, was set to 1 hour to be a trade-off between involving participants in a learning process with enough time and material, capturing their learning process in equivalent conditions (e.g., without extra time to study or external help) and demanding volunteer participants' efforts within a reasonable time.

f. E-learning platform

The platform hosting the course is related to the fourth secondary objective, which is to put the course online, because its choice depends on the features offered by the website. In our learning experiment, we chose a free e-learning platform named The Open University (OU) that has the advantage to offer a Moodle-based learning management system (LMS). Moodle is indeed the most widely used LMS in education so that it increases the chance to reproduce the experiment. Therefore, when manager rights are granted to run a course, OU permits the collection of numerous data, including the ones that we describe in Figure 2.

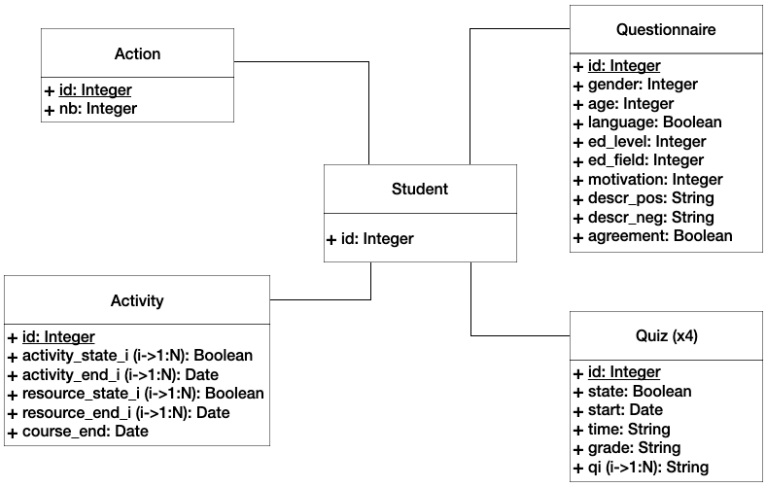


Figure 2: Relational model of anonymized and converted data (73 variables).

g. Review

The course had been reviewed by several teachers and volunteer students to provide feedback on their experience and on the relevance of the content. However, the creation of the course did not follow a specific protocol and can probably be improved.

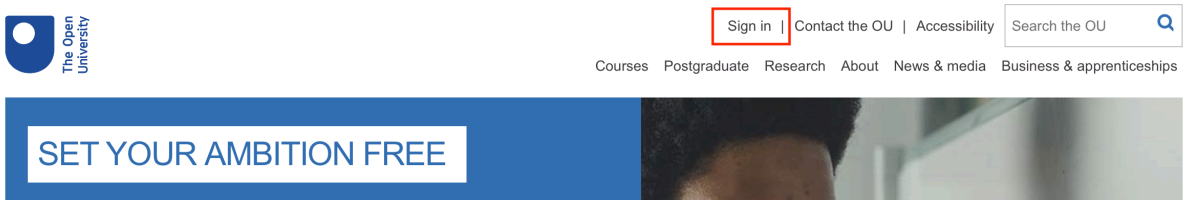
3. Guidelines

a. Create a course

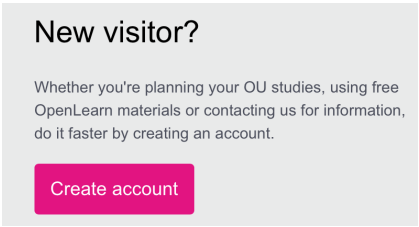
Create an OU account

Go to https://www.open.ac.uk.

Click on "Sign in" at the top right.



Click on "Create account" button in the "New visitor" subsection.

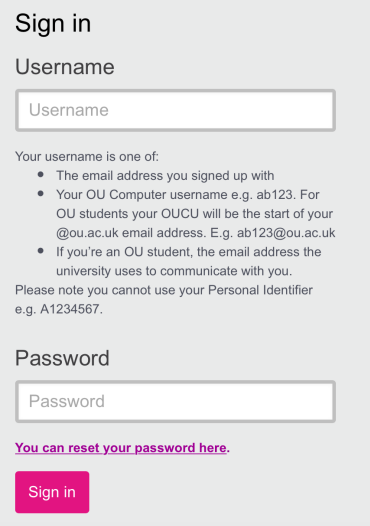


Fill out the form, accept the terms and conditions and select a contact preference ("Would you like to hear from us? y/n"). Click on "Submit".

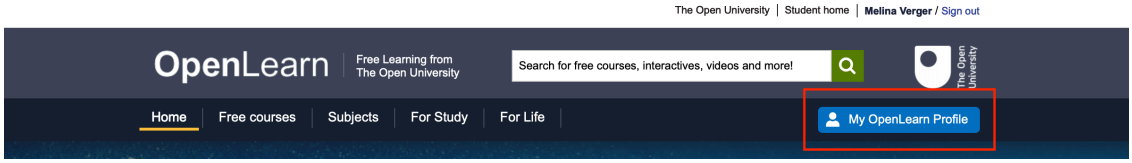
Wait to be redirected to the "Sign in" section. Check your emails to confirm your email address.

Create a new course

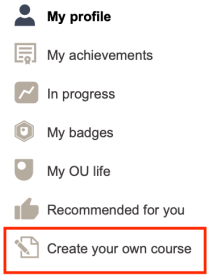
Sign in with the email username and the password you just created.



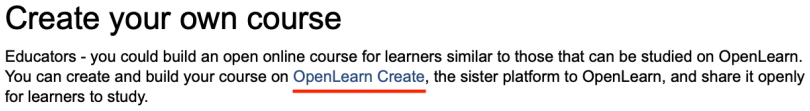
Click on “My OpenLearn Profile” button.



Click on “Create your own course” on the left side bar.



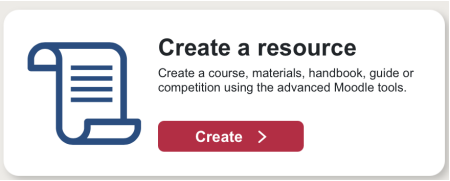
Click on the OpenLearn Create link.



Go to your profile by cliking on the “My Profile” button on the OpenLearn Create website you have been directed.

Click on “Create your own course” on the left side bar again.

Click on “Create” under the “Create a resource” subsection.



Fill the form keeping the “Type of resource” as “Course”.

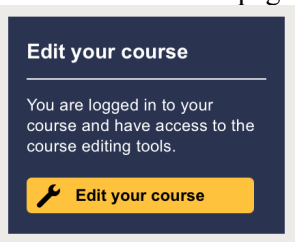
b. Collect data

To be able to have access to the data that the platform offers, you will need to ask manager rights to OpenLearn Create by sending them an email to openlearncreate@open.ac.uk. They will send you a form to fill in.

Identify the data to collect

On your OpenLearn Create profile, click on "Create" on the left side bar. Click on your new course.

You reach the main page of your course. Click on "Edit your course" button on the right square.



In the "Administration" left side bar, click on "Reports" to expand the list of available data to collect.

Download data reports

Still expanding the "Reports" list, click on the type of data you want. Filter the data. Find the "Download" button on the webpage. Choose the format of the desired file. Click on "Download". Be careful with the data you store, it could contain personal information you may not want to share (see the manager form to respect the conditions).

References

https://github.com/melinaverger/ed_project
https://www.open.edu/openlearncreate/course/view.php?id=6998
https://www.open.edu/openlearncreate/course/view.php?id=7827
https://www.open.edu/openlearncreate/course/view.php?id=7314