D 2.3

FOODI VLE

WP 2: CAPACITY BUILDING AND CURRICULA DEVELOPMENT

foodi
ERASMUS+ CBHE

Project Information

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Executive Summary

The report provides an overview of the online platform in terms of user requirements, developed features, content structure and methods of delivery. The report describes the design and development of the FOODI Virtual Learning Environment, the number and type of courses hosted (FOODI short professional courses) and the audience reached. The results of the design and development of the platform along with the online hosted content are described in the following Chapters:

- Chapter 2 presents the adopted methodology focusing on instructional design aspects and the different phases of design and implementation.
- Chapter 3 provides the technical overview of the web application: architecture, open-source software, installation methods and the main system components.
- Chapter 4 lists the main features of the platform from a navigational point of view, the functionalities offered by the platform, the structure of the content and the different methods of delivery.
- Chapter 5 provides details on the features for the online course management to be used by the members of the FOODI Course Team (FCT) during the MOOC lifetime.
- Chapter 6 illustrates the FOODI professional training in numbers, using data gathered from the analytics API.
- The last chapter summarizes the FOODI MOOCs report and provides a set of best practices as lessons learned during the design and development phase of the FOODI professional training courses.

Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including Commission services and project reviewers)	
CO	Confidential, only for members of the consortium (including EACEA and Commission services and project reviewers)	

1 INTRODUCTION

This report provides an overview of the online platform and the online courses that hosted during the project's lifetime. The design and development of the platform along with online content are structured around 4 different sections.

Section 2 presents the adopted methodology focusing on instructional design aspects and the different phases of design and implementation. Section 3 provides the technical overview of the application: Architecture, open-source software, installation methods and the main system components. Section 4 lists the main features of the platform from a navigational point of view, the functionalities offered by the platform, the structure of the content and the different methods of delivery. Section 5 provides details on the features used for the online course management during the MOOCs lifetime. The features are accessible by both LMS and CMS and they are targeting members of the FOODI Course Team (FCT).

2 Methodology – how the courses were developed

The FOODI online platform is based on the Open edX software . The Open edX software is an open-source technology focusing on learning easier and faster. It was created by MIT and Harvard University and was quickly supported by universities such as UC Berkeley, Georgetown and Stanford and companies such as Google and Microsoft.

This software platform is designed to engage students and teachers in an interactive and modular manner. It promotes active learning by using video snippets, interactive components, and game-like experiences.

Open edX powers edx.org MOOC portal with more than 6 million users, more than 500 available courses and around 50 involved international universities and business organisations, and it is considered a global success hosting blended and online courses all around the world.

The FOODI VLE hosted 8 different MOOCs covering the three partner countries:

- FOOD SAFETY VIA HACCP -designed and developed by UniKL
- FOOD SCIENCE & WELLNESS – designed and developed UM
- FOODI ACADEMIC STAFF TRAINING – designed and co-developed by FOODI EU partners (Academic Space)
- HALAL FOOD ASSURANCE – designed and developed UiTM
- INNOVATIONS IN SAFETY, QUALITY, AND SUSTAINABILITY IN FOOD PRODUCTION – designed and developed by AIT
- NEW FOOD PRODUCT DEVELOPMENT – designed and developed by UTM
- VALUE ADDED PRODUCTS FROM SEAFOOD INDUSTRIES – designed and developed by PSU
- FOOD PRODUCT DEVELOPMENT AND NUTRITION SECURITY – designed and developed by UHST

The Academic Staff training course consists of 6 modules developed by the EU partners (see D3.2)

The FOODI MOOCs were designed and implemented iteratively. To understand and agree on the delivery of the final product, several main factors had to be taken into consideration, including:

The main content development team consisted of 10 different groups with complementary areas of expertise that needed to be reflected in the content: From food packaging and marketing to innovative food production techniques.

The MOOCs were a completely 100% online learning experience. This affected the role of the Instructor. The Instructors acted more as facilitators/mentors/moderators than a Professors lecturing in a campus class environment.

All FOODI online resources were released under the Creative Commons Attribution-ShareAlike, meaning that a user has to:

Give appropriate credit, provide a link to the license, and indicate if changes were made. The user may do so in any reasonable manner, but not in any way that suggests the licensor endorses the user or his use.

Distribute his contributions under the same license as the original given any remix, transformation, or build upon the material.

From a technical point of view, the platform was up and running 24/7 more that one year. During this wide uptime service duration, updates and maintenance tasks should also take place so the "maintenance tasks" should be implemented during low traffic time zones.

It was clear from the very beginning that the realisation of such a complex process should take place in different and concrete steps, including small iterative cycles where it was feasible.

ReadLab, as coordinator of the development of the MOOC platform, adopted the main points of the ADDIE instructional design model towards splitting the tasks between the different actors and facilitating parallel work for time effectiveness. The key phases of the ADDIE model are depicted in the following picture.
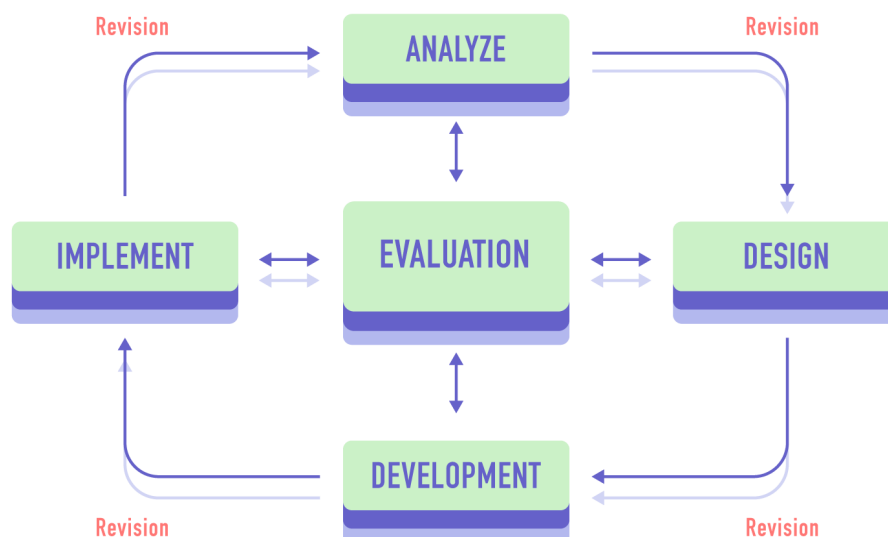

Figure 1 ADDIE instructional design model – Wikipedia

Analysis

During the analysis phase, the target audience and the overall objective of the courses were set. The overall description of the FOODI courses were mainly defined in this step and its contents are described in more detail in Section 4.

Design

During the design phase and based on a set of learning objectives, the following key concepts were defined:

Instructional strategy. The main outcome was to combine various resources and tools for delivering the content and be able to allow flexibility on the module level. The majority of the modules were designed to include video lectures as the basic delivery method. In contrast, the rest of the modules were structured around a combination of text/pdf and short videos – including external sources. The instructional strategy was reflected in the Course Outline template, where a clear learning sequence per lesson was defined.

Horizontal aspects. All modules included a set of assignments at the end. In addition, all video lectures had downloadable scripts and subtitles. All pdf files were downloadable.

User engagement. The engagement of learners strongly depends on the user experience of the online course. A user-friendly interface along with a clear learning sequence design ensured a smooth flow of topics and builds on learned concepts and ideas. Each lesson was unlocked upon successful completion of the previous one, in an effort to create "internal goals" during the participant's learning path.

Moreover, the partnership decided to create an award (FOODI Certificate) for the successful learners

Acquire user feedback. To better analyse and evaluate the FOODI learning experience, a set of questionnaires were designed to be integrated in the online platform (Pre-course and Post-course survey).

The outcomes of the design and analysis phase are fully described in D2.7 FOODI VET courses.

Development

During the development phase, the platform (OpenEdx) was installed and configured according to the design specifications. The developed content followed the micro-learning approach and was split into several learning components (see section 4.3). The next step was to define the FCT. Each partner provided at least one Instructor who onboarded on the online platform in order to review the content in the online version and be in charge of the delivery. The authoring tool was managed by ReadLab, while all Instructors were able to review and provide feedback on the online content before its final release.

A major part of the work was devoted to creating the subtitles of all video lectures in the 5 language versions.

Define roll-out timeline. The final dates of each MOOC depended on the progress of the two major tasks:

- Installation, user acceptance testing and configuration of the learning platform
- Development of the content and integration into the platform.

The first stand-alone task was finalised before the actual learning material was developed. ReadLab created a testing environment for deploying and testing the needed features of the application. Internal testing and manual QA tasks were performed in order to ensure stability and smooth operation of the application. The next step was to deploy the application to an identical environment - "production environment" – where the learning material would be hosted.

The second task was implemented in short iteration cycles. The work was organised around the "first come – first served" concept. Each individual piece of learning material was created by the content developers (FCT), uploaded to the platform and tested online. Upon reaching an 80% readiness for the online course (features, content, testing), the FCT was able to provide accurate opening dates for each MOOC.

An important factor was to define the opening of enrolments some days before the starting date – this setting allowed prospective users to see the courses in the FOODI course catalogue and view the description of each course and enrol. During the "enrolment window", the project partners had the chance to disseminate and communicate the announcement of the FOODI MOOCs through the well-established FOODI network mechanisms.

Both design and development phases were facilitated by the two study visits in Dublin and Salerno. Especially in Salerno, Readlab had the possibility to lead a MOOCs workshop were instructors had the chance to perform hands-on work in designing and defining the basic structure of their courses straight on the FOODI VLE. This was a very didactic experience and provided helpful information to the instructors about the look and feel of the final online product.

Implementation and roll out

The *"FOODI Academic Staff training"* course materials were developed in 2020. Its final version was published online in **July 2020** and was up & running for at least one year. The rest of the MOOCs were developed and released during 2022.

The final structure of the FOODI MOOCs is depicted in the following pictures.

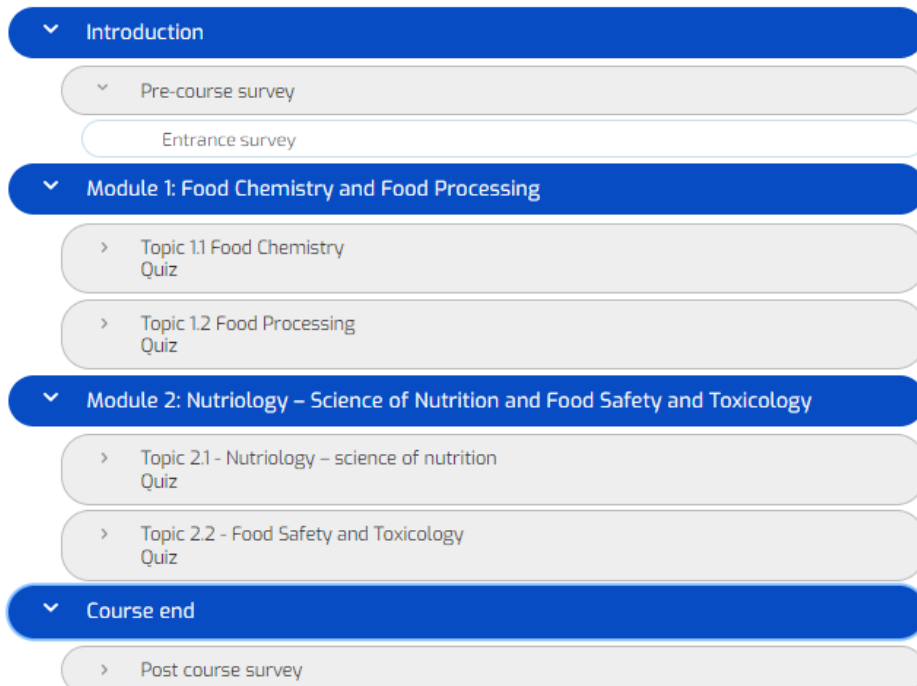*Figure 2 MOOC Structure - Food Safety via HACCP*

Figure 3 MOOC structure - Food science and wellness

Figure 4 MOOC structure - Halal Food Assurance

Contents

> Innovations in food quality ingredients

> Food Quality Management Systems (FQMS)

> Food Safety Management Systems (FSMS)

> Sustainability in the context of Waste management including regulations throughout food supply chain systems

> Exit survey

Figure 5 MOOC structure - Innovations in Safety, Quality, and Sustainability in Food Production

The principles of food safety and its role in new food product (NFP) development, food legislations and food-borne hazards.

Introduction ✅

Food Safety

Food Safety - Legal issues ✅

TRENDS AND INNOVATIONS ✅

HACCP CERTIFICATIONS ✅

Knowledge check

Slides

Raw Materials and Source of Supply

Introduction ✅

Raw Material Issues ✅

Sources Of Supply ✅

Traceability ✅

HACCP IN NFD DEVELOPMENT ✅

Slides

Product design and Process Development ✅

Introduction ✅

Introduction to product design and and process development ✅

Design Process ✅

Design Process Steps ✅

Product testing ✅

Product formulation and packaging ✅

Product Marketing ✅

Product And Process Specifications And Marketing Strategies ✅

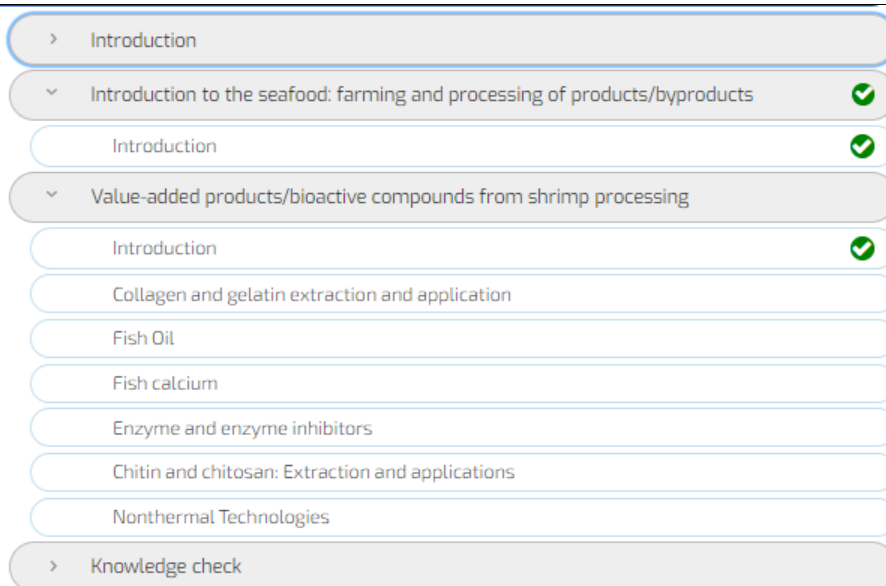*Figure 6 MOOC Structure - New food product development*

Figure 7 MOOC structure - Value Added Products from Seafood Industries

Figure 8 MOOC Structure - Food Product Development and Nutrition Security

For each of these MOOCs, a custom course description page was developed publicly available acting as an extra level of information for individuals wished to get an overview of the training material before creating an account into the FOODI VLE.

The UniKL case

UniKL decided to support its MOOC with synchronous meeting tools and used MICROSOFT TEAM as the platform due to its availability and familiarity with UniKL and the participants. To increase the number of participants, a poster banner was created for online VLE and distributed in online UniKL Facebook and circulated among WhatsApp groups to students, staff and alunis of UniKL MICET.

77 participants enrolled and accessed the training materials. The structure is in line with the rest of the FOODI professional courses, thus all participants had to

- Register for the course using online form provided
- Fill up the pre course survey
- Attended or listening to recording of introductory class
- Go through all the materials given (Module 1a, 1b, 1c and 1d) and (Module 2a and 2b)
- Perform the assessment within the specified period of time
- Pass the course (participant need to obtain at least 50% of the total course marks)
- Fill in the post course survey.
- After this session, all materials were populated into the FOODI VLE as a self-paced professional training course.
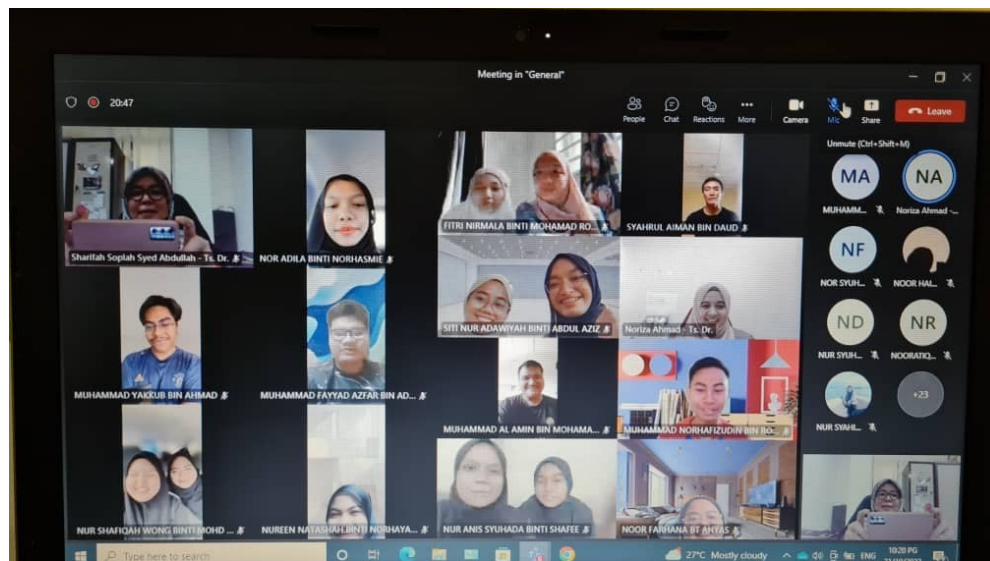

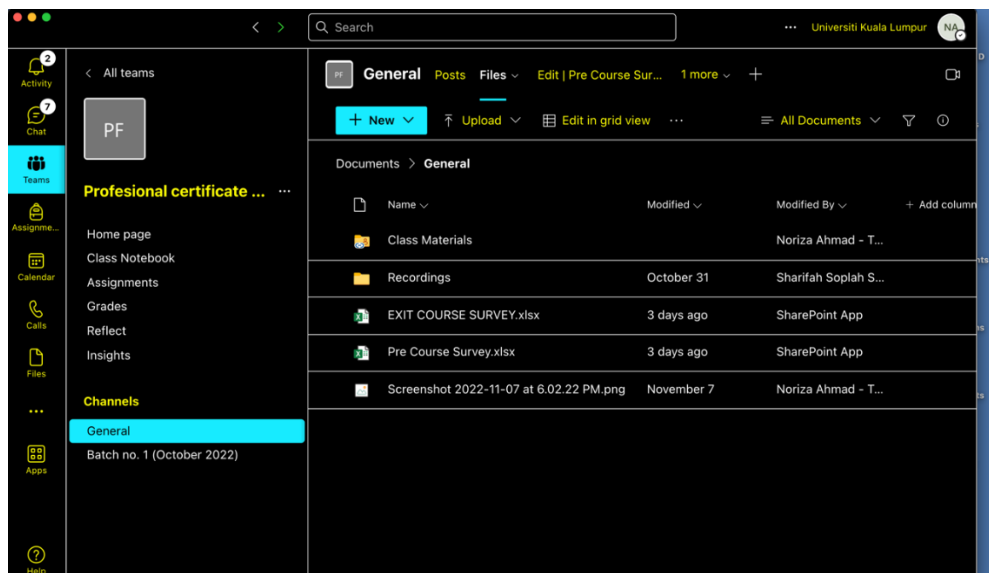*Figure 9 UniKL MOOC delivery - introductory online meeting*

Figure 10 Training material

3   Technical Overview

The FOODI learning platform is a web-based implementation for creating, delivering, and analysing online courses. The platform has been installed on a dedicated server supported by ReadLab.
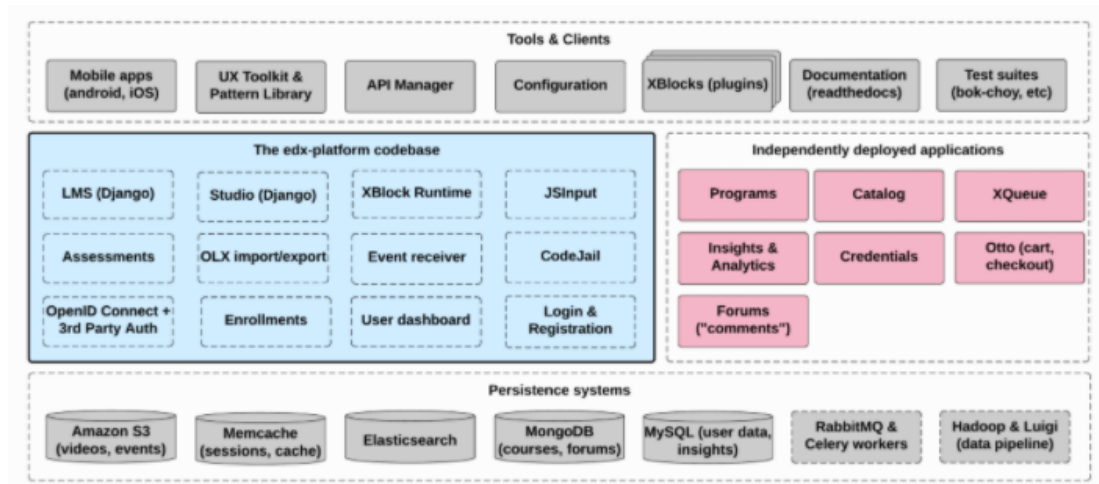

Figure 11 Open Edx reference Architecture

The platform is supported by a collection of autonomous web services called independently deployed applications (IDAs) in order to address scaling and expandability needs. The vast majority of the back end or server-side services are implemented in python, the front-end is based on the Django web application framework, while the browser-side code is written primarily in Javascript supported by SaaS[1], Backbone.js[2] and Bourbon[3] frameworks. At the centrepiece there are the two key components: the FOODI Learning Management System (LMS) and the FOODI Content Management System (CMS). The CMS or Studio, is the authoring tool where the FCT creates, updates and manages the course. A number of several heavy tasks are performed by separate background workers rather than in the web applications themselves. These tasks are queued and distributed using Celery[4] and RabbitMQ[5].

Examples of such tasks performed in the FOODI platform are:

- Sending bulk emails to enrolled users
- Generating distribution reports related to learner progress
- Producing Certificates of Course completion

The FOODI learning platform supports the latest versions of the most common browsers. For best performance Chrome and Firefox were recommended. The application also supports the latest versions of Microsoft Edge, Microsoft Internet Explorer and Opera.

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[1] https://sass-lang.com/
[2] https://backbonejs.org/
[3] https://www.bourbon.io/
[4] http://www.celeryproject.org/
[5] https://www.rabbitmq.com/

3.1 Learning Management System

The LMS is the most visible part of the platform where learners interact during the online course lifetime. In addition to the learners' view, the LMS provides an instructor dashboard that users with Admin or Staff roles can access with enhanced functionalities. As depicted in Figure 11, LMS uses several data storages of different technologies. Information relevant to the course organisation and structure is stored in MongoDB, while user data is stored in MySQL. All FOODI video lectures were served through a dedicated YouTube channel.

The structure of the courses consists of units called XBlocks. The Xblock specification is a key component architecture designed to facilitate the creation of new online education experiences. In educational applications, Xblocks are employed to represent custom features like individual problems, web-formatted text and videos, interactive simulations and so on. The FOODI Xblock suite currently implemented is described in detail in section 4.3, considering the two basic designing criteria:

- All Xblocks are independent of other Xblocks.

- All Xblocks should work together with other Xblocks and be combined in flexible ways.

3.2 CMS

Content Management System or Studio is the course authoring environment. The FOODI course team uses this application to create and update any course material and manage course schedule and grading policy. Studio utilises documented and open XML standards (OLX) to import/export created courses and provides access to rich 3rd party tools or additional building blocks (YouTube, Google shared documents, webinar tools, etc.). The data created here is stored in the same Mongo database that the LMS uses

3.3 Installation

The FOODI online platform was developed by ReadLab in June 2020 and it was publicly accessed through the link: *https://vle.FOODI-project.eu/*

Installation and technologies used. The main application was installed in a dedicated server hosted by ReadLab, and it was based on the open edX Ironwood release [6]. The tutor distribution was employed to simplify the process of deployment and facilitate future updates and debugging.[7].In general, the Tutor distribution separates the configuration logic from the deployment platforms, allows for running application processes in cleanly separated docker containers and provides user-friendly commands for common administrative tasks and monitoring.

Maintenance tasks, debugging and updates were performed during low traffic time zones, i.e. weekdays after 23.00 CET.

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[6]https://edx.readthedocs.io/projects/edx-installing-configuring-and-running/en/latest/platform_releases/ironwood.html

[7] https://docs.tutor.overhang.io

4   The FOODI Virtual learning Environment

4.1 Getting started

The FOODI platform can be accessed through the link: https://vle.FOODI-project.eu/. Users have direct access to the available course descriptions and can retrieve information related to information management regarding the platform and the FOODI project.

ReadLab has designed and deployed a custom theme following the visual identity of the FOODI project, ensuring responsiveness. The FOODI platform design is ideally in line with the FOODI website taking into consideration the main visual elements such as the project logo, colours, fonts, sizes, buttons, labels, etc.

The landing page of the FOODI MOOC is depicted in the following picture. The platform provides an initial set of information to the user without registering in the platform, including:

- A Welcome message
- A course information page (detailed description is following)
- Footer links describing the Terms of Use, the Privacy Policy and the Honor Code governing the use of the platform
- Footer links to external content such the project website and the partners of the FOODI consortium
- The EU emblem with the accompanying text « The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein» being in line with the Erasmus+ visual identity and logos[8].
- Search functionality for finding courses provided by the FOODI platform. The search functionality has been enhanced with language filtering since it the online course was published in 3 different languages i.e. EN, FR and AR.

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[8] https://eacea.ec.europa.eu/about-eacea/visual-identity-and-logos-eacea/erasmus-visual-identity-and-logos_en
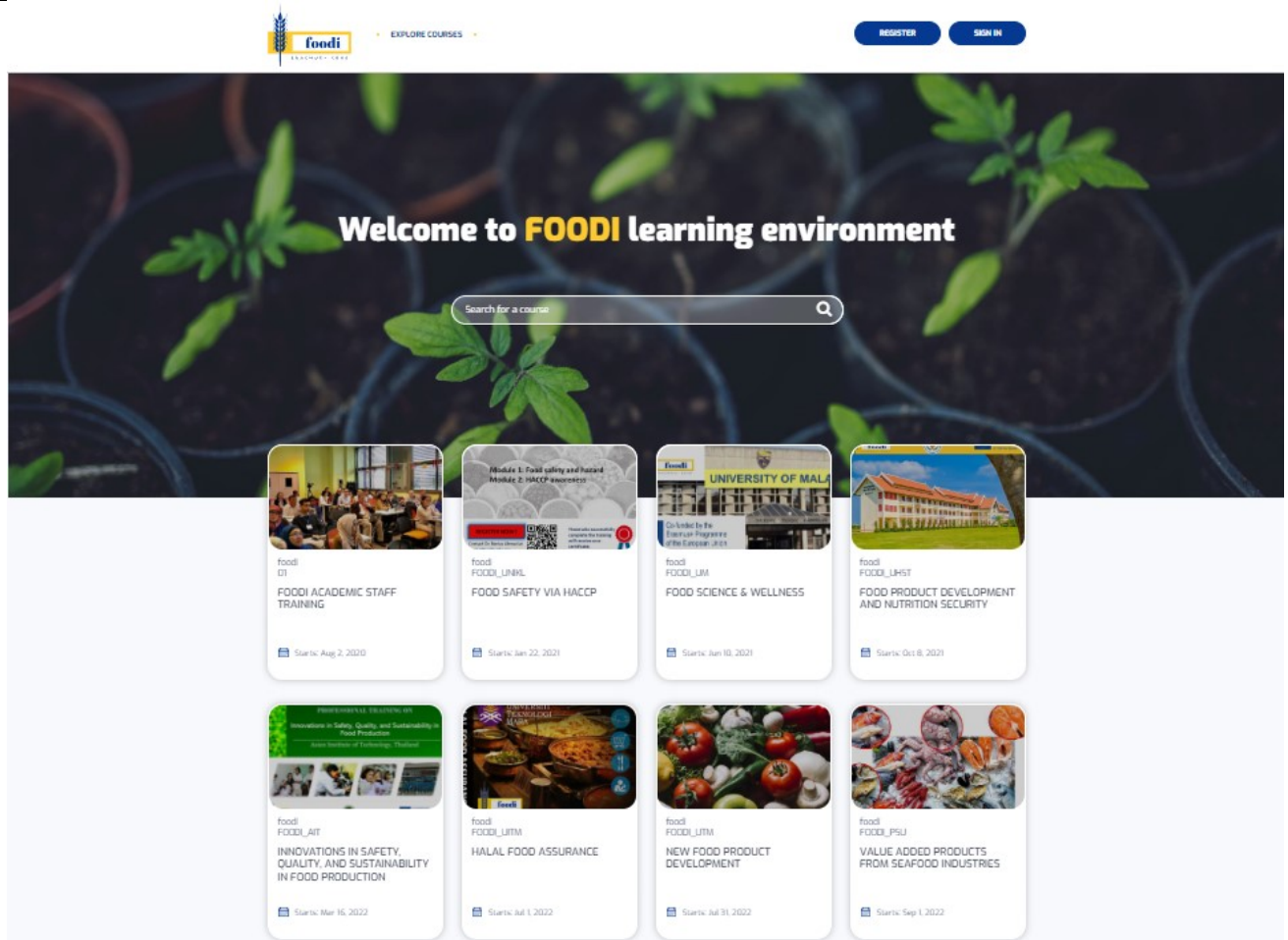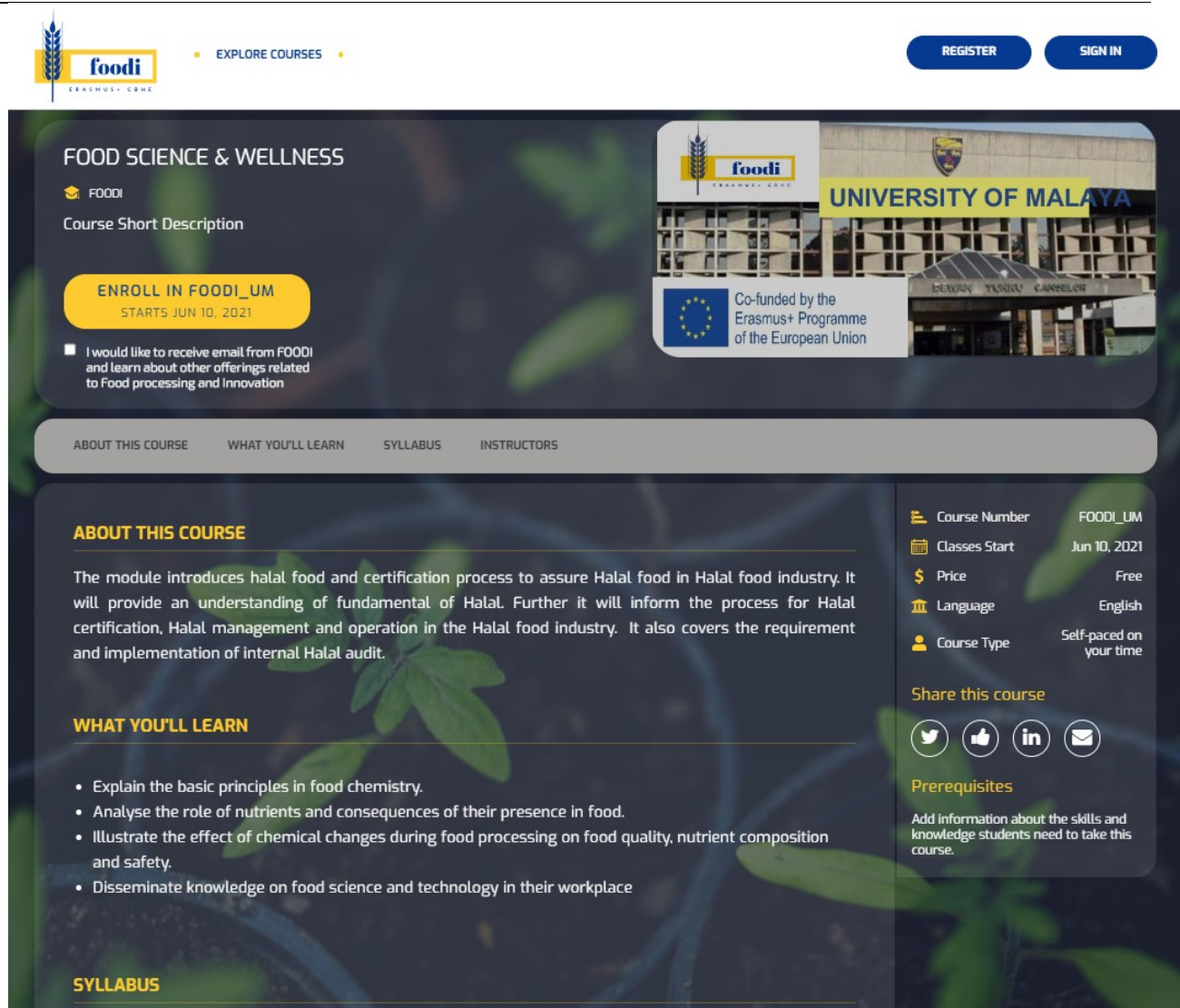
Figure 12 FOODI MOOCs catalogue

Course description

The course description page includes the following information:

- A general description of the online course including pre-requisite information and target groups
- Main learning objectives and outcomes
- An overview of the course syllabus and the structure of the modules
- General information about the course including estimated effort, delivery language, course type, i.e. self-paced vs instructor paced, prerequisites and social media sharing.

The course description page is handled (edit, update) through the FOODI CMS.

Figure 13 Course description web page

Useful Information

Apart from the course catalogue, the landing page contained links related to information regarding the project results and partners.

- **Project**. This is an external link to the project website
- **Contact**. A list of emails related to course management and technical support
- **Privacy Policy.** This page informs the user about the description of the service and provides detailed information related to personal data storage and processing. More specifically, it lists the data stored during the registration process and the data processed during the interaction with the platform. The latter is used for assessing user participation, engagement, and performance.
- **Terms of Use**. Users are informed of the Terms of Service that govern the FOODI learning platform and are owned and operated by the members of the FOODI consortium. It consists, among others, of information related to platform accessibility, security rules, License agreements, use of personal information, etc.
- **Honour Code**. Users are informed about user posting rules and their responsibilities regarding the proper use of the FOODI platform. A list of strictly prohibited items is included at the end of the document.

Figure 14 MOOC Privacy Policy

Finally, the footer includes the EU emblem as well as the social media links of projects as they are depicted in the following picture.
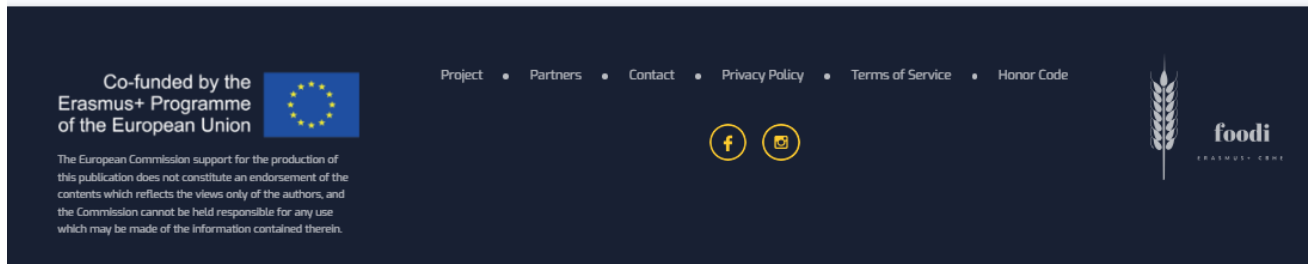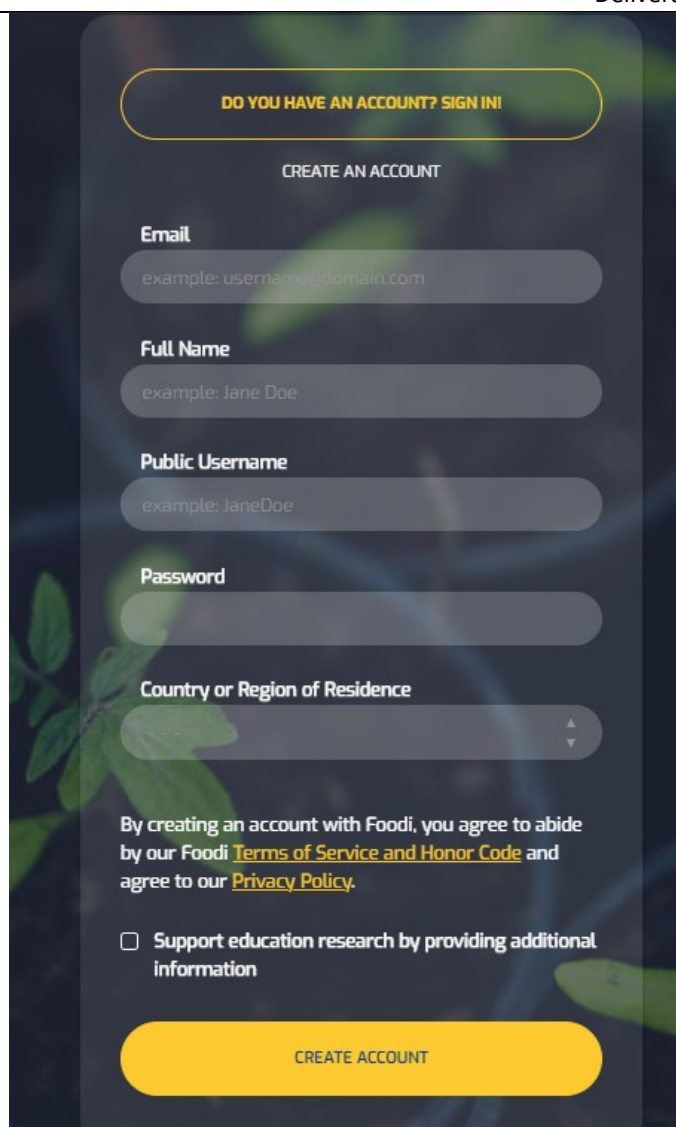
Figure 15 Landing Page- Footer information

Registration

The user needs to create or register an account to the FOODI platform to get started. Upon creating a FOODI account, the user has then the possibility to access/enrol in all FOODI available courses.

The registration functionality is a two-steps process. The user creates the account by filling in Email, Full Name, Public Username and Password and country of Residence. The second step is to activate his/her account through an activation link sent to his/her registration email. The registration process is performed only once. Having the account activated, the user can login/log out or change the password.

Figure 16 Registration form

The FOODI online courses were open to all users around the world. The users, upon registration, had the chance to enrol and attend the FOODI online courses. However, there were a few cases where the instructors had to register learners upon request. This functionality was supported by the Manual Enrolment feature, where the FCT manually enrolled the learners. In the case of unregistered learners, they were asked to first register on the FOODI platform through an automatic email. This functionality was mainly used for inviting specific users-experts to pilot the FOODI platform.
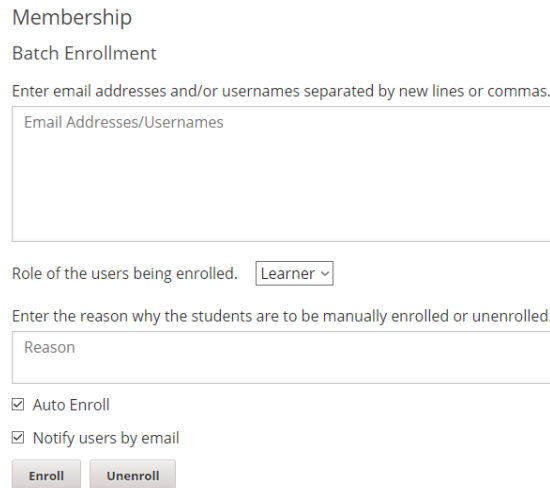
Membership

Batch Enrollment

Enter email addresses and/or usernames separated by new lines or commas.

Email Addresses/Usernames

Role of the users being enrolled.   Learner ⌄

Enter the reason why the students are to be manually enrolled or unenrolled.

Reason

☑ Auto Enroll

☑ Notify users by email

Enroll   Unenroll

Figure 17 Manual enrolment

Account features

Each registered user had access to specific course contents, profile and account settings.

Dashboard. The dashboard provides information on the status of courses where the user is enrolled. It includes Start/End date, email settings and acquired certificates. The user also has access to the content of archived courses with limited functionalities, e.g. no certifications are generated after course completion.

Account settings. Includes registration information and additional optional fields such as Education Completed, Gender, Year of Birth, and preferred language. Finally, through this feature, the user can link or unlink his/her social media accounts to the FOODI platform.

Profile Page. The profile page allows sharing information with the FOODI community by defining a complete profile. The learners' profile can be displayed through the discussion page upon selection of its username.

4.2 Course content and navigation

Each registered user has access to course contents upon enrollment and given that the course is released. Therefore, all FOODI courses are open to registered users (Educators, students, professionals, and self-learners).

The following section describes the structure of the FOODI courses and the underlying instructional design methodology and the navigational capabilities of the platform.

The microlearning approach

The FOODI user interface offers a brief course outline that helps learners see the full scope of the course contents and facilitates them to return to the last content area they were viewing. In the following picture, the outline of the course is presented. The course is structured in a modular manner and organised in sections (Weeks or Modules) and subsections (lessons). This is in line with the relatively new micro-learning concept. With microlearning, the content is broken down into bite-sized pieces of learning material. This

instructional approach is very efficient when incorporating various learning styles, and the basic design elements adopted during the FOODI online courses were:

- Granularity. The learning strategy focuses on narrow concepts or topics considering the respective learning objectives. This allows learners to learn complex concepts in the shortest amount of time.
- Briefness. Even though there is no strict limitation regarding the duration of each teaching unit, the components of the learning process were short. For example, the created video lectures were maximum 12 minutes in duration.
- Diversity. The FOODI learning material has the form of a video presentation, online text, quiz and book chapters as supporting material. The FOODI Staff team coupled visuals and audio to improve the microlearning impact. Combining visuals with audio helps in better retention of the information or recalling it in the future. Still, they are also powerful tools to engage learners and make learning a lot more comprehensive.

Modularity – navigational form

As a consequence of the micro-learning approach, the FOODI training material was built up of many bite-sized components, including different learning components. This was a major challenge as the content developers needed to switch from the traditional campus classes which are structured around hour-long lectures.

The modular approach is more suitable for online settings and provides several benefits. For example, learners can more quickly find compactly organised reference information about a specific topic without having to scroll through many texts or scrub through an hour-long video to find the one piece of information they were looking for.

Learning modules are organised so that learning material (e.g. video modules/reading material/PowerPoint presentations) alternate with exercises. This structure facilitates any updates or re-organisations needed during the course lifetime since it minimises the impact on adjacent material.

In this context, the architecture of the FOODI courses included the following general building blocks:

- The course outline is the container for all the course content. The outline contains one or more sections.
- Course sections (Modules/Weeks) are at the top level of the course and typically represent a period. A section contains one or more subsections.
  - Course subsections (Lessons) are parts of a section and usually represent a topic or other organising principle. Subsections are usually called "lessons" or "learning sequences". A subsection contains one or more units.
  - Course units are lessons in a subsection that students view as single pages. A unit contains one or more components.
  - Course components are objects within units that contain the actual course content: Videos, reading material, problems/quizzes and discussion forums.

Figure 18 FOODI Course Structure – Exampe from Food science and wellness

This structured approach helped to switch between modules and lessons or topics quickly. Navigation between lessons during the learning process is intuitive and the learners can always see where they stand and how many lessons are left for the current lesson/subsection. In addition, it was easy to understand whether there were some assessments to complete. In the figure above, this is depicted with the keyword Quiz. The Units are organised into small learning components, each acquiring a maximum of 30 minutes to walk through them. In addition, they are of different types, bringing together videos, presentations and self-assessment quizzes.
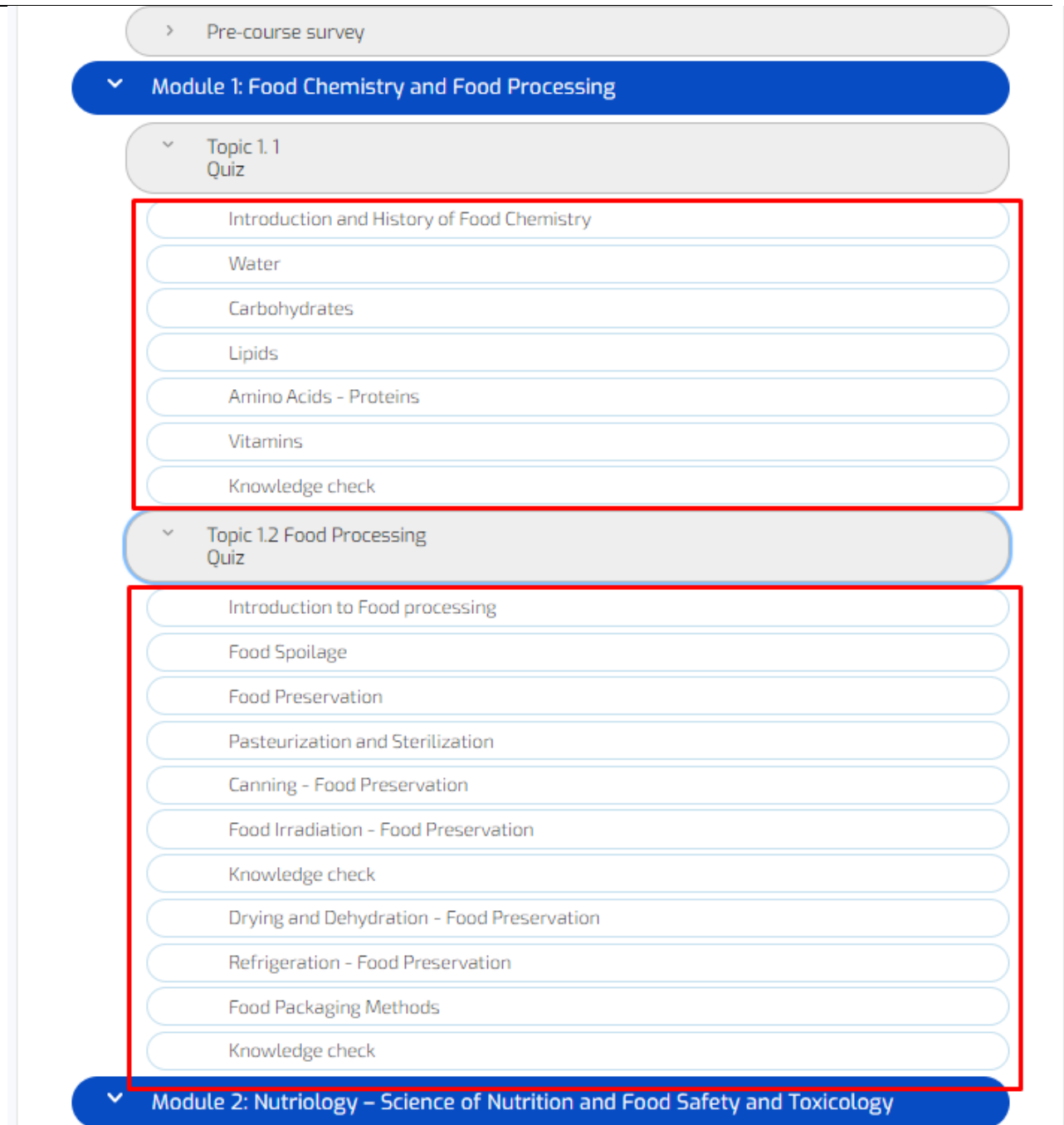
Figure 19 Example of a course outline and navigation

The structure of the content and the navigational form are depicted in Figure 20*. Each lesson was structured as a series of units forming the "learning sequence". The learning sequence comprises a set of different learning experiences combining free text, pdfs, online videos lectures, different types of assessments, discussion spaces, etc. From a User eXperience (UX) perspective, the learner is constantly aware of his web path through a horizontal navigation toolbar as highlighted in the picture below. In addition, he is informed that he has already visited the respective unit through an automated green check box. The linear navigation form is clean, practical, engaging and results in a great learning experience since the learner is focused on a specific learning objective and not distracted*

In this example, the learning material or learning sequence is built up in 7 different units i.e. single web pages. The user is aware from the very beginning that the content is delivered in 2 different methods: reading material in the form of online text or slide based and an assessment at the end of the learning sequence. The location is clear (purple box), and clickable, i.e. the user can click on the path and return to the main page. The digital pedagogy behind this sequential navigational flow or lean UX is to "instruct" the user to go through the whole lesson and not provide space and options for abandoning the current lesson space. In addition, in the left-hand side of the page the course outline is depicted.
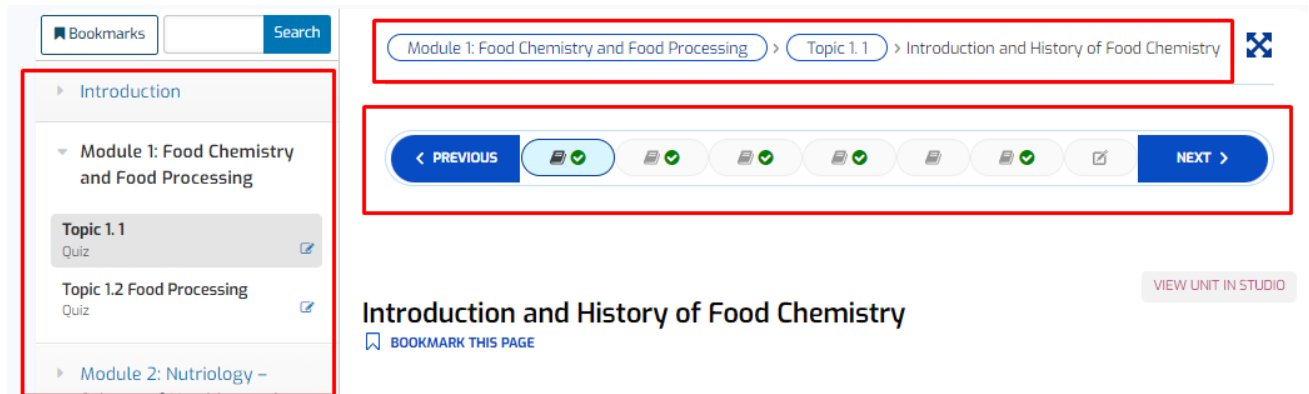
Figure 20 Learning sequence organisation – Module 3, lesson 1 example

4.3 Learning components in FOODI MOOC

The following methods of delivering the learning material (Xblocks) were employed.

Video component

All FOODI video lectures are hosted on a dedicated YouTube channel. They are integrated into the FOODI MOOC platform through a built-in YouTube player offering the following controls/functionalities as depicted in Figure 12:

- **Play/pause**. Each user can play and/or pause the video by selecting this control
- **Time information**. The first number indicates the length of the video already played and the second the total duration.
- **Playback bar**. Offers the capability to go to a different point in the video by selecting and dragging or by using the left and right arrow keys.
- **Speed**. The video can be played faster or slower.
- **Volume**. Adjust the volume of the sound
- **HD**. By selecting this control, the video can be played in HD mode. All FOODI videos were created with a minimum of 720p resolution (HD ready), so users with a fast internet connection had the opportunity to exploit this option fully.
- **Full screen**. Expand the video to fill the browser window. Selecting this control again or through the ESC button, the screen is returned to default mode.

The Growth of Halal Food industry

🔖 BOOKMARK THIS PAGE

Figure 21 Video component

Html component

A significant part of the learning material was presented as text utilising HTML code that is formatted and presented by the supported browsers. The following picture displays an example of such a component. All relevant elements (headings, colour, size, font family, etc.) are handled through the FOODI Studio application and the built-in HTML editor.

HTML source code

```
1  <p style="text-align: justify;"><span style="color: #993366;"><strong><span style="font-family: verda
   geneva;"> FOOD SAFETY AND CONSUMER RIGHTS</span></strong></span></p>
2  <p style="text-align: justify;"><span style="font-family: verdana, geneva; color: #000000;">Consumers
   have a right to expect that the foods they purchase and consume will be safe and of high quality. The
   have a right to voice theirs opinions about the food control procedures, standards and activities tha
   governments and industry use to ascertain that the food supply has these characteristics. </span
   </p>
3  <p style="text-align: justify;"><strong><span style="font-family: verdana, geneva; color: #993366;">F
   SAFETY RELATED LEGISLATIONS</span></strong></p>
4  <p style="text-align: justify;"><span style="font-family: verdana, geneva; color: #000000;">These are
   food safety standards practiced in Malaysia:</span></p>
5  <ul>
6  <ul>
7  <li><span style="font-family: verdana, geneva; color: #000000;">Food Act 1983</span></li>
8  <li><span style="font-family: verdana, geneva; color: #000000;">Food Regulation 1985</span></li>
9  <li><span style="font-family: verdana, geneva; color: #000000;">Food Hygiene Regulation 2009</span></
10 </ul>
11 </ul>
12 <p style="text-align: justify;"><strong><span style="font-family: verdana, geneva; color:
   #993366;">GLOBAL FOOD SAFETY ISSUES</span></strong></p>
13 <ul style="text-align: justify;">
14 <ul>
15 <li><span style="font-family: verdana, geneva; color: #000000;">Food Borne Illness</span></li>
16 <li><span style="font-family: verdana, geneva; color: #000000;">Food Adulteration</span></li>
17 <li><span style="font-family: verdana, geneva; color: #000000;">Climate change</span></li>
18 <li><span style="font-family: verdana, geneva; color: #000000;">Need for reduction of food waste and
   efficient use of natural resources such as clean water</span></li>
19 <li><span style="font-family: verdana, geneva; color: #000000;">Pesticide residue</span></li>
20 <li><span style="font-family: verdana, geneva; color: #000000;">Healthy Diet</span></li>
21 </ul>
```

Figure 22 HTML component example

PDF component

PDF component allows integration of PDF files into the MOOC environment. Each pdf is hosted in the MOOC platform, and it is presented inside a single unit. The file can be directly scrolled, printed or downloaded by selecting the appropriate control buttons.
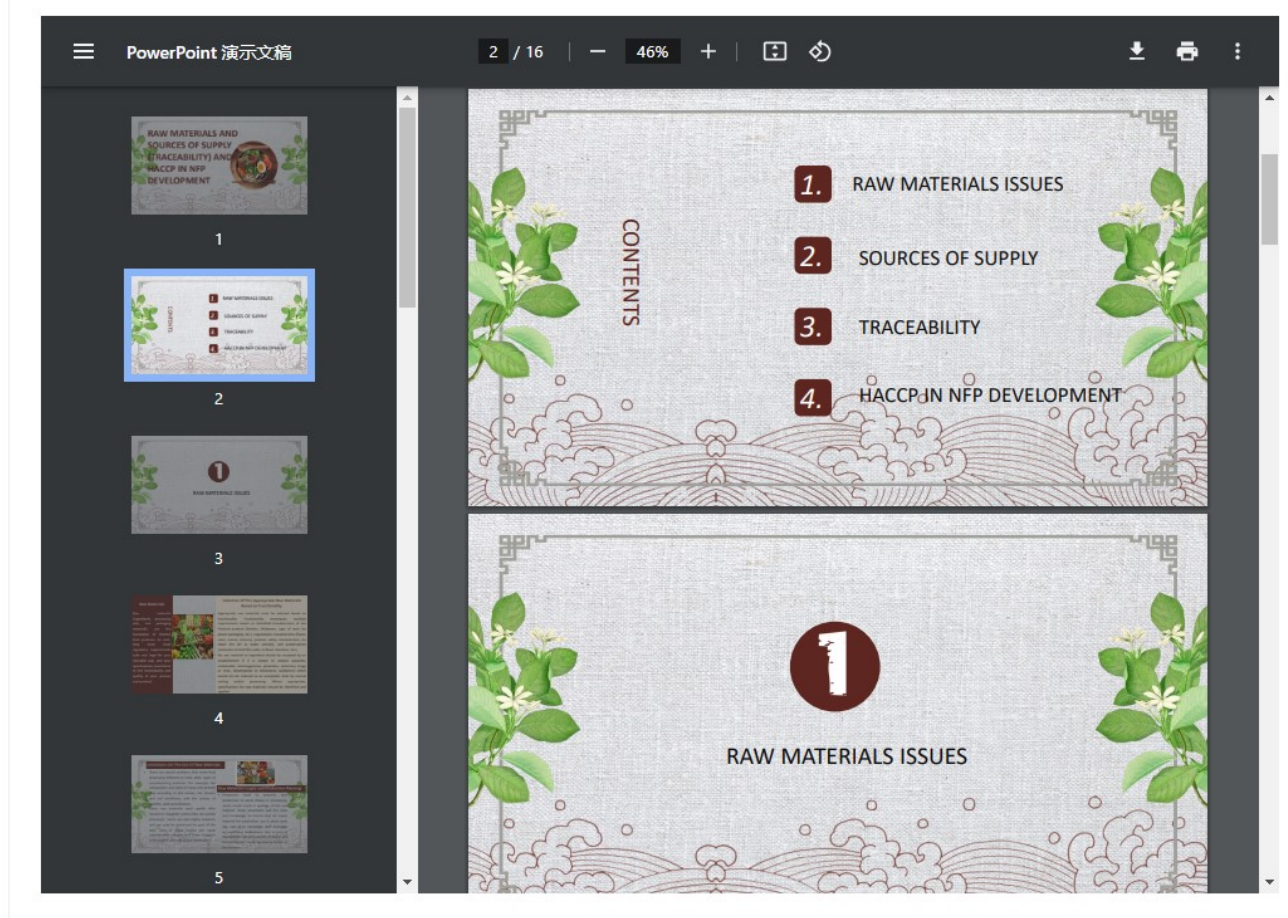
Figure 23 PDF component

Problem component

The assessment of the learners' progress was realised through a set of problem components in the form of multiple-choice questions. At the end of each lesson (learning sequence), the user had the chance to perform this kind of activity and acquire instant feedback. In addition, after the final submission, the learner had the opportunity to see the correct answers.

The score obtained by the Quizzes contributed to 59% of the total grade (see section Grading Policy for more details).

1. This animal is a Halal source

○ True

● False ✖

Answer
Incorrect:
There are no a such Islamic religious prohibitions to consume vegetarian animals like cattle/cows because of commonly raised as livestock.

2. This animal is a Halal source

● True ✔

○ False

4.4 *Progress page*

A dedicated web page was configured to display the progress of each learner. A column-based graph was automatically updated based on the results of the problems. The participant had the opportunity to check his progress per specific problem in real-time and understand the level of progress achieved. The "passing" threshold was set to 60% of the total grade. By scoring above this threshold, the participant could claim his online certificate of course completion through the progress page. The picture below depicts the look & feel of the progress page. 7 individual quiz scores are displayed on the progress page highlighting the individual and total scores achieved. The last column aggregated all individual scores into the "Final Grade". The user has the opportunity to check where he stands in terms of performance and "how far" (s)he is from completing the course.

Figure 24 Learner Progress dashboard

5   FOODI course management

This section describes the built-in tools and features used throughout the CarePath MOOC duration. The features were available to all Course Team members and the main operations were performed both from the LMS and CMs applications.

5.1 Instructor dashboard

Course management was mainly performed through the Instructor Dashboard in the LMS. The following features were configured in order to be accessible be the CarePath Course Team.

Review Course information. This dashboard provided information regarding the current enrollments, the total number of sections, the grade cut-offs, Course start and end dates, etc. This feature was used by all instructors since they were able to have a quick overview on the basic figures of the MOOC.
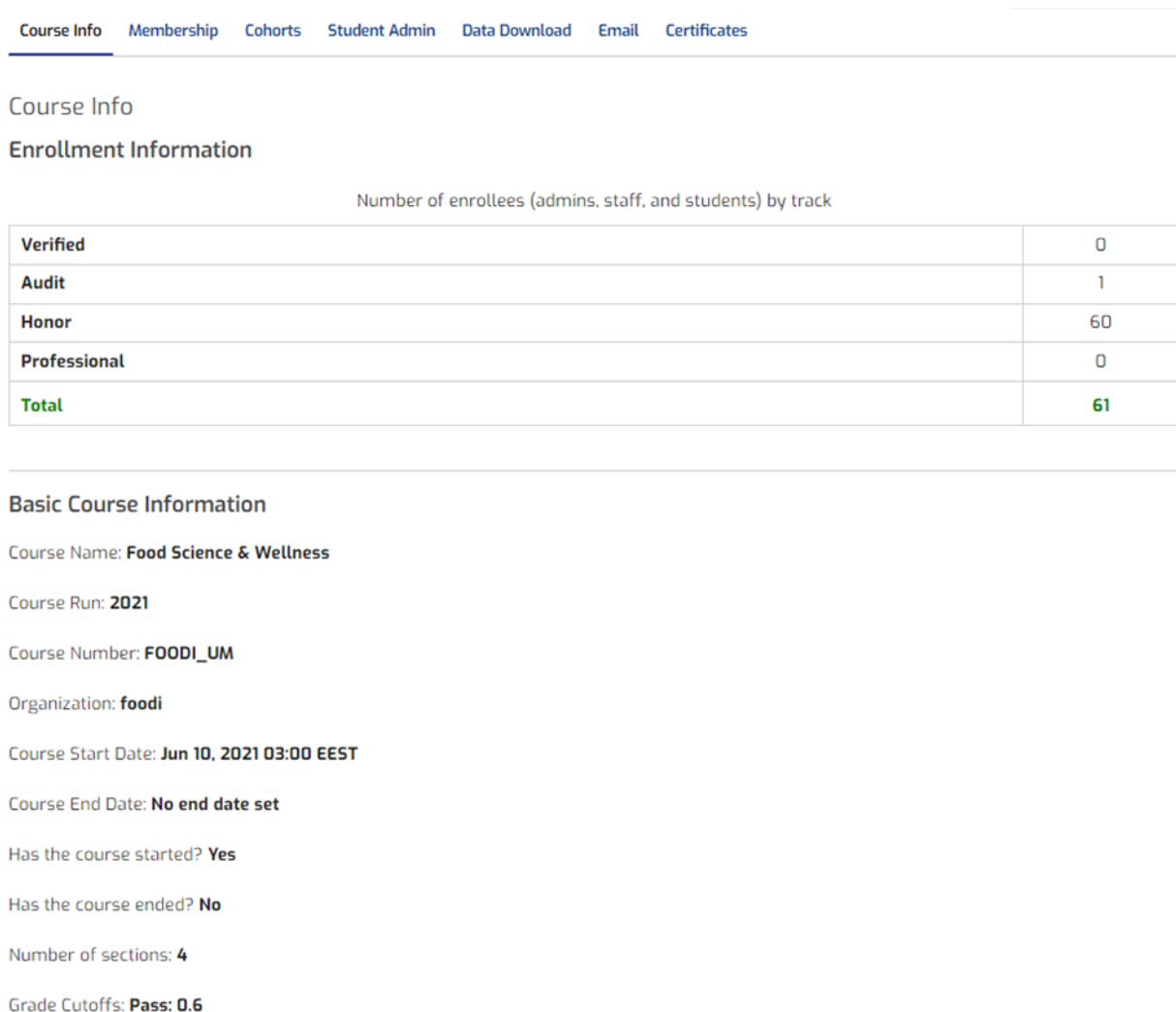

Course Info   Membership   Cohorts   Student Admin   Data Download   Email   Certificates

Course Info

Enrollment Information

Number of enrollees (admins, staff, and students) by track

Verified	0
Audit	1
Honor	60
Professional	0
Total	**61**

Basic Course Information

Course Name: **Food Science & Wellness**

Course Run: **2021**

Course Number: **FOODI_UM**

Organization: **foodi**

Course Start Date: **Jun 10, 2021 03:00 EEST**

Course End Date: **No end date set**

Has the course started? **Yes**

Has the course ended? **No**

Number of sections: **4**

Grade Cutoffs: **Pass: 0.6**

Figure 25 Course Overview Dashboard

Manual enrolments. An important number of course participants were experts or professionals in trauma-care. This target group was mainly enrolled through in-platform invitations exploiting the network of consortium members. Each course instructor had the chance to auto-enrol learners, through the

<u>Membership</u> page. All prospect participants were notified by a course invitation email automatically generated by the platform.

Grade reports. For each of the course, the instructor was able to generate grade reports. The reports are in csv format and downloadable and scores are presented by assignment for unique learner ID. To prevent the accidental distribution of learner data, the reports were downloadable by selecting the internal links generated by the platform as depicted in the picture below. These links were expiring within 5 minutes - copying and re-using them after this short period of time was not an option.

5.2 Grading Policy

The grading policy was agreed and configured after discussion with the MOOC content developers. The main rules governing the grade configuration were:

- The overall grade was a Pass/Fail configuration. The level as set to 60% of the total grade. Upon reaching this threshold the participants were able to claim their online certificate.
- No number of droppable assignments were defined. In other words, all assignments were contributed to the final grade and the learner was not given the opportunity to "drop" lower scoring problems.
- No restriction on dates or grace periods to deadlines were defined, given that the MOOC was configured as a self-paced learning experience.

5.3 On-Line Certificate

The MOOC platform was configured to allow learners to claim their online certificate upon successful completion of the course and not waiting the end of it. The view certificate functionality automatically appears in the progress page on each learner as depicted in the following figure.

Each certificate was accompanied with a <u>unique</u> ID that was generated from the system. This was a must-have functionality in order to secure uniqueness and verification procedures if needed by an official accreditation authority.

Figure 26 Online Certificate configuration

Figure 27 Online Certificate Layout

5.4 The FOODI Course Team

The CarePath Course Team consisted of Instructors supported the online delivery of the courses. The multidisciplinary nature of the subject was covered by employing consortium experts addressing marketing and food production experts as well as scientific/active research methodologies. At least one instructor was assigned to each MOOC

Apart from scientific expertise, the Course Team was able to address technical support and answer queries regarding the functionality of the platform. An important requirement was to ensure uptime service.

The FCT was responsible for:

- Supporting, mentoring and moderating issues coming from learners regarding the course content
- Communicating with the audience and keep them informed about important dates or deviations from the initial planned activities.

Providing technical support and help learners tackle any difficulties posed by the online application.

6 The FOODI MOOCs in numbers

The FOODI MOOCs reached a total of 344 enrolments mainly coming from Malaysia, Cambodia and Thailand while 24 enrolments were originated from neighbouring countries including Nepal, Myanmar and India. The 6 short professional training courses reached 235 enrolments while the rest 109 enrolments are originated from the Online training of academic personnel (see D3.3 Online training of academic personnel in FOODI VLE). The following picture depicts the profile of the participants as they were tracked and presented be the Platform's customised analytics engine. Female participants reached 61% while 60% of participants were young professionals and post-doc researchers or post graduate students.
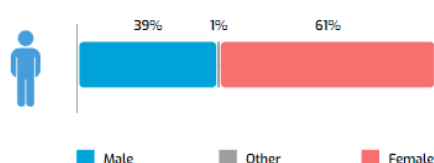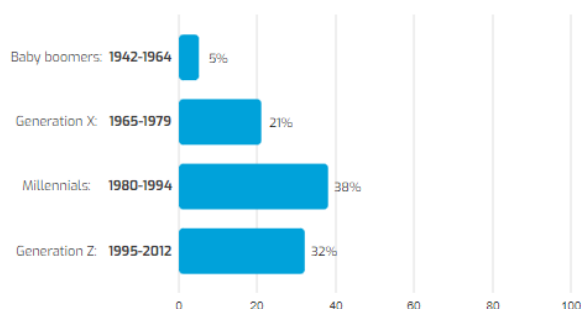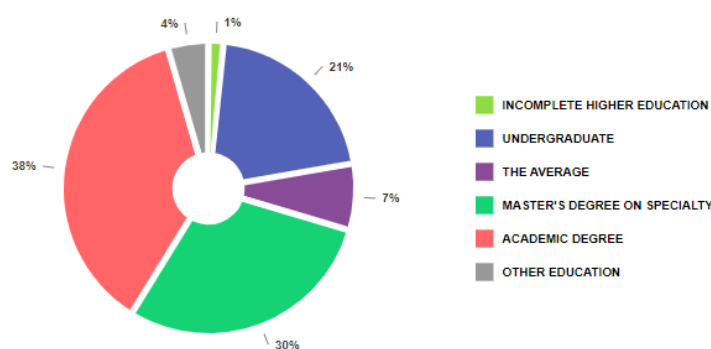

Figure 28 profile of the participants

The picture below depicts a summary of the results acquired from the common post course survey. The set of satisfaction-related questions the participants were asked to rate based on an 1-5 Likert scale were:

- Q1. The course delivered the information I expected to receive.

- Q2. The contents of the modules matter were presented effectively.
- Q3. The pace of the course was satisfactory.
- Q4.The instructors were available when needed.
- Q5.As a result of this online course, I gained new knowledge applicable to my work.
- Q6. I plan to apply what I learned in this course.
- Q7. The quizzes were relevant to the course contents
- Q8.The FOODI online platform was easy to use
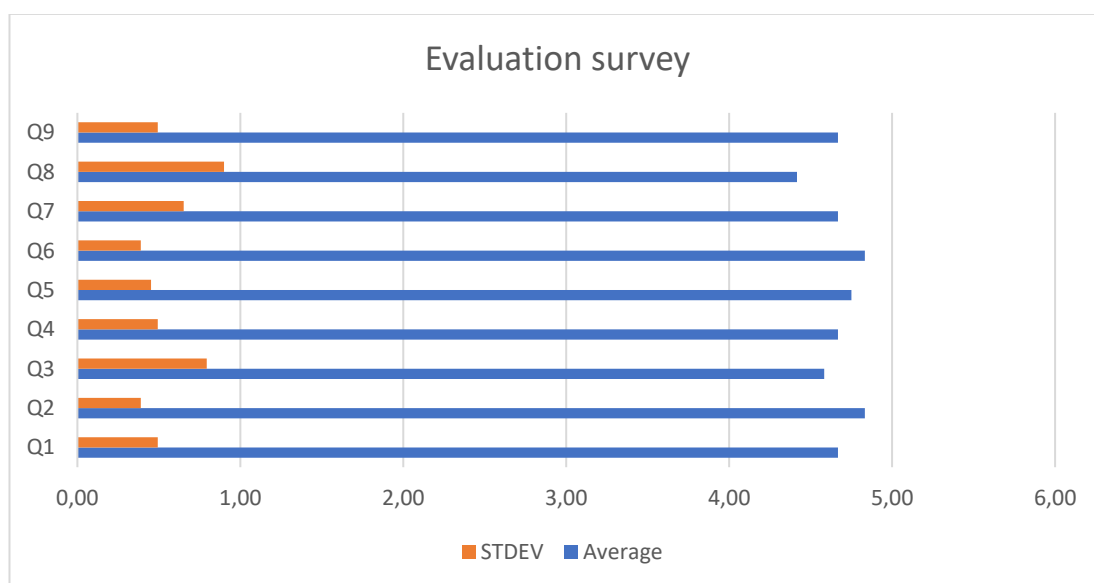- Q9.The overall visual design of the course was of high quality

Figure 29 Satisfaction rate regarding the eLearning experience

The statements with the more positive values were "The contents of the modules were presented effectively" and "I plan to apply what I learned to this course". The easiness of the platform and the pace of the course received also positive feedback but with larger STDEV values compared to the rest of the answers.

In general the delivery of the FOODI MOOCs demonstrated that there is demand in the food sector rom academic and industry sectors. The quotes below provide some interesting feedback regarding new topics or learning outcomes that should be added in future versions of these courses.

"Provide information on suggestive food for certain disease such as diabetic or hypertension".

In addition, the self-paced mode was received positively from the participants while the fact that lectures or slides could be downloaded and retrieved later was well pointed out as well.

"Free to enter any time to study and learn"

7 Conclusions

Through the FOODI platform, trainees had the possibility to alternate between learning concepts and solving simple exercises to check their understanding and knowledge.

Concluding, the FOODI professional training courses were designed and developed adopting the following general best practices and features offered by the platform:

- Set important course dates including Course and enrollments start and end dates. It is essential to set these dates once since constant updates on the course dates, especially the starting dates, discourage the participants. In addition, the pre-recorded sessions, integrated into the Course as additional material, facilitated the knowledge transfer for participants who could not attend the live sessions.
- Create a clear grading policy by setting a passing score and defining assignment types. All assessments add up to 100%. Make sure to communicate how the participants are going to be evaluated before the course start date. Design and enable course certificates if available – corrected text, uploaded signatures and activation of certification are the main steps.
- Build diverse learning sequences. Empirical studies and research show that a diverse content experience drives learner engagement.
- Always do an internal piloting or extended testing. This procedure in the FOODI project gave us the opportunity to fix and correct typos and other mistakes. It gave also the opportunity to the instructors and the content developers to reflect on an online ready-to-go product.
- Manage unit depth. Each course unit did not contain many components. Breaking up course contents into manageable pieces promotes learner engagement. Thus, up to 3 components per unit were used in the FOODI courses.
- Assign Staff and Admin roles for technical support. Create a technical support procedure for troubleshooting.

8 Abbreviations

Acronym	Definition
VLE	Virtual Learning Environments
ECTS	European Credit Transfer and Accumulation System
CMS	Content Management System
LMS	Learning Management System
FCT	FOODI Course Team
OLX	Open Learning XML
MOOC	Massive Open Online Course

Appendix 1. FOODI course Evaluation Form

1. The course delivered the information I expected to receive. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

2. The contents of the modules matter were presented effectively. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

3. The pace of the course was satisfactory. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

4. The instructors were available when needed. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

5. As a result of this online course, I gained new knowledge applicable to my work. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

6. I plan to apply what I learned in this course. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

7. The quizzes were relevant to the course contents *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Delrongly agree

Figure 30 Evaluation form - section 1

Please rate your satisfaction regarding the FOODI online platform

1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree

8. The FOODI online platform was easy to use *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

9. The overall visual design of the course was of high quality *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

10. Did you have any technical difficulties participating in the course? (select all that apply) *

☐ Confusion about the registration process

☐ Problems enrolling in the course

☐ Problems with the internet connection

☐ Luck of technical support

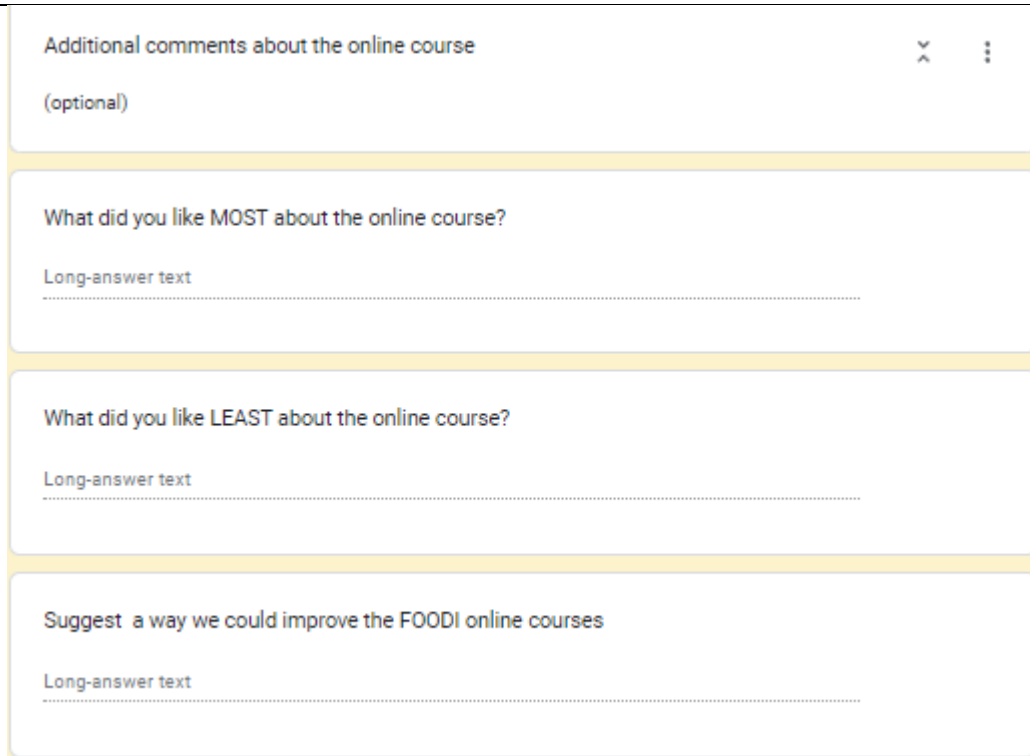☐ Not at all

☐ Other...

Figure 31 Evaluation form - section 2

Figure 32 Evaluation Form - Section 3[9]