Projet Erasmus+ Yabda

Strengthening of relations between higher education and the wider economic and social environment

586418-EPP-1-2017-1-MA-EPPKA2-CBHE-JP

WP2

R2.6 Yabda virtual learning platform

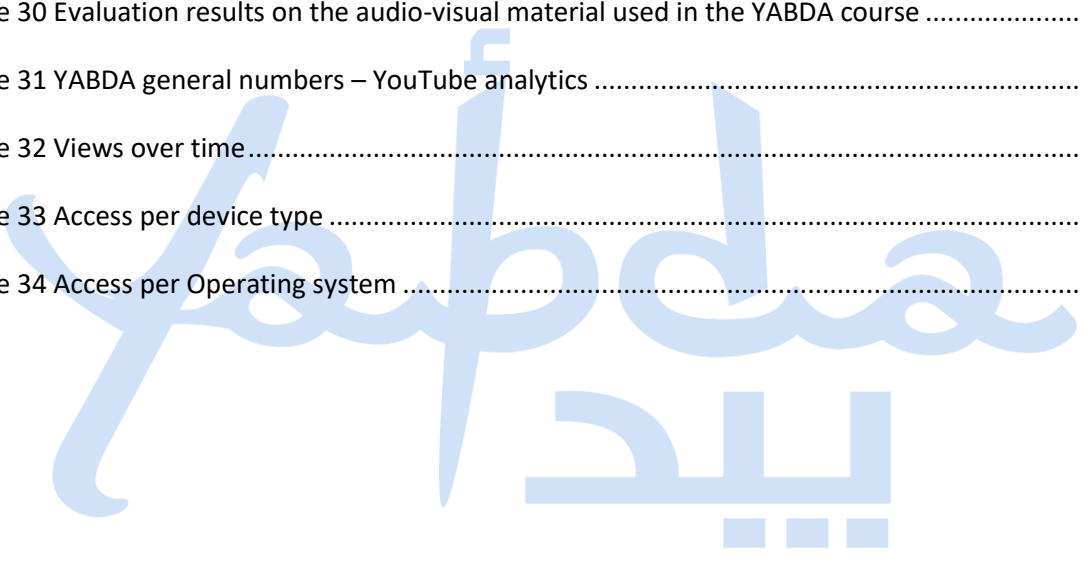| WP 2	DEVELOPMENT
Task 5	Development of the Yabda Virtual Learning Environment
Deliverable	Yabda virtual learning platform
Status of the document	Final
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Author	ReadLab

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1. INTRODUCTION

The YABDA virtual learning platform report provides an overview of the online platform regarding user requirements and systems specifications and features. 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 MOOC lifetime. The features are accessible through LMS and CMS applications by the YABDA Course Team (YCT).

The last section illustrates the YABDA MOOCs in numbers through the dedicated YouTube channel.

2. METHODOLOGY - How the online courses were developed

The YABDA online platform is based on the Open edX software[1] . 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 YABDA VLE hosted three different courses:

- **The Train the Trainers Yabda course** consists of 6 modules developed by the EU partners. Module 3 "Strategies of Financing" was co-developed by local experts from UH1 (MO), UTEM (TN) and Batna1 (DZ). The course is published in three languages.

- The "**Developing an Entrepreneurial Mindset**" course, developed by Sfax University, published in three languages and

- The "**Enjeux organisationnels et humains de l'entrepreneuriat**" course developed by EU partner LU (BE), published in French language as an extra professional course.

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[1] https://www.edx.org/

The YABDA MOOC was 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 3 different groups with complementary areas of expertise that needed to be reflected in the content: Entrepreneurship, Financing and funding strategies, networking and family business.

- The MOOCs would be a completely 100% online learning experience. This affected the role of the Instructor. The Instructor should act more as a facilitator/mentor/moderator than a Professor lecturing in a campus class environment.

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

  o 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.

  o 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 should be up and running 24/7 for about 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.

UNIVERSITÉ HASSAN II DE CASABLANCA

yabda
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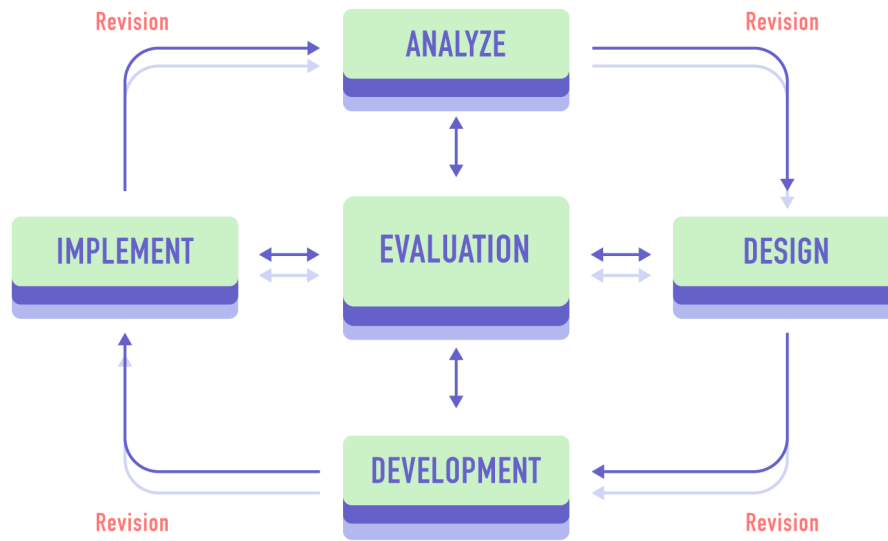
Figure 1 ADDIE instructional design model (Wikipedia)

Analysis

During the analysis phase, the target audience and the overall objective of the course were set. The overall description of the YABDA course was 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. Learners were encouraged to create their own material and content (Final assignment).

Moreover, the partnership decided to create an award (YABDA Certificate) for the successful learners (see section 0).

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

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 0). The next step was to define the YCT. 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 (YCT), uploaded to the platform and tested online. Upon reaching an 80% readiness for the online course (features, content, testing), the YCT 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 YABDA 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 YABDA MOOC through the well-established YABDA network mechanisms.

Implementation

The *"Train The Trainers"* course materials were developed in 2019. Its final version was published online in **September 2019** and was up & running for at least one year. The **"Developing an Entrepreneurial Mindset"** course materials were developed during the second half of 2020 and were published online in **February 2021**.

In addition, an extra course was designed and developed *"Enjeux organisationnels et humains de l'entrepreneuriat"*. Due to the significant participation in the YABDA course and the interest raised, the partnership decided to design and develop this extra course which acts complementary to the current YABDA resources. The additional course was developed by ULIEGE and **published online by ReadLab in September of 2021**. The course aims at teachers and researchers (doctoral and post-doc students) of the Yabda project partner universities who want to develop an entrepreneurial activity or are in the process of developing an entrepreneurial activity. The extra course is running after the project's end, in a self-studied mode.

3. Technical overview

The YABDA 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.
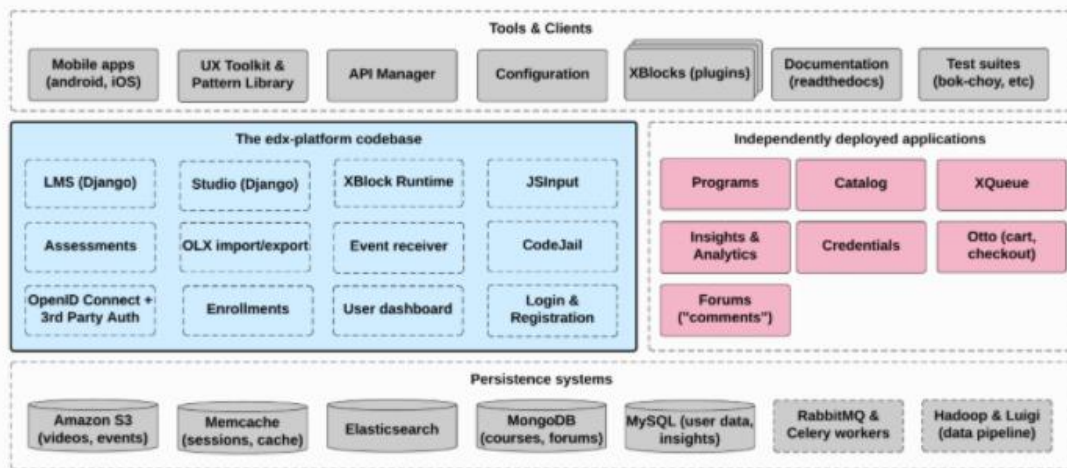
Figure 2 Open Edx reference Architecture

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[2], Backbone.js[3] and Bourbon[4] frameworks. At the centrepiece there are the two key components: the YABDA Learning Management System (LMS) and the YABDA Content Management System (CMS). The CMS or Studio, is the authoring tool where the YCT 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[5] and RabbitMQ[6].

Examples of such tasks performed in the YABDA platform are:

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

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

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 2, 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 YABDA 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 YABDA Xblock suite currently implemented is described in detail in section 0, 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.

CMS

Content Management System or Studio is the course authoring environment. The YABDA 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

Installation

The YABDA online platform was developed by ReadLab in June 2019 and it was publicly accessed through the link: https://mooc.yabda-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 [7]. The tutor distribution was employed to simplify the process of deployment and facilitate future updates and debugging.[8] 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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[7] https://edx.readthedocs.io/projects/edx-installing-configuring-and-running/en/latest/platform_releases/ironwood.html
[8] https://docs.tutor.overhang.io

4. The YABDA Learning environment

Getting started

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

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

Figure 3 Custom designs for course images

The landing page of the YABDA 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 YABDA 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[9].
- Search functionality for finding courses provided by the YABDA 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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[9] https://eacea.ec.europa.eu/about-eacea/visual-identity-and-logos-eacea/erasmus-visual-identity-and-logos_en
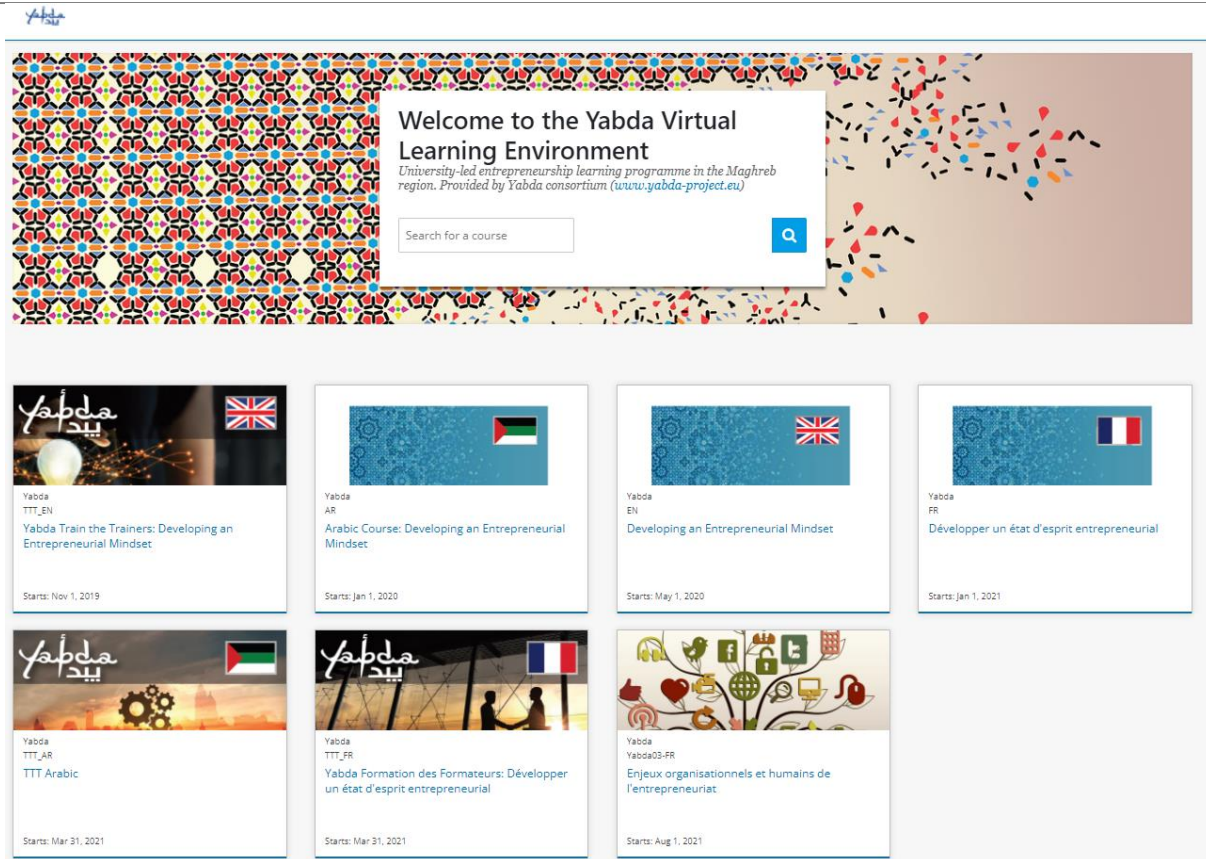
Figure 4 YABDA MOOC – Course catalogue

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 YABDA CMS.

Figure 5 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 YABDA learning platform and are owned and operated by the members of the YABDA 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 YABDA platform. A list of strictly prohibited items is included at the end of the document.

Privacy Policy

Name of the service	Yabda Online Course
Description of the service	The Yabda Online Course service is both a Content and a Learning Management System, based on the open courseware development platform Open edX (openedx.org), delivered in the context of the European-Commission-funded project Yabda (reference no. 586418, www.yabda-project.eu). It offers free web-based courses on University-led entrepreneurship in the Maghreb region.
Data controller	Yabda consortium
Personal data processed	- Full name - Email address - Country or region of residence - Year of birth - Level of education completed - Public username - User password
How your information is used	Yabda Partners use information, including Personal Information, to carry out the following purposes: **Operate and improve the Yabda VLE** - This includes creating and improving features that support the Yabda community and enable Yabda VLE usage at scale. This also includes personalizing the Yabda VLE, so your learning experience is tailored to your interests and needs. **Create, administer, provide, and teach courses** - This includes creating and improving the delivery of massive open online courses and programs on Yabda VLE. This also includes personalizing courses, so your learning experience is tailored to your interests and needs and assessing your performance and awarding certificates. **Offer and improve products and services** - This includes enabling you to navigate the Yabda VLE, to enroll and participate in courses and programs on the Yabda VLE and to learn effectively in such courses and programs. **Develop and maintain the security and performance of the Yabda VLE** - This includes tracking Yabda VLE outages and creating software solutions, detecting violations of the Honor Code and Terms of Service, and monitoring uses, misuses, and potential misuses of the Yabda VLE. **Communicate with you** - This includes answering your course and platform questions, notifying you of course and Yabda VLE maintenance and updates, marketing to you about course offerings, programs, news, and related products and services of Yabda project, and as permitted under applicable law, sending you communications about news and events of the Yabda project that may be of interest to you. **Support scientific research including, for example, in the areas of cognitive science and education** - This includes collaborating to enable and conduct research about how learners access and master course materials online, with the goal of improving course outcomes. **Track Yabda VLE usage against goals and mission** -This includes performing analytics to evaluate access to and performance in courses and course-related products and services and to report aggregate usage information (not Personal Information) to CarePartners and the European Commission. **Exercise, enforce, and comply with legal rights and obligations**-This includes responding to subpoenas, court orders, or other legal process; and investigating, preventing, or taking action regarding illegal activities, suspected fraud, security or technical issues, or to protect the rights, property, or safety of Yabda VLE, or others, and as otherwise required by applicable law.
Third parties to whom personal data is disclosed	None
How to access, rectify and delete the personal data	Contact the support at team@read-lab.eu. To rectify the data released by your Home Organisation, contact your Home Organisation's IT helpdesk
Data retention	Personal data is deleted on request of the user
Data Protection Code of Conduct	The processing of personal data shall always be in line with the General Data Protection Regulation (GDPR).

Figure 6 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.
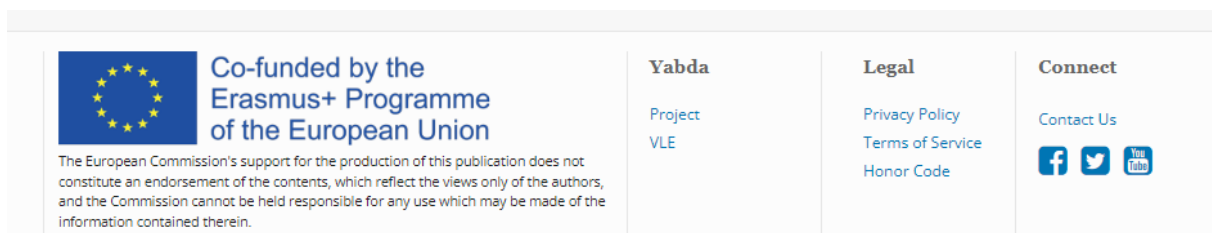
Figure 7 Landing Page- Footer information

Registration

The user needs to create or register an account to the YABDA platform to get started. Upon creating a YABDA account, the user has then the possibility to access/enrol in all YABDA 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. 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 8 Registration form

The YABDA online course was open to all users around the world. The users, upon registration, had the chance to enrol and attend the YABDA online course. 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 YCT manually enrolled the learners. In the case of unregistered learners, they were asked to first register on the YABDA platform through an automatic email. This functionality was mainly used for inviting specific users-experts to pilot the YABDA platform. The TTT course reached 86 enrolments (WP2), out of which 48 were registered as instructors in the YABDA Course delivered under WP3

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 9 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 YABDA platform.

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

Course content and navigation

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

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

The microlearning approach

The YABDA 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 YABDA 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 YABDA learning material has the form of a video presentation, online text, quiz and book chapters as supporting material. The YABDA 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 YABDA 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 YABDA 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.

The YABDA courses were organised in two levels of hierarchy. Three different courses were developed and hosted online. They were published in 3 languages while their delivery was done in the French language after agreement within the consortium. All courses contain a series of video lectures accompanied by slides and self-assessment quizzes.

The pictures below depict the online structure of the three courses.

Yabda Formation des Formateurs: Développer un état d'esprit entrepreneurial

> Questionnaire pré-cours
> 1. Les bases de l'entrepreneuriat
> 2.Stratégies de mise en réseaux
> 3. Stratégies de financement au Maroc / Algérie / Tunisie
> 4. Un financement de l'UE
> 5.Gestion d'entreprise familiale
> 6. Techniques pour développer l'esprit d'entreprise au sein de l'université
> Questionnaire d' évaluation - YABDA MOOC
> Webinaires

Figure 10 YABDA Course Structure - TTT

The TTT Course was designed around 6 different modules. The idea was to frame each module in a week duration and deliver an online learning experience equal to a 6-week online course. The 6 modules are:

- The Basics of Entrepreneurship (developed by the Athens University of Economics and Business, GR)

- Strategies of Networking (developed by Université d'Aix-Marseille, FR)

- Strategies of financing (developed by local experts from Tunisia, Morocco and Tunisia)

- EU Funding (developed by ReadLab, GR)

- Family Business (developed by ReadLab, GR)

- Developing an entrepreneurial mindset (developed by Université de Liège, BE)

Développer un état d'esprit entrepreneurial

> Bienvenue au cours Yabda

> MOOC 1.Entrepreneuriat et Innovation frugale

> MOOC 2. Démystifier le marché d'un projet innovant

∨ 3. Relever les challenges financiers

> MOOC 3. Relever les challenges financiers
Quiz

> MOOC 4. Quel design pour son étude financière ?
Quiz

∨ 4. Création et développement d'une Start Up Technologique

> MOOC 5. Comment Réussir un Projet d'Innovation?
Quiz

> MOOC 6. Comment protéger son projet d'innovation
Quiz

> MOOC 7 .Entreprenariat à l'ère de la Transformation Digitale
Quiz

> MOOC 8. Approches technologiques de Design
Quiz

> Post-course survey

Figure 11 YABDA Course Structure - Développer un état d'esprit entrepreneurial

The "Developing an Entrepreneurial Mindset" Course was developed by Sfax University (TN). In consists of eight MOOCs organised in four basic modules. The eight MOOCs are:

- MOOC1: Entrepreneurship and Education

- MOOC2: Demystify the market for an innovative project

- MOOC3: Meeting financial challenges

- MOOC4. Creation and development of a Technological Start Up

- MOOC 5: How to Succeed in an Innovation Project?

- MOOC6: Protect Your Innovation Project

- MOOC7: Entrepreneurship in the Age of Digital Transformation

- MOOC8: Design technological approaches

Figure 12 YABDA Course Outline - Enjeux organisationnels et humains de l'entrepreneuriat

The professional course developed by ULIEGE, was structured around 3 basic Modules each consisting of several individual lessons. In total, 15 different lessons are published under the specific course and offered in the French language.

This structured approach helped to switch between modules and lessons 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. The following picture depicts a part of the course outline. For each lesson, there is a "tag" word notifying that the lesson includes a Quiz unit. In this example the lesson "Démystifier le marché d'un projet innovant" consists of 6 different Units or learning components. 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.
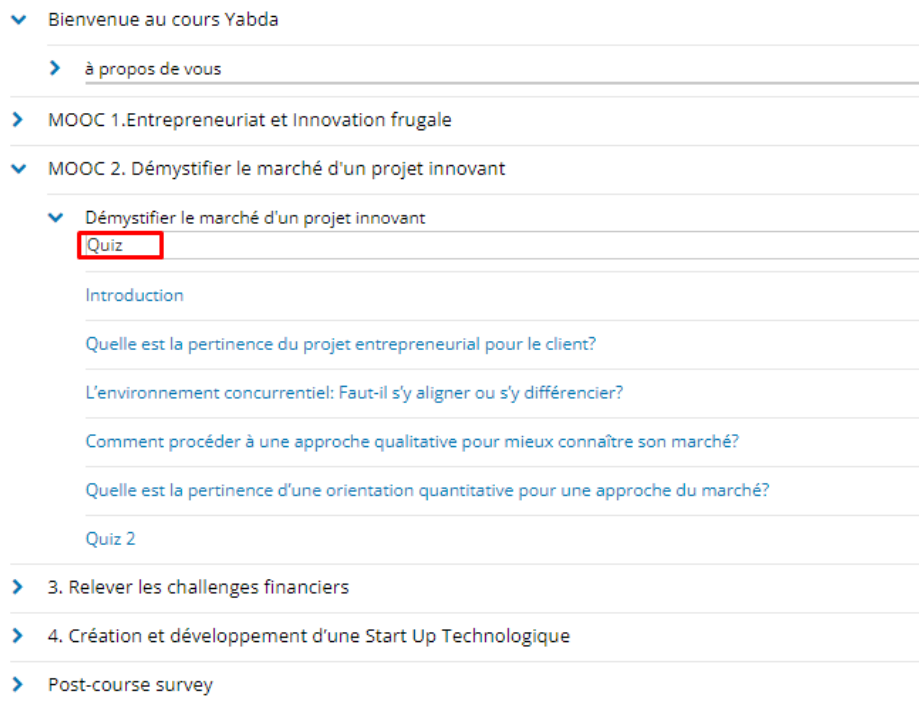
Figure 13 Example of a course outline and navigation

The structure of the content and the navigational form are depicted in Figure 14. 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 (red box). The user is aware from the very beginning that the content is delivered in 3 different methods: Video lectures, online text, and an assessment at the end of the learning sequence (Green boxes). 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.

Figure 14 Learning sequence organisation – Module 3, lesson 1 example

Learning components in YABDA MOOC

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

Video component

All YABDA video lectures are hosted on a dedicated YouTube channel. They are integrated into the YABDA MOOC platform through a built-in YouTube player offering the following controls/functionalities as depicted in Figure 15*:*

- **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 YABDA 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.
- **Show/hide subtitles**. The user is able to show or hide an overlaid transcript of the audio portion. The displayed captions can be moved to different areas on the video screen (drag & drop). Moreover, the user can select to switch between different languages. All YABDA videos included transcripts in all languages.

- **Download transcript**. This control allows users to download the subtitles in .srt or .txt format.
- **Transcript space**. On the right-hand side, the interactive space is displayed. The user can scroll through the transcript and select any line to that point in the video.

Figure 15 Video component
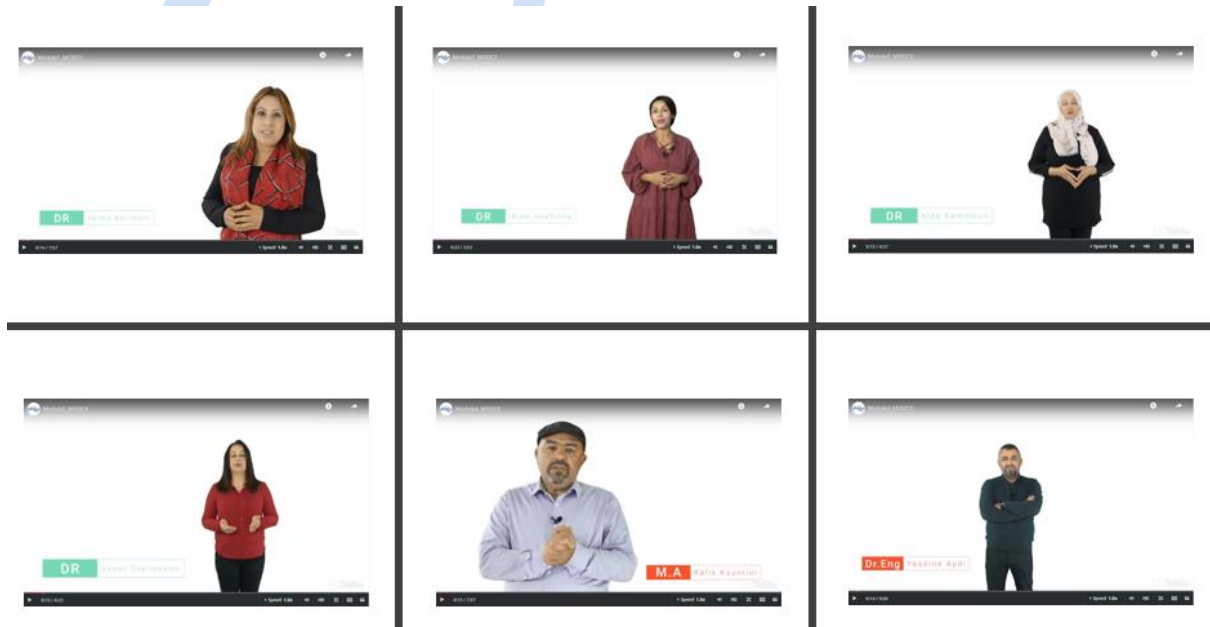
Figure 16 Video Lectures in YABDA MOOC

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 YABDA Studio application and the built-in HTML editor.
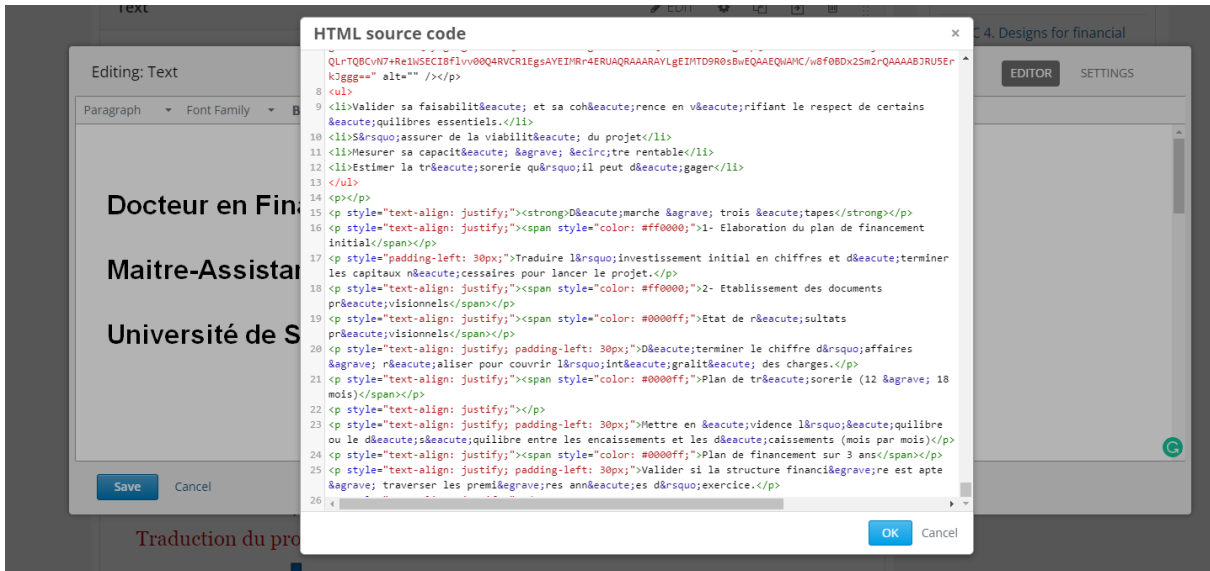
Figure 17 HTML component example

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 18 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).

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3. Laquelle des affirmations suivantes est vraie ?

○ A. Grâce à leur participation à des projets financés par l'UE, les entreprises peuvent acquérir de nouvelles compéte

○ B. Les possibilités de financement de l'UE ne sont ouvertes qu'aux organismes d'éducation et de recherche

◉ C. Les projets financés par l'UE sont des projets nationaux ✖

4. Participation à des projets financés par l'UE:

○ A. Accroître la charge de travail des entreprises sans aucun avantage

◉ B. Permet aux entreprises de financer l'intégralité de leur investissement ✖

○ C. Offre aux entreprises la possibilité d'établir des liens avec l'éducation et la recherche

○ D. est une forme d'entrepreneuriat dans laquelle un groupe de personnes crée sa propre entreprise

5. Laquelle des affirmations suivantes est vraie?

○ A. La participation à des projets financés par l'UE n'est pas ouverte aux entreprises

◉ B. Les entreprises ont facilement accès au capital, elles n'ont donc pas besoin de rechercher des possibilités de fina

○ C. La participation à des projets et initiatives financés par l'UE est bénéfique pour les PME et les jeunes pousses de
elle favorise le développement de l'entreprise et de l'entrepreneur

Submit   You have used 1 of 3 attempts

✖ Incorrect (0/5 points)

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. 13 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.
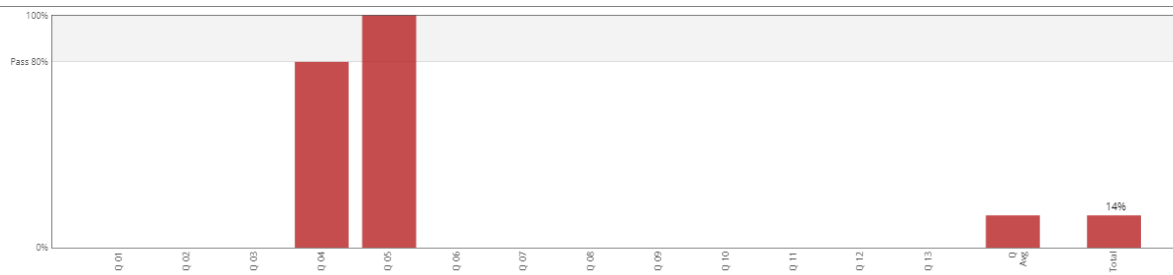
Figure 19 Learner Progress dashboard

5. YABDA Course Management

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

Instructor dashboard

Course management was mainly performed through the Instructor Dashboard in the LMS. The following features were configured in order to be accessible by the YABDA 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 of the basic figures of the MOOC.
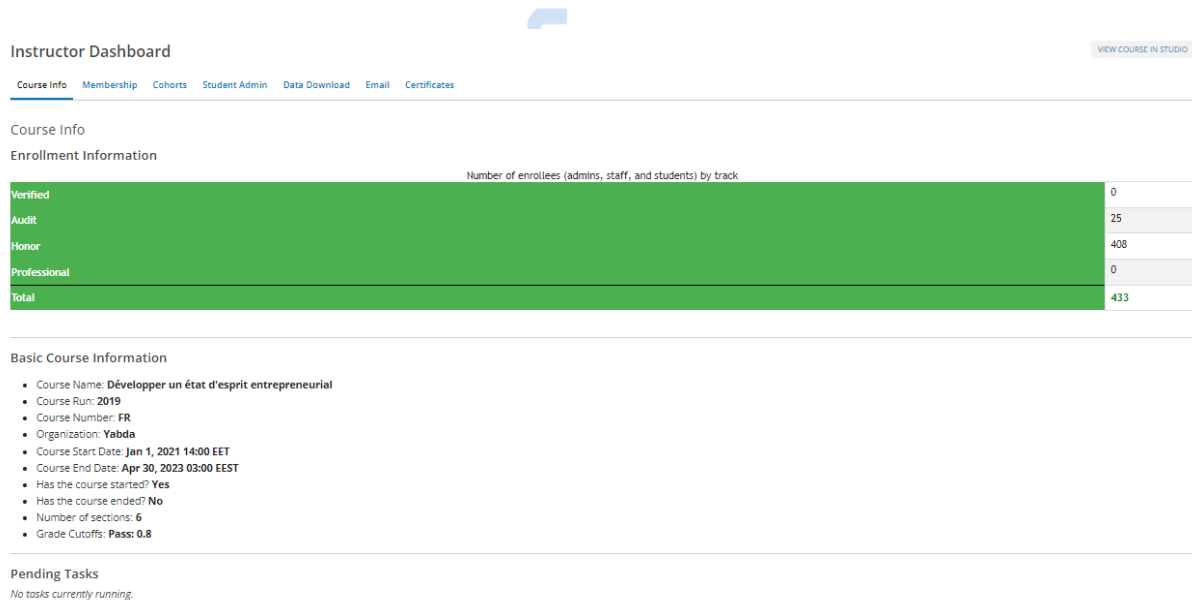
Figure 20 Course Overview dashboard

Manual enrolments. An important number of course participants were experts or professionals in business and entrepreneurship. 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 Membership page. All prospect participants were notified by a course invitation email automatically generated by the platform.

Grade reports. For each of the courses, the Instructor was able to generate grade reports. The reports are in CSV format, downloadable and scores aggregated by assignment per unique learner ID. To prevent the accidental distribution of learners' data, the reports were downloadable by selecting the platform's internal links, as depicted in the picture below. These links were expiring within 5 minutes - copying and re-using them after this short period was not an option.

Reports Available for Download

The reports listed below are available for download. A link to every report remains available on this page, identified by the UTC date and time of generation. Reports are not deleted, so you will always be able to access previously generated reports from this page.

Note: To keep student data secure, you cannot save or email these links for direct access. Copies of links expire within 5 minutes.

File Name
Yabda_Yabda01-FRx_2019_student_profile_info_2021-11-19-1246.csv
Yabda_Yabda01-FRx_2019_may_enroll_info_2021-11-19-1246.csv
Yabda_Yabda01-FRx_2019_student_profile_info_2021-09-24-1415.csv
Yabda_Yabda01-FRx_2019_may_enroll_info_2021-09-24-1415.csv
Yabda_Yabda01-FRx_2019_grade_report_2021-09-24-1407.csv
Yabda_Yabda01-FRx_2019_student_profile_info_2021-07-23-0650.csv
Yabda_Yabda01-FRx_2019_grade_report_2021-07-23-0648.csv
Yabda_Yabda01-FRx_2019_student_profile_info_2021-07-09-0838.csv
Yabda_Yabda01-FRx_2019_grade_report_2021-07-09-0831.csv

Figure 21 Generated Graded reports

Grading Policy

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

- One category was created (Quiz) – 13 Quiz sections for the TTT course and 8 quiz sections for the YABDA Course.
- The overall grade was a Pass/Fail configuration. The level is set to 80% of the total grade.
- Both assignment categories are mandatory, i.e. no participant should be able to claim his certificate without going through the Quizzes.
- 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.

Overall Grade Range — Your overall grading scale for student final grades

Fail	Pass
0-80	80-100

0 10 20 30 40 50 60 70 80 90 100

Grading Rules & Policies — Deadlines, requirements, and logistics around grading student work

Grace Period on Deadline:

00:00

Leeway on due dates

Assignment Types — Categories and labels for any exercises that are gradable

Assignment Type Name

Quiz

The general category for this type of assignment, for example, Homework or Midterm Exam. This name is visible to learners.

Abbreviation

Q

This short name for the assignment type (for example, HW or Midterm) appears next to assignments on a learner's Progress page.

Weight of Total Grade

100

The weight of all assignments of this type as a percentage of the total grade, for example, 40. Do not include the percent symbol.

Total Number

8

The number of subsections in the course that contain problems of this assignment type.

Number of Droppable

0

The number of assignments of this type that will be dropped. The lowest scoring assignments are dropped first.

Delete

Figure 22 MOOC grading policy

Online Certificate

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

Each certificate was accompanied by a unique ID generated from the system. This was a must-have functionality to secure uniqueness and verification procedures if needed by an official accreditation authority.

CERTIFICAT

C'est pour certifier que

a suivi le cours de formation intitulé

Yabda: Developing an Entrepreneurial Mindset

Abderrahim Khalidi
Coordinator Erasmus+ Yabda
University Hassan II Casablanca
Morocco

Pr. BENOUDNINE Hadjira
Vice-Rector of Foreign relations
University of Abdlehmaid Ibn Badis,
Mostaganem, Algeria
Yabda Coordinator Algeria

Majed Harchi,
Director of the career center and skills
certification
IT Service Manager, University of Tunis El
Manar, Tunis
Yabda Coordinator Tunisia

Certificate ID Number: Issued On:

c78928e8e2c848c5949e70446b4a2c5f   July 13, 2021

Figure 23 YABDA Certificate design

Course Team

The YABDA Course Team consisted of Instructors who supported the online delivery of the YABDA course. The multidisciplinary nature of the subject was ensured by employing consortium experts covering entrepreneurial mindset, business challenges, financial and funding opportunities, and scientific/active research methodologies. In addition, at least one Instructor was assigned to each of the five language versions of the MOOC (English, French, Greek, Hungarian and Italian).

Apart from scientific expertise, the Course Team was able to address technical support and answer queries regarding the platform's functionality. A necessary requirement was to ensure uptime service

The YCT was responsible for:

- Supporting, mentoring and moderating issues coming from learners regarding the course content
- Communicating with the audience and keeping them informed about important dates or deviations from the initially planned activities.
- Providing technical support and helping learners tackle any difficulties posed by the online application.

6. YABDA VLE in numbers

Material & Enrolments

The YABDA platform hosts 45 unique video lectures published in the 3 YABDA courses. All videos were developed by the YABDA partners, and they cover over 310 hours of lecturing. 155 subtitles were created to support the video lectures in EN, FR and AR.

In the YABDA TTT online course, 85 experts and potential instructors were enrolled (19 from Algeria, 29 from Morocco 37 from Tunisia. The following figure depicts the allocation per country.
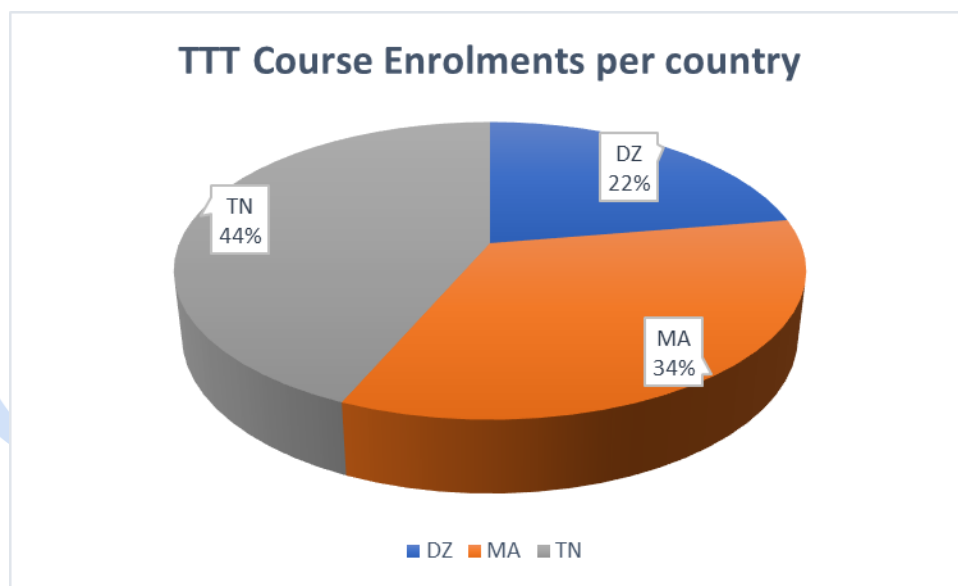

Figure 24 TTT Course – Enrolments per country

The YABDA course, delivered in the French language, reached a total of 419 enrolments (419 unique accounts registered for the YABDA course, consisting of eight Modules). More specifically, the share per country was:

- 216 enrolments from Algeria

- 114 enrolments from Morocco

- 78 enrolments from Tunisia and

- 11 EU enrolments (mainly acting as facilitators and technical support)

Figure 25 YABDA Course - Enrolments per country

The success rate was 32% (137 certificates issued from the platform) for participants that reached the 80% success threshold (out of 100 multiple choice questions).

Figure 26 Certificates issued per country

Evaluation questionnaire

The last section of the YABDA courses included an exit survey where all participants were kindly invited to provide their feedback. A total 0f 217 questionnaires were filled in, and the significant results are analysed in the diagrams below.

The first section referred to questions related to **Course contents and overall structure.** More specifically, the following eight questions were asked structured in a Likert scale/satisfaction level from 1 (completely unsatisfied) to 5 (completely satisfied):

- Q1. Your understanding of the course structure

- Q2. The coherence of the course content and objectives

- Q3. The relevance of the topic or course content

- Q4. Your level of confidence to complement the knowledge or skills prГ©sente

- Q5. The amount of material to be covered

- Q6. The quality of the examples presented in the YABDA Course

- Q7. Your enjoyment of the course

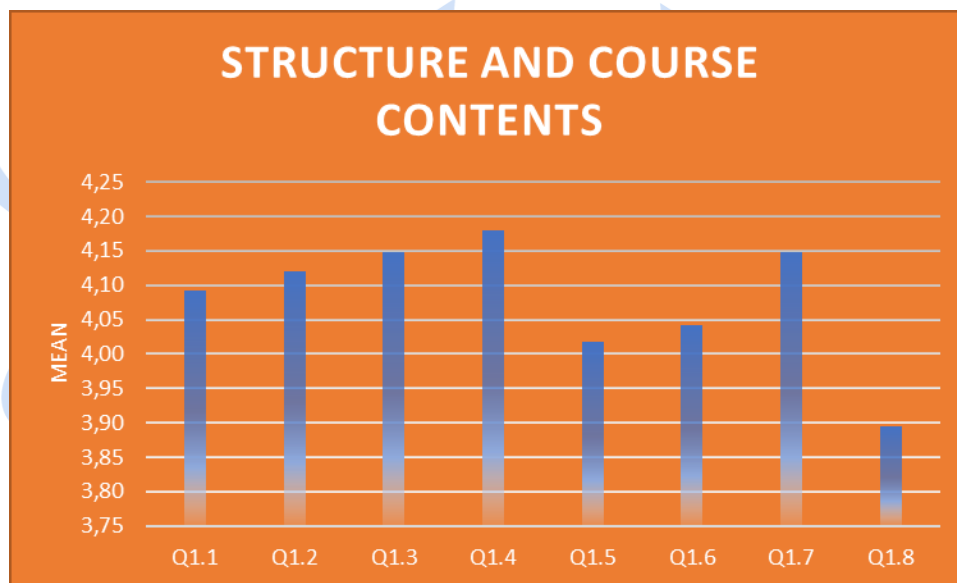- Q8. The workload of the course.

Figure 27 Evaluation results on Structure and course contents

The questions related to the amount of the material and workload of the course received the most negative opinions. The participants found the course challenging and quite large concerning the learning objectives that had to be covered. This was a beneficial feedback, especially for designing future online learning experiences where the learning objectives should be structured in smaller learning components. For example, creating two online (micro) courses is preferable instead of a big one. On the other hand, the questions related to the overall satisfaction, confidence and enjoyment of the course received the most positive opinions, highlighting the success of the online training as a very positive learning experience.

The second bunch of questions were dedicated to the assessment methodology and the quality of quizzes. More specifically, the following four questions were asked and structured again on a 1-to-5 Satisfaction scale.:

- Q1. The relevance of the quizzes and tests.

- Q2. The quality of the questions asked in the quizzes.

- Q3. The variety of quiz types.
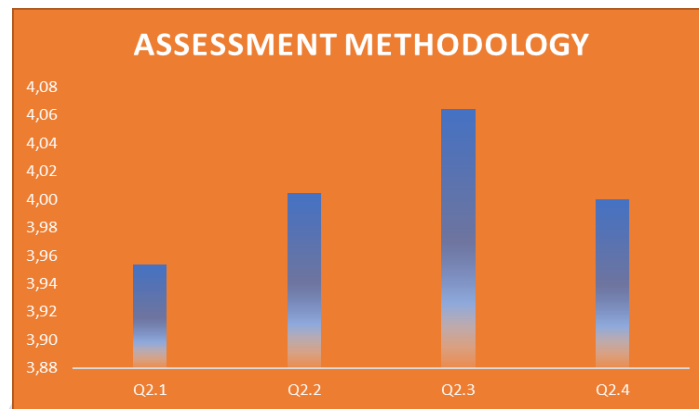
- Q4. The relevance of the feedback of the quizzes.

Figure 28 Evaluation results of the assessment methodology

The variety of quizzes received the more positive opinions, while the question on the relevance of the quizzes and tests received the less positive opinions. The total number of quizzes for the YABDA course was 100, which proved to be a relatively large number of questions.

The third section focused on the pace and the time needed to complete the online course. More specifically, the participants were asked to provide their level of satisfaction concerning the:

- The (relevance of) time spent on the course

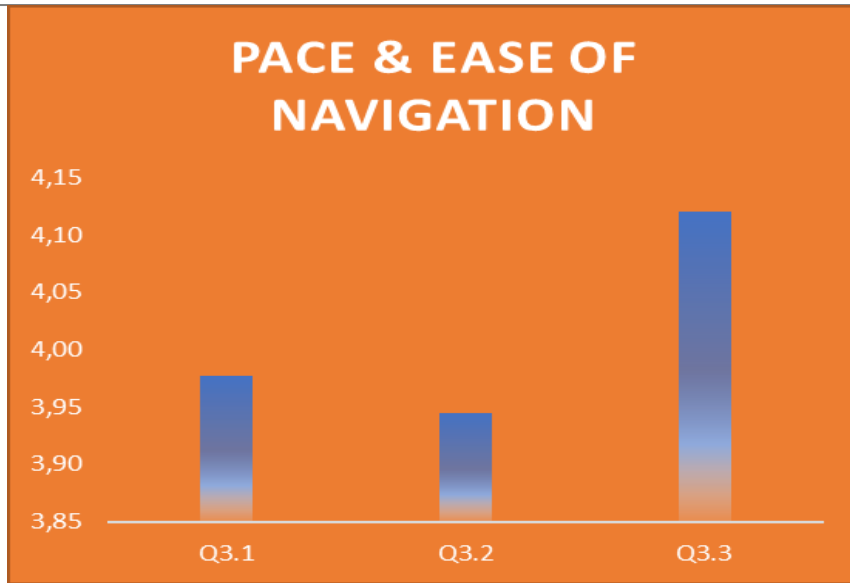- The pace at which the course has progressed and

- The ease of navigation

Figure 29 Evaluation results on pace and ease of navigation

It was clear that the online environment was quite easy to navigate, and responders didn't have significant issues walking through the platform. However, the pace at which the course has progressed received the least positive opinions.

Finally, three evaluation questions were dedicated to audiovisual material integrated in the YABDA course. More specifically:

- Q1. The number of multimedia used in the course

- Q2. The quality of multimedia used

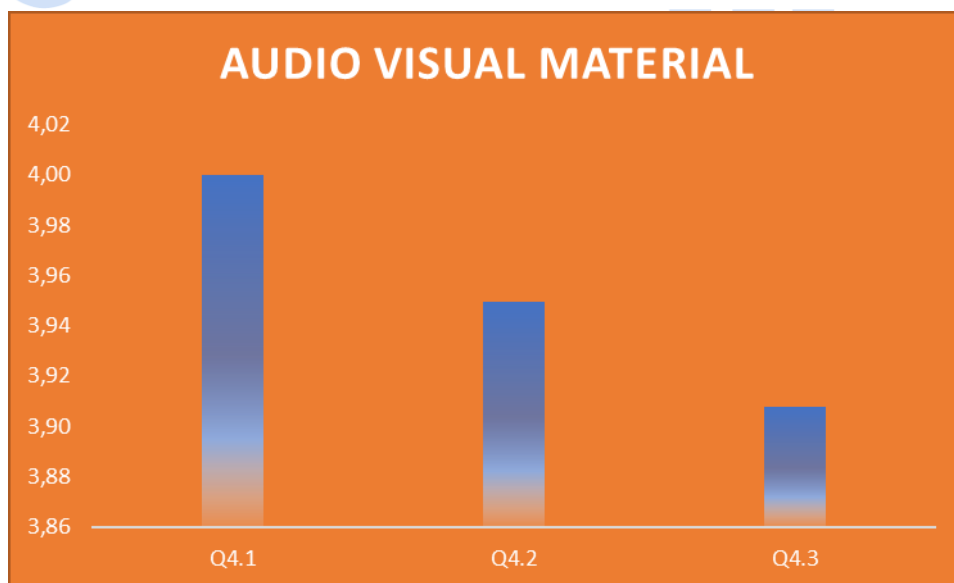- Q3. The voice and quality of the narration used in the course.

Figure 30 Evaluation results on the audio-visual material used in the YABDA course

The amount and quality audiovisual material was well received by the participants.

7. YABDA YouTube analytics

The audiovisual material consisted of 34 video lectures covering over 110 lecturing hours in total (main YABDA course and TTT course). More than 1500 views were tracked through the YouTube analytics engine.
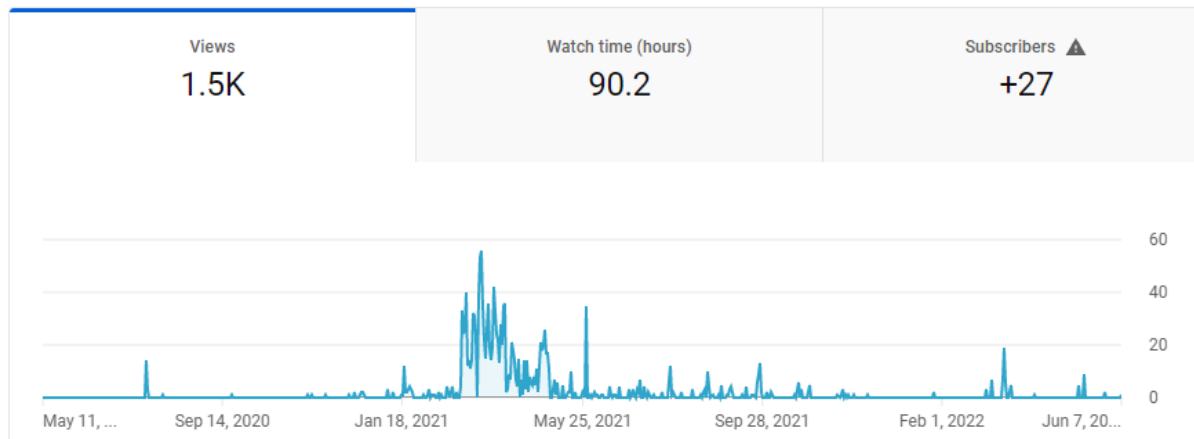

Figure 31 YABDA general numbers – YouTube analytics

The following figure depicts the traffic over time. The peak took place during the first four months of the MOOC offering. An important finding here is that the majority of the engaged users preferred to access the platform during evening hours, while higher volumes of traffic were reached during weekends.
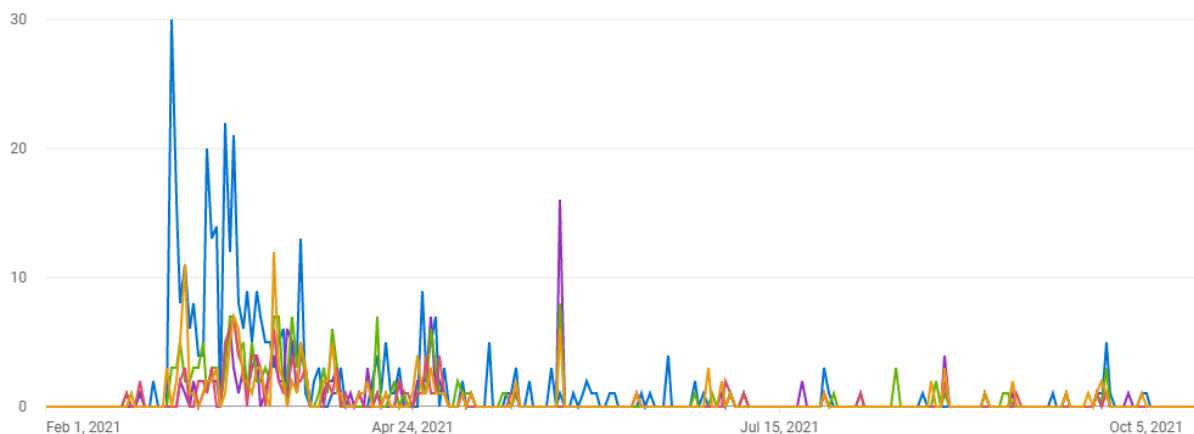

Figure 32 Views over time

A substantial proportion of the participants (over 30%) were engaged through their mobile devices as depicted in the figure below. This actually reveals that the YABDA platform was able to cater for mobile users through the installation of responsive themes and templates.

			Views ↓		Watch time (hours)		Average view duration
☐	**Total**		**1,479**		**88.7**		**3:35**
☐	Computer		1,006	68.0%	65.7	74.0%	3:54
☐	Mobile phone		453	30.6%	21.5	24.2%	2:50
☐	Tablet		3	0.2%	0.3	0.3%	5:12
☐	TV		1	0.1%	0.1	0.1%	7:37

Figure 33 Access per device type

The YABDA platform could be accessed from different operating systems. Due to the non-technical nature of the course, as expected, most of the participants were using Windows, while a substantial amount was on the Android operating system.

Operating system	⊕	Views ↓		Watch time (hours)		Average view duration
☐ **Total**		**1,479**		**88.7**		**3:35**
☐ Windows		940	63.6%	60.9	68.7%	3:53
☐ Android		455	30.8%	21.7	24.5%	2:52
☐ Macintosh		47	3.2%	3.4	3.8%	4:19
☐ Linux		17	1.2%	1.3	1.5%	4:39
☐ iOS		2	0.1%	0.1	0.2%	3:54

Figure 34 Access per Operating system

8. Conclusions

Through the YABDA platform, instructors created engaging learning sequences that promoted active participation as learners could alternate between learning concepts and solving simple exercises to check their understanding and knowledge. The course content was presented through learning sequences: a set of interwoven videos, reading material, exercises and material with automatic assessments and instant feedback, tailored discussion spaces and collaborative tools.

Participants could move at their own pace following a self-regulating learning process while receiving instant feedback upon completion of different types of assessments providing superior pedagogy.

Concluding, the YABDA MOOCs were designed and developed by adopting the following general best practices and features offered by the platform:

> *Create a clear grading policy by setting a passing score and defining assignment types. For example, all assignments had equal weight towards the final grade.*
>
> *Set important course dates, including course and enrollment start and end dates. It is essential to have these dates set once since constant updates on the course dates, especially the starting dates, are discouraging the learners.*
>
> *Take care of the video duration in the case of video lectures. Learners engage best with sort videos followed by opportunities to practice. As a rule of thumb, videos were no longer than 10 minutes.*
>
> *Build diverse learning sequences. Empirical studies and research show that a diverse content experience drives learner engagement [10]. Each YABDA MOOC included readings in text and pdf formats, discussion units and problems.*
>
> *Manage unit depth. Each YABDA unit should not contain many components. Breaking up course contents into manageable pieces promotes learner engagement. Thus, no more than three components per unit were used in the YABDA courses.*
>
> *Include time text captions in case of media-based content (subtitles). This universal built-in design mechanism enhanced the accessibility of the YABDA courses.*
>
> *Assign Staff and Admin roles. For each YABDA course, at least one Staff member was assigned.*
>
> *For future online course developments, creating two or more online (micro) courses of a big one is preferable.*
>
> *Pay special attention to the assessment methodology: If not properly designed, it can be a significant reason for un-enrolments.*

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[10] https://www.sciencedirect.com/science/article/pii/S0360131519301423

As recorded in the evaluation questionnaire, the overall satisfaction, confidence and enjoyment of the course received the most positive opinions, highlighting the success of the online training as a very positive learning experience.