BLISS project

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Identification of suitable platforms to host the BLISS VOOC infrastructures and content

Output type: O4-T1

EXELIA

June 2018

Contents

1. Introduction

The BLISS project's fourth intellectual output includes the development of the infrastructures for a Vocational Open Online Course (VOOC), which will comprise the BLISS learning units, contextualised and training and assessment materials produced in intellectual output (O3), in their online format (lecture notes/presentation slides, multimedia files and online interactive tools) and will also introduce additional pedagogical VOOC materials (e.g. VOOC video units, work assignments, collaboration mechanisms etc.), openly available to learners.

The BLISS VOOC will be available in English and all the six partnership languages (FR, NL, IT, EL, EE and BG) and is provided to include video units, supporting materials (slides, handouts, self-assessments), a discussion forum for interaction between participants, weekly assignments and a final examination at the end of the course.

The BLISS VOOC will be based on pedagogical principles derived from both the xMOOC and cMOOC models, and the learning process will be based on an online course delivery and self-learning, it is therefore necessary to facilitate the technical and functional preparation within suitable MOOC providers that will support the BLISS pedagogical mode. As a result, the preparation of the delivery of the VOOC infrastructure includes the a) identification of appropriate MOOC providers to support the BLISS pedagogical model and b) the development of the VOOC infrastructure and functionalities that include the authoring of descriptive materials to further facilitate the navigation of learners throughout the BLISS VOOC course.

This first deliverable of intellectual output (O4) consists of the identification of the most suitable MOOC provider that will enable and facilitate the successful development of the BLISS online course. Within the scope of this activity, a checklist of the characteristics of the most suitable available platforms is presented and a comparative analysis of their functionalities. The next step comprises of the development of the VOOC's structure in EN and all the official BLISS languages (FR, NL, IT, EL, EE, BG), including the authoring of descriptive materials and guidelines to be used for enhancing the learning experience, and for facilitating the navigation of participants throughout the BLISS VOOC.

1.1   What is a VOOC

A Vocational Open Online Course (VOOC)[1] belongs to the wider category of online courses namely MOOC (Massive Open Online Course); a targeted online course aimed at participation on the web.

A VOOC is typically defined as a MOOC oriented to help younger students to choose their career path (Clark, 2014). The main difference between these two types of online courses being the more specialised and vocational nature of the VOOC, meaning that it is usually addressed to more targeted to audiences and learners such as professionals or students for training purposes and are therefore take into account VET teaching and learning particularities. For this reason, VOOCs are often more specialised and technical in their nature and provide targeted learning opportunities for particular occupational profiles while addressing occupational skills gaps. The content of a VOOC can be adjusted to professionals' individual needs and training priorities, however their characteristics and functionalities remain common with a MOOC.

A MOOC encompasses an instructor/material-cantered and guided online course, which includes, short videos rather than full-length lectures, discussion forums, and provides the opportunity for a customised student course that is based on the acquisition of specific competencies and regards, learning as a process that can be tested and certified. As MOOCs evolve, there have been numerous attempts to classify them on the basis of various dimensions, such as underlying pedological principles, structural and economic design, technological background, type of content and resources, assessment methods etc.

1.1   Different types of MOOCs

The current MOOC literature categorises MOOCs into two main types based on the different pedagogical emphases and organisational models; connectivist MOOCs (cMOOCs) and the content-based or professor centric MOOCs (xMOOCs).

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[1] The term VOOC was coined by EC within the call for sector skills alliances (Applicants' guidelines - 04/2017)

Connectivist MOOCs (cMOOC) follow the principles of the theory of connectivism, which argues that learning processes need to be carried out within communities and networks of learners in order for the latter to increase their knowledge by making connections and interacting with the knowledge community (Anderson & Dron, 2011). cMOOCs employ a pedagogical model of self-organised learning in which learners are at the centre of learning process, defining their own learning objectives, establishing their personal learning pathways and collaboratively creating and sharing knowledge. Finally, cMOOCs employ a peer and self-assessment practice to improve learners' understanding of course material as well as to improve cognitive skills (e.g. recognise own strengths and weaknesses, understand grading process, etc.).

Content-based MOOCs (xMOOCs) follow the behaviourism, cognitivism, and to some degree constructivism learning theories.

Behaviourist learning theory assumes that all behaviors are either reflexes produced by a response to certain stimuli in the environment, or a consequence of that individual's history and current motivational state[2]. Consequently, behaviourist xMOOCs, tend to strictly pre-define the learning objectives, include well defined operative tasks and a rigid training path for learners.

Cognitivist learning theory suggests that the way people think impacts their behavior. Cognitivism xMOOCs therefore tend to have a less rigid framework since they recognize that thinking as essential to psychology and behaviours when developing the learning outputs.

Constructivist learning theory puts emphasis on the way humans determine meaning in relation to the interaction between their experiences and ideas. Consequently constructivist xMOOCs follows an open learning path, and offer the possibility of choosing the tasks based on their interests, while making further suggestions for additional information sources.

 xMOOCs employ an education model based on a traditional behaviourist approach in which information and knowledge is directly transferred by the instructor (Kesim and Altinpullut, 2014). In fact, in xMOOCs, learners have to complete the course in a given period of time (rigid learning path), attending sequential modules and conducting work assignments with fixed sequences and deadlines. Learning objectives are pre-defined by instructors, who deliver the knowledge through video

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[2] Chiesa, Mecca (1994), Radical Behaviourism: The Philosophy and the Science.

lectures, presentations, and textual readings, while learners passively receive the course.

The BLISS VOOC will incorporate aspects of both the xMOOC (more linear and instructor/material-cantered & guided) and cMOOC (more centered on social interactions and connectivism) models, however the emphasis will be put on the former model in which the constructivist aspect will be predominant on behaviorist aspects, since the BLISS VOOC will be freely accessible during and after the project's completion. Even if these models differ radically, the need to compromise and combine them, is dictated by the requirement to be as open for exploitation in various MOOC platforms as possible. This requirement is in turn set by the fast-emerging but still developing landscape of MOOCs in the EU, as well as the potential hybrid approaches of use in classroom-based environments.

1.2   Basic characteristics of a MOOC

Course structure: Every MOOC has a start and an end date, materials, facilitators and participants. It is differentiated from traditional lectures due to its engaging nature and its format variations, from quizzes to comprehension tests of smaller units. Lastly, a MOOC provides the opportunity to connect and collaborate with others, engaging the user in the interactive learning process.

Openness: The MOOC is freely accessible without payment to participate in the learning process, even though a user might be asked to pay to receive credit awarded by the institution. The work is available and shareable within the learners' community.

Participation: Via the MOOC, the learners become part of the course by engaging with other people's work, where everybody learns from each other and through interactive experiences. Additionally, learners can connect ideas and network, using information from the Internet.

Distribution: All the material (articles, tweets, tags, videos, materials etc.) produced and included in a MOOC course becomes automatically available in the Internet. There are several ways to implement the course and there are no restrictions as to how to run the course. A number or possibilities and pathways can be followed from the first to the last week of development, leaving room for a coexistence of approaches.

Lifelong: The MOOC structure promotes independence among learners, providing them with the ability to follow the learning process from their own space, to develop a reliable network easily maintained after the course and promote a lifelong learning culture among learners.

2. The BLISS VOOC

The BLISS online course will be characterised as a VOOC, due to its specialised thematic nature and target audience. The VOOC course that will be developed for the BLISS project will need to: a) include all learning units and pedagogical resources produced in intellectual outputs O2 and O3, b) be available in the six partnership languages (FR, NL, IT, EL, EE and BG) and EN, c) comprise of a material of up to 40 hours and d) become available in an open and free online platform.

The BLISS VOOC will be developed in six main stages, which involves:
- ✓ the preparation of the delivery
- ✓ the translations of the educational material in EN and all the languages of the partnership (FR, NL, IT, EL, EE and BG)
- ✓ the development of video material and work assignments
- ✓ the development of video subtitles and translation of work assignments in the languages of the partnership and the pilot run
- ✓ fine-tuning of the VOOC course.

The following table demonstrates the official timeline for the development of the BLISS VOOC.

Table 1|Steps towards completion of the BLISS VOOC

#	Activity	Task	By Who	Expected Deadline
1	Platform, structure & content preparatory work	O4-T1	EXELIA	M9 (June 2018)
2	Educational resources (OERs) for all learning units	O3-T1	BT, UCBL, UT	M15 (December 2018)
3	Online version of the (EN) BLISS VOOC	O4-T1	EXELIA	M23 (August 2019)
4	Additional OERs (incl. video units and work assignments)	O4-T2	UT, UCBL, TELESIG	M23 (August 2019)

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5	Translations of OERs	O3-T1	All partners	M15 (December 2018) M23 (August 2019)
6	Online version of the (FR, NL, IT, EL, EE, BG) BLISS VOOC	O4-T1	EXELIA	M23 (August 2019)
7	Pilot run in EN	O4-T3	UT, EXELIA	M24 (September 2019)
8	Fine-tuning the BLISS VOOC	O4-T3	EXELIA	M25 (October 2019)

2.1 Key activities

The BLISS VOOC pedagogy will be reflected in both the content of the VOOC and its accompanying pedagogic guidelines (manual). The content will comprise Open Educational Resources (OERs), and will allow for reuse, revision, remix, and redistribution, while the accompanying pedagogic guidelines will foster peer learning mechanisms. More specifically, the BLISS VOOC will be developed to facilitate what recent pedagogic research is converging to acknowledge as the four key MOOC activities.

a) **Lecture notes, presentation slides and case studies** will allow for the key activity of aggregation (i.e. filtering, selecting, and gathering personally meaningful information).

b) **Online quizzes and assessments** will facilitate the key activity of remixing (i.e. interpreting the aggregated information and bringing it to personal perspectives and insights).

c) **Interactive assessments, peer and self-assessment** will promote the key activity of repurposing (i.e. refashioning the information to suit personal purposes).

d) **Collaboration mechanisms, and/or features** such as discussion forums, twitter, blogs, chat, live webcasts, hangouts, wikis, group assignments will allow for the key activity of feeding forward (i.e. sharing the newly fashioned

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information with and learning from other participants) and for leveraging massive participation (i.e. having all learners contribute something that adds to or improves the course overall).

3. Technical and functional requirements for online course delivery

Building upon the pedagogical model of the BLISS course, the platform that will host the BLISS learning units and educational resources will need to be compliant with several functional and technical requirements.

3.1 Access & Registration

The BLISS online course and materials will be primarily addressed to ICT professionals in need of Continuous education and training[3] (C-VET) that require up-skilling to respond to the dynamic penetration of blockchain technology across multiple sectors of the EU economy, as well as Initial Vocational Education and Training[4] (I-VET) students aspiring to get employed as blockchain developers, VET providers who desire to integrate the developed course or module into an existing training program and finally other sector representatives.

Access to the BLISS course and content will also be open to everyone who may be interested in different aspects of blockchain technologies applications. There will be neither a registration fee nor an admission process, so registering for the BLISS VOOC will be as easy as clicking on the relevant link in the platform and completing the required information to sign up.

3.1   Course duration & structure

Most VOOCs involve a substantial time commitment, with estimated course workload usually ranging from 7 to 15 hours of work per week for learners to study

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[3] Education or training after initial education and training – or after entry into working life aimed at helping individuals to: improve or update their knowledge and/or skills; acquire new skills for a career move or retraining; continue their personal or professional development (Cedefop, 2008)

[4] General or vocational education and training carried out in the initial education system, usually before entering working life (Cedefop, 2008)

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the materials and complete their assignments; still, participants will be free to devote as much time as they'd like according to their needs and preferences. The BLISS online course will last approximately 1 to 3 weeks and will comprise materials of 35-50 hours, offered in seven languages (EN, FR, NL, IT, EL, EE and BG). The duration of each learning unit is estimated at 5-7 hours. Each course week will focus on a specific learning unit complemented with learning materials and resources to increase learners' retention and engagement. A typical course week will consist of concise lecture notes, interspersed with relevant literature or work on exercises and assignments.

3.2   Technological environment

Collaboration mechanisms, and/or features such as discussion forums, twitter, blogs, chat, live webcasts, hangouts, wikis, group assignments allow for the key activity of feeding forward (i.e. sharing information, discussing ideas with and learning from other participants) and for leveraging massive participation (i.e. having all participants contributing something that improves course quality). Some key features that should be included in BLISS learning environment: Online discussion forum following the same structure with the BLISS course:

- Based on the learning outcomes and units; Personal writing space in the format of a blog for course participants and
- Facilitators; and social connections and micro-blogging tools (Twitter, Facebook and Google+).

3.3   Communication & documentation

A communication scheme between teachers and learners to support learning throughout the course, as well as descriptive material needs to be carefully created and contextualised in the BLISS VOOC. Strategic structured communication through regular messages, including weekly feedback, announcements and reminders will assist to maintain the engagement and focus of learners on the course experience and enhance the perception of teaching presence by participants. Another means to interact and communicate with participants is through the different communication and collaboration channels (discussion forum, chat and blog) provided by MOOC platforms. To support learning, the partnership will also create descriptive material and guidelines to enhance the learning

experience, as well as to facilitate the navigation of learners through the BLISS VOOC. These materials will present:

1. The curriculum objectives
2. The knowledge to be gained
3. The learning units
4. The recommended background for participants
5. Navigation directions for learners to help them easily find the learning materials and how to use them
6. Explicit instructions for each step of every assignment
7. The average time necessary to complete each unit
8. The languages in which the learning materials are available
9. The curriculum level in accordance with EQF
10. Reference to the partnership, Erasmus+ and licensing issues

Open Educational Resources such as lecture notes, presentation slides, and exercises should meet the following training and content requirements to assure the high-quality level of VOOC delivery and an optimum learning experience.

4. Presentation of existing MOOC providers and services

This section focuses on the examination of the main features, services and functionalities of a list of possible MOOC providers and online learning platforms to host the BLISS online course. The section includes a checklist designed to capture the characteristics, provisions and weaknesses of MOOCs, which will be utilised as the main tool for evaluating MOOC platforms in terms of compliance to the BLISS functional and technical requirements. This tool defines five key categories to assess different MOOC platform providers:

<u>Learning content and training resources</u>

This category deals with the type of content that platforms support to facilitate teachers structuring the course and decide upon the material to be used in the learning process. We seek information on the types of training material and resources that platforms provide learners to increase their engagement. Such types of material may include video lectures, video tutoring, text-based documents,

slides/presentations and external resources provided as links of interest. Also, in this category, we will investigate the organisational aspects of courses offered by platforms in terms of instructions and information (e.g. objectives of the curriculum, course syllabus, navigation directions, instructions for each task, FAQs, announcements, etc.) provided to learners for facilitating their navigation through the MOOC.

Tasks and assessment

In this category we seek information about the type of tasks (individual or group tasks) that the platform supports and provides to learners, and the scheduling of tasks to be carried out (i.e. whether they have a reasonable content order and whether they are conditional to previous tasks and learning activities). We also seek to gain insights into the types of assessments supported by the different platforms (peer to peer, self-assessment, and feedback provided by the facilitator), as well as the tools to be embedded for assessing skills acquisition such as quizzes, multiple choice tests, case studies, exercises and hypothetical scenarios.

Technology

This category aims to gather information related to the technological features supported by the platforms, including course and material availability, mobile access through browsers on tablets and smartphones, languages available and web 2.0 features (social networking, user blogs, micro blogging, etc.).

Communication and interaction

This category refers to the communication patterns supported by MOOC platforms and how learners and facilitators engage in online discussions and with each other. Particularly during the pilot run, it is essential to gain insights into how learners and facilitators engage in online discussions and interact with each other in the different platforms under investigation. This is because we seek to obtain information about the communication tools that MOOC platforms offer to better support learning process. Such tools may include discussion forums, social media integration, private messaging, contact forms, chat, video conference, messaging platforms, etc.

This characteristic however maybe difficult to implement and keep running after the project's completion, since the partnership will not provide facilitation after its

completion. If this is the case, when the BLISS VOOC is used by schools and training centers, with groups of students, tutors are advised to propose external communication tools.
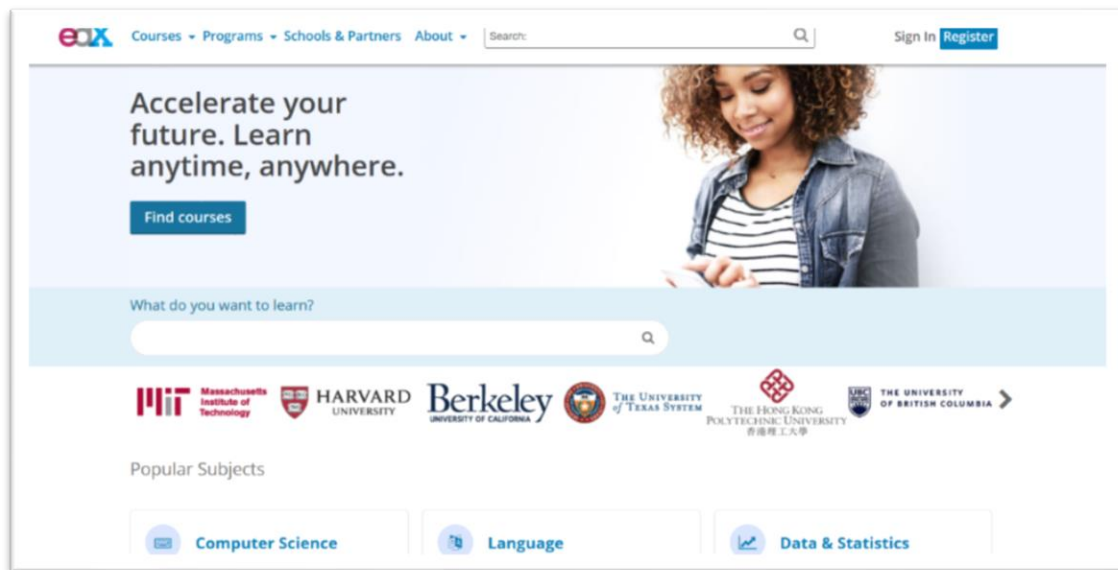
4.1 Description and evaluation of MOOC platforms

Since the MOOC phenomenon took off in the education landscape (2012), several providers have emerged (such as edX and FutureLearn in the UK, Coursera in the US, Alison in Ireland, and Iversity in Germany), offering students a large variety of online courses in almost every field of study. This subsection comprises a review of some of those MOOC platforms that seem appropriate to host the BLISS course, identifying their strengths and weaknesses and assessing whether they embed the features and tools that are essential for the implementation of the BLISS pedagogical model.

The evaluation of the different MOOC platform providers has been carried out by exploring their authoring environment, by attending a trial course, and by retrieving information from relevant user reviews. The analysis and comparison of these platforms against the BLISS pedagogical requirements, will assist the consortium in the selection of the most appropriate to host the BLISS online course. A brief description of eight candidate online platforms for the BLISS VOOC (edX, Udemy, Coursera, Futurelearn, Alison, Iversity, Versal, Openlearning) is provided below.

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4.1.1 EDX

EdX, founded in 2012 by MIT and Harvard, is a non-profit online learning platform that offers interactive online classes from the world's best universities in a wide range of disciplines such as biology, business, chemistry, computer science, economics, finance, law, literature, and math. The edX platform currently offers approximately 980 interactive online courses to more than 3 million users; most of which free of charge.

EdX provides weekly learning sequences for each course, comprising of short videos (10 minutes on average) interspersed with interactive learning exercises, which offer learners the opportunity to practice the concepts and topics addressed by the videos. Courses consist of modules or learning units complemented with specific course material in the format of textual documents, tutorial videos, discussions and exercises. To facilitate learning process, edX provides facilitators with the capability to define different scheduling for each module and adopt their own grading policy. Also, edX platform offers an online discussion forum where learners can post and review questions and comments to each other and teaching assistants.

Features, functionalities and tools include self-paced learning, direct access to course material, online discussion groups, wiki-based collaborative learning, certification availability, assessment of learning as a student progresses through a course, online laboratories and other interactive learning tools and social media integration.

Official Website: https://www.edx.org/

4.1.2. UDEMY
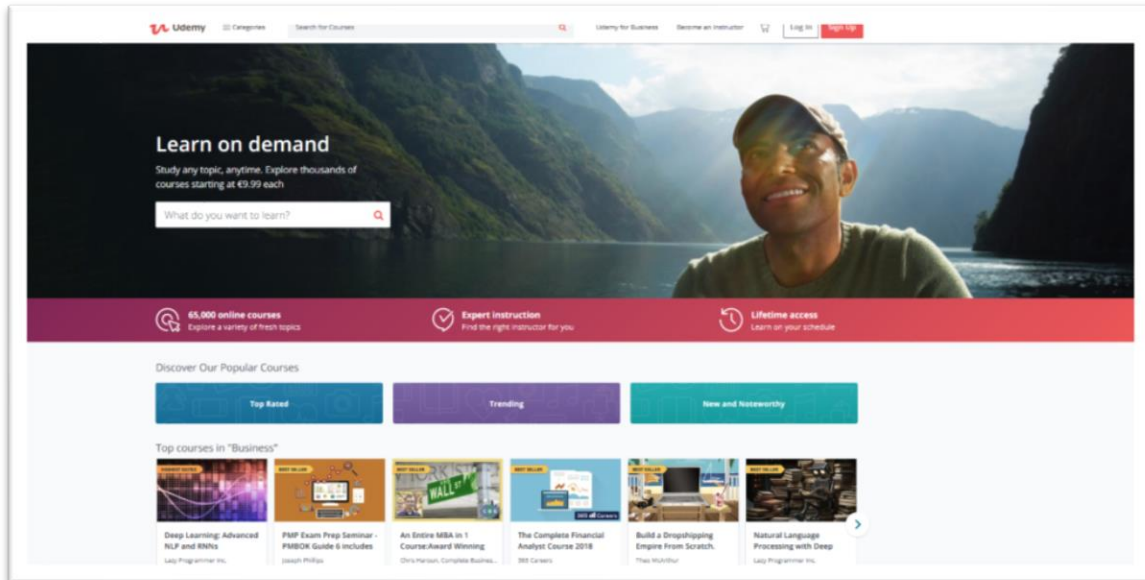
Established in 2009, Udemy is a leading online educational platform, with more than 8 million registered learners worldwide. Courses offered by Udemy cover a wide range of disciplines and categories, including business and entrepreneurship, philosophy, academics, arts, health and fitness, languages, music, and technology. Udemy's mission is to empower on-demand learning, accessible to all by offering affordable, simple, and flexible education, so that participants share the capability to fulfil their expectations and objectives. At the time being, Udemy offers more than 65,000 courses in more than 80 languages, while 30 percent of Udemy students consume courses via iPhone, iPad, and Android mobile devices.

Udemy courses are made up of independent modules that contain different types of learning materials such as video lectures, presentation slides, and textual document, interspersed with automated quizzes and assignments to provide a comprehensive learning experience. Udemy provides a discussion forum to leverage interaction among participants as well as an "announcement" section where instructors can post course updates, reply to participants' request and questions, and inform learners about developments and changes in course schedule and structure. In Udemy, creating a course is entirely free; however the course should fulfil minimum requirements to become eligible for getting published. In particular, courses should be well structured to deliver on learning objectives,

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contain at least 30 minutes of content with 60% video content, while video files should be clear, well-lit and high-definition.

Features, functionalities and tool include self-paced learning, video, audio and text lectures, quizzes and coding exercises, certificates of completion, resource area, FAQs and instructor announcements.

**Official Website:** www.udemy.com

4.1.3. Coursera
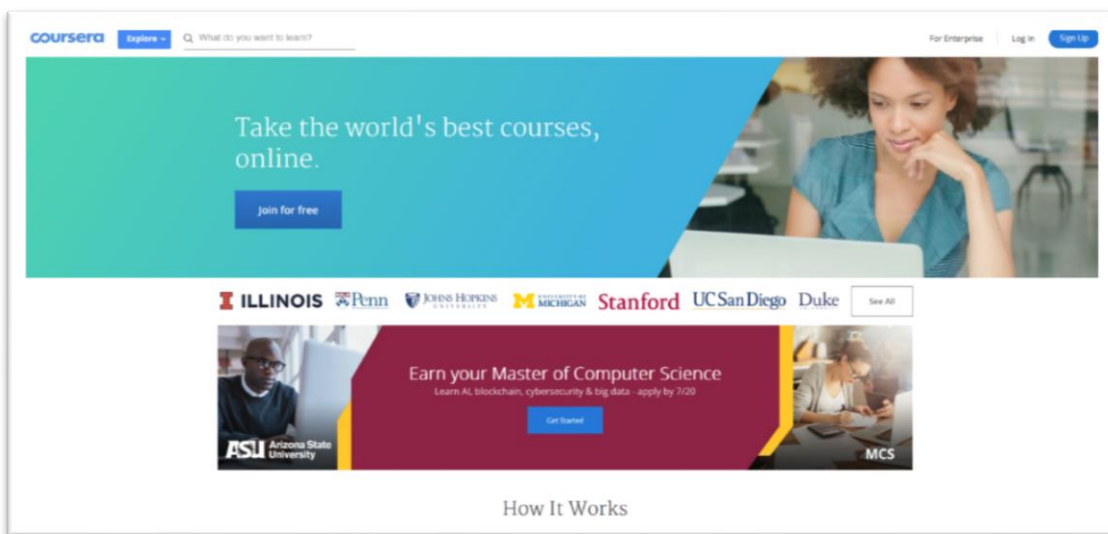
Coursera is a non-profit education platform that partners with top universities and organizations worldwide, to offer free courses online for anyone to take in a wide range of disciplines such as physics, engineering, humanities, medicine, biology, social sciences, mathematics, business, and computer science. As of October 2017, Coursera has more than 28 million registered users in more than 2000 courses from 149 institutions. Each Coursera course consists of a set of learning units/modules, which are supported by a pool of short video lectures, textual material, external links of interest, and work assignment to be submitted by learners at the end of each module. Coursera courses last from six to ten weeks, requiring a substantial time commitment from learners, which translated into 5 to 10 hours of study per week. Also, the platform provides a Web Forum to facilitate learners' interaction with peers and instructors and promotes peer assessment allowing learners to evaluate and provide feedback on each other.

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Features, functionalities and tools include self-paced learning, web discussion forum, peer graded assessment, interactive quizzes and exercises, schedule and resource area, direct access to course material, course wikis, meet-ups, FAQs and mobile apps.

Official Website: https://www.coursera.org/
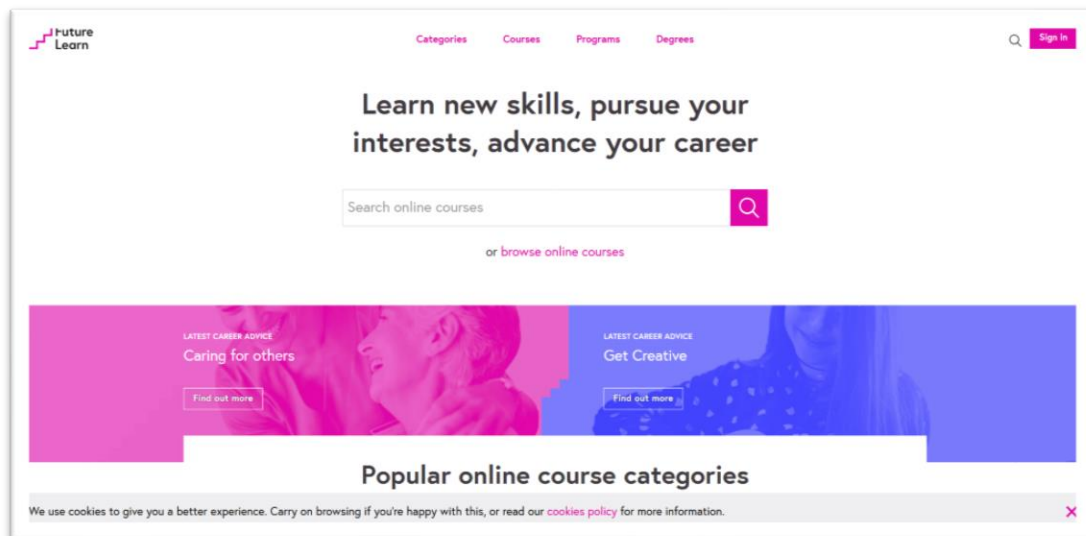
4.1.4. FutureLearn

FutureLearn is a private online learning platform wholly owned by the Open University in Milton Keynes (UK), offering a diverse selection of courses from leading universities and cultural institutions around the world, free of charge. FutureLearn has 143 partners from the UK, Europe and Africa, Asia and the Middle East and work with a range of internationally renowned organisations such as the Association of Chartered Certified Accountants (ACCA) and Institution of Engineering and Technology (IET). FutureLearn courses are divided into weeks, which contain various activities, each one built from a sequence of straight-forward steps.

Resources provided to support learning include videos, audio files, textual documents and slides, usually complemented by multiple choice quizzes aimed to help learners check how well they have understood the key points of the topic addressed. Learning resources have also a small space to allow learners to comment, ask questions, and discuss topics with their peers and instructors. Many courses offer learners the capability to do assignments and get feedback from other learners promoting peer assessment, while graded test are available during the course to enable learners assess knowledge acquisition.

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Features, functionalities and tools include user profile pages, social network features (follow button), progress monitoring, peer assessment, discussion space, schedule and resource area, multiple choice quizzes and tests and mobile apps.

Official Website: https://www.futurelearn.com/

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4.1.5 ALISON
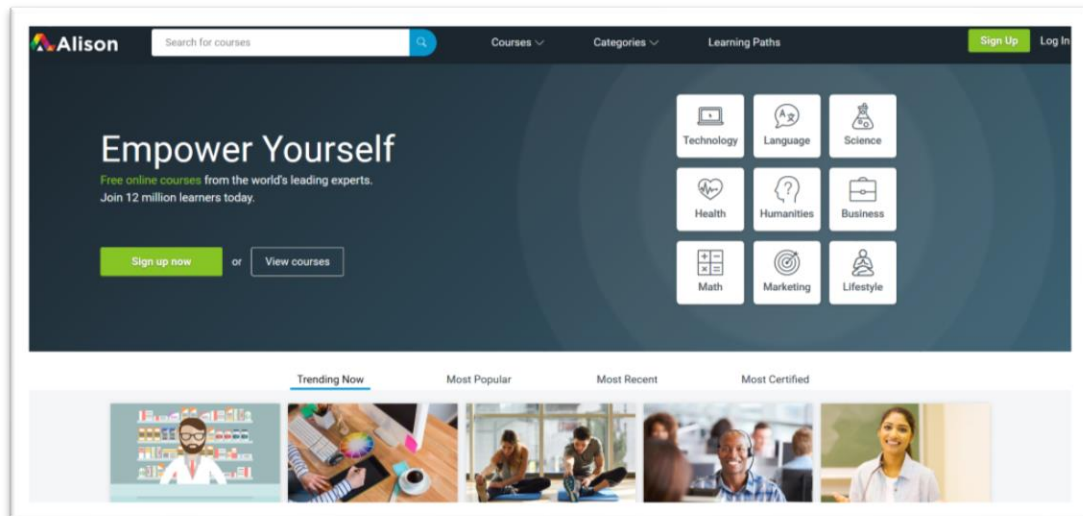
Alison is a leading provider of free online courses with 11 million registered learners and 1,5 million graduates worldwide. Founded in 2007 by serial entrepreneur Mike Feerick, Alison engages in a new model of free certified learning offering over 1000 high quality courses across 9 distinct categories in subjects ranging from touch typing, English grammar to business management and health & safety compliance. Each course has a fact sheet outlining a range of information including course description, learning objectives, certification, minimum age appropriateness, course duration, medium of delivery and estimated education compared with qualification frameworks in the UK.

Alison courses are structured into comprehensive learning units/modules. Inclusive within modules are the materials that learners need to attend in order to engage in learning activities. These educational resources may include a range of presentations and slides, video and audio files, textual documents and animation. Assessments are foreseen for all courses and are generally in the format of a quiz. Some courses have assessment throughout the course; most have just one at the end leading to a certificate of attainment. Furthermore, the Alison platform provides a course forum to promote the interaction among learners attending the same content as well as a general discussion forum where participants can discuss anything else ALISON related, or topics of education of interest to them. All Alison courses are available online aimed to facilitate self-paced learning; however it is not possible to download the course material to study offline.

Features, functionalities and tools include self-paced learning, progress monitoring, graded assessment, social media integration, course and discussion forums, certification availability, descriptive material, and direct access to course material.

Official Website: www.alison.com

4.1.6 IVERSITY
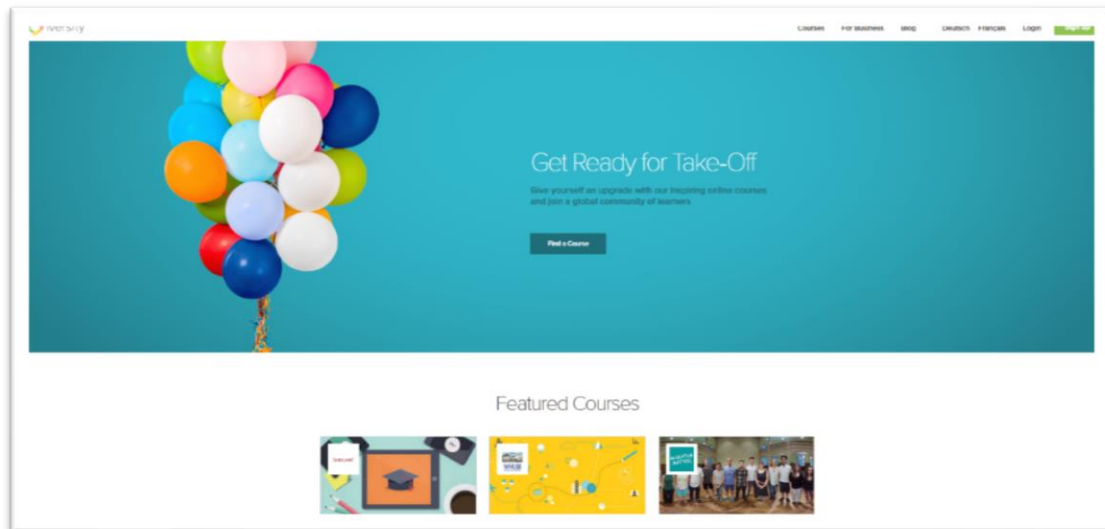
First established in October 2013, Iversity is a European online learning platform offering free and open online courses and lectures in a wide range of disciplines including political science, medicine, application design, architecture, business management, economics, languages, and personal development. Iversity MOOCs enable professors to experiment with innovative teaching formats and provide students and independent learners with a customised higher education experience. Being based in Europe, Iversity is also specialised in working within the European Credit Transfer and Accumulation System (ECTS).

A detailed description for each course is available to learners providing a range of information including course summary, learning outcomes, course duration and schedule, recommended background, course instructors, average time of study per week, and course release date. Iversity courses are made up of comprehensive chapters, units and assessments; each chapter is released weekly containing 6-10 units to be attained by learners. Units are supported by lecture videos, interspersed with interactive quizzes and homework assignments. The platform provides instructors with the capability to create project groups and promote peer to peer

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reviews in order to enhance collaboration and interaction among learners. To this end, the platform also encourages participants to participate actively in the discussion forum by posting questions and comments and receiving feedback from instructors. Once learners have completed 80% of the course material (video lectures and quizzes) they receive a free statement of Participation, which confirms their active involvement throughout the course. There is also the possibility for learners to certify their learning and receive a certificate of accomplishment by taking an online-proctored exam at the end of the course.

Features, functionalities, and tools include self-paced learning, case studies, practical exercises, graded tests, discussion forum, direct access to material, certification availability, accessible from tablets and smart phones.

Official Website: https://iversity.org/

4.1.7 VERSAL
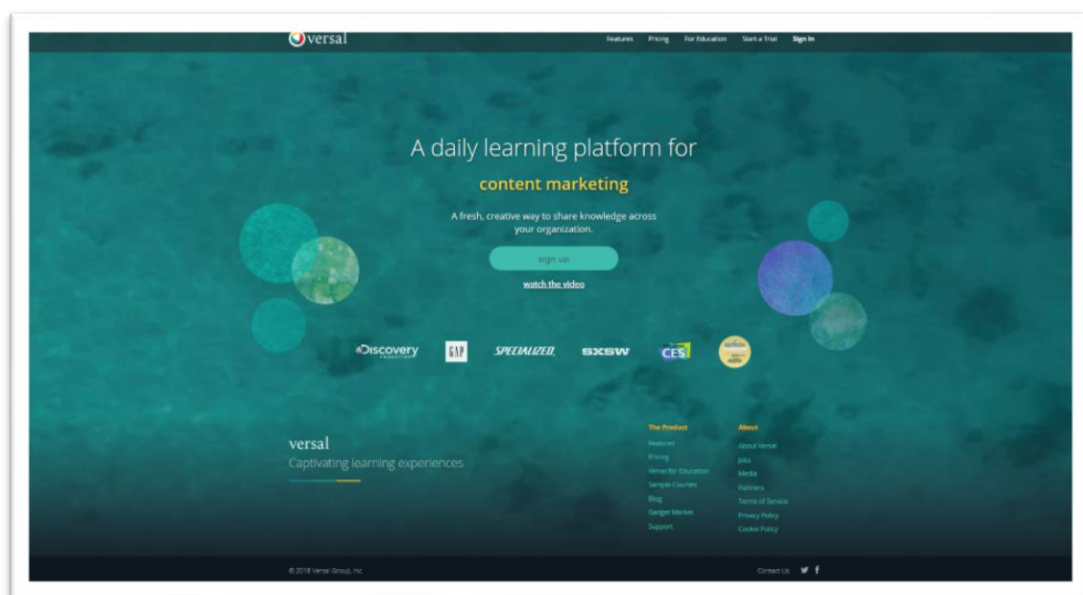
Versal is an e-learning platform offering free, open, and interactive courses in a wide range of disciplines and subjects including marketing, economics, ICT, biology, social sciences and math. Founded in 2012, Versal provides course builders with a library of gadgets to easily incorporate videos, surveys, quizzes, diagrams, and other tools to make the course more engaging and interactive. To ensure interoperability of course content, all MOOCs are SCORM compliant.

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Courses provided by Versal are divided into individual lessons (modules), supported by short video units, textual documents, presentations, recommended readings, exercises and automated quizzes aiming to enhance learning process and enable learners assess knowledge and skill acquisition. The platform also enables instructors to create fixed learning paths with interdependency of sequential modules and tasks. Also, the platform offers a discussion forum, a blog and social media connections targeting at enhancing learners' engagement and support interaction with peers and instructors. To support flexible and ubiquitous learning, all MOOCs are compatible with smart phones and tablets.

Features, functionalities and tools include self-paced learning, learning activities that can be sequenced, direct access to material, interactive quizzes and exercises, automated and peer assessment, discussion forum, blog, social media connections.

Official Website: www.versal.com

4.1.8 OpenLearning
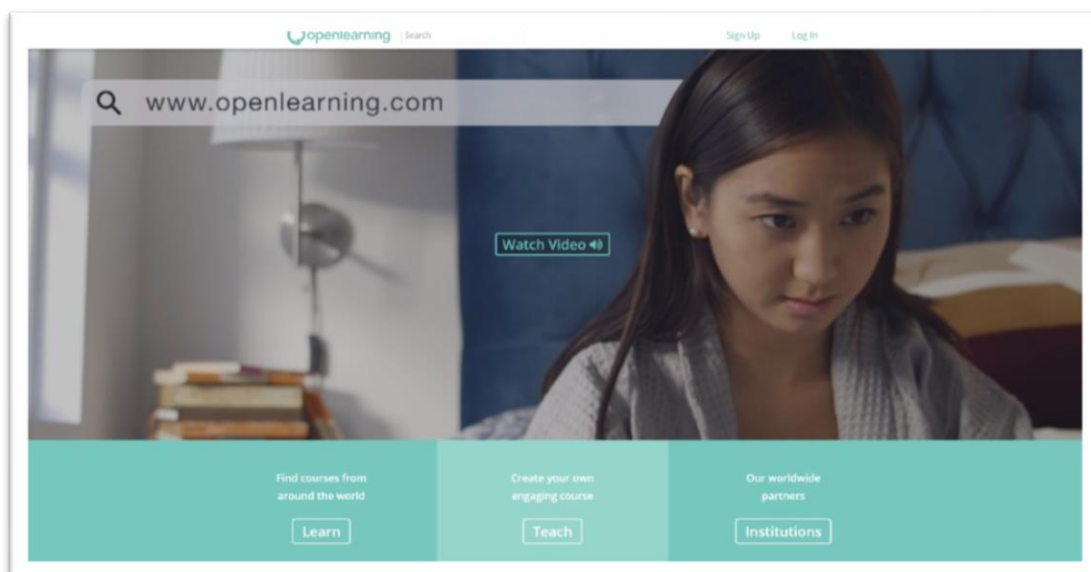
OpenLearning platform is an online learning platform that goes beyond content delivery, focusing on community, connectedness and student engagement. Founded in 2013, OpenLearning is a for-profit educational technology institution based in Sydney, Australia that offers a social-learning platform for the delivery of MOOCs. In August 2017 OpenLearning had 931,194 registered users and over 1,000 available courses in November of the same year. One of OpenLearning's

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primary objectives is to create meaningful learning by motivating students and encourage them to learn via an engaging, socially motivating and active experience.

Amongst the most important advantages of OpenLearning, is its increased interactivity between users and facilitators, as well as the provision of truly interactive instructions. Increased engagement of users is also enhanced in learning experienced via social media mechanisms and facilitation/monitoring tools; learners are therefore increasingly active and involved and empowered in the learning process.

OpenLearning uses social media workflow to enable and encourage commenting and liking, meaning that each course will foster a community of collaborative learners instead of individuals feeling lost in a sea of information. It also provides a wide range of authoring tools to make the process of learning easier and more entertaining (e.g. auto-assessment, blog, discussion forum). OpenLearning allows publishers to download course content to promote interoperability and reusability of their educational resources. In addition OpenLearning gives the opportunity to access online courses free of charge, facilitating and encouraging wider participation in MOOC.

OpenLearning provides a wide range courses in more than 12 categories including Economics and Business, Computers and Technology, Humanitites, Law and Maths and Science.

Features, functionalities and tools include self-paced and modular learning, learning activities that can be timed and sequenced, direct access to material 24/7, interactive quizzes and exercises, automated and peer assessment, discussion forum, online chat, blog, social media connections, badges, certification, progress monitoring and analytics.

Official Website: https://www.openlearning.com/

5   Comparative Analysis

5.1   Context

All MOOC platforms contain a course description section to introduce learners to course content, answer initial questions and concerns, and set course expectations. These platforms usually provide information about course materials, learning

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activities and objectives, recommended background, certification, duration, and facilitators' profile. A course schedule is available in courses designed to be delivered in fixed data sessions, containing sequential activities & rigid learning paths.

Only edX, Udemy, Iversity and OpenLearning contain a special "announcement" section that enables facilitators and trainers to publish changes in course structure & content, provide instructions for tasks & assignments, and reply to learner's comments & inquiries. In the rest platforms, facilitators make use of the discussion forum to make announcements and update participants on course related issues.

To assist learners in navigating throughout the MOOC, all MOOC providers include a FAQ section, which provides participants with quick answers to common questions associated with online learning. The only exception is Coursera, which offers the FAQ section within the course description.

Table 2|Comparative analysis of MOOC platforms based on context

	Course description	Course structure	Syllabus	FAQ section	Announcements
Coursera	✓	✓	✓	✓	
EdX	✓	✓	✓	✓	✓
Versal	✓	✓	✓	✓	
Udemy	✓	✓	✓	✓	✓
FutureLearn	✓	✓	✓	✓	
Iversity	✓	✓	✓	✓	✓
Alison	✓	✓	✓	✓	
OpenLearning	✓	✓	✓	✓	✓

5.2 Content & evaluation

All MOOC platforms make explicit mention on the value of self-paced and flexible learning. They all support independent training modules/units, as a means to accommodate for different preferences and needs, and make learners feel convenient to decide the pace at which they want to go through content.

Moreover, the majority of MOOC platforms (Coursera, edX, Versal, FutureLearn, OpenLearning and Iversity) offer instructors the capability to create online classes

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with tightly monitored learning paths, greater interdependency among learning activities, and written assignments with deadlines.

MOOC platforms do support different file formats and types of learning materials to be embedded within courses such as presentation slide sets, video & audio files, textual documents, images, and animation. Notwithstanding, Versal and OpenLearning allows instructors to integrate and customise online interactive tools & gadgets (e.g. Educreations, Quizlet,) to create engaging new content and import existing materials.

As concerns the evaluation of participants' performance, the majority of MOOC providers support schemes of automated (through quizzes and multiple-choice questionnaires) and peer assessment (through uploading work assignments and request feedback from peers). Provision of feedback is being realised through the discussion forum or the "announcement" section (if available).

Table 3|Comparative analysis of MOOC platforms based on content

	Modularity	Sequential activities	Different content format	Interactive online tools	Automated assessment	Peer assessment
Coursera	✓	✓	✓		✓	✓
EdX	✓	✓	✓		✓	✓
Versal	✓	✓	✓	✓	✓	✓
Udemy	✓		✓		✓	✓
FutureLearn	✓	✓	✓		✓	✓
Iversity	✓	✓	✓		✓	✓
Alison	✓		✓		✓	✓
OpenLearning	✓	✓	✓	✓	✓	✓

5.3   User interactivity & communication

All MOOC platforms provide adequate communication mechanisms to foster interaction among participants, and provide collaboration opportunities, thus making MOOC feels more like a real classroom. Course discussion forums and blogs enable learners to converse with other participants, give & receive feedback on

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assignments, report errors and post questions, hence increasing learners' engagement and triggering intervention on the part of the facilitator.

OpenLearning, Iversity and Alison allow the formation of learners' groups, as a way to foster collaborative learning and increase interactivity. To leverage massive participation, all platforms except Canvas Network contain a button that permits learners and instructors to share courses on social media (Twitter, Facebook, Google+ and LinkedIn). Moreover, the majority of platforms (Versal, Udemy, FutureLearn, Iversity and Alison) do support the sharing of documents and images via the course discussion forum.

Table 4 | Comparative analysis of MOOC platforms based on interactivity

	Discussion forum	Blog	Social media connections	Group of learners
Coursera	✓	✓	✓	
edX	✓	✓	✓	
Versal	✓	✓	✓	
Udemy	✓	✓	✓	
FutureLearn	✓	✓	✓	
Iversity	✓	✓	✓	✓
Alison	✓		✓	✓
OpenLearning	✓	✓	✓	✓

5.4 Technical Operation

The main characteristic of all MOOC platforms is that they are designed to support unlimited participation and open access via the web; all course materials and resources are always available and downloadable with the aim of increasing flexibility and promoting self-paced learning.

Although free access is met in all MOOC platforms, some providers tend to reduce the exploitation possibilities of resources by retaining the copyrights to course content and learning materials. At Coursera, edX and Alison, course content is being made available only for personal use and strictly in connection with course activities. Notwithstanding, Versal, Udemy, FutureLearn and Iversity) offer a bigger

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flexibility on this matter; for instance, these platforms have clauses that allow publishers to determine the preferred licensing for their course content, which implies that the BLISS online course can be released under open license to be used without restrictions.

To ensure ubiquitous access and facilitate remote learning, most platforms provide access to courses through mobile devices on the latest versions of Android, iOS and Windows browsers, while a small number of them have developed dedicate mobile applications to foster on-the go access; nevertheless these applications currently have more limited functionalities than the ones offered by the web-based version.

Finally, Coursera, Versal, OpenLearning and Udemy are the only platforms to support non-English languages and thus are able to offer courses in the native languages of participating institutions (such as Italian, French, Spanish, Dutch, Hindi, German, etc.), providing instructors with a great number of languages to choose from for creating course content.

Table 5 |Comparative analysis of MOOC platforms based on technical operation

	Free and open access to content	Course and materials always available	Course content under open license	Mobile access	Support of non-English languages
Coursera	✓	✓		✓	✓
edX	✓	✓		✓	
Versal	✓	✓	✓	✓	✓
Udemy	✓	✓	✓	✓	✓
FutureLearn	✓	✓	✓	✓	
Iversity	✓	✓	✓	✓	Only German
Alison	✓	✓			✓
Open Learning	✓	✓	✓	✓	✓

5.5   Additional requirements

Only a small number of MOOC platforms do not have limitations concerning the type of organisations eligible to create and publish courses in their marketplace. Versal, Udemy and Alison fall into this category, being open to anyone interested in developing and making available online classes and modular courses. All other platforms host courses only from universities, higher education institutions, and

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exclusive partner members (e.g. leading enterprises, foundations, NGOs, governmental agencies, and academic consortia etc.), as a way to ensure the quality and popularity of courses provided.

To this end, Udemy has put in place a quality review process that every single course should go through before getting published. Creators have to submit their course for review once it has been completed and only if it passes the quality review process; it becomes eligible to get published in the Udemy marketplace.

As regards accessibility and usability, the great majority of MOOC platforms do not have a multilingual e-learning interface; most platforms are available only in English (e.g. Versal, Udemy, FutureLearn and Alison) or support a small number of languages just like Iversity (English and German). Notable exceptions are EdX and Coursera, Openlearning which allow learners to select among a great number of default languages including French, German, Spanish, Russian, Hindi, etc.

6   Conclusions

The Open Educational Resources (OERs) can be hosted online independently of the platform chosen to host the MOOC. For example, lecture notes may be shared on YouTube, while podcasts may be shared on iTunes. Universities involved in the OER production may host HTML or text material on their website. Teachers may even host their course materials on their personal websites. Integrating OERs from different platforms is part of the essence of MOOC openness presented in Section 1. In this context, the core role of the MOOC platform is not of hosting OERs but rather of providing a federative point of access to the participants in a particular MOOC session to implement the chosen pedagogical model as discussed in Section 2 (aggregation, remixing, repurposing, feeding forward). The more independently from the MOOC platform the OERs are hosted, the easier it is to evolve the course and to keep up with the evolution of MOOC technology. While a particular course session is bound to a chosen MOOC platform, it remains possible to choose another platform for a subsequent session using the same OERs. For instance, different sessions may be organized in different languages using different MOOC platforms. The MOOC platform chosen to host a BLISS course session needs to offer as many as possible of the following functionalities, features and tools to support the BLISS online course, and hence provide participants with a multifaceted learning experience.

1. To support learning, the MOOC platform needs to provide descriptive materials and guidelines to facilitate the navigation of learners through the BLISS VOOC

context. Such materials will include course description, course schedule, syllabus, announcements and FAQs.

2. The MOOC platform needs to support content in the format of video, text, image and presentations to be compatible with the developed OERs.

3. As the BLISS course aims to employ a learner-centred approach that will allow learners establish individual objectives and a personal learning path, the MOOC platform needs to ensure learning flexibility through individual modules and course materials that will be easily accessible and always available.

4. In order to evaluate learners' skill acquisition and assess knowledge building, the BLISS pedagogical approach foresees schemes of diagnostic and formative assessment with self-correction, peer to peer evaluation, and feedback from facilitators.

5. The BLISS pedagogical model relies heavily on the value of peer assistance and collaboration to support learning in an online context. To this end, the MOOC platform needs to embed communication mechanisms and tools such as discussion boards, blogs, social media connections that will enhance the level of interactivity and collaboration.

6. The BLISS online course aims to support learning in any context and situation, and thus needs to be accessible through mobile devices such as laptops, tablets and smart phones.

The main conclusions drawn from the evaluation of MOOC providers and services are the following:

1. Alison, Udemy, OpenLearning and Versal do not impose limitations on the type of organisation that is eligible to publish MOOC content on their platform and there are no restrictions on the

2. Coursera, Udemy, OpenLearning and Versal do not have a restriction on which language to use for developing course content, although some seem to have content only in English.

3. The vast majority of MOOC platforms do not provide a multilingual interface except for Versal and OpenLearning.

4. Most platforms retain the copyright to course content and material. Notwithstanding, Versal, Udemy, OpenLearning, FutureLearn and Iversity leave room for releasing learning content under open licenses.

5. Content and materials in the format of video, audio, text, and presentation are supported by all MOOC platforms.

6. All MOOC platforms provide communication tools (such as discussion forums and blogs) to support the interactivity of learning process. All platforms support access to courses through mobile devices (smartphones, laptops and tablets).

Overall, OpenLearning is the preferable online platform to host the BLISS online course, due to the numerous advantages that it presents. Increased interactivity, the lack of limitations and restrictions on the publishing source and languages to use, the release of learning content under open license, the access to course materials through mobile devices and numerous additional functionalities (e.g. communication tools, interactive gadgets, auto-assessment, timed learning activities) are amongst its on top of its aesthetical appeal and by virtue of previous user-friendly experience.

Finally, OpenLearning provides a range of tools that facilitate the learning process, provides personalised assessment, timed learning activities, and allows the evaluation of the course progress.

These characteristics distinguish OpenLearning from the other MOOC platforms and verify the platform's appropriateness to host the BLISS online course.