

# DIMENSIONS OF OPENNESS IN MOOCS & OERS

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## Abstract

This paper proposes a framework of Openness in Education regarding Educational Resources, Infrastructure, Participants, Educational Institution and Outside Environment across ten Capabilities plus the Time and Place dimensions. Next, it evaluates the Openness of ten Massive Open Online Courses on Language Learning. The results reveal that they lack Openness at a large extent.

Keywords: Evaluation, Open Education, Open Educational Resources, Openness in Education, Massive Open Online Courses.

## 1 INTRODUCTION

The concept of Open Education relies on the idea that the world's knowledge is a public good [1]. The United Nations (U.N.) Universal Declaration of Human Rights states that "Everyone has the right to education. Education shall be free" [2]. Consequently, Open Education is a human right and education should be free and open. However, there is a lot of ambiguity what it means free and open education. A lot of attempts have been made in order to define Openness in Education. However, there is still confusion since Openness is a broad, abstract, general and complex concept that encompasses many meanings. So, the analysis of Openness in Education is not an easy task.

Recently, various movements have been initiated in order to support and promote Openness in Education. These movements include Open knowledge, Open Content, Open Data, Open Educational Resources (OERs), Open Educational Practices (OEPs), Open CourseWare (OCW), Massive Open Online Courses (MOOCs), Open Design, Open Source Software, Open Source Hardware, Open Research, Open Science, Open Access, Open Internet & Network Neutrality, Open Government, Open Standards among others.

All these movements promote resources (e.g. data, objects, design, process, software, hardware) that anyone can freely access, retain (download, duplicate, store, print), use, reuse, revise (translate, change, adapt, adjust, modify, alter, extract), remix (combine), and distribute (share) under some licenses. These licenses offer no or limited restrictions but recognize authorship of work.

The term Open Educational Resource (OER) was first proposed at UNESCO in 2002. UNESCO defines OERs as "any type of educational materials that are in the public domain or introduced with an open license. The nature of these open materials means that anyone can legally and freely copy, use, adapt and re-share them." [3], [4].

Open Educational Practices (OEPs) have a slightly different meaning and refer to educational and teaching practices based on creating, using, re-using and sharing OERs [5], [6], [7]. Massive Open Online Courses (MOOCs), on the other hand, refer to open online courses designed for a very large number of learners while Open Access (OA) refers to research results such as academic journal articles, conference papers, book chapters, monographs, theses. Open Science refers also to research methodologies, processes, algorithms, data, and results in various sciences. Moreover, Open Collaboration refers to collaboration in projects and environments such as open source software, forums, social networks, crowdsourcing among others. Finally, Open Internet refers to Internet infrastructure and resources while Network Neutrality means that all Internet traffic should be treated equally, and not discriminated or charged differently depending on the user, content, website, platform, application, type of attached equipment, or method of communication.

Recently, MOOCs and OERs have attracted a lot of attention. These resources include educational courses, syllabus, curriculum, content, videos, presentations, case studies, assignments, assessments, tests, among others. However, Openness in MOOCs and OERs has multiple dimensions, and each dimension has multiple levels (degrees). This paper aims at presenting a framework to describe the dimensions of Openness in MOOCs and OERs.

## 2 PREVIOUS STUDIES

In order to describe important factors of Openness in Education, and establish a shared view and a common language regarding Openness in Education, several researchers proposed appropriate frameworks. In 2006, the UK's Open University defined its mission in terms of four Openness concepts: openness to people, places, methods and ideas [8]. Kahle [9] identified five principles associated with Open Education: access, agency, ownership, participation and experience. Wiley and Hilton III [10] argued that Openness affects connectedness within higher education, personalization of educational materials, and the ability to create and share new works. Mulder [11] distinguished the following six dimensions of openness: Open access (anyone can basically participate regardless of their prior education); Freedom of time (students can begin a course or programme at any point during the year and study at any time); Freedom of pace (the student can basically determine his/her own pace and schedule); Freedom of place (the student can study at home, at work, at a library, in a virtual classroom, on the train or on a plane, abroad, on a boat, in prison, etc.); Open programming (the student can take and if necessary combine modules/courses in any order); Open to target groups (any type of learners). Hilton et al. [12] measured Openness of OERs according to the ability of anyone to openly reuse, redistribute, revise, and remix them. Later, Wiley [13] added the ability to openly retain them. Beetham et al. [5] considered six features of paradigmatic open practices: opening up content to students not formally enrolled; sharing and collaborating on content with practitioners; reusing content in teaching contexts; using or encouraging others to use open content; making knowledge publicly accessible. Gilliot et al. [14] classified MOOCs across the following dimensions of Openness: learning goals, resources selection, organization of learning activities, organization of group work and collaboration.

Mulder and Janssen [15] presented the Five Components for Open Education (5COE) framework consisting of: a) Open educational resources (OER); b) Open learning services (OLS) (e.g. tutoring, advice, meetings, communities, teamwork, presentations, consultation of sources, navigating the Internet, testing, examining); c) Open teaching efforts (OTE) (the efforts of teachers, instructors, trainers, developers, and support staff); d) Open to learners' needs (OLN) (quality and interesting education; not imposing any restrictions on admission requirements, time, place, pace, or programme; provisions for lifelong learning, certification of practical experience, easy switching between formal and informal learning); e) Open to employability & capabilities development (OEC) (open to a changing society and labour market, the decisive role of knowledge and innovation, and the influence of globalisation; must offer scope for new skills, critical thinking, ethics, creativity, and personal growth and citizenship). Next, Sanchez-Gordo and Luján-Mora [16] classified MOOCs across three dimensions of openness: i) open for enrolment of students both on-campus as well as off-campus, with no prerequisites to enrol, ii) open course content and resources, without any time or money constraints, and iii) open technology and/or platform on which the course is offered. Clark [17] proposed, similarly, Openness across the following dimensions: Access, Structure, Content (Educational Resources), Collaboration, Accreditation, Source Code and Data. Hodgkinson-Williams [18] also adopted a number of dimensions of openness: a) technical openness (e.g. interoperability and open formats, technical skill and resources, availability and discoverability); b) legal openness (e.g. open licensing knowledge and advice); c) cultural openness (e.g. knowledge on a continuum between homogenous and diverse) and d) curriculum (on a continuum between institutionalised and autonomous); pedagogical openness (e.g. student demographics and types of engagement), and e) financial openness (e.g. whether OER should be free or not, funding arrangements). Furthermore, Dalsgaard and Thestrup [19] outlined three pedagogical dimensions of openness: a) transparency, b) communication, and c) engagement. Transparency relates to the opening up of student work, thoughts, activities, and products in order to provide students with insight into each other's activities. Communication aims at establishing interaction between educational activities of an institution and surrounding practices. Openness as joint engagement in the world aims at establishing interdependent collaborative relationships between educational institutions and external practices.

In the following years, more researchers have tried to explore openness in many ways. More concretely, Inamorato dos Santos et al. [20] proposed a framework of six (6) core dimensions (access, content, pedagogy, recognition, collaboration and research) and four (4) transversal dimensions (strategy, technology, quality and leadership). Moreover, Cronin [6] investigated the teachers' openness across two areas: i) open to students; that is, being visible online, interacting and sharing resources in open online spaces, and ii) teach openly; that is, to create learning and/or assessment activities in open online spaces (e.g. Twitter, WordPress blogs). Panda and Santosh [21] considered, also, the following key notions associated with openness in academic institutions: Open access and open publishing; Sharing and collaboration; Openness of resources; Creation and use of open.

Educational resources; and Open and collaborative pedagogy. Furthermore, Economides and Perifanou [22] [23] described Openness in MOOCs as the degree to which the particular MOOC could provide free access to, participation in, interaction, use, creation and sharing (distribution, delivery) of free information, knowledge, competences, skills, resources (e.g. hardware, software, networking, power), outcomes, artefacts, communications and collaborations with other people without restrictions anywhere anytime in order to achieve a specific educational goal. Economides and Perifanou [24] described, also, eleven meanings (interpretations) of Openness in Education: a) Openness as Freedom in Acting; b) Openness as Non-Discrimination; c) Openness as Absence of Requirements and Negative Consequences; d) Openness as Transparency and Awareness; e) Openness as Diversity; f) Openness as Autonomy; g) Openness as Adaptability; h) Openness as Easiness; i) Openness as Quality; j) Openness as Tolerance; and k) Openness as Opportunities. The current paper considers a holistic view of Openness and proposes the OPEN FASUCICESA - CPT Framework to describe the Openness of MOOCs and OERs.

### 3 THE OPEN FASUCICESA - CPT FRAMEWORK FOR MOOCs & OERS

This paper aims at developing a holistic framework to describe the Openness in MOOCs and OERs. In order to construct such a framework, we first define the following:

- *what (or whom) to open*: Educational Resources, Infrastructure, People, Educational Institution, and Outside Environment;
- *to whom to open*: Educational Resources, Infrastructure, People, Educational Institution, and Outside Environment;
- *at what cost*: no cost vs. specific fees;
- *where to open*: anywhere vs. specific locations;
- *when to open*: anytime and any pace vs. during specific times.

For example, an OER or a MOOC is open to learners with a B.Sc. degree in computer science at no cost anywhere during specific time intervals. A sensor is open to a specific teacher to receive measurements anytime. A teacher is open (available) to specific learners at specific locations during specific time intervals. An Educational Institute is open to anyone for a fee, anywhere and anytime. A teachers' social network is open to Italian language teachers at no cost, anywhere and anytime. Note also that the cost has many faces such as one-time fee per OER, fees for supplements (e.g. certificate, tutoring), subscription/ time-based, pricing per usage, new release pricing, imposed requirements (e.g. required to watch advertisements/ commercials, to give personal information, to allow user tracking/ measuring behaviour, to contribute something).

In order to make the presentation clear, concrete and compact, we define the following important factors (Table 1).

**Table 1.** Definitions.

<i>Term</i>	<i>Explanation</i>
Open	Free, Non-Discriminated, Absence of Constraints and Negative Consequences, Transparent, Diverse, Adaptable, Autonomous, Easy, Quality, Tolerant to Different.
Participant	Learners; Teaching Staff (e.g. Teachers, Advisors, Instructors, Tutors, Facilitators, Communities' Managers); Support Staff (e.g. Technicians, Administrators, Psychologists, Career Advisors);

Participate	Find, including Seek, Locate, Discover; Access, including View, Watch, Read, Listen, Hear; Store, including Save, Retain, Download, Copy, Duplicate, Print; Use, including Control, Manage, Select; Create, including Design, Develop, Produce, Construct, Build, Calculate, Solve, Modify, Alter, Change, Adapt, Revise, Translate, Mix, Integrate, Combine; Interact and Communicate; Collaborate, including Cooperate, Co-Create; Evaluate, including Assess, Review, Critique, Rank; Share, including Distribute, Teach, Publish, Display, Present, Present, Display, Show; Abandon, including Quit, Drop Out, Leave, Depart.
Participant's Profile	Demographics, Age, Gender, Language, Nationality, Culture, Personality, Socio-Economic Status, Experience, Knowledge, Skills, Abilities, Disabilities, Competences, Expertise, Needs, Preferences, Interests, Goals, Objectives, Intentions, Wills, Beliefs, Strategies, Profession, Jobs, Achievements, Portfolios, Artefacts, Collections, Assets, Credentials, Certificates, Connections, Relatives, Friends, Co-Workers, etc.
Participant's Current State	Profile, Ideas, Thoughts, Opinions, Emotions, Feelings, Mood, Effort, Motivation, Attitude, Behaviour, Learning Pace, Progress, Schedule, Location, Decisions, Actions, Practices, Interactions, Communications, Collaborations, Relationships (e.g. Peers, Teachers, Tutors, Advisors, Facilitators), Teams' Member, Contributions, Performance, Outcomes, Results, etc.; Own Infrastructure (e.g. Devices, Hardware, Software, Tools, Energy).
People Involved before Learning	Educational Resource Creators: Instructional Designers, User Interface Designers, Authors, Content Producers, Multimedia Producers, Assessments Producers, Applications Developers, Psychologists etc.; Technology Developers: Specialists on Platforms, Devices, Networking, Learning Analytics, Programming etc.; Others: Marketers/Advertisers/ Promoters, Financial Managers/ Accountants/ Investors, Lawyers/Copyright Specialists, Psychologists, Administrators etc.
People Involved after Learning	Evaluators, Assessors, Examiners, Certifiers, Facilitators (e.g. Alumni, Community Manager), Administration Staff, Recruiters, etc.
Outsiders	Field Experts, Specialists, Researchers, Practitioners, Accreditation Authorities, Government Officials, Employers, Parents, Relatives, Volunteers, Citizen etc.
People	Participants, People involved before learning, People involved after Learning, Outsiders
Subject	MOOC or OER; Infrastructure; People; Educational Institution.
MOOC or OER	Course or Module composed of Educational Objects plus the following: Pace and Interaction Mode (synchronous-asynchronous, visual-auditory-haptic); Policies and Requirements, i.e. Participation Policies, Assessment/Grading Policies, Evaluation Criteria, Fees/Pricing, Schedule, Duration, Deadlines, Pace, Place/ Location/ Space, Language, Academic Level, Difficulty Level etc.; Badges, Credentials, Certificates etc.
Educational Object	Content, Data, Goals/ Objectives, Curriculum, Syllabus, Learning Path/ Sequencing, Learning Map, Bibliography, Material, Articles, Books, Multimedia, Videos, Photos, Music, Maps, Apps, Simulation, Games, Tools, Software, Blogs, Wikis, Community of Practice, Presentations, Examples, Case Studies, Tasks, Assignments, Quizzes, Assessments, Tests, Exams, Recommendations, Feedback, Expected Outcomes, Performance, Artefacts, Portfolios, etc.; Interactions, Communications, Collaborations etc.; Experiences, Experiments, Activities, Projects; Educational Design, Pedagogies, Strategies, Methods, Practices, Procedures, Processes, Planning, Interventions etc.; Human Teaching, i.e. Lecturing, Tutoring, Advising, Consulting, Communicating, Designing, Supervising, Organizing, Managing, Recommending, Giving Feedback, Grading, etc.

Infrastructure	Hardware (e.g. Sensors, Devices, Wearables, Smartphones, Tablets, Laptops, Computers, TV, Game Consoles, Servers, Switches, Routers, Storage); Software (e.g. Operating Systems, Web Browsers, Mobile Apps, Learning Analytics, Multimedia, Visualization Tools, Simulations, Games, Virtual Reality, Augmented Reality, etc.); Information Systems, Data Bases, Learning Management Systems, Platforms; Networking (e.g. RFID, ZigBee, Bluetooth, WiFi, LoRaWAN, 5G, Internet of Things, Clouds).
Educational Institution Profile	Organization/Structure, Administration, Strategies, Policies, Resources, Staff, Accreditation, Budget/Finances, etc.
Outside Environment	Outsiders; Outside Resources (Educational Resources, Websites, Repositories, Data Banks, Libraries, Journals, Social Networks, other MOOCs etc.); Outside Infrastructure; Governments (Laws, Polices, Regulations, Accreditation Agencies etc.); Employers (Organizations, Companies etc.); Professional Societies, Organizations, Clubs, Unions, Changers; Society, Businesses, Markets etc.

This paper defines the OPEN FASUCICESA- CPT (Find, Access, Store, Use, Create, Interact, Collaborate, Evaluate, Share, Abandon – Cost Place Time) Framework in order to describe the Openness of MOOCs and OERS. This framework describes the Openness Capabilities performed on Subjects plus the Cost, Place and Time dimensions. A participant is free at some extent to perform these Capabilities on a Subject (Fig. 1).

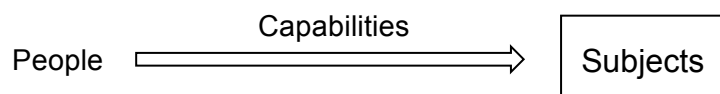


Figure 1. People perform Open Capabilities on Open Subjects.

We define the following **Open Subjects** (What would be Open):

- MOOC or OER;
- Open Infrastructure (adhering to Open Standards- Interoperability);
- Open People (anyone irrespectively from his/her profile);
- Open Educational Institution (providing MOOCs or OERs);
- Open Outside Environment.

We also define the following **Open Capabilities**:

- Open to Find (Seek, Locate, Discover);
- Open to Access (View, Watch, Read, Listen, Hear);
- Open to Store (Save, Retain, Download, Copy, Duplicate, Print);
- Open to Use (Control, Manage, Select);
- Open to Create (Design, Develop, Produce, Construct, Build, Calculate, Solve, Modify, Alter, Change, Adapt, Revise, Translate, Mix, Integrate, Combine);
- Open to Interact (Communicate);
- Open to Collaborate (Cooperate, Co-Create);
- Open to Evaluate (Assess, Review, Critique, Rank);
- Open to Share (Distribute, Teach, Publish, Display, Present, Present, Display, Show);

- Open to Abandon (Quit, Drop Out, Leave, Depart) without any penalties, charges, fines, obligations, punishments etc.;
- Open Cost (allow anyone to participate at no cost);
- Open Place (allow anyone to participate from anywhere).
- Open Time (allow anyone to participate anytime);

The following Table 2 presents an example of the Openness degree (scale: 0 to 3) with which a Participant performs Capabilities on Subjects.

**Table 2.** Open Capabilities performed on Open Subjects.

<b>OPEN Subject Capability</b>	MOOC or OER	Infrastructure	People	Educational Institution	Outside Environment
Find	3	3	3	3	3
Access	3	3	3	3	1
Store	3	3	-	-	2
Use	3	3	-	-	3
Create	3	3	-	-	-2
Interact	3	3	2	3	3
Collaborate	3	3	2	3	3
Evaluate	3	3	3	3	3
Share	3	3	-	-	-
Abandon	3	3	3	3	3

For example, a learner attending a MOOC or OER would select *specific* (among a variety of alternatives) Content, Learning Path, Books, Multimedia, Tools, Community of Practice, Presentations, Examples, Case Studies, Tasks, Assignments, Quizzes; Collaborations; Experiments, Activities, Projects; Pedagogy; Lecturing, Tutoring; Interaction Mode; Participation Policy, Assessment Policy, Pricing, Schedule, Duration, Deadlines, Pace, Language, Academic Level, Difficulty Level; Certificate. He/she may even change his/ her selections anytime.

The learner can openly access (at some extent) the MOOC or OER, freely store (at some extent) its educational material on his laptop, freely interact (at some extent) with the teachers, other learners and outsiders, openly participate (at some extent) in a community and collaborate (at some extent) with other learners, openly evaluate (at some extent) the MOOC, the teachers and the Educational Institute, openly create and share (at some extent) educational objects and freely leave the MOOC or OER and the community anytime.

#### 4 EVALUATING MOOC OPENNESS

In order to apply the proposed framework for evaluating the Openness of MOOCs, we have developed the following questionnaire (Table 3).

**Table 3.** Questionnaire for evaluating the Openness of a MOOC.

<i>Open Capabilities regarding Cost, Place, and Time</i>	<i>Not Available</i>	<i>Low</i>	<i>Medium</i>	<i>High</i>
The extent to which a participant can openly participate in the MOOC without any cost is				
The extent to which a participant can openly participate in the MOOC from anywhere is				
The extent to which a participant can openly participate in the MOOC anytime and any pace is				

<i>Open Capabilities regarding Educational Resources on the MOOC</i>	<i>Not Available</i>	<i>Low</i>	<i>Medium</i>	<i>High</i>
The extent to which a participant can openly find the MOOC as well as many, diverse, appropriate and qualitative educational resources on the MOOC is				
The extent to which a participant can openly access the MOOC as well as many, diverse, appropriate and qualitative educational resources on the MOOC is				
The extent to which a participant can openly store many, diverse, appropriate and qualitative educational resources from the MOOC is				
The extent to which a participant can openly use the MOOC as well as many, diverse, appropriate and qualitative educational resources from the MOOC is				
The extent to which a participant can openly create many, diverse, appropriate and qualitative educational resources on the MOOC is				
The extent to which a participant can openly interact with the MOOC as well as many, diverse, appropriate and qualitative educational resources of the MOOC is				
The extent to which a participant can openly collaborate and co-create many, diverse, appropriate and qualitative educational resources on the MOOC is				
The extent to which a participant can openly evaluate the MOOC as well as many, diverse, appropriate and qualitative educational resources of the MOOC is				
The extent to which a participant can openly share many, diverse, appropriate and qualitative educational resources on the MOOC with other participants is				
The extent to which a participant can openly drop out the MOOC				
The extent to which a participant can openly find many, diverse, appropriate and capable teachers and peers on the MOOC is				
The extent to which a participant can openly access the Profile of many, diverse, appropriate and capable teachers and peers on the MOOC is				
The extent to which a participant can openly interact with many, diverse, appropriate and capable teachers and peers on the MOOC is				
The extent to which a participant can openly collaborate with many, diverse, appropriate and capable teachers and peers on the MOOC is				
The extent to which a participant can openly evaluate any teacher or peer on the MOOC is				
The extent to which a participant can openly abandon any teacher or peer on the MOOC is				

Next, we have chosen a list of ten (10) Language MOOCs (English, Italian and Spanish courses) offered by several institutions and supported by a variety of providers:

- 1 "English for Absolute Beginners-Adults and Children" offered by Dr. Raymond Connors and supported by the MOOC provider *Udemy*.
- 2 "English for the Workplace" offered by the British Council and supported by the MOOC provider *Futurelearn*.
- 3 "Introduction to Italian" offered by the University of Siena and supported by the MOOC provider *Canvas*.

- 4 “Italian for Beginners 3: My Daily Life” offered by the Open University and supported by the MOOC provider *Futurelearn*.
- 5 “Italian language and culture - beginner” offered by the Wellesley College and supported by the MOOC provider *edx*.
- 6 “Italian for Beginners 5: Time To Travel” offered by the Open University and supported by the MOOC provider *Futurelearn*.
- 7 “Benvenuti in Italia! Orientarsi con l'Italiano” offered by the Polytechnic of Milan and supported by the MOOC provider *Futurelearn*.
- 8 “Learn Spanish: Basic Spanish Vocabulary Specialization” offered by the University of California Davis and supported by the MOOC provider *Coursera*
- 9 “Spanish for Beginners” offered by the Distance University of Madrid (UDIMA) and supported by the MOOC provider *iversity*
- 10 Basic Spanish 1: Getting Started offered by the Polytechnic of Valencia and supported by the MOOC provider *edx*.

Following the research data selection and analysis, the results have shown that all evaluated MOOCs lack Openness at a large extent. More specifically, as far as the cost and accessibility are concerned, most of the courses were free of charge and accessible but under many limitations. For example, in many cases, participants could have a limited access to the course material after the end of the course or they could only review it as it was no longer active. Moreover, in another case the course was accessible for free only for a certain period of time (i.e. one week) and participants had to cancel their subscription before the end of the trial period, if they did not want to be billed. Almost in all evaluated MOOCs, anyone could pursue/earn a certificate of achievement by paying a certain amount of money.

Regarding open Capabilities of MOOCs educational resources, results have shown that collaboration elements (co-creation, sharing, interactivity) were almost absent while possibilities to access, store and use the educational material were many but with not any open licenses which could permit unrestricted use, distribution and reproduction in other mediums. Also, dropping out of a MOOC could apply cost penalties in rare cases.

Finally, the level in which the learners could openly access a teacher’s or a peer’s profile and choose to interact, collaborate with any of them or even provide them any kind of feedback (evaluation, etc.), was overall low.

## 5 CONCLUSIONS

This paper proposed the OPEN FASUCICESA- CPT framework of Openness in Education regarding MOOCs and OERs, Infrastructure, Participants, Educational Institution and Outside Environment across ten Capabilities plus the Cost, Place and Time dimensions. Next, it developed an appropriate Questionnaire, which was used in order to evaluate the Openness of ten MOOCs on Language Learning. The results revealed that they lack Openness at a large extent and that there are many issues that learners need to take under consideration before they choose to take a “free” MOOC as more changes in conditions may occur in short period of time.

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