Work in Progress: Contributing to becoming aware of the value of Open Education

An initiative of the IEEE Education Society

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Abstract—**This paper shows the design, approach and first collection of data of the MOOC "Foundations to Open Education and OERs repositories". This is the first MOOC of the IEEE Education Society, and it has been delivered freely and open available through IEEEx, a channel of edX.**

Keywords—open education; mooc; open educational resources; OER

I. INTRODUCTION

MOOCs started as open campus courses and are normally associated with Open Educational Resources (OERs). However not always take that way because MOOCs don't require use open licenses, and the materials are frequently copyrighted. The word "open", in these cases, really means open enrolment and not "open education" in its broadest sense.

Opening licensed educational materials have tremendous potential to contribute to improving the quality and effectiveness of education, the development and improvement of curricula, ongoing programme and course design, development of quality teaching and learning materials, and design of effective assessment with benefits in at least three areas: Increased availability of high quality, relevant learning materials, allowing adaptation of materials provides roles for students as active participants in educational processes, and to build capacity by providing institutions and educators access.

The IEEE Education Society is aware that the educational activities undertaken by the Society are not typical, given its distinct membership needs. Engaging students who may be interested in academic careers is a distinct opportunity and further the development of web-based educational resources for students and academic staff are strongly encouraged, with the goal of meeting the needs of a membership that is geographically diverse.

Therefore, this Society has established a strategic line for the next years focused on the promotion of OERs to attend to this demand, aiming to be a relevant source for information and resources for the engineering educator and support the educational needs of faculty members and academic departments.

Aligned to this strategy IEEE Education Society highlight two actions:

- A MoU with MERLOT, that allowed the participation and endorsement of the IEEE Education Society in the building two new open communities - Computer Science (CS), and Information Systems (IS/IT) in MERLOT.

- A MOOC to be published in IEEEx in August, entitled "Foundations to Open Education and OERs repositories".

This paper presents the design, approach and first collection of data of this MOOC whose main target is to identify and develop the basic learning characteristics and competences for the participation and involvement in Open Education [1].

The course deal with Foundations to Open Education developing the way that Open Education is being installed as well as the evolution of Open activities around the Technical world.

OER (Open Educational Resources) and their repositories are the practical implementation of the Open Education, where, how, and for what will be questions to be answered inside the MOOC to have a practical approach of this education implementation inside academic and industry learning orientation.

II. FOUNDATIONS OF OPEN EDUCATION AND OER REPOSITORIES THROUGH A MOOC

A. Main features and purpose

Open education and open educational resources are deeply influencing and transforming the educational environment.

This course, therefore, has dealt with Foundations to Open Education developing the way that Open Education is being installed as well as the evolution of Open activities around the Technical world.

OER (Open Educational Resources) and their repositories has been considered by the authors as the practical implementation of the Open Education and additionally where, how, and what questions have to be answered inside the MOOC to have a practical approach of this education implementation inside academic and industry learning orientation.

This course offers a practitioner's view of open education, open educational resources, repositories and applications for educators and professionals.

During 4 weeks, and currently archived and accessible from edX to be reviewed, the course provides a comprehensive understanding of the ways in which open education and open educational resources are changing the rules of education. Its purpose is to help faculty and professionals dedicated to education to understand the advantages of open education and how they can apply it to their everyday teaching

The intended audience is academics, people acquiring the basis of the Open Education as well as the basis of the OERs (Open Educational Resources) and Industry oriented people that would have interest how this could affect to the Industry Education and about the interest to use these principles inside their learning structures.

The course, the first MOOC of the IEEE Education Society, has been delivered freely and open available through IEEEx, a channel of edX. Several subject matters experts were gathered to join the course as guest lecturers. These experts provided further insight into their particular topics of expertise.

B. Learning outcomes and design

On completing this course, the students have strengthened their knowledge and career potential by demonstrating an understanding of:

- Foundations of open education and open educational resources (OERs)

- Open licenses that apply to OERs;

- How to search, create, use, remix and share OERs;

- OERs repositories;

- OERs Applications to Academia & Industry

The Course Outline is:

Unit 1: Introduction to Open Education & OERs

- Open source way

- Open education

- Open educational resources

- Open courses: from OCW to MOOCs

Unit 2: Repositories

- Communities based on OER Repositories. Repositories of general purpose

- Open practices based on repositories

- Challenges to use OER from repositories

- Open engineering communities. The case of IT and CS communities in Merlot repository

Unit 3: Applications to Academic and Industry

- Teaching through Open Education

- Research and Open Access

- Industry and Open Education

- The Future

Unit 4: Applications for OERs

- OERs: properties, formats and tools

- Creative Commons Licenses and their use

- OERs and media: presentations and documents / video (creation and modification)

- Other OERs (Lesson Plans, Rubrics, Assessments, etc.)

The resources developed for the course include video. These videos include intro videos, video-lectures (Figure 1), video conclusions and video lectures as additional resources.
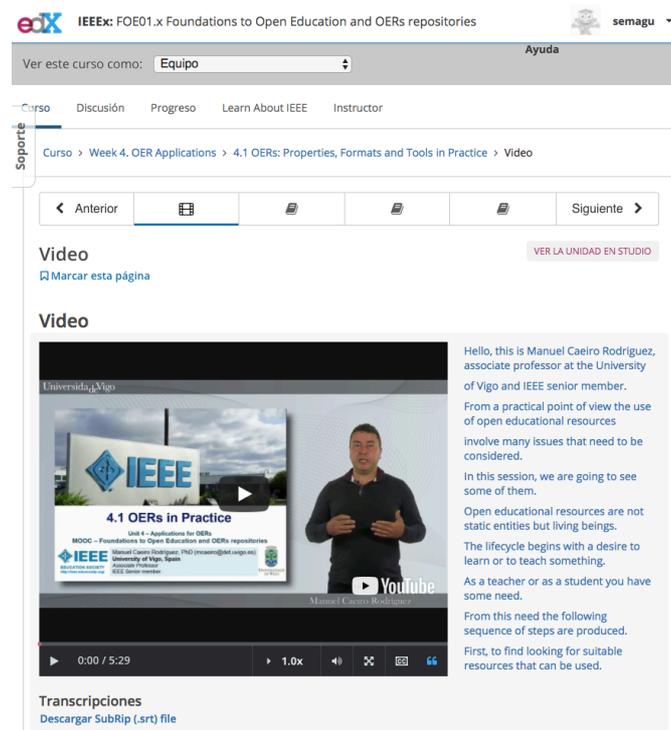

Fig. 1. Screenshot of the virtual course with a video lecture.

The course also includes mandatory and additional readings, basically consisting on links to website and digital resources where to learn more in detailed the contents explained in the video lectures. And finally each module includes several research exercises where the students must research about a certain topic on the Internet and discuss about it in the forum with the peers (Figure 2).
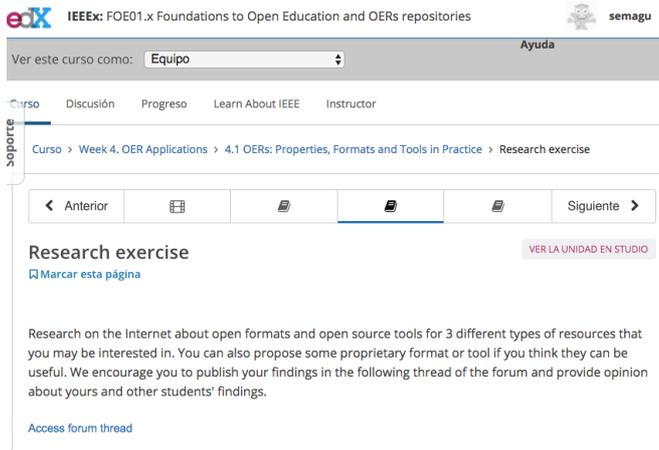
Fig. 2.   Screenshot of the virtual course with a research exercise.

III. FIRST COLLECTION OF DATA

Once the first edition is completed, there is a first assessment of sociodemographic data of the participants, including enrolment time data, age, studies, genre, geographic distribution and learner performance data.

A. Enrolment data

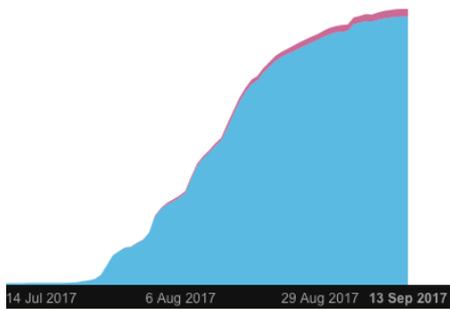Currently there are 1173 students enrolled in the course (Figure 3). Most of them were enrolled from July 25, 2017.

Fig. 3.   Daily learner enrollment
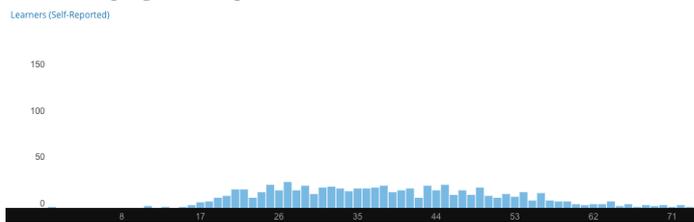
B. Demographics. Age

Fig. 4.   Graph showing the age demographics

Regarding the Median Learner Age (Figure 4), the midpoint of the learner ages, computed from the provided year of birth is 37. The percentage of learners aged 25 years or younger is 17.3%.

The percentage of learners aged from 26 to 40 years (of those who provided a year of birth) is 41.8%. The learners with 41 and Over are the 40.8%.

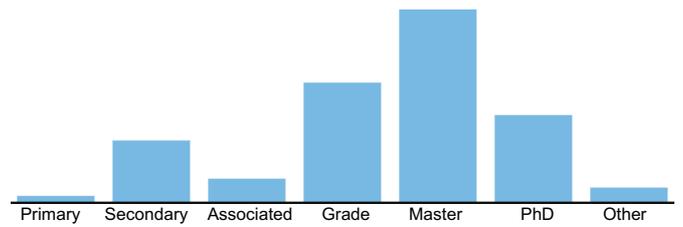### C. Demographics. Studies

Fig. 5.   Graph showing the studies demographics

The 29.5% of the participants, (Figure 5) had a University degree and 55.1% Master or PhD.
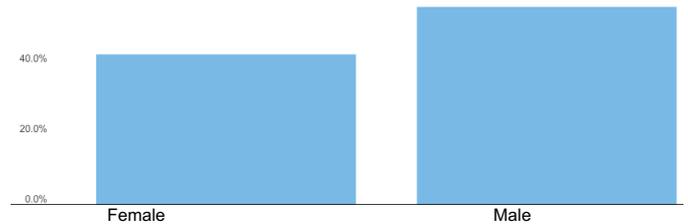
D. Demographics. Genre

Fig. 6.   Graph showing the genre demographics

Regarding genre (Figure 6), 57.3% of the participants were male and 41.6% female.

E. Geographic distribution

There are students from 117 countries (Figure 7). The country with more students is USA with 17.4% of the total, followed by Spain (6.9%) and India (6.8%).
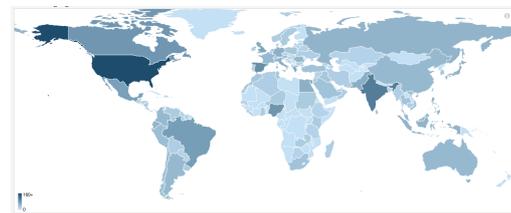

Fig. 7.   Distribution by countries

F. Learner performance data

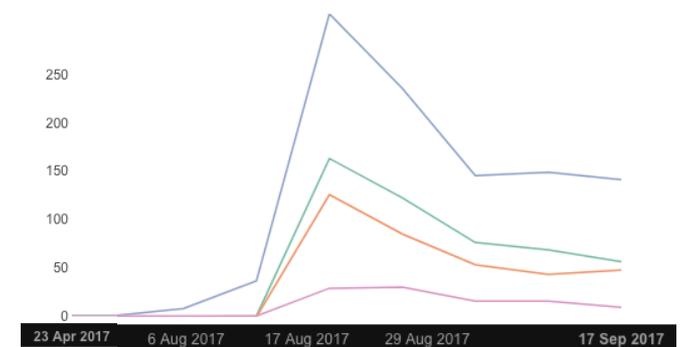The following graph (Figure 8) shows the students weekly interaction during the course:

Fig. 8.   Graph showing the weekly performance

The following table (Table I) shows the analysis of the interaction of students with the resources:

Module	Videos	Average of full views	Average of incomplete views	Percent Complete
0. Course organization	2	105,0	24,5	81,1 %
Week 1. Introduction to Open Education & OERs	7	67,3	20,4	76,7 %
Week 2. Repositories	5	25,0	12,0	67,6 %
Week 3. Applications to Academia & Industry	5	14,4	9,0	61,5 %
Week 4. OER Applications	6	13,3	3,2	80,8 %
5. End of the course	3	7,3	5,3	57,9 %

Regarding video visualization, the following graph (Figure 9) and table (Table II) show the evolution of learner activity:

TABLE II.   EVOLUTION OF LERNER ACTIVITY

Weekend	Active students	Watched a video	Atte npt to a task	Participated in Discussions	Percent of Current Learners
September 10, 2017	136	63	40	15	12,5 %
September 3,2017	133	70	49	15	12,9 %
August 27, 2017	215	112	78	28	22,2 %
August 20, 2017	285	149	115	27	33,3 %
August 13, 2017	34	1	0	1	5,9 %

Regarding discussion forums, there were a total of 37 discussion threads. The most active forum discussions were the ones associated to the research exercise of the modules. The activity decreases in the forums decreases according to the activity in the different units. For example, the research exercise of unit 1.2 had 80 messages, the exercise of unit 1.3 had 49 messages, 25 the exercice 1.4 and 24 the exercise 1.5.
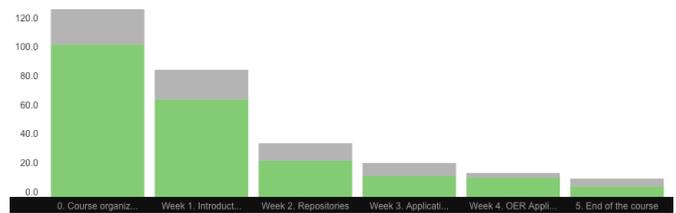

Fig. 9.   Graph showing the learner activity

Regarding grading, most students (93%) did not attempt any module assignment. Only 7% (82) of the students attempted any test. From these students 56.1% (46) passed the course obtaining at least a 5 in a scale from 0 to 10. In the global of the 1155 students enrolled in the course (during the period where was open), it means that only 3.98% of students passed the course.

From the 46 students that passed the course, 16 requested a verified certificate from edX. This means that 34.7% of the students that passed the course requested a paid certificate. In the global of the total enrolled students, only 1.39% of students passed the course and requested a paid certificate.

IV.   AND NOW?

The first IEEE Education Society MOOC course was located at IEEEx inside his area under the umbrella of the edX platform. The second edition of this MOOC will be delivered in November-December of 2017. The second phase of the research around this experience will take once be completed.

The plan for the future include the following the tasks:

- Collecting data for this new edition.

- Analyzing and comparing both data set.

- Analyzing the impact in the community of IEEE Education Society members as well as in academics in general.

- Reflecting about new actions aligned with this experience.

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