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Designing and Implementing a Massive Open Online Course: Lessons Learnt

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ABSTRACT

In this paper, we describe the design, implementation, and evaluation of a Massive Open Online Course, or MOOC, on good practice in the application of Intellectual Property. It is aimed primarily at teachers and students, and taught in Spanish. We have used the Spanish legislation on Intellectual Property. This paper outlines the structure and content of a course developed on an ad-hoc basis, and describes its evaluation by participants in questionnaires and a final survey. The results of the initial questionnaire are framed by a) the participant's profile, and b) by consideration of the MOOC´s implementation, given the results of the satisfaction survey. In this paper we describe the advantages of the MOOC and identify areas for improvement.

CCS Concepts

• Applied Computing→ Education Management System Engines→ E-Learning

Keywords

MOOC design; e-learning; MOOC implementation; Intellectual property

1. INTRODUCTION

George Siemens and Stephen Downes are considered to be the creators of the Massive Open Online Course (MOOC) in literature [1]. It was an online introductory course that had more than 2,200 participants [2]. The eLearning platform Moodle [3] was used in combination with other tools such as social networks, wikis, or blogs, to encourage communication and collaboration among students [1].

In fact, the appearance of the first MOOC courses in 2008 came to be seen as a step forward in the evolution of eLearning, which began in the 1980s with the first multimedia platforms. [4]. One of the contributions of the MOOC to eLearning is precisely its openness, since it allows anyone access to higher education and the chance to participate as active learners. This contributes to social inclusion and the sharing of knowledge [5]. However, in the early stages of the MOOC, concerns about technical-pedagogical issues prevailed [6]. An initial definition of MOOC establishes two typologies: cMOOC and xMOOC. The former is based on connectivist educational approaches, whereas the latter focuses more on teacher designed content, and is therefore closer to traditional

online courses [7].

In this paper, we study the pedagogical implications of a MOOC on Good Practices in the academic use of intellectual property. This MOOC has been implemented by the MiriadaX platform. MiriadaX is an interdisciplinary group of the University of Zaragoza and the Polytechnic University of Madrid. It identifies with the larger institutional effort of creating a culture of respect, recognition and awareness towards intellectual property.

The objective of the MOOC has been to raise awareness of respect for copyright, and of the concepts that define intellectual property and its misuse by way of plagiarism, to give but one example. Good practice (or conduct) is encouraged both individually and collectively by communicating the proper application of intellectual property to the performance of academic work or teaching tasks. Spanish legislation on intellectual property constitutes the normative reference and example for other countries to follow. The language of the course is Spanish.

The paper is structured in five sections: the introduction (section 1), the design (section 2) and the implementation of the MOOC (section 3), the evaluation and satisfaction metrics (section 4) and the conclusions (section 5).

2. DESIGN

Firstly, having borne in mind that the course could be widely accessed, it was necessary to establish a profile of the kind of candidate to whom the course would be addressed. In this case, we included teachers of all levels and students above the age of twelve. This decision allowed a better adjustment of the course to the needs and interests of the prospective participants.

Therefore, the range of content, activities, examples, resources or complementary material raises specific problems, which come to the fore during the development of academic or research papers. The duration of the course was five weeks, an estimated forty hours of study, adequate to the profile of the expected participant.

All the MOOCs of the MiriadaX platform begin with a short video presentation of the course as well as a brief description of the course, summarizing the objectives and briefly presenting the contents of the course. The MOOC modules are subsequently accessed.

The structure of the course is modular, to facilitate an ongoing evaluation adapted to the interests of the participants, since all modules could be equally accessed from the beginning of the course. The course consists of five modules, the first of which involves the presentation of the course and includes the initial survey to be completed by the participants.

The initial survey aims to obtain basic information about participants such as their age, gender, educational level, current professional profile, etc. It also aims to record participants' pre-existing knowledge of the subject. It consists of ten questions. Two are open: nationality and e-mail address, for the benefit of candidates wishing to receive updates regarding MOOC related developments.

Each module features a short video presentation, accompanied by a transcription of voice to text, which summarizes the objectives of the module by raising the basic questions and answers which occur throughout the course. This design is due to the fact that the participant can choose both the module and the order in which they are to be completed, according to their preference and requirements. The questions encourage continual evaluation by presenting participants with challenges and targets.

Each module consists of a variable number of sections. The initial modules always contain the study material. The last two feature supplementary material and the mandatory questionnaire.

The study material includes an instructional video (5-10 mins), an audio transcription and a copy of the presentation in .pdf format. The study material reflects and articulates the progression of the course as it is developed and refined.

The complementary material, in html format, is intended for those who wish to broaden their knowledge of the subject or familiarise themselves with different resources. It makes reference to scientific articles, open educational resources (OERs), free web applications, videos, portals (libraries, European organizations, etc.)

The obligatory questionnaire in each module allows us to verify how much has been learnt, since the answers to some of the questions occur in the study material, whereas other questions require candidates to apply knowledge to a given situation. It is a test of ten multiple-choice questions, with three possible answers, only one of which is correct.

To pass the questionnaire it is necessary to answer correctly at least five of the ten questions. Each participant has three attempts to answer the questions in each questionnaire. By submitting the completed questionnaire, the participant obtains feedback on answers correct and incorrect. An erroneous answer directs the participant to the corresponding section of study in need of review. To obtain the course certificate it is necessary to correctly answer the four questionnaires.

To facilitate the interaction between the participants of the MOOC, we provided a general discussion forum and one for each of the modules. The general forum was designed to deal with questions relating to the general operation of the course. Introductory welcomes, encouragement and congratulation notices were all issued on the forum. The members would inform or warn of any technical problems. Attempts were made to filter messages according to the theme of the module so that it would be easier for teachers to review.

The last module contains the final survey of the course. It is compulsory. It consists of twelve questions, several of which are aimed at obtaining basic information about the participant´s gender, age, nationality, level of education and current professional profile. Other questions are designed to

collect and evaluate information about a) modules completed before the final survey, b) the relevance of the content, and c) what was learned on the course. For further feedback, the survey ends with three open prompts in order to know the reasons why they value the utility and what they have learned in the MOOC. Each prompt asks participants to specify three features they enjoyed the most, three features they did not, and to suggest areas for improvement. The survey, is, as such, designed to ascertain the degree to which course objectives are met, to evaluate participant satisfaction, and to identify any weaknesses in the project.

3. IMPLEMENTATION

1329 people started the course. This is satisfactory, because, on the one hand, participants were largely teachers and students and, on the other, the legislation which determined the course content on intellectual property was Spanish. The MOOC completion rate, 57%, is very high (See Table 1).

Table 1. Number of participants in the MOOC

	Total	Percentage
People who started the MOOC	1329	100
People who completed the initial survey	1232	92.70
People who finished the MOOC	758	57.0

Table 2 demonstrates how the age distribution fits the profile for intended participants of the MOOC. 33% are under 30 years old, many of them students perhaps, and almost half, 47%, are aged between 31 and 50.

Table 2. Age of participants

	Total	Percentage
Aged under 15	**29**	2
Aged between 16 and 30	386	31
Aged between 31 - and 50	580	47
Aged between 51 - and 65	221	18
Aged up 65	14	1
Nk/Na	2	0

Figure 1 represents the nationality of the participants. The MOOC was delivered in Spanish, so it is not surprising to observe that 96% of the participants are from Spain (48%) or Latin America (48%). Only 1% of those surveyed are of other nationalities.

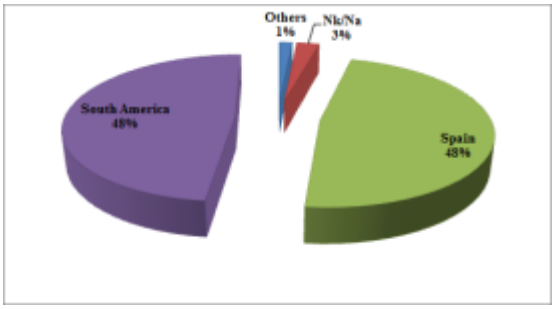

Figure 1. Participants and their Nationalities

When we look at the break-down of course modules in Table 3, we see that the initial "Presentation", Module 0, obtains the highest rate of completion at 97.5%. It is followed by Module 3, entitled "Intellectual Property and Teaching: Good Practices" with a rate of 91.4%. We conclude that its content may have been particularly useful to teachers. Notwithstanding the difficulty of the subject matter, Module 4 obtains a completion rate of 88.8%. Module 1, in which participants complete a piece of academic writing or research, exhibits the lowest rate at 86.5%. This is likely due to the fact that many of the participants are already well-versed in this capacity.

Table 3. Number and percentage of participants who started and finished the course

Module	People who started the course	People who finished the course	Completion Rate
Module 0. Presentation	1274	1242	97,5
Module 1. Production of Academic Work	1260	968	76,8
Module 2. Intellectual Property Basics	1003	868	86,5
Module 3. Intellectual Property and Teaching: Good practices	905	827	91,4

Module 4. Legal Perspective of Intellectual Property	866	769	88,8

The figure 2 shows the same data clearly.

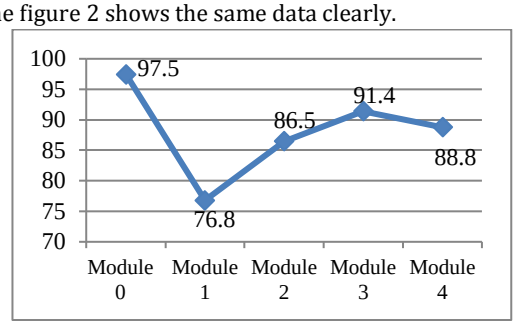

Figure 2. Completion rate of each module

Table 4 confirms the proximity of the candidates' profiles with our own predictions about the kind of people who would enroll, since 26.95% are teachers, and 19.81% are students.

The figures for participation are as follows:

- Teachers: 21 (2%) are from Nursery, Primary or Secondary (up to 12 years), 66 (5%) are from Secondary Education or Sixth-form (up to 18 years) and 245 (20%) are from Higher Education.
- Teachers 332 (26.95%), Students 244 (19.81%), Others 254 (53.08%) and Nk / na 2 (0, 16%). Total: 46.76% related to Education and 53.24% not related to education.
- Of the students: 36 (3%) are non-university students and 308 (17%) are university students.

Table 4. Current professional profile

	Total	Percentage
Non-teaching employee	260	21
University Teachers	245	20
University Students	208	17
Independent Professional	137	11
Secondary Education Teacher	66	5
Company or institution manager	49	4
Secondary Education Student	36	3
Elementary Education Teachers	21	2
Others	208	17
Nk/Na	2	0

4. EVALUATION AND SATISFACTION METRICS

The final survey had two objectives. The first was to obtain the views of the participants as to how much they felt they had learnt. The second was to obtain feedback on the design and organization of the course, taking into consideration teaching and the overall quality of the learning experience itself.

The participants are asked three open-ended questions. They are asked to indicate the three areas they enjoyed the most, the three areas they did not, and to suggest areas for future improvement.

775 participants completed the final survey. Their responses have been classified using the following categories:

- Design and Implementation
- Course Content
- Formal, Organisational and Technical Features
- Others

With respect to the design and implementation of the course, Table 5 indicates the three most appreciated facets.

Table 5. The 3 BEST liked areas

CONTENT (Delivery, Pedagogy, Structure, Direction, Methodology, Teaching staff, Development of teaching material)	**Total**	**Percentage**
Clarity of content and clarity of exposition	266	32.84
Additional material "To know more" and the texts themselves	171	21.11
Structure	98	12.10

The three least popular aspects of the course are shown in Table 6.

Table 6. The 3 WORST liked aspects of the course

CONTENT (Delivery, Pedagogy, Structure, Direction, Methodology, Teaching staff, Development of teaching material)	**Total**	**Percentage**
Too much Spanish / European legislation	59	37

Lack of focus on practical applications	24	15
Test	23	14

These results almost completely coincide with the three areas in which improvement is said to be required, as per Table 7.

Table 7. Three areas in which the course could be IMPROVED

CONTENT (Delivery, Pedagogy, Structure, Direction, Methodology, Teaching staff, Development of teaching material)	**Total**	**Percentage**
Practical guidance (for examples used and for material and indications)	45	23
Use of examples	44	22
Too much Spanish / European legislation	34	17

With respect to the formal, organizational and technical standards of the course, Table 8 details the three most well-liked features.

Table 8. The 3 BEST liked areas

Formal, organisational and technical aspects of the course	**Total**	**Percentage**
Video	68	35
Easy downloading of content	44	23
Open and accessible content	26	13

Table 9 indicates the least liked aspects of the formal, organizational and technical standards of the course.

Table 9. The 3 WORST liked areas of the course

Formal, organizational and technical aspects of the course	**Total**	**Percentage**
Duration	37	53
Technical problems unrelated to the course	13	19
Technical questions regarding the test	7	10

These results coincide with the recommendations made in Table 10.

Table 10. Three areas in which the course could be IMPROVED

Formal, organizational and technical aspects of the course	**Total**	**Percentage**
Duration	16	44
Technical problems unrelated to the course	12	33
Technical questions regarding the test	5	14

With regard to the forums, it should be noted that both welcome and farewell messages were sent at the beginning and at the end of the course. The first one communicates how the course is to be developed and encourages participation. The final message informs of the next deadline and encourages candidates to finish any remaining activity. It also allows candidates to consult about any doubts or issues they may have. They are thanked for their participation on the forum and their collaboration on the survey.

The forum registered 158 messages, with an average of 32 messages per sub-forum. Table 11 shows how such activity is distributed.

Table 11. Forum message distribution

Category	**Discussions**	**Messages**
General discussion	23	71
Module 1 Forum	7	29
Module 2 Forum	3	17
Module 3 Forum	8	27
Module 4 Forum	6	14

In the general discussion forum, there are three key types of message: welcome or induction messages and farewell messages; those related to technical issues (questions about certificates and a request to be offered in .pdf format the only section which remained in .html), and questions related to concrete individual problems, such as a wish for the course to expand and cover issues of Intellectual Property in other nations, or in education, for example.

The module sub-forums largely received requests for clarification on particular aspects about the topics covered in them. They have also been useful for sharing and disseminating relevant bibliographical information.

5. CONCLUSIONS

The course addresses a topic of interest not only to teachers and students but also to other professionals. The best liked areas are clarity of content and clarity of exposition, the additional material "To know more" and the texts themselves. The structure of the course is liked too. The worst liked aspects of the course are that it deals with too much Spanish / European legislation, the lack of focus on practical applications and the tests. One of the conclusions is that the course should introduce some adaptive elements like special exercises and international legislation references.

Finally, respect to the formal, organizational and technical standards of the course, to introduce some collaborative and participative activities like peer-evaluation or debates should improve this MOOC.

6. ACKNOWLEDGMENTS

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