

Article

# Citizenship Training through sMOOCs: A Participative and Intercreative Learning

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**Abstract:** sMOOCs (social massive open online courses) have revealed themselves as a remarkable opportunity to foster the culture of participation and open knowledge and sustainability. Due to their communicative potential, they make it possible for participants to interact, to create ubiquitous learning, and to build knowledge in a collective way. This educational and communicative line has set the basis for the European ECO (e-learning, communication, open data) Project, i.e., the purpose of our study, which, beyond training teachers, is decidedly betting on open life-long education. The results presented in the study have been elicited by following a quantitative methodology, through the analysis of a “sMOOC Step by Step” community, intended to become an educational gate to students’ empowerment, shared knowledge, and participation in the course. Results show that collaborative work practices organized by teachers in that virtual learning community encourage educational changes. Both the degree of satisfaction with the learning achieved and the way students perceive its direct applicability to real-life professional contexts prove the effectiveness of this training model. Our research has expanded, aiming to discover sMOOCs opportunities for teacher training and assessing the motivation shown by the virtual learning community towards such an educational reality.

**Keywords:** massive open online courses; sMOOC; social participation; bidirectional communication; open knowledge

## 1. Introduction

MOOCs provide members in the virtual learning community with a wide range of opportunities for interaction and communication, using their applications in different ways according to learning concepts, activities, resources, media, methodology, assessment processes, and interactivity. Advantages in this kind of training include issues such as interactivity between members in the virtual community, the promotion of universities or educational institutions hosting the courses, and the possibility to reconsider the curricular elements structuring online training courses. However, there are some disadvantages to be taken into account as well, such as the success of “package content” which means, in other words, reverting back to educational approaches characteristic of the late 20th century which included content and several resources lineally structured with no intention of fostering a pedagogical change. Regarding their benefits and risks [1] in higher education, MOOCs can be classified into three types: xMOOCs, cMOOCs and sMOOCs. Firstly, those following the xMOOC model, applicable to most MOOCs currently online [2,3]. With a clear objectivist and instructivist approach, xMOOCs either offer a new educational trend or follow a traditional learning model based on videos and short multiple-option quizzes. The communicative model they represent, specifically in the case of sMOOCs, breaks the unidirectionality previously associated to this term in some of its modalities (xMOOC) and takes a step further on social interaction (cMOOC), warranting bidirectionality—reinforced by a multitude of connections between different nodes, constantly being created and developed. Intercreativity (Osuna & Camarero, 2016) is therefore prioritized, so that knowledge flows among all

those sharing and constructing the learning process, contrary to the earlier vertical model in which the teacher instils knowledge into their pupils through memorisation. Although both cMOOCs and sMOOCs (social massive open online courses) use the connectivist model as a reference, sMOOCs favor a stronger sense of learning community among students. Next is the cMOOCs model, with a connectivist learning approach, which encourages students' creation of knowledge, creativity, self-sufficiency, and social-collaborative learning [4]. Finally, recent research works point to the tMOOCs (transfer massive open online courses) model, which advocates for transfer of knowledge and professional advancement [5]. In this study, we present the sMOOCs. A genuine culture of participation thrives in sMOOCs, revealing new forms of co-creation and collective co-authorship among citizenship and embodying the "collective intelligence" concept coined by Lévy [6]. The sMOOCs model is student-centered, and moreover, it favors the development of autonomous students. It encourages connectivism, socioconstructivist learning, and situated learning. It is oriented toward creating opportunities for collaborative learning and seeking strategies or resources to facilitate an adaptative learning.

The new educational reality reveals wide horizons for change through social interaction, thus drifting away from the paradigms of instructivist teaching which have characterized university institutions since their foundation. This theory of learning places more attention on stimulants that generate responses than on the structure of knowledge. Social changes, the evolution of both educational paradigms and new didactic methodologies, etc. have led to a rethinking of teaching-learning processes, where students acquire a more significant role that places them in a more active position from which they can participate in the collaborative creation of knowledge. Educational contexts are opening up toward a horizontal communication which sets the basis to establish collaborative practices based on consensus and mutual trust. This consensus-trust binomial is the key to success, to achieve a true culture of participation [7]. We are witnessing an intervention of citizens in sustainable social development, which makes a twenty-first century education possible, with attention to those social abilities needed to participate in this social enclave [8], which requires new professional competences [9]. All actors intervening in this process are responsible for the development of citizens' participation, but a question should be nevertheless raised on whether people may have acquired the necessary competences to decide collaboratively about their own fate [10]. Wanting to participate in the development of new professional competences is not enough; one must know how to participate. In this sense, an unknown global scenario is shaping up, structured in a rather decentralized form, with bidirectional communicational models for the construction of open knowledge. Such opening toward a learning style based on a non-hierarchic, bidirectional communicational model, as demanded by the culture of participation, is currently developing through a better training of teachers as mediating agents in social change, while a new educational proposal is breaking through and settling worldwide: the sMOOCs (social massive open online courses). This reality is widely present thanks to the inclusive model that breaks all kinds of barriers and allows access to training through all kinds of devices, which makes it a ubiquitous learning modality.

From this perspective, Berners-Lee [11] coined the term intercreativity to describe the capacity of individuals to create original and more productive elements in a virtual environment through collaboration and participation. Intercreativity involves two indissoluble actions, creativity and interactivity. This has been also the goal at the ECO (e-learning, communication, open data) European Project, coordinated by Spain's UNED (National Distance Education University). ECO started in February 2014, funded by the European Economic Community under the CIP (Competitiveness and Innovation Framework Program) program. Among the educational institutions participating in that innovative proposal are the National University of Distance Education, the University of Cantabria, the University of Valladolid, the University of Oviedo, the University of Zaragoza, and the Loyola University of Andalusia; in France, the Sorbonne-Nouvelle University; in the United Kingdom, the University of Manchester; in Italy, the Polytechnic of Milan; and in Portugal, the Open University. Further specialized companies eventually joined the project as well, such as Telefónica Educación Digital from Spain, Sünne Eichler from Germany, FEDRAVE from Portugal, and Tabarca Digital from

Spain. Additionally, two off-EU institutions have also contributed to the project: the University of Quilmes in Argentina and the Manuela Beltrán University in Colombia. The main distinguishing feature in this macro-project, whose MOOCs have engaged over 55,000 students and trained over 200 e-teachers, is to turn participants into autonomous e-teachers, able to develop their own sMOOC courses. The purpose of the ECO Project and its sMOOC-based pedagogical approach is to enable training for everyone, providing them with the necessary tools to step forward and take control of their own educational process within a ubiquitous environment (anywhere, anytime, and from any device) [12]. On a wider scope, the goal is to create a multicultural, intercreative environment for knowledge, purposely built through the collaboration of all participants and its degree of engagement in educational institutions. This way, through this training model, we contribute to the construction of collective intelligence which is, at the same time, accessible for everyone. A more democratic social space becomes a reality [13], on the one hand, through participation on social media and a break-up with closed-down educational structures and, on the other hand, through a collaborative construction of knowledge. ECO provides online training on all fields of knowledge with an educative approach, with special attention paid to new ways of learning through the connectivist learning theory [14]. This reality has been made possible thanks to the preparation of the teaching team, whose members have encouraged students' digital empowerment [15], enabling them to create their own sMOOCs within the project's learning scenarios. We firmly believe that collaboration among equals and the creation of networks in sMOOC courses, even if done gradually and through hybrid forms, open up new horizons for development toward learning and knowledge sharing at college higher education [16]. Success in these courses is based on an interactive participation [17] which spans beyond the course platform applied to social software, through all those spaces which contribute to the architecture of participation [18], resulting in a committed participation by individuals who position themselves as active cultural agents. The purpose of this research work is to analyze new education formats, to be able to provide a better response to the requirements of the current era. This proposal for the capacitation of the citizens also makes open and ever-changing knowledge possible, aiming to train innovative professional educators, but also to gather together, through virtual learning communities, all those who are meant to be trained as a community of practice [19], which will have an impact on improving the social layer from a sustainability perspective.

## 2. Materials and Methods

The goal of the "sMOOC Step by Step" is to motivate students enough to become e-teachers and, as such, create their own sMOOCs. At the end of the sMOOC, participants should be able to answer the following questions: "Why is a sMOOC worth doing? How is a sMOOC built? How is a sMOOC designed? What content does the sMOOC focus on? How can we make a sMOOC accessible and successful? How can we assess a sMOOC and how can we use the data it contains?". Thus, the course's contents, including materials and activities, were designed purposely.

Overall, the purpose of this research work is to analyze new education formats, to be able to provide a better response to the requirement of the current era. In particular, from an operational point of view, the present research work intends:

- Objective 1: To examine the professional profile of participants in the sMOOC;
- Objective 2: To assess the degree of satisfaction, as seen from the students' perspective, concerning three factors: the course's activities, resources, and services; the learning achieved, and its applicability to professional life.

The present research aims to show how its 250 participants perceived the "sMOOC Step by Step" course through its first and second iterations (January and June 2015, respectively), bearing in mind that the educational and communicative practices carried out were based on the culture of participation. The study was carried out through a voluntary questionnaire accessible from the course's virtual platform and which was completed by 250 participants out of the 3416 who enrolled in the

MOOC. The questionnaire consisted of a total of 30 questions, most of which provided multiple-choice answers and included a Likert's scale, in order to know the degree of satisfaction for the learning acquired, the interaction, and the usefulness related to the different dimensions learned in the course. The questionnaire was validated by experts through a series of interviews before administering. As our sample consists of a significant number of students attending the sMOOC study, we can assume that the data can be generalized as they are a positive representation, bearing in mind the digital scenario where they are being developed.

The dissemination of the MOOC was launched with a fortnight's notice and was open to all citizens. During that time, the MOOC accepted pre-enrollment pending its opening. From the start date, the contents, documents, forums, working groups, etc. were opened. The platform hosting the sMOOC itself reported on the confidentiality of the data and other standard ethical issues, which each person has to accept and give their consent to in advance before they can enroll in the course. In the initial part, a form was incorporated to detect previous knowledge and attend to the expectations of the students. The sMOOC was initially configured by thematic cores, which includes an introductory and explanatory video, a specific discussion forum, microblogging discussion associated with a course hashtag, and a series of activities related to challenge-based learning. It is worth highlighting the gambling activities designed to encourage motivation and the participation and involvement of students, including progress bars, likes, monitoring of other students, scores achieved in the activities or karma level obtained, in addition to the serious games developed with the theme of the sMOOC.

This descriptive project, presented from a determined reality, is also supported by some hypotheses which have led our analysis on a specific direction and canalized information gathered through quantitative techniques. These hypotheses have provided an explanation for the studied phenomena and a structure to the final report of results. The hypotheses have been phrased as follows:

**Hypothesis 1.** *Students show a high level of satisfaction with the “sMOOC Step by Step” course;*

**Hypothesis 2.** *The overall satisfaction degree regarding the course corresponds to the students' perception of the sMOOC's activities resources and services, the learning achieved, and its applicability to professional life.*

The analysis carried out is based on quantitative techniques and is therefore framed within positivist research methods. This methodology is based on an approach oriented toward the generalization of the results, focusing on facts that are observable and able to be measured through experimental control and statistical analysis. The quantitative method used clearly responds to the hypotheses put forward in this study and which are intended to produce concise results, in order to facilitate the veracity of the conclusions formulated. In order to define the problem area and suggest specific proposals for research, a systematic search for information was developed in which the researcher presents the research on the data they wish to obtain.

A quantitative methodology was followed because it makes it possible to study a phenomenon in a standardized way, greatly limiting the interference of the researcher's—consciously or not—biased input [20]. Data compilation was carried out from the feedback obtained through a questionnaire [21] displayed at the end of the sMOOC. Significantly, the questionnaire was available for students from the moment they enrolled. We chose this descriptive method because we consider it to be the best-known quantitative data-compilation technique, which provides a fast, accurate, and convenient way to describe inclinations, frequency of opinions, and attitudes shown by a specific sector of the population. It also allows locating the outreach and distribution of a given phenomenon. The questionnaire was carried out using *LimeSurvey* software, which allows answers to be classified and certain variables to be associated according to population traits, so that correlations among variables can be later studied through SPSS software. Such tools have proven helpful to rightly specify each answer, in order to figure out sMOOC students' opinions, expectations, and criteria concerning this educational model, which encourages the culture of participation and its interest for social change.

### 3. Results

#### 3.1. Students' Profile

The sample includes students between 19 and 73 years old, 52.1% of them female and 47/9% male. A prevalence of the educational sector can be observed, with a 48.6% providing a positive answer to the first hypothesis to be confirmed. The greatest interest was perceived among those working in the field of education, who saw an opportunity to improve their professional teaching skills in their regular classroom work. All other percentages follow at a certain distance, such as a 6.2% of participants working in IT or mathematics, 3.7% in administrative positions and office work, and 2.7% in cooperation or social work. Educators are therefore one of the sectors working on the ECO project's sMOOCs the most. The significant participation of teachers should be favourably considered, as far as teachers are perceived as agents of social change who, moreover, show interest in training through this type of courses, as well as engaging in specialized and continuous training.

#### 3.2. Students' Overall Degree of Satisfaction

Through the analysis of frequent issues referring to students' degree of satisfaction, varied results can be observed, as shown in Table 1. On the one hand, satisfaction was high concerning audiovisual materials and the design of collaborative activities. On the other hand, participants are still critical toward the technical support provided during the course. The quality of the curricular material of this training model and the didactic approach are clearly stated. It is observed, though, that digital MOOC platforms, in general, are not responding yet at an appropriate level of interaction for these types of courses.

**Table 1.** Students' overall assessment on audiovisual materials (X22), assessment of documents (X21), assessment of design of collaborative activities (X18), and assessment of technical support (X24).

	X22		X21		X18		X24	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Very good	69	23.6	77	26.4	57	19.5	52	17.8
Good	95	32.5	101	34.6	79	27.1	56	19.2
Adequate	68	23.3	68	23.3	97	33.2	73	25.0
Poor	39	13.4	30	10.3	38	13.0	55	18.8
Very poor	21	7.2	16	5.4	21	7.2	56	19.2
Total	292	100.0	292	100.0	292	100.0	292	100.0

As implied by the presented frequencies, a good level of satisfaction of sMOOC participants can be perceived in three out of the four studied factors. A closer examination of the profile for "sMOOC Step by Step" students on X1\_age level and X3\_residence is advisable, in order to determine whether there is a correspondence among the four variables shown in Table 2 (X22, X21, X18 y X24). The values obtained for Chi-squared tests, aimed to check the independence of such variables, are shown in Table 2, in order to be able to subsequently measure their positive or negative correlation.

**Table 2.** P-values of Chi-squared test for the independence of variables.

	X1: Age (n = 268)
X22: Audiovisual materials (n = 268)	0.000 *
X21: Documents (n = 292)	0.002 *
X18: Collaborative activities (n = 292)	0.008 *
X24: Technical support (n = 292)	0.003 *

\* The relationship is significant at 0.01.

Students' assessment toward audiovisual materials, provided documents, collaborative practices, and sMOOC technical support are clearly dependent on age variables. Calculating Kendall and Spearman's correlation coefficients (Table 3) among the ordinal variables of the previous table, a significant and negative connection can be observed between variables X1 (age) and X21 (assessment of course documents). It can therefore be inferred that the older the age in the sample, the lower the degree of satisfaction with the course documents. By contrast, a positive inclination can be observed between variables X18 (assessment of collaborative activities design), X21, X22 (assessment of audiovisual materials), and X24 (assessment of technical support), from which it can be inferred that the higher the satisfaction with audiovisual materials, the higher the satisfaction with the provided documents, with the collaborative tasks carried out, and with the technical support offered. The positive experience in these training environments predisposes the participants to express their general satisfaction in all the didactic areas that motivate their learning. These data show that the older the age, the more satisfied participants are regarding materials used throughout the course, due to their greater learning experience and their more critical point of view toward learning materials.

**Table 3.** Kendall and Spearman's correlation coefficients among ordinal variables X1 and X18, X21, X22, and X24. X1 = Age. X18 = Assessment of collaborative activities design. X21 = Assessment of course documents. X22 = Assessment of audiovisual materials. X24 = Assessment of technical support.

			X1	X18	X21	X22	X24
Tau_b de Kendall	X1	Correlation coefficient	1.000	−0.032	−0.126 **	−0.075	−0.002
		Sig. (bilateral)		0.493	0.007	0.104	0.969
		N	268	259	267	266	195
	X18	Correlation coefficient	−0.032	1.000	0.525 **	0.572 **	0.427 **
		Sig. (bilateral)	0.493		0.000	0.000	0.000
		N	259	281	280	279	213
	X21	Correlation coefficient	−0.126 **	0.525 **	1.000	0.740 **	0.481 **
		Sig. (bilateral)	0.007	0.000		0.000	0.000
		N	267	280	290	289	216
	X22	Correlation coefficient	−0.075	0.572 **	0.740 **	1.000	0.512 **
		Sig. (bilateral)	0.104	0.000	0.000		0.000
		N	266	279	289	289	215
	X24	Correlation coefficient	−0.002	0.427 **	0.481 **	0.512 **	1.000
		Sig. (bilateral)	0.969	0.000	0.000	0.000	.
		N	195	213	216	215	216



Table 3. Cont.

Rho de Spearman	X1	Correlation coefficient	1.000	−0.042	−0.163 **	−0.095	0.000
		Sig. (bilateral)	.	0.506	0.008	0.122	1.000
		N	268	259	267	266	195
	X18	Correlation coefficient	−0.042	1.000	0.595 **	0.646 **	0.492 **
		Sig. (bilateral)	0.506		0.000	0.000	0.000
		N	259	281	280	279	213
	X21	Correlation coefficient	−0.163 **	0.595 **	1.000	0.798 **	0.548 **
		Sig. (bilateral)	0.008	0.000		0.000	0.000
		N	267	280	290	289	216
	X22	Correlation coefficient	−0.095	0.646 **	0.798 **	1.000	0.578 **
		Sig. (bilateral)	0.122	0.000	0.000		0.000
		N	266	279	289	289	215
X24	Correlation coefficient	0.000	0.492 **	0.548 **	0.578 **	1.000	
	Sig. (bilateral)	1.000	0.000	0.000	0.000		
	N	195	213	216	215	216	

\*\* Correlation is significant at level 0.01 (bilateral).

### 3.3. Degree of Satisfaction Perceived by Students Concerning the Learning Achieved and its Applicability to Their Professional Life

In addition to sMOOC students' satisfaction degree, further study on the real degree of learning achieved and the transfer of that content to students' professional activity was considered necessary. Such a purpose involved studying the X63 (How\_much\_did\_you\_learn\_in\_MOOC) and X62 (Applications\_MOOC\_content\_in\_daily\_professional\_life) variables. The information provided by Table 4 confirms that 73.7% of the students participating in the sMOOC claim to agree very much or to some extent with the idea of this educational model being adequate for their training. Moreover, data show that this type of learning is positively valued as far as its impact on their professional life is concerned. Such data are furtherly reinforced by the results provided by Table 5, according to which 59.9% of the participating students confirm that the learning is applicable to their regular professional lives and to the construction of a sustainable society.

Table 4. Frequency distribution in the X63 variable: How\_much\_did\_you\_learn\_in\_MOOC.

	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Very much	65	22.3	22.3	22.3
To a large extent	150	51.4	51.4	73.7
To some extent	56	19.2	19.2	92.8
A little bit	15	5.1	5.1	97.9
Not at all	2	0.7	0.7	98.6
I don't know	4	1.4	1.4	100.0
Total	292	100.0	100.0	

**Table 5.** Frequency distribution in the X62 variable: Applications\_MOOC\_content\_in\_daily\_professional\_life.

	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Very much	45	15.4	15.4	15.4
To a large extent	130	44.5	44.5	59.9
To some extent	69	23.6	23.6	83.6
A little bit	35	12.0	12.0	95.5
Not at all	5	1.7	1.7	97.3
I don't know	8	2.7	2.7	100.0
Total	292	100.0	100.0	

### 3.4. Participation and Empowerment of Students

The measure of the researchers' success shows that the completion rate in these courses is lower than in traditional e-learning courses. Moreover, its massive features set a noticeable tendency toward transmissive learning methods [22,23]. The Educational Goals 2021 proposed by the Organization of Ibero-American States outlines a series of standards which these courses should meet as a quality requirement; for instance, students should actively participate in their own learning, as well as create and share their knowledge [24,25]. In addition to those studied in the previous epigraph, there are further variables in Table 6 to be considered, such as the promotion of discussion and personal reflection, interaction among students and creativity, aimed to minimize effects such as high drop-out rates in this kind of courses. Kendall and Spearman's correlation coefficients of the ordinal variables in Table 7 show a significant positive correlation among variables X29, X30, X31, and X32, from which we can infer that the more discussion and reflection are encouraged during the course, the higher students' commitment is, as well as their mutual interaction and creativity, seen in Table 6. Based on this fact, we could be glimpsing at a possible solution to counteract the high drop-out rates, which are related to motivation [26,27], commitment or degree of engagement. The participants, motivated by this training model, will be more predisposed to developing their learning in virtual scenarios and keeping a constant degree of participation and involvement, thus decreasing drop-out rates.

**Table 6.** Students' overall assessment on whether the course encourages discussion and personal reflection, peer-to-peer interaction, and creativity. X29 = Encourages discussion and personal reflection on the field tackled. X30 = Promotes learner involvement in the course. X31 = Promotes interaction with other learners in the course. X32 = Promotes student creativity.

	X29		X30		X31		X32	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Totally	82	28.1	95	32.5	70	24.0	102	34.9
To a large extent	133	45.5	124	42.5	125	42.8	130	44.5
To some extent	63	21.6	62	21.2	75	25.7	48	16.4
Inadequately	14	4.8	11	3.7	22	7.6	12	4.1
Total	292	100.0	292	100.0	292	100.0	292	100.0



**Table 7.** Kendall and Spearman’s correlation coefficients among variables X29, X30, X31, and X32. X29 = Encourages discussion and personal reflection on the field tackled. X30 = Promotes learner involvement in the course. X31 = Promotes interaction with other learners in the course. X32 = Promotes student creativity.

			X29	X30	X31	X32
Tau_b de Kendall	X29	Correlation coefficient	1.000	0.633 **	0.660 **	0.530 **
		Sig. (bilateral)		0.000	0.000	0.000
		N	289	289	286	288
	X30	Correlation coefficient	0.633 **	1.000	0.678 **	0.615 **
		Sig. (bilateral)	0.000		0.000	0.000
		N	289	291	288	290
	X31	Correlation coefficient	0.660 **	0.678 **	1.000	0.561 **
		Sig. (bilateral)	0.000	0.000		0.000
		N	286	288	288	288
	X32	Correlation coefficient	0.530 **	0.615 **	0.561 **	1.000
		Sig. (bilateral)	0.000	0.000	0.000	
		N	288	290	288	290
Rho de Spearman	X29	Correlation coefficient	1.000	0.680 **	0.705 **	0.573 **
		Sig. (bilateral)		0.000	0.000	0.000
		N	289	289	286	288
	X30	Correlation coefficient	0.680 **	1.000	0.726 **	0.661 **
		Sig. (bilateral)	0.000		0.000	0.000
		N	289	291	288	290
	X31	Correlation coefficient	0.705 **	0.726 **	1.000	0.609 **
		Sig. (bilateral)	0.000	0.000		0.000
		N	286	288	288	288
	X32	Correlation coefficient	0.573 **	0.661 **	0.609 **	1.000
		Sig. (bilateral)	0.000	0.000	0.000	
		N	288	290	288	290

\*\* . Correlation is significant at level 0.01 (bilateral).

#### 4. Discussion

The 2016 research has permitted the verification of hypotheses contrasted with the results obtained from the sample. A firm articulation between the construction of knowledge and a strong social dimension (collaborative learning) is proving essential, as well as between the flexibility required by sMOOC students and the working pace they need to achieve their goals. Therefore, the elimination of rigid learning paths, highly structured tasks with fixed sequences, and the tiresome interdependence of sequential tasks—all of them typical xMOOC features that reduce flexibility and increase the distance between teachers and students—has been positively valued. In addition, a robust interaction among all the members in the learning community makes the difference when compared to the cMOOC model. In sMOOCs, teachers engage as mediators and facilitators to encourage students’ collective learning, while in cMOOCs, there is no such role for teachers. As a matter of fact, the teachers’

accompanying role empowers participants toward a socioconstructivist learning and a bidirectional, horizontal communication among them all.

As we conclude, students' satisfaction with documents, audiovisual materials, and collaborative practices, together with their satisfaction with the degree of interaction among members in the educational community, are clearly interdependent from age factors. Moreover, it is highlighted that in addition to the previously mentioned correlation, the degree of satisfaction concerning the learning achieved by students is mainly assessed as "very much" and "to a large extent", while the level of transferability of contents to students' professional life is assessed as "to a large extent" and "to some extent". Results are therefore good in both cases, especially concerning the degree of learning. Hence, it can be stated that students' level of satisfaction corresponds to the learning achieved and its applicability to their daily professional life and to the construction of a sustainable society.

Participants state that members in the virtual learning community are potential peers in the learning process, which leads us to think of good rates of motivation and participation achieved. Social interaction experienced through the course can be positively considered, which proves the effort made by the "sMOOC Step by Step" teaching team to foster interaction between participants.

Obviously not only the teachers, but also the students share this belief and, subsequently, created a practice community within the course which made collaborative work real. There, the students shared interesting links, discussed the concepts studied in the forums, assessed the gamified activities that they had previously carried out, etc. Students at "sMOOC Step by Step" have experienced intercreative practices and collaborative learning, through which they have committed to becoming active cultural agents. Moreover, it is noteworthy how 700 participants voluntarily decided to join forces, found common learning subjects, and jointly created and developed 70 sMOOCs. There is a high level of satisfaction toward this way of teaching, including peer assessments, far away from traditional models. In this sense, students' self-assessment, introduced on cMOOCs and normalized on sMOOCs, responds satisfactorily to students' demands [28], offering learning opportunities on a third level of interactivity, also known as "multidirectional" [29]. Answers on the questionnaire reflect the idea of a learning community showing willingness to participate, since they themselves are the ones getting enriched by others' contributions, thus appropriating a role traditionally granted to teachers. To that end, they agreed they would have to participate and be mutually responsible for their learning. Doubts about their empowerment or commitment with their own learning are nowhere to be found throughout the course.

From this perspective, intercreativity and participation of contributors in the learning process have been valued. We should not forget that one of the main educational challenges of the present century is to provide a sound basis for continuous learning, making it available to the largest possible amount of people, thus helping to fight the digital gap still present in some societies and excluded groups. sMOOCs should support an educational practice contextualized in the current media, thus increasing the possibilities for interaction and the creation of a richer, more diversified learning environment, through which people resort to a wider range of materials, contexts, and situations in order to participate in the educational experience. We are referring to a series of educational and communicational strategies implemented in the "sMOOC Step by Step" and aimed at promoting social change and the revolution of citizens, toward a new educational reality in which formal and informal educational contexts will merge into one. The purpose pursued by an sMOOC cannot be carried out if we do not allow in course structures and on the same platforms the empowerment of students, a space aimed at the participation of the virtual community of learning [30] and projected by social software, opening the way to a new collaborative style of knowledge construction toward a community of practice, a collective intellect. From this perspective, sMOOCs show an intelligent crowd that is built through the architecture of participation and that is projected toward consolidation as a community of practice.

sMOOCs stand out as a clear point of attraction within the scope of Higher Education. In this study, the students' perspective has centered the analysis of the satisfaction degree regarding the

learning achieved throughout the sMOOC and its transfer to professional contexts [31]. The goals have been reached, moreover, from a training model based on participation and students' engagement in their own training process. The study, however, also shows some limitations. Firstly, the obtained data only correspond to students' personal perception. Such a perception should eventually be cross-checked by experts in massive, open, online education, so that students' degree of satisfaction can be compared to the actual learning achieved through the course. Secondly, there is a clear bias regarding the measurement of the satisfaction degree, because the only opinions available are those of students who voluntarily filled the questionnaire. There are cases of students who completed the course but then declined to fill the questionnaire form, as well as some others who, in a less expected move, answered the questionnaire without having completed the sMOOC. Finally, 200 of the students who had completed the "sMOOC Step by Step" course decided to become e-teachers and created teams to jointly implement all they had learnt in the design and development of a total of 70 sMOOCs.

## 5. Conclusions

sMOOCs present themselves as educational proposals with a great potential for continuous and updated training for people, especially for active teachers, thus allowing an educational change able to meet the current society's demands. Due, on the one hand, to the high degree of heterogeneity of sMOOC participants in terms of competences, previous knowledge, and motivation and, on the other hand, due to these courses' nonformal nature, students should play a central role in the educational process, assuming an active, co-responsible approach to their own learning. Knowledge is constructed through reflection, practice (creation, production), and dialogue in a social context of collaboration [32], which fosters collaborative working. Success in this type of courses shall be measured bearing in mind the goals and aims of the participating subjects.

The sMOOC proposal at the ECO European Project shall permit the possibility to adjust itself to the ever-changing aims of each participant through the course and respond to their motivation and learning demands. Collaborative working and the joint construction of open knowledge are fostered and supported by teaching materials provided in varied formats, making the most of spaces and tools provided by virtual environments. Fostering collaborative learning within the community requires from the team of teachers and facilitators a careful planning, interventions through the process to solve conflicts, and a final analysis of team-working [33]. Such a reality is built from communicative tools promoting debate, exchange of experiences, and the construction of a different way of learning based on collaboration and social openness online. This communicational model is completed by further pedagogical aspects intending to achieve quality learning on these environments, to pay attention to group processes and their impact on the construction of knowledge [34]. This situation requires an in-depth analysis of key aspects such as teachers' professional competences [35] in higher education. Those competences are not limited to using certain technological tools or performing mechanical tasks [36] but also include reaching out for pedagogical and learning management requirements, which are essential for the transformation of an online, open college experience [37].

We need a greater effort invested in providing alternative learning routes focused on intercreativity, the collaborative construction of learning, and sustainable practices, but the technological evolution of sMOOCs and teachers' own training prevent us from progressing according to the demands of the digital society. All aspects concerning communication and interaction among participants in educational environments, albeit highly valued, are still the subject of constraints which obstruct the construction of a bidirectional approach. Therefore, we consider it necessary to insist on a continuous improvement in these areas, in order to achieve even higher levels of satisfaction and improved learning transfer for a sustainable society. We must keep researching how to constantly improve future sMOOCs editions, betting on a new model with an approach opting for the transference of the knowledge acquired by students, in order to develop a professional transformation. Once improvements are made on this formative model, its connections with the empowerment levels of students will be studied.

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## References

1. Valverde, J. MOOCs: Una visión crítica desde las ciencias de la educación. *Profr. Rev. Curric. Form. Profr.* **2014**, *18*, 93–111.
2. Hollands, F.M.; Devayani, T. *MOOCs: Expectations and Reality*; Columbia University: New York, NY, USA, 2014.
3. Riehemann, J.; Hellmann, J.H.; Jucks, R. Your words matter! Relevante of individual participation in sMOOCs. *Act. Learn. Higer Educ.* **2018**. [[CrossRef](#)]
4. Pernias Peco, P.; Luján Mora, S. Los MOOC: Orígenes, historia y tipos. *Comun. Pedagog. Nuevas Tecnol. Recur. Didact.* **2013**, *269–270*, 41–48. Available online: <https://goo.gl/8BVzhG> (accessed on 19 July 2020).
5. Osuna-Acedo, S.; Marta-Lazo, C.; Frau-Meigs, D. From sMOOC to tMOOC, learning towards professional transference. ECO European Project. *Comunicar* **2018**, *55*, 105–114. [[CrossRef](#)]
6. Lévy, P. *Inteligencia Colectiva. Por una Antropología del Ciberespacio*; Organización Panamericana de la Salud: Whashintong, DC, USA, 2004.
7. Aparici, R.; Osuna-Acedo, S. La Cultura de la Participación [The Culture of Participation]. *Rev. Mediterr. Comun.* **2013**, *4*, 137–148. [[CrossRef](#)]
8. Jenkins, H. *Convergence Culture. La Cultura de la Convergencia de los Medios de Comunicación*; Ediciones Paidós Ibérica S.A: Barcelona, Spain, 2008.
9. Tang, S.Y.F.; Wong, A.K.; Li, D.D.; Cheng, M.M.H. The contribution of non-formal learning in higher education to student teachers’ professional competence. *J. Educ. Teach.* **2017**, *43*, 550–565. [[CrossRef](#)]
10. Fidalgo-Blanco, A.; Sein-Echaluce, M.L.; García-Peñalvo, F.J. From massive access to cooperation: Lessons learned and proven results of a hybrid xMOOC/cMOOC pedagogical approach to MOOCs. *Int. J. Educ. Technol. Higher Educ.* **2016**, *13*. [[CrossRef](#)]
11. Berners-Lee, T. WWW: Past, Present and Future. *Comput. Mag.* **1996**, *29*, 69–77. [[CrossRef](#)]
12. Gil-Quintana, J.; Camarero-Cano, L.; Osuna-Acedo, S. sMOOC and Gamification—A Proposed Ubiquitous Learning. In *International Symposium on Emerging Technologies for Education*; Springer: Cham, Switzerland, 2016; pp. 507–513.
13. García de Torres, E.; Farmer, Y. Ética en los medios de comunicación: Retos y oportunidades para la investigación. *El Profesional Información* **2017**, *26*, 153–157. [[CrossRef](#)]
14. Siemens, G. Connectivism: A Learning Theory for a Digital Age. Available online: <https://bit.ly/33bFa06> (accessed on 19 July 2020).
15. Fuente-Cobo, C. Públicos vulnerables y empoderamiento digital: El reto de la sociedad e-inclusiva. *Prof. Inf.* **2017**, *26*, 5–12. [[CrossRef](#)]
16. Castaño Garrido, C.; Maiz Olazabalaga, I.; Garay Ruiz, U. Redes sociales y aprendizaje cooperativo en un MOOC. *Revista Complut. Educ.* **2015**, *26*, 119–139. [[CrossRef](#)]
17. Osuna-Acedo, S.; Gil-Quintana, J. El proyecto europeo ECO. Rompiendo las barreras en el acceso al conocimiento. *Rev. Educ. XXI* **2017**, *20*, 189–213. [[CrossRef](#)]
18. O’Reilly, T. What is Web 2.0? Design Patterns and Business Models for the Next Generation of Software. 2020. Available online: <https://bit.ly/2ZIKgwU> (accessed on 20 June 2020).

19. Chin-Yi, K.; Ko-Fong, L.; Yen-Lin, C. El uso de un sistema de aprendizaje ubicuo interactiva para mejorar las experiencias de aprendizaje auténticas en un curso de patrimonio cultural. *Interact. Learn. Environ.* **2017**. [CrossRef]
20. Hueso, A.; Cascant, M.J. Metodología y técnicas cuantitativas de investigación. In *Cuadernos docentes en Proceso de Desarrollo*; Universidad Politécnica de Valencia: Valencia, Spain, 2012; Available online: <https://bit.ly/2r4OtV3> (accessed on 13 June 2020).
21. Díaz de Rada, V. *Diseño y Elaboración de Cuestionarios Para la Investigación*; Editorial ESIC: Madrid, Spain, 2001.
22. Capuano, N.; Caballé, S. Towards an adaptive peer assessment for MOOCs, P2P Parallel Grid Cloud and Internet Computing (3PGCIC). In Proceedings of the 2015 10th International Conference on P2P, Parallel, Grid, Cloud and Internet Computing (3PGCIC), Krakow, Poland, 4–6 November 2015; pp. 64–69. [CrossRef]
23. Daradoumis, T.; Bassi, R.; Xhafa, F.; Caballe, S. A review on massive e-learning (MOOC) Design, delivery and assessment. In Proceedings of the Eighth International Conference on P2P, Parallel, Grid, Cloud and Internet Computing, Compiègne, France, 28–30 October 2013; pp. 208–213. [CrossRef]
24. Joksimovic, S.; Dowell, N.; Poquet, O.; Kovanovic, V.; Gasevic, D.; Dawson, S.; Graesser, A.C. Exploring development of social capital in a CMOOC through language and discourse. *Internet Higher Educ.* **2018**, *36*, 54–64. [CrossRef]
25. Yang, D.; Sinha, T.; Adamson, D.; Rosa, C.P. Turn On, Tune In, Drop Out: Anticipating Students Dropouts in Massive Open Online Courses. In Proceedings of the 2013 NIPS Data-Driven Education Workshop, Lake Tahoe, NV, USA, 9–10 December 2013; Available online: <https://bit.ly/2t3fGHw> (accessed on 20 June 2020).
26. Atenas, J. Modelo de democratización de los contenidos albergados en los MOOC. *Rev. Univ. Soc. Conoc.* **2015**, *12*, 3–14. [CrossRef]
27. Maartje, A.; Henderikx, K.K.; Marco, K. Refining success and dropout in massive open online courses based on the intention–behavior gap. *Distance Educ.* **2017**, *38*, 353–368. [CrossRef]
28. Luo, H.; Robinson, A. Is peer grading a valid assessment method for Massive Open Online Courses (MOOCs)? In Proceedings of the 7th Annual International Symposium. Emerging Technologies for Online Learning, Dallas, TX, USA, 9–11 April 2014; Available online: <https://bit.ly/2SzXT7E> (accessed on 30 July 2020).
29. Raposo-Rivas, M. Orientaciones Pedagógicas Para los MOOC. III Workshop Internacional Sobre Creación de MOOC con Anotaciones Multimedia. 2014. Available online: <https://bit.ly/30KDfWX> (accessed on 19 July 2020).
30. Osuna-Acedo, S.; Gil-Quintana, J.; Cantillo-Valero, C. Open, Mobile and Collaborative Educational Experience. Case study: The European ECO Project. *J. Univers. Comput. Sci.* **2017**, *23*, 1215–1237.
31. Marta-Lazo, C.; Frau-Meigs, D.; Osuna-Acedo, S. A collaborative digital pedagogic experience in the tMOOC “Step by Step”. *Australas. J. Educ. Technol.* **2019**, *35*, 111–127. [CrossRef]
32. García-Almeid, J.D.; Cabrera-Nuez, M.T. The influence of knowledge recipients’ proactivity on knowledge construction in cooperative learning experiences. *Act. Learn. Higher Educ.* **2018**. [CrossRef]
33. Del Barco, B.L.; Mendo-Lázaro, S.; Felipe-Castaño, E.; del Río, M.I.P.; Fajardo-Bullón, F. Potencia de equipo y aprendizaje cooperativo en el ámbito universitario. *Rev. Psicodidact.* **2018**, *12*, 9–17. [CrossRef]
34. Bollmann, A.; Becker, S.; Sander, K. It’s the learning, stupid! Discussing the role of learning outcomes in MOOCs. *Open Learn. J. Open Distance e-Learning* **2018**, *33*, 203–220. [CrossRef]
35. Salinas, J.; Benito, B.; Liana, A. Competencias docentes para los nuevos escenarios de aprendizaje. *Rev. Interuniv. Form. Profr.* **2014**, *28*, 145–163. Available online: <https://bit.ly/2JvrsFB> (accessed on 20 June 2020).
36. Caballo, M.B.; Caride, J.A.; Gradaille, R.; Pose, H.M. Los MOOCs como extensión universitaria. Profesorado. *Rev. Currículum Form. Profr.* **2014**, *18*, 43–61. Available online: <https://bit.ly/2HEYBbZ> (accessed on 30 June 2020).
37. Affounedh, S.; Wimpenny, K.; Ghodieh, A.R.; Alsaud, L.A.; Obaid, A.B. Reflection on MOOC Design in Palestine. *Int. Rev. Res. Open Distrib. Learn.* **2018**, *19*. [CrossRef]

