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Master Thesis:

**QUALITY ASSURANCE METHODS ASSESSING INSTRUCTIONAL DESIGN AND
ACTIVE LEARNING PEDAGOGIES IN MOOCs:
AN EVALUATIVE CASE STUDY**

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*As you set out for Ithaca,
hope the journey is a long one,
full of adventure, full of knowledge...*

-C.P. Cavafy-

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Abstract

Nowadays more and more Massive Open Online Courses (MOOCs) appear, offering numerous online courses around a variety of topics. Many big institutions around the world devote too much effort on providing high-quality MOOC experience, encouraging the participation of as many as possible individuals worldwide. Consequently, many studies appear focusing on the improvement of MOOC experience from various aspects, while analyzing the feedback that they receive after the implementation of their courses.

Mainly, this feedback is based on the final questionnaires that designers' and MOOC instructors' receive from their students, in combination with the learning analytics of the MOOC platform. There are efforts from many researchers, who try to point out the necessity of nourishing a quality assurance culture in MOOCs, taking into account that these courses are addressed to a vast community of learners and the quality in the design and pedagogy of MOOCs could be an important factor for the sustainability of enrolled students' learning. However, it is not that clear how these efforts are being addressed and more importantly it is not clear up to which point they are appropriate to assess active learning pedagogies.

For this reason, we planned to carry out an evaluative case study, to apply current quality assessment methods on a MOOC that the group had proposed last year, implementing active learning pedagogies. To that end, we carried out a systematic literature review in order to identify the existent MOOC quality assurance methods and select those that could be used in the case study. The research was focused on assessing whether these methods evaluate effectively the instructional design of a MOOC implementing active learning pedagogies, while assessing meanwhile the quality of the MOOC itself.

As the results suggest, the tools of the selected quality frameworks provide important and useful elements while assessing the instructional design of a MOOC. However, they need enrichment in active learning pedagogies elements, like collaborative learning and gamification. The evaluation also found further strengths and weaknesses that the quality frameworks present, hinting the path for future research lines.

Keywords: MOOCs, *quality assurance methods, quality frameworks, assessment tools, instructional design, active learning pedagogies, collaborative learning, gamification*

Περίληψη

Στις μέρες μας εμφανίζονται όλο και περισσότερα Μαζικά Ελεύθερα Διαδικτυακά Μαθήματα (Massive Open Online Courses - MOOCs). Πολλά μεγάλα πανεπιστήμια παγκοσμίως έχουν αφοσιωθεί στο να προσφέρουν υψηλής ποιότητα «μαζική» εκπαίδευση. Κατά συνέπεια, γίνονται πολλές έρευνες για τη βελτίωση αυτής της μαθησιακής εμπειρίας.

Η ανατροφοδότηση βασίζεται κυρίως στο ερωτηματολόγιο, το οποίο συμπληρώνουν οι μαθητές στο τέλος ενός MOOC. Οι εκπαιδευτές λαμβάνουν την ανατροφοδότηση, την αναλύουν και σε συνδυασμό με τα learning analytics της πλατφόρμας πραγματοποιούν τη γενική αξιολόγηση του μαθήματος. Όμως, δεν φτάνει μόνο αυτό. Έχουν σημειωθεί προσπάθειες από ερευνητές, οι οποίοι επιδιώκουν να τονίσουν την ανάγκη καλλιέργειας συγκεκριμένων μεθόδων εξασφάλισης της ποιότητας (quality assurance culture) στα MOOCs, λαμβάνοντας υπόψιν ότι τα μαθήματα απευθύνονται σε μια τεράστια κοινότητα μαθητών. Κατά συνέπεια ο ποιοτικός σχεδιασμός και η παιδαγωγική των MOOCs αποτελούν σημαντικούς παράγοντες για ποιοτική μάθηση.

Η παρούσα έρευνα επικεντρώνεται στη συγκεκριμένη ανάγκη, μελετώντας κι ερευνώντας το πεδίο διασφάλισης της ποιότητας στα MOOCs. Πρωτίστως, πραγματοποιήθηκε μια συστηματική βιβλιογραφική επισκόπηση με σκοπό να εντοπιστούν οι μέθοδοι διασφάλισης της ποιότητας (quality assurance methods). Η συστηματική βιβλιογραφική επισκόπηση οδήγησε στον εντοπισμό ποιοτικών πλαισίων (quality frameworks) και ποιοτικών εργαλείων (quality tools), που έχουν χρησιμοποιηθεί μέχρι στιγμής. Αυτά τα αποτελέσματα μας ενθάρρυναν να διεξάγουμε μια μελέτη περίπτωσης (evaluative case study), με σκοπό την εφαρμογή των ποιοτικών εργαλείων σε ένα MOOC. Η έρευνα επικεντρώθηκε στο να αξιολογηθούν τα ποιοτικά εργαλεία για το εάν μπορούν να προσφέρουν χρήσιμα αποτελέσματα κατά την αξιολόγηση του εκπαιδευτικού σχεδιασμού ενός MOOC, το οποίο έχει σχεδιαστεί με βάση την ενεργητική παιδαγωγική μάθηση (active learning pedagogies).

Σύμφωνα με τα αποτελέσματα, τα ποιοτικά εργαλεία αξιολόγησης και τα ποιοτικά πλαίσια, προσφέρουν σημαντικά και χρήσιμα στοιχεία αξιολόγησης του εκπαιδευτικού σχεδιασμού ενός MOOC. Εντούτοις, τα ποιοτικά εργαλεία που αξιολογήθηκαν, χρειάζονται εμπλουτισμό ως προς την αξιολόγηση της ενεργητικής παιδαγωγικής μάθησης όπως είναι η συνεργατική μάθηση και η παιχνιδοποίηση. Κατά την διαδικασία αξιολόγησης των εργαλείων, διαπιστώθηκαν περαιτέρω πλεονεκτήματα και αδυναμίες που παρουσιάζουν, αφήνοντας γόνιμο έδαφος για μελλοντική έρευνα.

Λέξεις κλειδιά: διασφάλιση ποιότητας στα MOOCs, ποιοτικά πλαίσια, εργαλεία αξιολόγησης της ποιότητας, εκπαιδευτικός σχεδιασμός, ενεργητική παιδαγωγική μάθηση, συνεργατική μάθηση, παιχνιδοποίηση

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Chapter 1: Introduction

Everyone has the right to education (UNHR, 2016). But do all individuals all around the world have this self-evident human right? And what happens with those individuals who do not have access to education, although they want to expand their learning horizons? Goal number four of UNESCO's Sustainable Development Goals states: *"Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all"* (UNESCO, 2017, p.18). In addition to this, the Education 2030 Declaration (UNESCO, 2017, p.18) states: *"The provision of tertiary education should be made progressively free, in line with existing international agreements"*.

Massive open online courses (MOOCs) are generally seen as contributing to these goals as they provide complete learning experiences in terms of open education. Anyone with a passing interest in Open and Technology Enhanced Learning Environments might suspect that these days MOOCs have been widely heralded as a sort of "revolution" or "game changer" in open online education (Doyle, 2015). After all, some of the world's top institutions are now busily making high quality learning materials available to "students"- participants who only need to sign up online, rather than actually "enroll" in the conventional sense (Atenas & Havemann, 2013). Consequently, millions of people are learning in hundreds of MOOCs, offered by universities and other public and private organizations worldwide (Hyman, 2012; Yuan & Powell, 2013).

Since more and more MOOCs appear constituting an innovative part of online education, they should also undergo quality assurance like other online courses (Daniel, 2012; Stracke, 2015; Gamage, Fernando & Perera, 2015; Jansen, Rosewell & Kear, 2016). MOOC learners are a vast online learning community with diverse motivational interests. Therefore, MOOC designers should ensure the quality of their courses by taking into account learners' specific needs, personal goals, learning styles and inner motivations, while designing and implementing their courses. The quality in the design and pedagogy of MOOCs could be an important factor for the sustainability of enrolled participants' learning, as well as their credibility and acceptance as a valid entity of learning (Amo, 2013). Luckily there are several authors who have dedicated their

efforts to establish the fundamentals of design and pedagogy for MOOCs in order to meet quality criteria and convert them to adaptive and effective learning environments (Guàrdia, Aina & Sangra, 2013; Mazoue, 2013; George, Forsey & Riley, 2013). Nevertheless, course evaluations are usually based on learners' experience (Fini, 2009; Kop, 2011; Kop & Fournier, 2010; Kop, Fournier, & Mak, 2011; Mackness, Mak, & Williams, 2010; Milligan et al., 2013) and other key stakeholders' opinions, without focusing on the instructional design quality in MOOCs, which is a critical indicator and a prerequisite of the potential of the course for effective learning (Margaryan, Bianco & Littlejohn, 2015). Recently, some new studies have appeared, presenting quality assurance methods for assessing the instructional design in MOOCs (Yousef, Chatti, Schroeder & Wosnitza, 2014; Margaryan et al., 2015; Rosewell & Jansen, 2014).

Furthermore, instructional design quality assessment in MOOCs should be taken into account, since MOOCs with new design initiatives appear, like those ones implementing active learning pedagogies. Active learning pedagogies provide designers and instructors with useful strategies in order to design more interactive and upgraded MOOC learning environments (Bonwell & Elison, 1991). Collaborative learning (CL) is one of those strategies, according to which students are grouped in order to achieve a common learning goal through team effort (Dillenbourg, 1999). Several researchers have explored the use of collaborative learning in MOOC contexts reporting their findings (Ferguson, Clow, Beale, Cooper, Morris, Bayne & Woodgate, 2015; Alario-Hoyos et al., 2016; Alario-Hoyos, Muñoz-Merino, Pérez-Sanagustín, Delgado-Kloos and Parada-G, 2016; Blom, Li & Dillenbourg, 2013; Grunewald, Meinel, Totschnig & Willems, 2012; Manathunga & Hernández-Leo, 2015; Sinha, 2014; Spoelstra, Van Rosmalen, & Sloep 2014; Wen, 2016; Zheng, Vogelsang, Berlin & Pinkwart, 2015). Moreover, the latest years, more and more studies on gamification are appearing (Khalil, Wong, de Koning, Ebner & Paas, 2018), which focus on several issues such as: the way that gamification is being implemented in MOOC platforms according to several design decisions; the use of badges in discussion forums analyzing students' participation; the application of specific game elements investigating students' engagement and motivation, etc. (Anderson, Huttenlocher, Kleinberg & Leskovec,

2014; Rizzardini, Chan & Guetl, 2016; Khalil, Wong, de Koning, Ebner & Paas, 2018; Dicheva, Dichev Agre & Angelova, 2015; Dichev & Dicheva, 2017).

As these new learning design initiatives appear in MOOCs, there is a need to assess their quality. Up to our knowledge, none of these methods has been sufficiently applied to assess the instructional design quality in MOOCs implementing active learning pedagogies. Therefore, the MOOC quality assurance terrain should be researched deeper in order to identify and analyze whether existing quality assurance proposals can be applied to assess MOOCs implementing active learning pedagogies, and if not, which aspects these assessment methods should cover in order to help practitioners and researchers evaluate this kind of MOOCs.

1.1 Motivation

As it has been already mentioned there is an emerging need to study in depth MOOCs quality assurance terrain. In order to address this problem in real contexts that would help to understand it better, we cooperated closely with the transdisciplinary research group GSIC-EMIC¹ at the University of Valladolid. GSIC-EMIC group has been involved in several projects related to MOOCs, with several researchers (PhD and Post-docs) working full time on this field. One of these projects was RESET² national research project (Reformulate Scalable Educational Ecosystems Offering Technological innovations), in collaboration with GTI³ group from the University of Pompeu Fabra⁴ and with the University Carlos III⁵. RESET project aimed to tackle the limitations in MOOCs imposed by the scale and the Web space, through pilot experiments in real MOOCs, in the context of secondary education, higher education, lifelong learning and learning at the workplace.

As part of the RESET project, GSIC-EMIC and GTI collaborated in the design and the implementation of the “Innovative and Collaborative Learning with ICT” MOOC (CLAT MOOC)⁶. Through CLAT MOOC, designers wanted to encourage as much as possible the active

¹ GSIC-EMIC research group: <https://www.gsic.uva.es/>. Last accessed: May 2018

² Reset projects webpage: <http://reset.gast.it.uc3m.es>. Last accessed: May 2018

³ GTI research group: <http://gti.upf.edu/>. Last accessed: May 2018

⁴ Universitat Pompeu Fabra Barcelona: <https://www.upf.edu/en/>. Last accessed: May 2018

⁵ Universidad Carlos III de Madrid: <https://www.uc3m.es/Home>. Last accessed: May 2018

⁶ CLAT MOOC: <https://www.canvas.net/browse/valladolid-en/courses/innovative-collaborative-learning-en>. Last accessed: June, 2018

engagement of all participants. This is the reason why CLAT MOOC was designed based on the principles of active learning pedagogies, applying innovative elements in terms of collaboration and gamification. Concerning collaboration, the group formation policy was specific in order to encourage the collaboration among all group members. As far as gamification was concerned, collaborative quizzes were designed leading to badge acquisition.

The fact that the CLAT MOOC implements active learning pedagogies makes it a good case for our purposes of studying quality assurance procedures in such kind of MOOCs. Consequently, we can analyze the data of this special MOOC and assess its instructional design quality by exploiting existing quality assurance methods. This case study can offer a wider contribution to the MOOC research community, as the results of the study can be transferred to other cases, providing new insights into the field of quality assurance in MOOCs. We can also study whether those approaches can help MOOC experts detect weaknesses in the instructional design quality of their MOOCs implementing learning pedagogies. Figure 1 shows a diagram with an outline of the thesis context, objectives, contributions and methodology, which will be analyzed thoroughly in the following chapters.

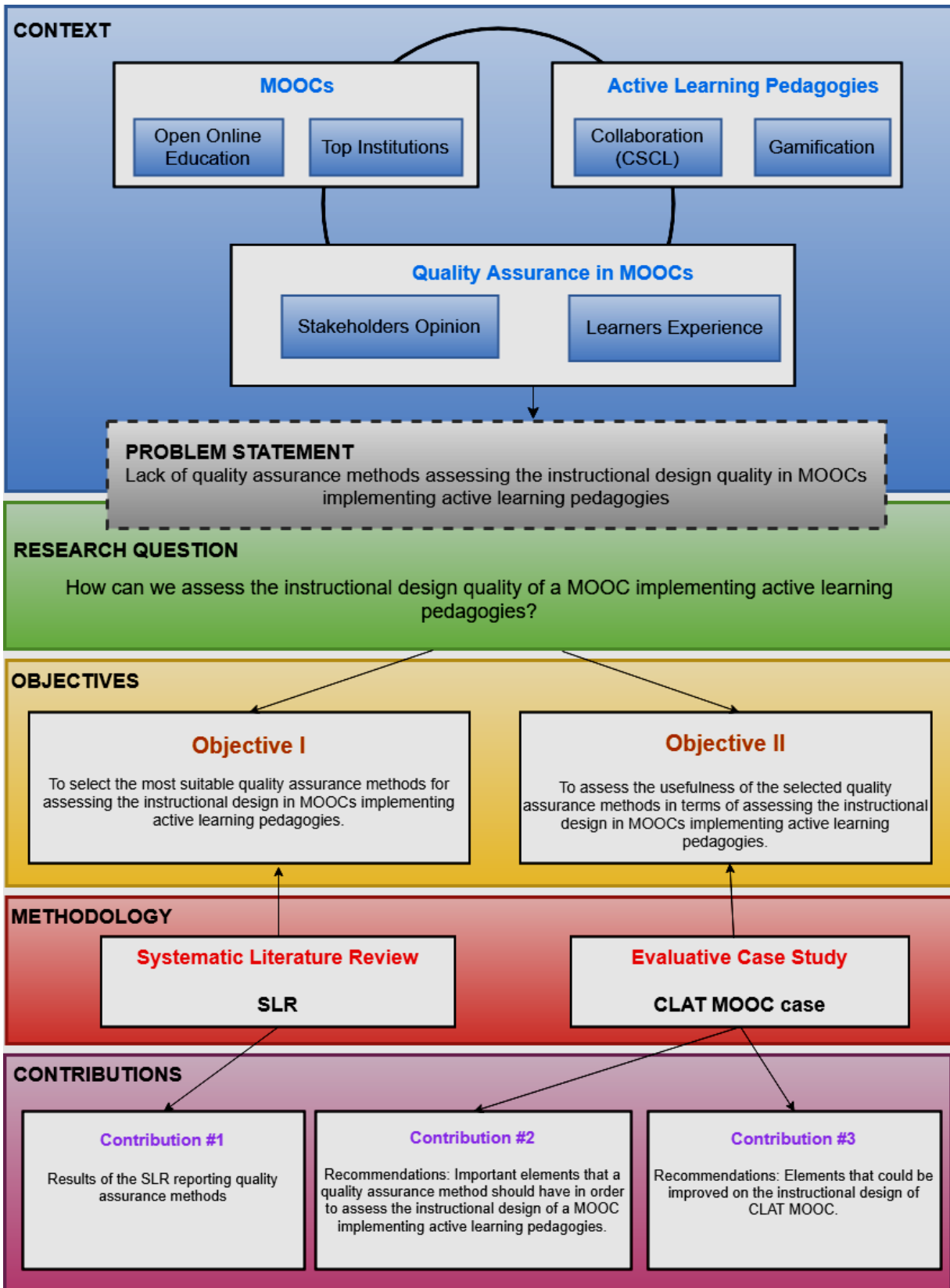


Figure 1: Research Schema of the study

1.2 Research questions and objectives

The present study was organized under the general research question: *How can we assess the instructional design quality of a MOOC implementing active learning pedagogies?* Following this general research question, we wanted to search the terrain of quality assurance in MOOCs and check the quality methods proposed so far in assessing the instructional design quality in MOOCs implementing active learning pedagogies. Consequently, we wanted to find out:

- Which are those quality assurance methods used in order to assess the instructional design quality in MOOCs implementing active learning pedagogies?
- Which are their main strengths and weaknesses while assessing the instructional design of a MOOC implementing active learning pedagogies?
- To what extent do the existing quality assurance methods help to assess the instructional design quality of a MOOC implementing active learning pedagogies?

Following the initial motivation of the dissertation, the main objectives are:

1. **To select the most suitable quality assurance methods for assessing the instructional design in MOOCs implementing active learning pedagogies:** Fulfilling this objective will enable us to identify the quality assurance methods which have been proposed so far and focus on the instructional design element, which is of great importance while assessing the quality of MOOCs implementing active learning pedagogies. In order to achieve this, an organized method should be carried out which will lead us to significant findings.
2. **To assess the usefulness of the selected quality assurance methods in terms of evaluating the instructional design in MOOCs implementing active learning pedagogies:** The selected quality assurance methods will be analyzed in order to find out what kind of elements they provide, which can be useful while assessing the instructional design of a MOOC implementing active learning pedagogies.

The general contributions to the MOOCs research community are:

- ✓ The results of the Systematic Literature Review (SLR) in MOOCs quality assurance methods terrain.

- ✓ Recommendations on important elements that a MOOC quality assurance method should have in order to assess the instructional design of a MOOC implementing active learning pedagogies.
- ✓ Recommendations on instructional design elements that need improvement on the CLAT MOOC.

1.3 Methodology

The topic of the present study was explored following a specific research design (Creswell, 2009). As we can see in Figure 2 that research design involved specific decisions that they were carefully taken in order to make sense and cover the objectives (Creswell, 2009). We took into account the nature of the issue, which is to find out ways in order to assess the instructional design of a MOOC implementing active learning pedagogies. We addressed the problem through a qualitative perspective in order to collect detailed information using a variety of data collection procedures over a sustained period of time (Stake, 1995). Concerning the qualitative approach, we followed the constructivist worldview, since we wanted to construct the study by collecting and interpreting the participants' views. One of the key elements of collecting data in this way is to take participants' perspectives into account.

The two aspects that needed to be tackled were: (i) to advance the knowledge of the state of the art in order to identify their desirable components and select the most suitable quality assurance method, (ii) to understand better the problem by applying the chosen quality assurance methods to a real case, which is the CLAT MOOC. For the first part, we used a Systematic Literature Review (SLR). SLR is a means of identifying, evaluating and interpreting all available research relevant to a particular research question, or topic area, or phenomenon of interest. It is useful for researchers, instructional designers and teachers, since they can address issues that need further research (Kitchenham & Charters, 2007). We decided that this method was the most appropriate since it could help us to search for studies and papers referring to quality assurance in MOOCs and identify the desirable quality assurance methods. Consequently, apart from covering the objectives of the present study, we could also provide a background in order to position new research activities. The findings of the SLR provided us

with three finally selected quality assurance methods. On the next phase we evaluated those identified quality assurance methods in terms of the instructional design and active learning pedagogies element by organizing a set of criteria, to check which of them fulfill them. To help with the planning and organization of the evaluation, we followed the Evaluand-oriented Responsive Evaluation Model (EREM) using a variety of qualitative data gathering techniques (Jorrín-Abellán, Stake & Martínez-Monés, 2009). We chose this model because it is deeply focused on the Evaluands (the subject under evaluation), and it is framed within the Responsive Evaluation approach (Stake, 2004). Moreover, the model is oriented to the activity, the uniqueness and the plurality of the Evaluand to be evaluated, promoting responsiveness to key issues and problems recognized by participants at the site. Last but not least, it is worth mentioning at this point that through this research design process we don't intend to fully cover the pretty general research question: *"How can we assess the instructional design quality of a MOOC implementing active learning pedagogies?"*, but to start exploring the terrain and provide recommendations that could be useful to address this question in full.

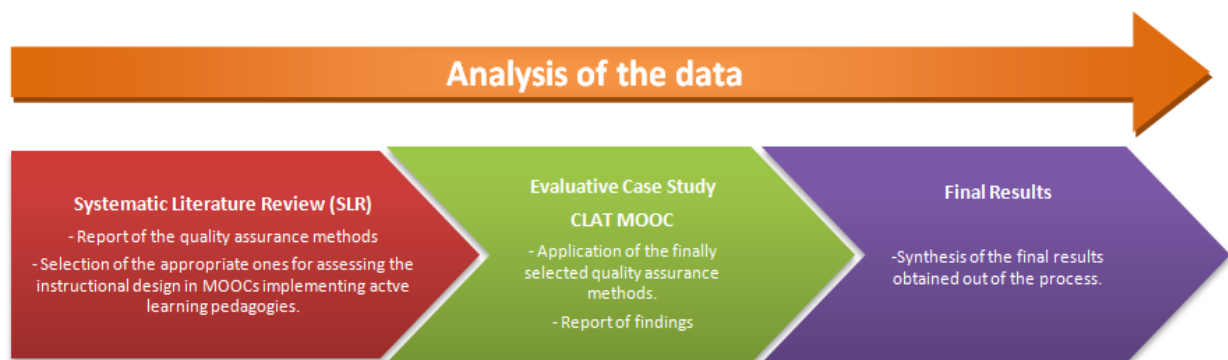


Figure 2: The research design process

1.4 Structure of the study

Having as a main focus to present clearly the steps followed in the present study and the findings respectively, the structure is organized as follows:

- In Chapter 2 the Systematic Literature (SLR) is thoroughly presented reporting the steps which were followed and the first findings. Those findings constitute the first contribution of the study which was also important for the following phase.
 - Chapter 3 provides a detailed description the evaluative case study and how was it organized in order to acquire the desirable results.
 - Chapter 4 reports and analyzes the findings of the evaluative case study.
 - Chapter 5 presents the final conclusions obtained from this work, its limitations and lines of the future work.
-

Chapter 2: Systematic Literature Review (SLR)

2.1 Introduction

We carried out the SLR in order to contribute to the first objective of the study, which is to select the most suitable quality assurance methods for assessing the instructional design in MOOCs implementing active learning pedagogies (see fig. 1 p.15). Firstly we carried out a wide search on databases in order to find out studies referring to quality assurance methods. Afterwards we identified the first 10 quality assurance methods and we reported some basic information about them. Next, we defined a set of criteria according to the objectives of the present study and we selected the final 3 most appropriate for assessing the instructional design and active learning pedagogies in MOOCs. We chose the SLR method proposed by Kitchenham and Charters (2007), since it provides concrete and organized steps which were the most appropriate ones for the first phase of the present work and it has been already implemented in previous surveys in the Technology Enhanced Learning field. Subsequently we present the steps of the SLR and its results.

2.2 Description of the SLR approach carried out

To carry out this phase of our work, we have followed the SLRs' approach defined by Kitchenham and Charters (2007). Although this approach is primarily aimed at software engineering, it can be applied in a wider set of contexts, e.g. adaptive and intelligent systems for collaborative learning (Magnisalis, Demetriadis, & Karakostas, 2011); indeed, this methodology is based on existing guidelines for systematic reviews in medical and social sciences (Vega-Gorgojo, Asensio-Pérez, Gómez-Sánchez, Bote-Lorenzo, Muñoz-Cristóbal & Ruiz-Calleja, 2015).

An SLR (often referred to as a systematic review) is a means of identifying, evaluating and interpreting all available research relevant to a particular research question, topic area, or phenomenon of interest. There are many reasons for undertaking an SLR. The most common ones are:

- To summarize the existing evidence concerning a treatment or technology e.g. to summarize the empirical evidence of the benefits and limitations of a specific agile method.
- To identify any gaps in current research in order to suggest areas for further investigation.
- To provide a framework/background in order to appropriately position new research activities (Kitchenham & Charters, 2007).

In the field of Technology Enhanced Learning, SLR can be very useful for researchers, instructional designers and teachers, because the results obtained can inform them about the work done so far and identify issues than require further research. In the present study, we carried out the SLR in order to provide a background of existing quality assurance methods assessing the instructional design in MOOCs applying active learning pedagogies. The proposal by Kitchenham and Charters (2007), was adapted to suit the goals and limits of the master thesis. Through a thorough research on the databases we identified a couple of quality assurance methods and we proceeded to a specific final selection following a set of criteria according to the needs of the present study.

When conducting the review, specific electronic databases were selected. Those were IEEE Xplore Digital Library⁷, Springer Link⁸, ACM Digital Library⁹ and Google Scholar¹⁰. According to the review protocol of this research we used the search strings: “MOOCs quality”, “pedagogical quality in MOOCs” and “instructional design quality assurance in MOOCs”. The search included journal publications, conference proceedings, books and book chapters. The inclusion criteria were publications: (i) written in English, (ii) referring to quality assurance and accreditation, (iii) analyzing quality frameworks and (iv) presenting quality indicators. The exclusion criterion was publications not referring at all to online learning quality assessment or evaluation. The retrieved publications were reviewed based firstly on the year of publication, secondly on the title, thirdly on the abstract and finally on the whole document to check if the publication met

⁷ IEEE Xplore Digital Library, available at <http://ieeexplore.ieee.org/Xplore/home.jsp>. Last accessed: March, 2018

⁸ Springer International Publishing, available at <https://link.springer.com/>. Last accessed: March, 2018

⁹ ACM Digital Library, available at <https://dl.acm.org/>. Last accessed: March, 2018

¹⁰ Google Scholar, available at <https://scholar.google.gr/>. Last accessed: March, 2018

the inclusion criteria. Concerning the year of publication, the year range was between 2013 and 2018. That specific range was selected since in earlier years, 2012 and backwards, there were not many publications referring to quality assurance in MOOCs. Most publications searching the terrain around quality assurance in MOOCs more thoroughly were available the years right after 2012.

On the first wide inspection the search string *MOOCs quality* was used. On IEEE Xplore digital library database, 119 results were displayed from which 116 were conference publications, 2 journal and magazine publications, and 1 early access article, from which 10 followed the aforementioned inclusion criteria. On Springer database 1,079 results were displayed, from which 793 were book chapters, 342 conference papers, 248 articles and 35 Reference work entries. The results were filtered by disciplines: Education and Computer Science and by the sub disciplines: Computers and Education, and Educational Technology. After the implementation of these filters and by taking into account the inclusion criteria, 40 results were finally selected. On ACM Digital Library 16,213 results were initially found, among which 11,662 were proceedings, 1292 journals, 508 newsletters and 111 magazines. Those first results were firstly filtered by the most recent year publication. Secondly they were revised by the relevance to the research problem by taking into account the topic, the key words and the abstract. Finally 50 publications were selected for further study. On Google Scholar database 21.000 results were initially found, which were filtered like the results in ACM Digital Library. From those results 20 publications were finally selected for a thorough study.

Moreover, we followed a parallel search and selection procedure with the strings "pedagogical quality in MOOCs" and "quality frameworks for instructional design in MOOCs". From these two parallel threads we selected 20 additional publications. Overall, we selected a total of 140 publications for further inspection. Right afterwards, we studied carefully those 140 publications by revising the abstract and the whole document. After this revision, we finally selected 36 publications most of them around the topic of quality in MOOCs, MOOCs quality assurance and quality frameworks. These final publications are provided in Appendix A (A.1). In a first overview to these 36 publications, it can be seen that the greatest distribution referring

to MOOCs quality assurance is noticed the years 2015-2016 (figure 3). 26 out of 36 selected publications refer to quality frameworks. These quality frameworks are presented subsequently. The remaining publications provide important quality indicators and research outcomes around the topic of quality assurance in MOOCs.

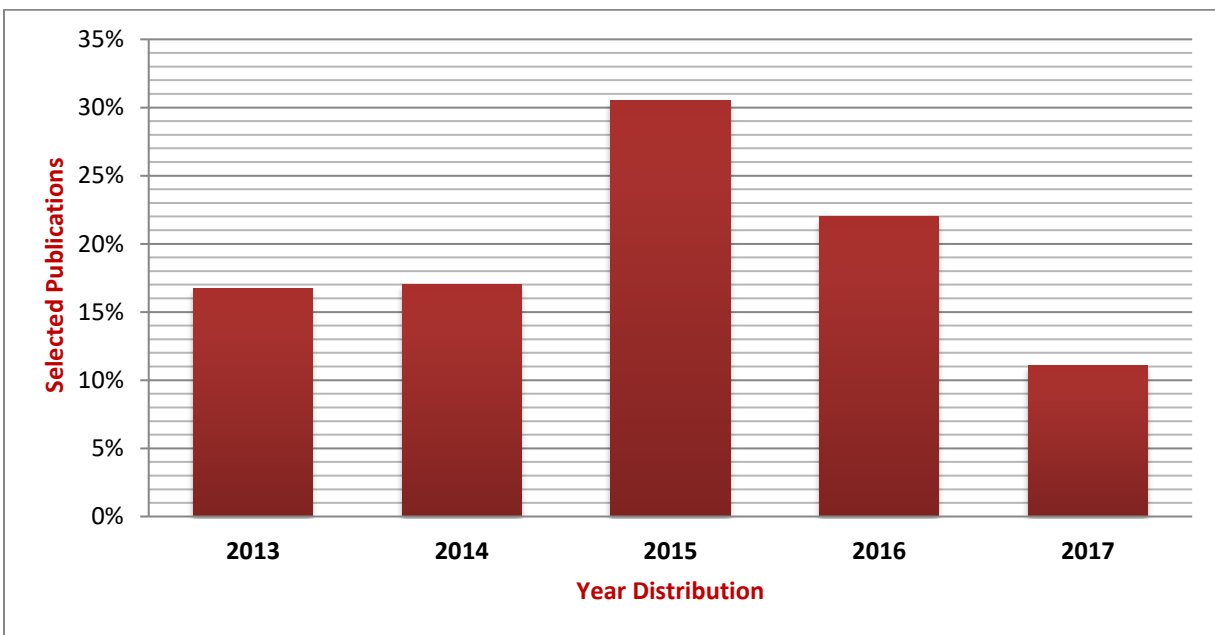


Figure 3: Year distribution of selected publications

2.4 Findings from the SLR

The first important findings of the SLR were the 36 publications referring to quality assurance and they were carefully studied, with the aim to identify proposed assessing methods. In those publications there were references to specific quality frameworks presenting their tools, results from their implementation and other important elements. The initially identified quality frameworks in those publications were 10 in total. This section presents those 10 initially identified quality frameworks, then the way that the selection criteria were set in order to choose the most appropriate ones for our study, and finally the ones which fulfilled most of the criteria and were eventually selected.

2.4.1 Identifying and reporting the quality frameworks

Through the SLR we initially identified 10 quality frameworks which were fulfilling most of the aforementioned criteria (see sections 2.1 and 2.2) (table 1).

Quality Frameworks	Cite
The ten-principle framework	Margaryan, Bianco & Littlejohn, 2015
OpenupED Quality Label	Rosewell & Jansen, 2014
Quality Matters Framework	Quality Matters, 2016-2018
The 7Cs Framework	Conole, 2014
EMMA 5D MOOC Framework	Guàrdia & Maina, 2016
ADECUR assessment tool	Cabero & Lopez, 2009
Standard UNE 66181: 2012	Fernández, Silvera, & Meneses, 2015
Quality Reference Framework (QRF)	Stracke, 2017
mesoMOOC Framework	Schoenack, 2013
EFQUEL E-Quality Label	EFQUEL, 2014

Table 1: The 10 initially selected quality frameworks

The rest of this section reports on these frameworks, providing an overview of their context.

The ten-principle framework was proposed by Margaryan, Bianco and Littlejohn (2015). The theoretical context of the framework is based on the so-called first five principles of instruction; problem-centered, activation, demonstration, application and integration (Merrill, 2002; Merrill, 2009; Merrill, 2013). However, since Merrill's first principles of instruction focus on learning activities, the authors of the framework augmented these principles by a set of five further principles focused on learning resources (i.e. course materials), and learning supports (i.e. the processes and procedures such as: expert feedback that assist learners in carrying out learning activities) with the aim to create a framework that would focus on the assessment of the instructional design in MOOCs. These additional principles were abstracted from the literature and include: collective knowledge, collaboration, differentiation, authentic resources and feedback. The authors followed those principles and they created the *Course Scan* instrument which consists of a set of specific criteria to measure the course design quality in

relation to each of the ten principles (Margaryan & Collis, 2005). The authors applied the *Course Scan* instrument in 76 randomly selected MOOCs assessing their instructional design and they reported their findings (Margaryan, Bianco & Littlejohn, 2015).

OpenupED Quality Label was proposed by Rosewell & Jansen (2014). It intended to encourage quality enhancement for MOOCs and their providers. It was derived from the E-xcellence label¹¹, which provides a methodology for assessing the quality of e-learning in higher education (HE) (Rosewell & Jansen, 2014). OpenupEd aims to be a distinct quality brand embracing a wide diversity of institutional approaches to open up education via the use of MOOCs. As a consequence, OpenupEd partners agreed to develop a quality label for MOOCs tailored to both e-learning and open education (Jansen, Rosewell & Kear, 2016). The associated institutional benchmarking with this label is primarily meant to be applied as an improvement tool, comparing institutional performances with current best practices and leading to measures to raise the quality of its MOOCs (Rodrigo, Read, Lancho & Paniagua, 2014). This process is designed to complement both an institutional course approval process, and ongoing evaluation and monitoring of courses in presentation (Rosewell & Jansen, 2014). OpenupEd provides guidance to enhance the quality of MOOCs tailored to the best practices in e-learning and open education. To this end, OpenupEd offers various checklists and support materials open to anyone. The OpenupEd Label supports institutions in their quality enhancement of MOOC provision as well, focusing on quality assurance processes in place (Rosewell, 2015). They therefore have developed several checklists that support universities in self-assessing their MOOC development (OpenUp Ed, 2017).

Quality Matters Framework was proposed by Lowenthal & Hodges (2015). Quality Matters (QM) is an international organization focused on improving the quality of online courses at the K-12, Higher Education, and Professional Education levels by providing online quality assessment tools. There are currently more than 800 QM subscribers (Shattuck, Zimmerman, & Adair, 2014). QM is a peer review and faculty development process that is centered on the following eight general standards: course overview and introduction, learning objectives,

¹¹ E-xcellence in e-learning: <http://e-xcellencelabel.eadtu.eu/>. Last accessed: January, 2018

assessment and measurement, instructional materials, learner interaction and engagement, course technology, learner support and accessibility (Quality Matters, 2016-2018). Each of these general standards has a number of related and more specific sub-standards. While each subscriber arguably could use QM differently, the formal QM process involves taking a course that has been taught before and having it reviewed by three peer reviewers (which must include one master review, one subject matter expert, and one external reviewer), to see if each standard has been met and then revising the course to meet any standards that were not met. It is a widely accepted model for designing quality online courses (Shattuck, 2012). Moreover, there are some studies reporting the results of using the QM in MOOCs as well (Zutshi, O'Hare, & Rodafinos, 2013; Kocdac & Aydin, 2015; Lowenthal & Hodges, 2015).

Quality Reference Framework (QRF) is the planned outcome of the MOOQ research project (MOOQ, 2018). Therefore, it has not been developed yet. The framework is expected to be the outcome of the MOOQ research project (MOOQ, 2018). MOOQ is the European Alliance for quality MOOCs. MOOQs' mission is to develop a quality reference framework for the adoption, the design, the delivery and the evaluation of MOOCs in order to empower MOOC providers for the benefit of the learners. For this purpose, MOOQ launched a survey on the quality of MOOCs (MOOQ, 2018). The main goal of MOOQ is therefore the development and the integration of quality approaches, new pedagogies and organizational mechanisms into MOOCs with a strong focus on the learning processes, methodologies and assessments (Stracke et al., 2017). The first activity of the project was the launch of three online surveys for the different target groups of MOOC learners, designers and facilitators. Based on their results, semi-structured interviews the consortium is planning to ask MOOC designers, facilitators, providers and policy makers for their experiences and demands. The final aim is the validation of design patterns and tools to facilitate and improve the MOOC development for designers and the MOOC learning experiences for learners (Stracke, 2017).

The 7Cs Framework: The 7Cs framework was introduced by Conole (2014). The 7Cs framework aims to provide teachers with the guidance and support they need to make more pedagogically informed design decisions that make effective use of new technologies. It consists of the

following elements: Conceptualize (what is the vision for the course?), Capture (resources that need to be developed), Communicate (mechanisms to foster communication), Collaborate (mechanisms to foster collaboration), Consider (assessment strategies), Combine (overarching views of the design), and Consolidate (implementing and evaluating the design in a real learning context). For each C the author has developed a range of resources and tools to guide the teacher through the design process. These include the Course Features view (Conceptualize), which enables teachers to design a vision for the course in terms of key principles and pedagogical approaches, a resource audit which includes open educational resources and other resources that need to be developed (Capture), mechanisms to foster communication and collaboration (Communicate and Collaborate), assessment strategies, such as ensuring learning outcomes are aligned to assessment elements (Consider), a Course Map view, showing what guidance and support, content and activities, reflection and demonstration, and communication and collaboration are included, along with an activity profile showing the percentage of time learners spend on different types of activities (Combine), and an evaluation rubric for assessing the quality and effectiveness of the design (Consolidate) (Conole, 2013). The 7Cs framework can be used both to design and evaluate MOOCs. The tools and resources associated with each of the Cs enable the designer to make more informed design decisions. The evaluation rubric under the Consolidate C enables them to ensure that the design is fit for purpose, hence ensuring the quality of the MOOCs and the ultimate learner experience.

EMMA 5D MOOC Framework was proposed by Guàrdia & Maina (2016). It aims at describing the full cycle of MOOC creation and delivery. The framework introduces a set of questions as well as examples taken from three complementary perspectives: institutional, pedagogical and technical. EMMA 5D MOOC framework is the result of a comparative literature review on the subject (EMMA, 2016). This framework can be used as a tool from three complementary perspectives; (i) institutional: helping senior level stakeholders and decision-makers to support the adoption of MOOCs as a strategy, addressing administrative and logistic issues, (ii) pedagogical: supporting teachers and instructional designers in providing guidelines for MOOC design and facilitation, (iii) technical: orienting technologists and developers to implement and integrate the learning environment. The framework identifies 5 stages of MOOC

implementation. Each stage is composed of a set of key aspects together with a list of guiding questions organized according to the three framework perspectives. It also provides examples from the EMMA experience or other MOOC initiatives. These 5 stages are: Decide: the first step involves stabilizing the overall purpose and scope of the MOOC. It deals with many aspects including legal issues, logistics, technology infrastructure, and cultural and linguistic diversity, Design: this step highlights decisions regarding the planning of the MOOC addressing topics such as expected learner profiles, course content and structure, assessment, interaction and facilitation, Develop: in this step the focus is on the production of learning materials and the integration of all media content and services into the MOOC delivery platform, e.g. videos, simulations, quizzes, social tools, translation and transcription processes, etc., Deliver: this step addresses learner facilitation and peer-to-peer support, technical assistance for teachers and learners as well as the continued monitoring of the MOOC, Document: This step covers the process of documenting and reflecting on the decisions that have been taken in relation to the MOOC from start to end focusing on quality assurance and improvement (Guàrdia & Maina, 2016).

ADECUR assessment tool was proposed by Cabero & Lopez (2009). It is an assessment tool capable of analyzing and identifying the defining features of teaching quality in online courses. It is a way to promote the proper development of educational innovation processes (Cabero et al, 2009). This instrument is the result of the doctoral thesis entitled: *Analysis of teaching models and teaching strategies in Tele-training: design and testing of an instrument for assessing teaching strategies of telematic undergraduate courses* (Fernández, Silvera, & Meneses, 2015). This tool has two main dimensions:

1. Psycho-educational dimension. It consists of six axes of progression: the virtual environment, the type of learning that it promotes, the objectives, content, activities, sequencing, assessment and tutoring.
2. Technical aspect dimension. It consists of an axis of progression: resources and technical aspects.

Additionally, the tool has some didactic elements listed as components of the axes of educational progression (Cabero et al, 2009). The instrument consists of 115 items. Each item

has one or more criteria to respond to one of two options only: “1” if the statement is met, or “0” if it is not. The teaching tool emerging from this research can be used by education professionals and experts in the field of MOOCs (Fernández et al, 2015).

Standard UNE 66181: 2012 was published in 2012 and aims to improve users’ satisfaction of virtual training, considering that the level of satisfaction depends on the difference, positive or negative. It establishes a quality model based on a series of quality indicators that represent factors of satisfaction of users, each of which is broken down into key attributes that can act to improve the factor for satisfaction. The quality of a training activity is determined by the combination of the level of satisfaction associated with each factor. These three factors are: Recognition of training, learning methodology, and accessibility. For the quantification of each factor of satisfaction, a different list of specific criteria is used; Table 2 in Appendix A shows how to quantify the level of accessibility of an online course. As shown, it is necessary to verify compliance with the hardware accessibility requirements set by a prior Spanish Standard, with software accessibility requirements established by ISO 9241-171, and Web accessibility success criteria established by WCAG 2.0 (Appendix A). This standard is intended to serve as a guide to identify the characteristics of e-learning programmes. Users may select online courses that best suit their needs and expectations, and educational organizations may improve their offering, thereby satisfying their students (Fernández, et al, 2015).

mesoMOOC Framework was proposed by Schoenack (2013). It addresses several challenges that hinder current effective delivery of MOOCs (Gamage, Fernando, & Perera, 2015). The framework utilizes strategies in online learning to better implement MOOCs by addressing the orientation process, embed a connectivist synchronous component to the classroom, provide online formative and summative assessment, and develop subsections within classes. Although frameworks’ criteria are presented in studies, there aren’t any reported results occurring after the testing of the framework (Gamage et al, 2015). Moreover, it has not been used as a quality framework in MOOCs.

Last but not least, there was another framework of some interest, the **EFQUEL E-Quality Label** (2014), but we could not consider it, because the organization closed at the end of 2014.

EFQUEL was a leading international network in the field of quality in education and was open for individual members, academic & non-academic institutions, and corporations (Wikipedia, 2016). EFQUELs' services were covering training, review services and conformity checks for higher education and other educational organizations and consulting (EFQUEL, 2014). Apart from the EFQUEL, we did not also consider the mesoMOOC framework, since it was not referred in any recent publications as a quality assessment tool and we could not find further details about it. With those 8 finally selected quality frameworks we proceeded to the next phase which is subsequently reported.

2.4.2 Comparing the selected quality frameworks

In this phase we organized a set of criteria, in order to compare and contrast the 8 finally selected quality frameworks. The ultimate goal at this phase was to find out which were the frameworks that better fulfilled the criteria presented below:

- 1. Focus on MOOCs:** The search of quality assurance projects yielded proposals referred to different MOOC domains (tertiary education, online platforms, online courses etc.). It is obvious that depending on the context of those fields, the adaptation of the quality assurance is corresponding to their needs. So, it is important to set this criterion for the selection of the quality framework, since if the quality framework is initially designed for MOOC quality assurance, its layout could be easily applicable in our case study.
- 2. Inclusion of assessment instruments:** From pedagogy principles and theories, to practical implication there is sometimes a gap to cover. For this reason, tools and instruments are usually very useful. Consequently, it is important to find out whether these frameworks present a specific assessment instrument, which could be useful and practical in order to assess the quality of a MOOC course.
- 3. Focus on instructional design:** The main focus of this study is to identify which quality framework helps to better assess the instructional design of MOOCs. So it is an important criterion to find out which of the selected frameworks provide elements

assessing the instructional design, what exactly do they assess in terms of the instructional design and what important information can we obtain this assessment.

4. **Evidence of testing of the framework:** In some studies it is referred whether the quality framework has been tested, and in some cases the implementation results are reported. If a quality framework is highly tested and it is widely used, it is more probable that the framework is effective and useful for its purposes, especially if there is evidence that the quality framework has been already tested, e.g, with studies that report these testing.
5. **Inclusion of the process/methodology of analysis:** Apart from the assessment instruments, a reference to the process of the analysis is also necessary in order to clarify the steps for the quality frameworks implementation. In this way, the results can be organized, measured and reported more precisely, increasing the quality of the assessment.
6. **Assessment of active learning pedagogies:** We set this criterion in order to find out which of those quality frameworks evaluate MOOCs that implement active learning pedagogies.

As reported on Table 2, each quality framework was analyzed according to the criteria above, where “V” means that the framework fulfills 100% this criteria, “X”: the framework does not fulfill the criteria, “~”: the framework fulfills the criteria to some extent and “?”:the criterion has not been assessed due to a lack of reported information about it. Looking at the table, it is possible to see that some frameworks do not comply with all the criteria, like the ADECUR assessment tool and the EMMA 5D MOOC framework, with the greatest missing information related to testing evidences. However some others, like the ten-principle framework, the OpenupED Quality Label and the Quality Matters, fulfill most of the criteria, constituting possible final options since they include assessment instruments, they focus on the instructional design, they have been widely used, they have a specific methodology and they include elements assessing the active learning pedagogies. Concerning the 7Cs framework, although it fulfills most of the criteria, we did not find many evidences of it being widely used as an assessment tool in MOOCs. It has been mostly used as learning design tool in other contexts. Consequently, according to the table marking and the above explanation, the Ten-principle

framework, the OpenupED Quality Label and Quality Matters are the ones that fulfill most of the criteria.

Criteria	Quality Frameworks						
	The ten-principle framework	OpenupED Quality Label	Quality Matters	The 7Cs Framework	ADECUR assessment tool	Standard UNE 66181: 2012	EMMA 5D MOOC Framework
Focus on MOOCs	✓	✓	~ Not officially but some designers have used it	✓ Help designers in making pedagogically effective design decisions	X	X	~ Only Monitoring & Evaluating
Inclusion of assessment instruments	✓ Course Scan questionnaire	✓ Checklists assessing MOOC design	✓ Quality Matters Rubric	✓ Consolidate C-evaluation rubric	✓ Pedagogic instrument	✓ Tool that measures courses with quality indicators	✓ Entry, satisfaction surveys and final achievements
Focus on the instructional design	✓ On sections 1 to 3	✓ Review: Quality of the design of a MOOC (table 2)	✓ Standard: Instructional Materials	✓ Enables the designers to ensure that the design fits the purpose	~ Not of MOOCs but of online university courses in general	~ Not of MOOCs but of e-learning programmes in general	X
Evidence of testing of the framework	✓ Having assessed 76 randomly selected (MOOCs)	~ Not officially reported but is a tool widely used by partner universities	✓ More than 800 QM subscribers	? Not officially reported; only references in some papers. Mostly as a learning design tool	? Not officially reported or widely referred	? Not officially reported or widely referred	? Not officially reported
Inclusion of the process/methodology of analysis	✓ Open-ended questions, mixture or dichotomous (Yes/No) and four-point Likert-scale items	✓ Well structured questions based on Likert-scale	✓ Rubric point system	✓ Rubric system	✓ Yes/No close type questions	✓ Quality indicators learning Methodology	✓ Focused learning analytics of ongoing activity
Assessment of active learning pedagogies	✓ Collaboration is one of the additional principles	✓	✓ Active learning standard	? Criteria: Student Engagement and Community building but not very clarified	✓ Component number 11: Collaboration	✓ Sub factor 2.4: Technological and digital learning Environment, Indicator: Allows collaborative technology or of active participation	✓ Pays special attention to learners' experiences through the collection of meaningful data from social tools

Table 2: Comparing and contrasting the quality frameworks

2.5 Final remarks

This chapter has presented the SLR carried out with the purpose of identifying the quality assurance methods which have been proposed and used so far. Afterwards we set a list of criteria and we selected the most appropriate quality frameworks that better comply with our research objectives. The result of the SLR is a contribution to the MOOCs research community since through a systematic search we identified the quality frameworks which are most suitable to assess the instructional design in MOOCs implementing active learning pedagogies, based on specific criteria. Moreover, we fulfilled the first objective of the present study which is the selection of the most suitable quality assurance methods for assessing the instructional design

in MOOCs implementing active learning pedagogies: The next step is to compare the Ten-principle framework, the OpenupED Quality Label and Quality Matters, by implementing their assessment tools on the CLAT MOOC course. This was done through an evaluative case study which is subsequently presented.

Chapter 3: Evaluative case study

3.1 Introduction

As a result of the SLR, we identified 3 quality frameworks which were suitable for our objectives. In order to fulfill the second objective of the present study, which is to assess the usefulness of the selected quality assurance methods in terms of evaluating the instructional design of MOOCs implementing active learning pedagogies, we considered necessary to apply the methods selected from the SLR in a real case study. For this case study we selected the CLAT MOOC, which design was based on the active learning pedagogies initiatives. This chapter presents the design of the evaluative case study, based on the Evaluand-oriented Responsive Evaluation Model (EREM), which highly encourages the plurality of data gathering techniques and informants in order to obtain different perspectives about the evaluand, thus enriching the evaluation process (Jorrín-Abellán & Stake, 2009). We assumed that this research method was the most appropriate one, due to the mixed data gathering techniques and the multiple informants needed in order to gather all necessary data in this phase of the work. More specifically the present chapter presents a brief reference to the EREM model layout, the way that the CLAT MOOC study was organized, an overview of the CLAT MOOC, the evaluation context and finally the data gathering techniques.

3.2 The EREM research model

The EREM is a framework conceived as an evaluation model for a wide range of ubiquitous collaborative learning settings (Jorrín-Abellán & Stake, 2009). It provides clear and understandable guidance to researchers involved in the evaluation. By proposing a particular organization of the complexity of the field, it is especially useful for those researchers that are novice in evaluation (Jorrín Abellán, 2009). The EREM strengthens the idea of conducting evaluations centered in the phenomena to be evaluated (evaluand) rather than in the field of expertise of the evaluators (e.g., human computer interaction, didactics, etc.)(Jorrín-Abellán, Stake & Martínez-Monés, 2009). The model is framed within a responsive evaluation

approach¹², promoting responsiveness to key issues and problems recognized by participants at the site and stakeholders elsewhere (Stake, 2004). This evaluation method follows an interpretive research perspective (Cohen, Manion & Morrison, 2007; Guba & Lincoln, 1994; Miles & Huberman, 1994; Orlikowski & Baroudi, 1991) that does not pursue statistically significant results or generalizations; notwithstanding, it aims at a deeper understanding of the concrete phenomena under study (Guba, 1981).

We chose to use the EREM model because it is an evaluation instrument that matches well with the underlying interpretive research perspective of the thesis as well as with the phenomena and context investigated: quality frameworks assessing the instructional design of a MOOC implementing active learning pedagogies. Moreover, we considered it very appropriate due to the guidance and help that the framework provides to novel evaluators, as is the case in this thesis. Examples are the different conceptual tools provided by the EREM, such as an evaluation design diagram, or a multimedia collaborative report. These conceptual tools are supported with corresponding software tools¹³ that facilitate to plan and conduct an evaluation. A final reason that led us to decide to use the EREM as an evaluation framework in the thesis was that, it had been used successfully in multiple studies, papers and PhD thesis in the GSIC/EMIC research group (e.g. Muñoz-Cristóbal, 2015; Muñoz-Cristóbal, Rodríguez-Triana, Gallego-Lema, Arribas-Cubero, Asensio-Pérez & Martínez-Monés, 2016; Muñoz-Cristóbal, 2013; Gallego-Lema, Muñoz-Cristóbal, Arribas-Cubero & Rubia-Avi, 2017; Prieto, Dimitriadis & Asensio-Pérez, 2014; Muñoz-Cristóbal, Prieto, Asensio-Pérez, Jorrín-Abellán & Dimitriadis, 2012; Prieto Santos, Villagrà Sobrino, Dimitriadis, Jorrín Abellán & Asensio Pérez, 2013). So, there was experience in its use in the team, which could help and support the present evaluation process.

As can be seen in Figure 4, the model's core parts are: Three facets (perspective, ground and method) that summarize some characteristics that could be taken into account while conducting an evaluation; four question-oriented practical courses (pathways) according to the possible evaluands that can be evaluated; a representation diagram with the aim of helping evaluators in the planning stage of an evaluation; and finally a set of recommendations to write

¹² *Responsive Evaluation* is an approach, a predisposition, to the evaluation of educational and other programs. Compared to most other approaches it draws attention to program activity, to program uniqueness, and to the social plurality of its people (Stake, 2003).

¹³ EREM software tools: <http://pandora.tel.uva.es/cscl-erem/>. Last accessed: May 2018

the report of an evaluation (Jorrín-Abellán, Stake & Martínez-Monés 2009). Concerning the facets, the first one is called *Perspective* and it can be understood as the point of view based on which an evaluation process can be both designed and carried out. Its emphasis relies on the main goal from which we are performing an evaluation. The main goals of a CSCL evaluation can be: To improve the educational practice; to improve the design of a tool; to monitor the progress of something within a CSCL system or; to support a research process. The second facet, called *Ground* is the context in which an evaluand takes place or is intended for, taking into account the characteristics of the evaluation we want to perform (extension, number of evaluators, experience in evaluation, etc), the main features of the participants (number, learning and teaching styles, previous knowledge, etc) and the features of the setting in which we are going to evaluate (climate, grade, extension, etc). The third facet, the *Method*, refers to the sequence of steps that lead the evaluation process, involving reasoning, observations, data collection, data processing, analysis and interpretation. The model encourages the use of mixed data gathering techniques as well as a variety of informants, in order to provide multiple perspectives to enrich the evaluation process. A profuse set of data gathering techniques like observations, interviews, expert reviews, costing techniques, heuristics, cognitive walkthroughs, social network analysis or feature inspections are proposed.

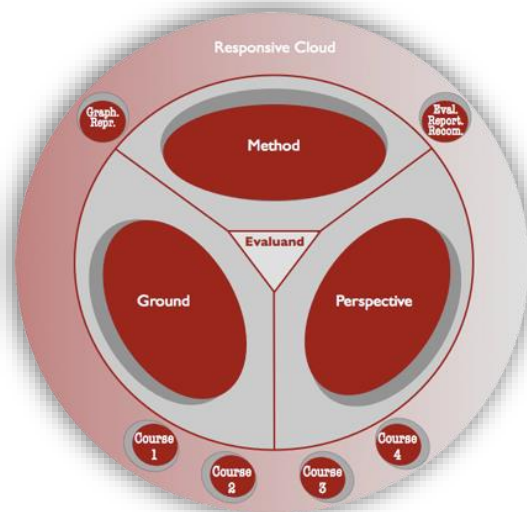


Figure 4: EREM components

3.3 Organizing the CLAT-MOOC study based on EREM model

The evaluative case study was organized based on the EREM model. The evaluation design was organized on the EREM software tool¹⁴. Figure 5 illustrates a graphical representation of the EREM framework applied to the evaluation process of the CLAT MOOC. The *perspective* of this EREM evaluation is to support an evaluative process.

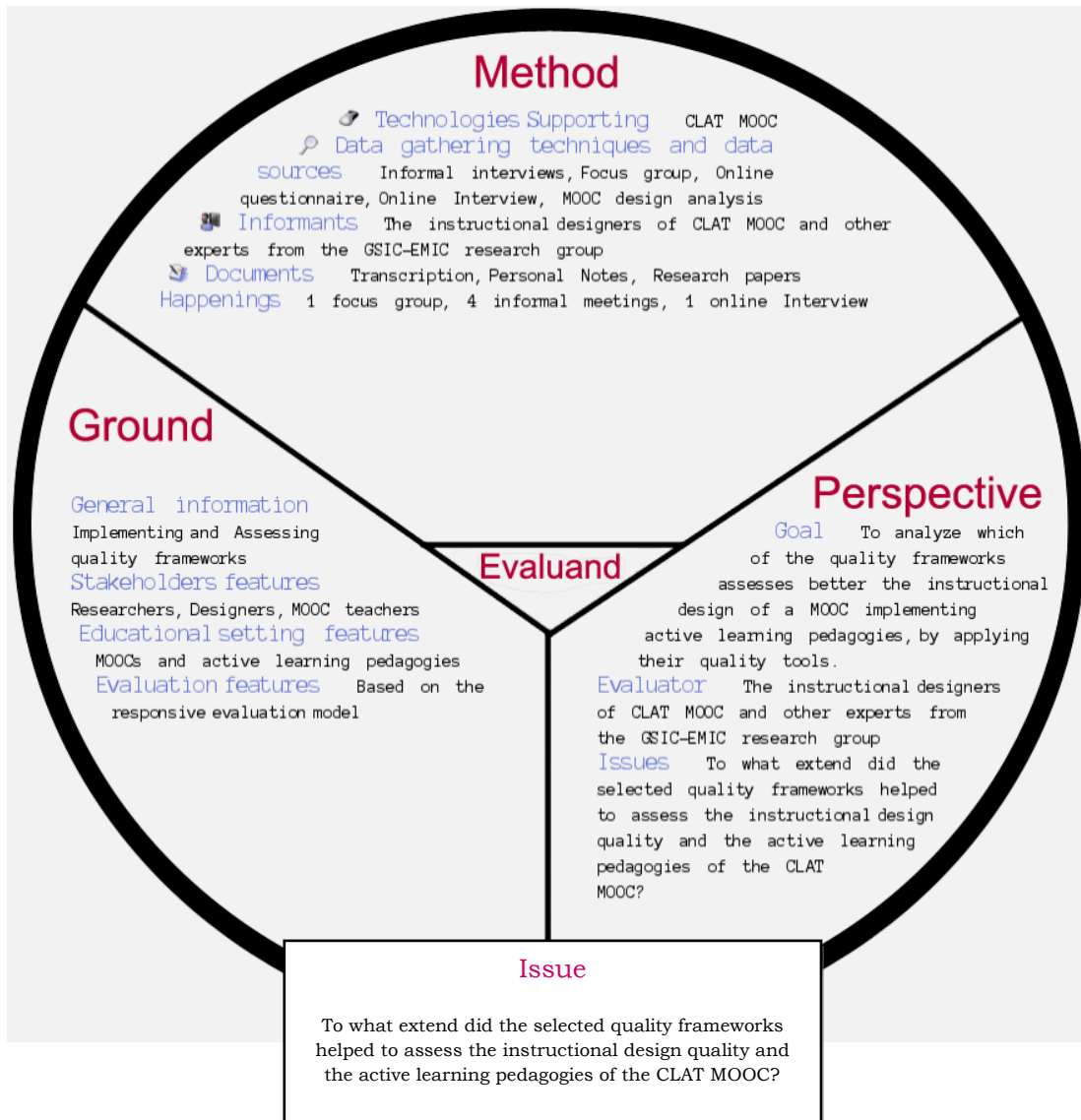


Figure 5: Graphical representation of the Evaluative case study

¹⁴ EREM software tool: <https://pandora.gsic.uva.es/cscl-erem/index.php>, Last accessed: 30/4/2018

The main goal of this evaluative study was to analyze which of the 3 finally selected quality frameworks (see Chapter 2), can assess better the instructional design of the CLAT MOOC by applying their quality tools. Thus, the evaluation tries to explore an evaluative tension (or “Issue” in EREM terminology) defined as “To what extent did the selected quality frameworks helped to assess the instructional design quality and the active learning pedagogies of the CLAT MOOC?”. This issue can be explored through informative questions grouped into several topics (see Figure 6), defined not only at the beginning of the evaluation, but also emergent while gathering and analyzing data in a progressive in-focus (Stake, 2010). These topics can be exemplified by the following aspects:

Topic 1 (T1) Usefulness of the quality frameworks: explores which of those quality frameworks are more useful in terms of assessing the instructional design of a MOOC and how introduces active learning pedagogies.

Topic 2 (T2) Strengths and limitations of the quality frameworks: explores which are the strengths and which are the limitations of these quality frameworks, focusing on the assessment of instructional design and active learning pedagogies elements.

Topic 3 (T3) Effort required: analyzes which of the tools provided by the quality frameworks are more specific and clear, thus making their application easier and faster.

Topic 4 (T4) Elements assessed: explores which important elements of the instructional design in MOOCs do these quality frameworks assess and whether they miss any.

Topic 5 (T5) Designers’ satisfaction: reports whether MOOC designers are satisfied with the quality tools and whether they are going to use them in the future in order to assess their MOOC courses.

Topic 6 (T6) CLAT MOOC assessment: reports whether MOOC designers managed to assess any quality elements of the instructional design in CLAT MOOC.

Figure 5 shows, this conceptual organization of the data from the evaluation which is adapted from Miles & Hubermans' anticipated data reduction procedure (typical in qualitative data analysis) (Miles & Huberman, 1994).

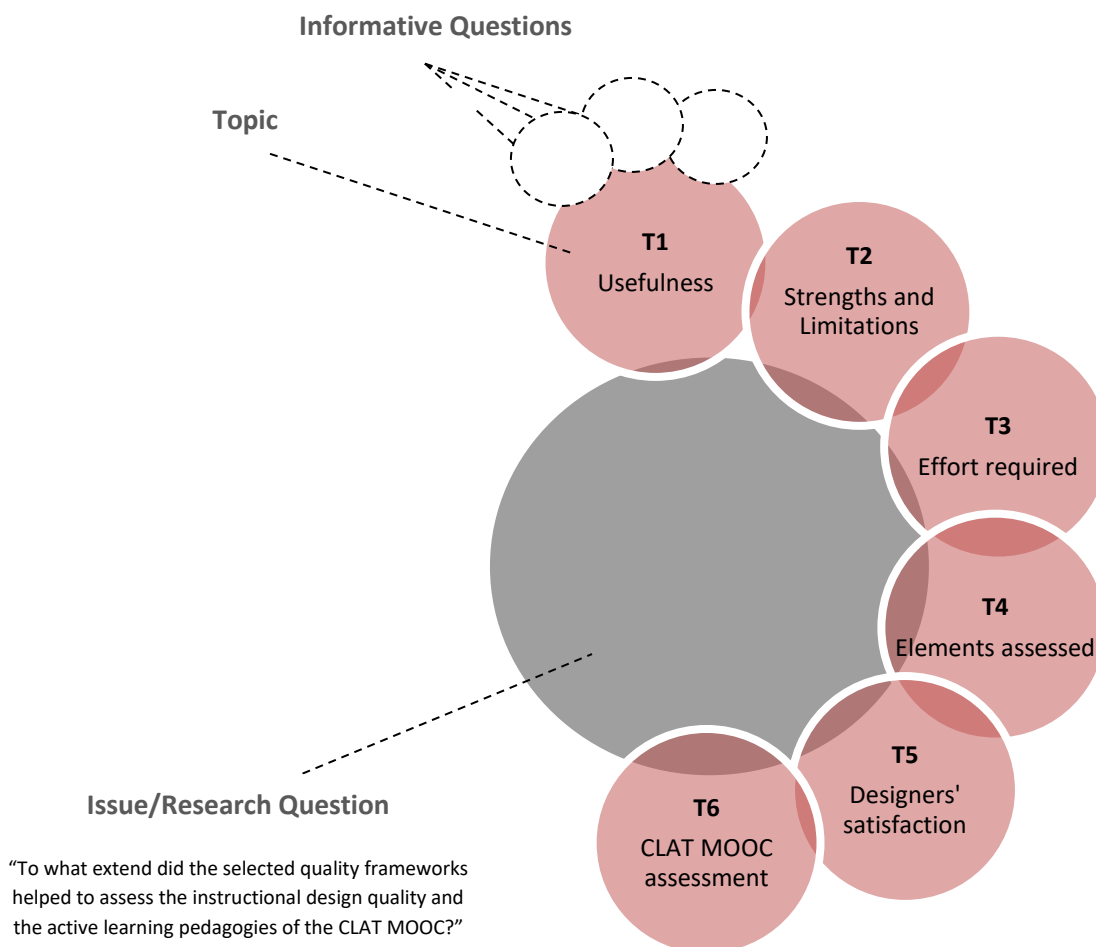


Figure 6: Graphical representation of the research question/issue, topics and informative questions used in the evaluative case study

As it can be seen in Table 3, each topic is explored with a number of informative questions (IQ), which are finally mapped to data gathering techniques. These questions were formed in order to explore each topic and give answers to the issue of the CLAT MOOC study, and apparently lead us to the desirable findings.

T1: Usefulness of the quality frameworks
<p>IQ1.1: Where the designers able to assess the instructional design of the CLAT MOOC by applying each quality framework assessment tools?</p> <p>IQ1.2: To what extent were the instructional designers of the CLAT MOOC able to assess the active learning pedagogies of CLAT MOOC by applying their quality assessment tools?</p> <p>IQ1.3: Which are, according to the experts, the most important elements that a quality assessment tool should have in order to assess the instructional design and the active learning pedagogies elements?</p>
T2: Strengths and limitations of the quality frameworks
<p>IQ2.1: What are the main strengths of the assessment tools?</p> <p>IQ2.2: Does any quality framework show more weaknesses than the others? In that case, which one and which weaknesses?</p> <p>IQ2.3: What are the main weaknesses of the assessment tools?</p>
T3: Effort required
<p>IQ 3.1: How long did it take to the experts to use each one of the analyzed frameworks?</p> <p>IQ 3.2: Which aspect took the experts up more time: to understand the assessment tool or to apply it to assess the MOOC?</p> <p>IQ 3.3: In which ways the assessment tools could be more efficient in terms of time required to use them?</p>
T4: Elements assessed
<p>IQ4.1: Did the experts miss any important elements?</p>
T5: Designers' satisfaction
<p>IQ5.1: What is the designers' general opinion about the quality tools?</p> <p>IQ5.2: Do the designers express their intention to use these quality frameworks in the future in order to assess the instructional design quality of their MOOCs?</p>
T6: CLAT MOOC assessment
<p>IQ6.1: To what extend the reflection of the tools helped CLAT MOOC designers to analyze the CLAT MOOC weaknesses?</p>

Table 3: Topics and informative questions of the evaluative case study

In order to answer the informative questions, we firstly analyzed the design of the CLAT MOOC and afterwards, we shared questionnaires, we carried out informal interviews and we conducted a focus group. Table 4 shows a brief description of the nature of the different types of data obtained. The main informants were the instructional designers of the CLAT MOOC and other experts from the GSIC-EMIC research group. Also, the research team of Quality Matters¹⁵ framework provided us with important data in order to understand the layout of the online tool. Figure 7 illustrates the quoting system that will be used in the next chapter to show the

¹⁵ Quality Matters research team: <https://www.qualitymatters.org/research/qm-research-colleagues>. Last accessed: 23/06/2018

evidences. The documents which were gathered for further revision through *happenings* were transcription files, meeting notes, research papers, and documents extracted from the CLAT MOOC. Those happenings were: questionnaires, 1 focus group and 5 informal interviews.

Data Techniques/Sources	Description of technique	Label
Informal Interviews	Informal interviews with CLAT MOOC designers to analyze the instructional design of the CLAT MOOC, focusing on the analysis of collaborative learning and gamified activities.	[INT]
	Informal interview with the Quality Matters research team, in which 3 researchers participated, in order to analyze the layout of the online tool and gather information about how it has been used so far.	[QM_INT]
Questionnaire	Questionnaires provided to GSIC-EMIC experts, to gather their initial opinion regarding the quality frameworks and their tools.	[QUEST]
Focus group	Focus group with the designers of the CLAT MOOC and GSIC-EMIC experts to gather their opinion about the quality frameworks and their tools, after the application of the tools on the CLAT MOOC.	[FOC]
CLAT MOOC design	Analysis of the CLAT MOOC design to understand its general layout and how the active learning pedagogies were designed and implemented.	[CLAT]

Table 4: Data techniques, data sources and labels used to quote them along the study

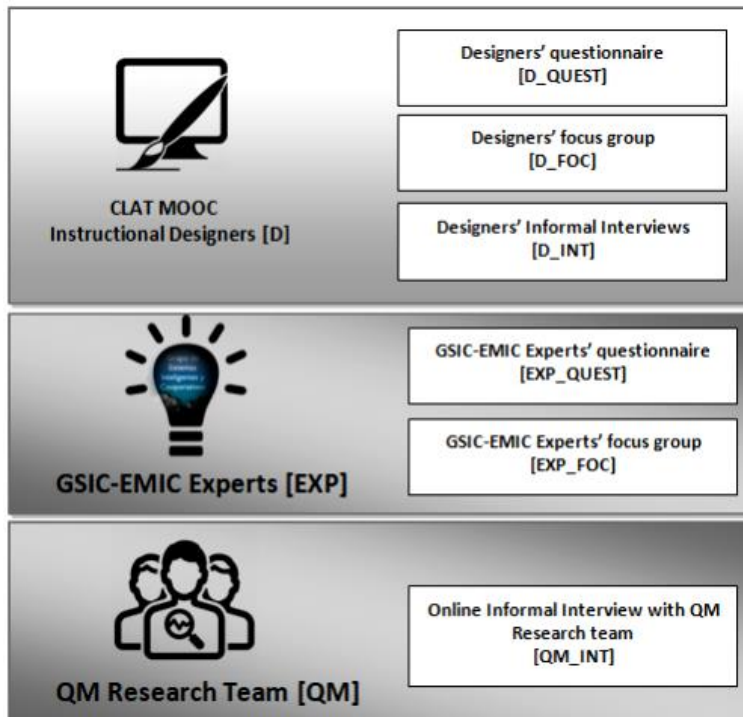


Figure 7: Informants and data sources of the evaluative case study

The Evaluative case study was carried out in 3 phases; (1) understanding the design of the CLAT MOOC, (2) understanding the quality frameworks and their tools and (3) carrying out the evaluation of the selected quality frameworks. The first phase comprised the analysis of the CLAT MOOC design, which was enriched with data gathered through informal interviews with the CLAT MOOC designers. This first phase was very important in order to understand the context of the CLAT MOOC before applying the frameworks. In the second phase, the layout of the online tools provided by the evaluation frameworks was analyzed. The Ten-principle framework and OpenupED Quality Label provide their assessment tools online, in downloadable sources or in published papers. However, the third one; Quality Matters quality framework, provides its tool online in which you can have access under request and after covering a specific enrollment free. For the need of this study, we contacted the research team of the quality framework (QM Research)¹⁶, in order to request a partial access to the online tool. The research team kindly provided us with two months free of charge access, in order to gather information for the study. Apart from this, an informal online interview was held with the researchers of the quality framework, who described the Quality Matters philosophy, the layout of the online tools and how researchers, teachers and MOOC designers use them. On the third phase, we proceeded with the evaluation of the quality frameworks, conducting one questionnaire and a focus group. Table 5 shows the timeline of the above data gathering techniques and data sources.

Informal interviews	Online questionnaire	Focus group	CLAT MOOC design analysis
<ul style="list-style-type: none"> ▪ 2nd February 2018 ▪ 9th March 2018 ▪ 16th March 2018 ▪ 23rd March 2018 ▪ 20th April 2018 	<ul style="list-style-type: none"> ▪ 1st of April - 10th of April 2018 	<ul style="list-style-type: none"> ▪ 13th April 2018 	<ul style="list-style-type: none"> ▪ February – May 2018

Table 5: Timeline of data gathering techniques and data sources

Table 6 shows the number of informants and the data gathering techniques/data sources of the CLAT-MOOC evaluative case study.

¹⁶ QM Research team: <https://www.qualitymatters.org/research/conduct-qm-research>, Last accessed: 8/06/2018

Data gathering techniques/data sources	Informants			Total
	CLAT MOOC Designers	GSIC-EMIC experts	QM researchers	
Informal Interviews	2	-	3	5
Online questionnaire	4	3	-	7
Focus group	4	3	-	7
CLAT MOOC design analysis	1	-	-	1

Table 6: Number of informants and data gathering techniques/data sources in the evaluative case study

3.4 Evaluation context

This section describes the design of the CLAT MOOC, as it is very important to understand the context of the study. From February 2018 to May 2018, an analysis of the CLAT MOOC design was conducted, which was enriched with data from the informal interviews with the instructional designers in order to acquire deep knowledge about collaborative learning and gamification. More specifically, three informal interviews were carried out with CLAT MOOC instructional designers, who were in charge of designing the activities based on the principles of active learning pedagogies, with the aim to promote collaborative learning and gamification. The two informal interviews were carried out with a PhD candidate-researcher in the area of Collaborative learning in MOOCs¹⁷ and the third meeting was carried out with a PhD candidate-researcher in the area of Gamification in MOOCs¹⁸. All data gathered from the informal interviews, enriched the analysis of the CLAT MOOC design and are subsequently presented.

3.4.1. CLAT MOOC design overview

The CLAT MOOC was a five-week MOOC course. The course was delivered both in English and in Spanish. The course targeted innovative pre-service and in-service teachers interested in incorporating collaboration with technology into their own teaching practices. It was deployed in the Canvas Network platform, with a duration of six weeks: five weeks (one for each of five modules) plus an additional week to allow students to complete the peer review of the final project and fill out the final satisfaction survey. The enrolment was closed at the end of the first week to allow the designers to configure properly the groups for the collaborative assignment of the second week. A free certificate was given to the students who completed the mandatory

¹⁷ GSIC-EMIC members: <https://www.gsic.uva.es/personal/luisa>. Last accessed: 11/05/2018

¹⁸ GSIC-EMIC member: <https://www.gsic.uva.es/personal/alex>. Last accessed: 11/05/2018

assignments (one per week) in addition to the two surveys. As we can see in Table 7, the initial total enrolments were 759. From those participants the 6.85% filled in the final satisfaction survey and only the 3.8% received the certificate.

Concept	Number of Participants
Total Enrolments	759
Welcome Survey	174 (22.9% of the enrolled)
Final satisfaction survey	52 (6.85% of the enrolled)
Certificate	29 (3.8% of the enrolled)

Table 7: Summary data of the CLAT MOOC

Figure 8 shows a graphic representation of the various profiles of participation and engagement of students observed in this course. These patterns of engagement have been calculated by the designers of the CLAT MOOC course using the platform analytics and they are based on previous research (Alario-Hoyos et al., 2014; Hill, 2013 & Anderson et al., 2014), where the authors identified several categories of students (e.g. active, passive, observer, no-shows) regarding their behavior during the course.

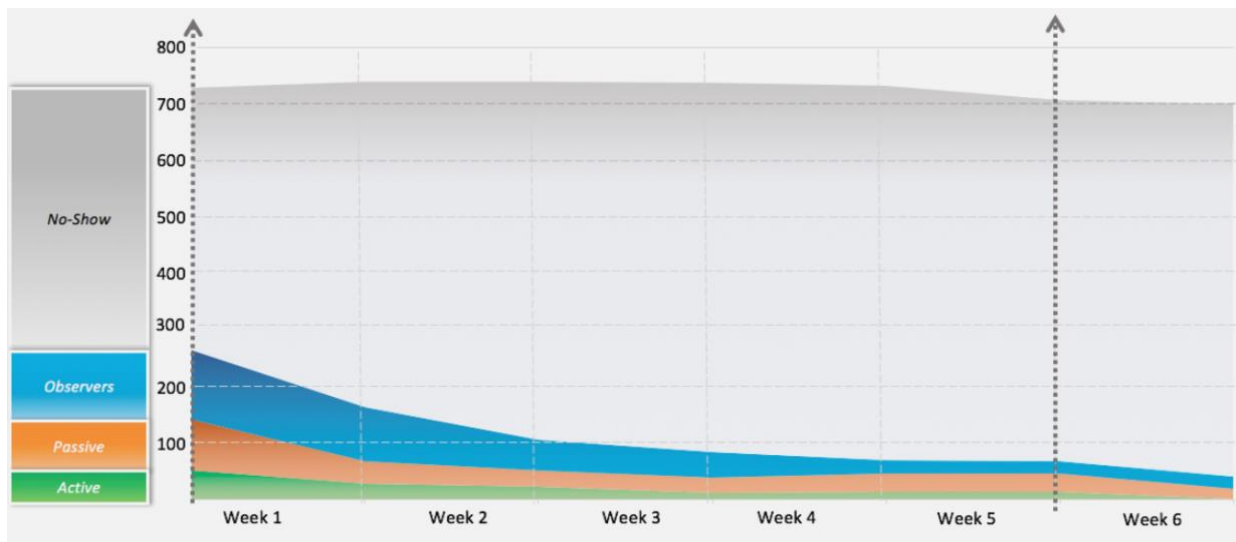


Figure 8: Patterns of engagement in the "Innovative CL with ICT" MOOC

On the *home page* of the course there is a *welcome note* from the instructors, presenting an overview of the course context (figure 9). The language selection is clearly displayed on the upper side of the *welcome note*. Scrolling down the home page we can see the course structure

according to which: *“Each course module spans a whole week. Before the starting date (12/June) we invite you to visit the contents of the “Week 0” module where you will find additional information about the course, as well as a set of preliminary small tasks that you need to complete before starting with the subsequent modules”*. In this part, is pretty clear that the participants should go through *Week 0* before starting their course in order to acquire important information concerning the context of the course. Also, participants should go through preliminary tasks, which are very important for the collaborative learning activities. Subsequently the weekly modules are presented, followed by an embedded welcome video and its transcription. In that video, MOOC course instructors offer a warm welcome to all participants, introducing themselves and providing them with important information concerning the course and its general layout.

The screenshot shows the home page of a MOOC course. At the top, the course title 'Innovative Collaborative Learning with ICT' is highlighted with a red dashed box. Below it, a language selection box with 'ENGLISH' and 'ESPAÑOL' options is highlighted with a blue dashed box. A 'Welcome!!' note is highlighted with a purple dashed box. The 'Course Structure' section is highlighted with a blue dashed box. A list of 'Week Modules' is highlighted with an orange dashed box. An 'Embedded welcome video' is highlighted with a green dashed box. On the right side, a 'Welcome note' is highlighted with a purple dashed box, and a 'Course Structure' section is highlighted with a blue dashed box. The 'To Do' list on the right includes assignments like 'Grade 2.1.1 ASSIGNMENT: Individual Proposal' and 'Grade 3.2.1 ASSIGNMENT: Conceptualization of Pyramid in Virtual Learning Environment'. A 'CC Attribution' license notice is at the bottom.

Figure 9: Home page of the “Innovative and Collaborative Learning with ICT” MOOC course

The week modules were organized as follows (table 8):

Week 0 - Course information and preliminary steps: This week consists of course general information; preliminary short tasks; a questionnaire and options for interaction in social networks. In *course information* there is a video explaining the main goals of the course, its structure and the different ways in which students can participate and contribute. Furthermore more information is provided including: *course description*; with course dates, workload and

requirements, *course objectives*, *course audience*, *certificates*, *badges* and a brief presentation of the instructors. In *preliminary short tasks*, participants are asked to follow specific steps in order to register in ILDE (Integrated Learning Design Environment)¹⁹, a web-based environment in which communities of teachers can collaborate in order to design their learning scenarios (also known as "learning designs"). This registration is important because participants should use the ILDE many times during the course. ILDE manual and a supportive embedded video are also provided to help the participants complete this preliminary short task. ILDE also provides support to teachers to the whole lifecycle of CSCL activities (conceptualization, instantiation, deployment). In the course, students had the opportunity to perform activities following the whole cycle. The assignment is a questionnaire of 22 questions such as: "In which language do you prefer to carry out the activities of the course?", "Please, let us know your highest level of education", "What is your domain/sector of work/study?", "There are different roles in the course attending to the goals of each student. What type of online student do you think it describes you better?". This questionnaire is very important for the instructors, since is intended to get to know the profile of the participants, their preferences, their level of knowledge, and their potential needs along the course. Through this information, instructors can later on divide the participants into groups in order to carry out the collaborative activities. This is a reason why it is a compulsory activity in order to acquire the final certificate. The last section of this week, informs the participants how they could socialize online through Twitter and general forums. From the Twitter profile *@CLaTmooc*²⁰ participants could use the hashtag *#CLaTmooc* to publish information about the course (events, updates, etc.). They could publish their messages both in English and Spanish sharing their thoughts, suggestions, material etc. Moreover, participants could use a general forum to post any comment regarding the course (e.g., doubts about scheduling, suggestions for improvements, technical problems, etc.). They could also use the forum to share resources, links, videos, etc., that they thought might be interesting for the course. Finally, participants could give a "like" to the posts of other participants.

¹⁹ ILDE Environment: <https://ilde.upf.edu>. Last accessed: 11/05/2018

²⁰ CLaTmooc on Twitter: <https://twitter.com/CLaTmooc>. Last accessed: 11/05/2018

	Activities	Resources	Assignments	Discussion	Quizzes
Week 0	<ul style="list-style-type: none"> - Course Information - Canvas user orientation - Registering and using the ILDE 	<ul style="list-style-type: none"> - Video - Transcription files - PowerPoint slides - Guidelines - Tutorials 	- Welcoming questionnaire	<ul style="list-style-type: none"> - Twitter: @CLaTmooc & #CLaTmooc - General Forum in English - Foro general en Español - Γενικό φόρουμ στα ελληνικά 	-
Week 1	<ul style="list-style-type: none"> 1.1 Warming-up activities! Benefits and problems of collaborative learning 1.2 A collaborative learning primer 1.3 Planning for "Good" Collaborative Interactions 1.4 Designing Collaborative Learning 1.5 Structuring the Collaborative Learning FLOW with Patterns 	<ul style="list-style-type: none"> - Video - Transcription files - PowerPoint slides - Guidelines - Learning Situation Examples - External links - Book chapter - Recommended references 	- Individual assignment	<ul style="list-style-type: none"> - Forum/ Week 1 in English - Foro/ Semana 1 en Español - Φόρουμ/Εβδομάδα 1^η στα Ελληνικά 	<ul style="list-style-type: none"> - Optional quiz for a new badge - Optional extra quiz for a new badge
Week 2	<ul style="list-style-type: none"> 2.1 Collaborative Learning and ICT for Students 2.2 Collaboration and ICT for Teachers 2.2.1 Practice ILDE's social features 2.2.3 Practice the In ILDE community panel 	<ul style="list-style-type: none"> - Guidelines - PowerPoint slides - ICT tools description - External links - Examples - Steps for the Assignments submission 	<ul style="list-style-type: none"> - Individual proposal - Group proposal - Teachers' interaction in ILDE - Community analytics in ILDE 	<ul style="list-style-type: none"> - Group Forum - Foro Grupal - General Forum to share the group proposals in week 2 - Foro global para compartir las propuestas grupales de la semana 2 - Forum Week 2 - Foro Semana 2 - Φόρουμ Εβδομάδα 2 	- Optional Group quiz for a new badge
Week 3	<ul style="list-style-type: none"> 3.1 Designing and implementing a Pyramid-based scenario using the authoring tool PyramidApp 3.1.3 Implementing and monitoring PyramidApp scenario 3.2 Designing a Pyramid-based scenario for a Virtual Learning Environment 3.2.3 Implementing the Pyramid in a Virtual Learning Environment 	<ul style="list-style-type: none"> - Guidelines - PowerPoint slides - External links - Examples - Steps for the Assignments submission 	<ul style="list-style-type: none"> - Conceptualization of PyramidApp scenario - Authoring PyramidApp scenario - Conceptualization of Pyramid in Virtual Learning Environment - Authoring of Pyramid in Virtual Learning Environment 	<ul style="list-style-type: none"> - Forum Week 3 - Foro Semana 3 - Φόρουμ Εβδομάδα 3 	- Optional individual quiz for a new badge
Week 4	<ul style="list-style-type: none"> 4.1 Designing and implementing a Puzzle-based scenario for a Virtual Learning Environment 4.1.3 Implementing the Jigsaw in a Virtual Learning Environment 	<ul style="list-style-type: none"> - Guidelines - PowerPoint slides - External links - Examples - Steps for the Assignments submission 	<ul style="list-style-type: none"> - Conceptualization of Jigsaw in Virtual Learning Environment - Authoring of Jigsaw in Virtual Learning Environment 	<ul style="list-style-type: none"> - Forum Week 4 - Foro Semana 4 - Φόρουμ Εβδομάδα 4 	<ul style="list-style-type: none"> - Optional individual quiz for a new badge - Optional extra individual quiz for a new badge
Week 5	- My own collaborative learning project	<ul style="list-style-type: none"> - Guidelines - Instructor materials (course design checklists) 	<ul style="list-style-type: none"> - Final Design Project - Final Questionnaire - Questionnaire for certificate acquisition - User Experience Survey 	<ul style="list-style-type: none"> - Forum Week 5 - Foro Semana 5 - Φόρουμ Εβδομάδα 5 	<ul style="list-style-type: none"> - Optional Group quiz for a new badge - Optional extra individual quiz for a new badge

Table 8: Week modules of CLAT MOOC

Week 1 to Week 5: During these weeks a variety of individual activities, assignments and a collaborative activities were designed under the topics: “Collaborative learning and ICT for students”, “Collaborative learning and ICT for teachers” (designing and implementing a Pyramid-based scenario etc.). Complementary resources and open forums were available for the participants for further support. Apart from the activities and the assignments, there were also optional individual and group quizzes for gaining badges each week, so that participants could refresh their knowledge through gamified learning (table 9). The weeks were organized as follows:

- **Week 1:** Presents the basic concepts of CL in general (not necessarily using ICTs).
- **Week 2:** Presents ICT for CL: tools for students (i.e., for carrying out learning activities) and for teachers (i.e., for designing CL situations).
- **Week 3 and Week 4:** Illustrate how to design and implement CL situations based on 2 patterns (pyramid and jigsaw) using ILDE. The scenarios to design and implement are provided by the instructors.
- **Week 5:** The participants are asked to design and implement their own learning scenarios.

The course finishes with a final questionnaire of 61 questions, asking participant’s opinion about the structure of the course, its activities, the collaboration experience and their final knowledge acquisition. Finally, at this point participants can request their course certificate.

3.4.2 Implementation of active learning pedagogies in the CLAT MOOC

As it has been already mentioned, CLAT MOOCs’ initial design novelty was to promote active learning pedagogies by including collaborative learning and gamified activities. The collaborative learning was promoted through organized assignments, in which participants should collaborate with the members of their assigned teams in order to prepare a final product. This collaboration was encouraged through group forums where team members could discuss their thoughts and provide their arguments on the topic. Participants were able to communicate and interact with the rest of the team members in the same language (either English or Spanish), and according to their schedule availability (weekends or weekdays). Moreover, the collaboration was also encouraged in the *Group Quiz Forum* activities, in which

participants should firstly discuss on the forum the possible answers to the quizzes and afterwards they could submit their final answers. All quizzes were optional, either individual or in groups. Through quizzes participants could check the acquired knowledge, while challenging themselves for a badge acquisition. In order to understand the innovative instructional design process, which is hidden behind the specific collaborative learning and gamified activities, a deeper study on the CLAT MOOC design was carried out. All important information is presented in detail at the end of the present study (Appendix B).

3.5 Evaluation process

This section describes the processes followed to carry out the evaluation of the frameworks and of the CLAT MOOC itself. This process firstly consisted of an online questionnaire, which was sent to the instructional designers of the CLAT MOOC and the other GSIC-EMIC experts. Secondly, right after the analysis of the questionnaires' feedback, a focus group was organized and conducted in order to clarify specific emergent points.

3.5.1 Online questionnaire

As it has been already reported in Chapter 2, after the conduct of the SLR, three quality frameworks were finally selected: Ten-principle framework, OpenupED Quality Label and Quality Matters Framework. In order to find out which of those quality frameworks were considered as the most suitable for assessing the instructional design quality of a MOOC course, our online questionnaires (Appendix B), were shared with the CLAT MOOC designers and other GSIC-EMIC experts.

The online questionnaire was addressed to a total of 7 people comprising CLAT MOOC instructional designers and GSIC-EMIC research group experts. At first place, all participants were invited through a message (Appendix B) to answer the online questionnaire, in which they could also find attached an information sheet (Appendix B) with the background of this study, a brief analysis of the quality assessment frameworks and their tools, the purpose and the objectives of the questionnaire, an overview of the instructional design of the CLAT MOOC course and the questionnaire. We have also attached the assessment tools of the two (2)

quality frameworks (Appendix B) and the link of the *Quality Matters* tool, which is provided online.

All participants were asked to apply the tools on the CLAT MOOC in order to evaluate them. As soon as they had completed this procedure, all participants were asked to answer the online questionnaire, which main focus was to make comments concerning the usefulness of the assessment tools, their strengths and limitations, the effort required and the elements assessed focusing on the instructional design and active learning pedagogies (Appendix C). After the deadline of the online submission, all data were collected (Appendix C) and analyzed.

3.5.2 Focus group

After summing up the feedback from the questionnaires, a focus group was conducted in order to analyze and clarify some points that occurred. Focus groups are a research method of producing rich quality data through a process of interaction between group participants and a defined area of research interest (Krueger, 1994). It is not a group interview with an interviewer who asks questions and respondents simply answer them, but it is a group discussion in which participants are asked to talk to each other about a particular subject through an interaction process that it is "vertical", i.e., involves interaction between the researcher and the participants, but above all, it implies a "horizontal interaction" between group members (Wilkinson, 1998). Interaction between group members results in lesser influence of researchers in the process and greater emphasis on participants' responses (Frey & Fontana, 1993). The data produced by focus groups let the researchers understand the multi-level and dynamic nature of human perception as well as the fluidity, contradiction and plurality of views, feelings and experiences of respondents (Wilkinson, 1998).

In this study the focus group was an important tool in order to develop a fruitful discussion with GSIC-EMIC experts and CLAT MOOC instructional designers, concerning the tools of the quality frameworks. We chose the focus group method because it provides face to face interaction with all participants in order to exchange ideas. At the same time participants could share their experience while applying the tools for the questionnaires' needs. The focus group of this study was organized based on Kruger's approach (2002). The objectives of this focus group were: (i)

to clarify issues concerning the assessment tools and their usefulness, (ii) to make an overall assessment of the instructional design and the active learning pedagogies of the MOOC, (iii) to point out elements of the MOOC that need improvement, (iv) to discuss about the success or not of the specific MOOC in terms of some concrete elements.

Seven (7) participants took part in the present study focus group (table 11). The focus group participants were GSIC-EMIC experts and CLAT MOOC instructional designers (Appendix C). Before the focus group all participants received a message to take part in the focus group under the topic: *“Further analysis of important points that arose from the questionnaires’ feedback for the Master thesis study of the Erasmus+ granted student, Valeria Aloizou”*. In the message was also attached the agenda of the focus group (table 12).

Name	Involvement in MOOC
Participant 1	Instructional designers’ assistant
Participant 2	Instructional Designer
Participant 3	Instructional Designer
Participant 4	Instructional Designer
Participant 5	GSIC-EMIC expert
Participant 6	Instructional Designer
Participant 7	GSIC-EMIC expert

Table 11: Participant’s list and their involvement in the MOOC

Focus Group Agenda Friday 13 th 12pm GSIC-EMIC Lab Topic: Further analysis of important points that occurred from the research group	
12:00 - 12:10	Welcome note
12:10 - 13:00	Presenting important points from the feedback - Discussion
13:00 - 13:30	Discussion about the tools
13:30 - 14:00	Discussion about the MOOC course instructional design quality
14:00 - 14:30	Summing up

Table 12: Focus Group Agenda

The focus group took place in the premises of the GSIC-EMIC research lab. The discussion was recorded and transcribed (Appendix D). Throughout the focus group notes were taken. The focus group was guided by questions, which occurred after analyzing the important points of the questionnaires and were presented in a PowerPoint during the focus group (Appendix D).

The questions were posed in order to reflect on the strengths and the weaknesses of the quality tools, the elements assessed, the effort required and the participants' satisfaction. At first, questions were posed and afterwards a fruitful discussion was developed among the participants. If some questions have been already covered through previous discussion, the questions were skipped in order to avoid referring constantly to the same points. Important results emerged after the data analysis of the transcription and the notes, which helped us to organize the findings of the present study.

3.5 Final remarks

The design of the study presented in this chapter is very important, as it structures the findings which are presented in the following chapter (Chapter 4). CLAT MOOC study was based on the EREM MODEL and included the topics, the data gathering techniques and a brief description of the MOOC itself. Moreover, through the evaluation context we analyzed the instructional design of the CLAT MOOC and we acquired important information for its general layout. Nevertheless, since our research started after the CLAT MOOC had finished, it was not possible to get the participants opinions or to analyze the data of the activity of the users in the course given by the system logs.

Chapter 4: Findings

4.1 Introduction

This chapter describes the main findings obtained during the evaluative case study, organized following the anticipatory data reduction diagram. Throughout the text, the data sources that support the different assertions are indicated with labels between square brackets which have been already presented in the previous chapter. Regarding the data sources of the evaluation process, we carried out questionnaires and one focus group. It is important to emphasize that, in accordance with the evaluative case study followed we do not aim at obtaining generalizations but to explore in depth, and understand the experts' perspective and impressions regarding the quality frameworks and their tools, trying to make some recommendations concerning instructional design quality assurance in MOOCs. The findings were analyzed based on the analysis of the topics which have been already presented. Moreover, the results of the qualitative content analysis are supported by participants' illustrative quotations (Wilkinson & Silverman, 2004). The rest of this chapter presents these findings organized by topic.

4.2 T1: Usefulness of the quality frameworks

To begin with, concerning the first topic around the usefulness of the quality frameworks, there was supported that **assessment instruments are essential to provide guidelines** to MOOC designers although assessing the quality of a MOOC it is a **complex endeavor**:

- “These tools can be useful as a kind of “checklist” during the design of the MOOC. But I’m not sure they can be used easily as a way of assessing the quality. Implicitly, answering “yes” to the questions implies a higher quality. But: some of the questions are very difficult to answer “objectively”; and, some of the questions don’t apply so much to the MOOC. I still see some value on them to be used as “guidelines” during the design... but not so much as an ‘assessment’ instrument”. [D_QUESTION]
-

- “...So the instruments partially offer support for the first part by asking: “Did you include the objectives?” etc. that I should take into account. And then there were other questions that had to do with the other part: “Did the objectives have an influence on how the students learnt?” But this question is difficult to answer. And this is a big question that can’t easily answer because I can say if I included or not the objectives but I don’t know if they were effective”. [D_FOC]

Another finding on this topic is that the MOOC assessment tools could be **an important element to help MOOC designers to identify gaps during the design process:**

- “In general terms, I have found the three instruments relevant for MOOC designers. I think that these tools might help MOOC designers to pay attention to significant aspects to improve the quality of their MOOC courses”. [D_QUESTION]
- “The tools have been quite useful in order to identify several characteristics that should have been achieved in a MOOC. These instruments make me realize about many issues that should be taken into account when designing a MOOC”. [EXP_QUESTION]
- “To begin with, the three tools include interesting questions which help you to reflect on many aspects that perhaps while designing you do not pay attention”. [EXP_QUESTION]
- “The QA tools are useful to identify aspects that should be taken into account when designing a MOOC, and to identify possible weaknesses that have to be addressed. For example, in our case, the aspects related to assessment and the institutional support seems to be the weakest aspects”. [EXP_QUESTION]
- “Concerning the checklists they help you to avoid some mistakes before the design, which is already good because we all make mistakes when we design. And afterwards we realize that we have forgotten something”. [EXP_FOC]
- “The first time that you design a MOOC this is very helpful. Having MOOC specific criteria or assets or whatever is even more important. Because you might have an itinerary that ok you have some experience in MOOCs but not in applying collaborative learning, so use this variation, to that you will not skip things”. [D_FOC]

Moreover, it was supported that the assessment tools could work as a good strategy while **re-designing a MOOC**, after taking into account the results of the quality assessment:

- “The creation of quality assessment tools seems a good strategy to help MOOC teachers design and re-design their courses”. [EXP_QUESTION]
- “The first time that you design a MOOC this is very helpful. Having MOOC specific criteria or assets or whatever is even more important. Because you might have an itinerary that ok you have some experience in MOOCs but not in applying collaborative learning, so use this variation, to that you will not skip things”. [D_FOC]
- “Spotting the weaknesses...”. [EXP_FOC]

There is a gap in the reviewed quality frameworks in order to be suited to **a more extended audience. Quality assessment tools should be aimed at experts and non-experts in instructional design:**

- “For me *Quality Matters* was well organized. My basic problem, since I am not an instructional designer, was the vocabulary. I devoted too much time to process the information of the questions. However in the other 2 assessment tools I could straight ahead understand of what they are talking”. [EXP_FOC]
- To tell the truth, I am not an expert on the instructional design. In general the three tools attempted more or less to assess the quality of the instructional design of a MOOC and perhaps a bit more the online quality framework with questions stretching the focus on the way the material was organized. [EXP_QUESTION]
- “I couldn’t answer many of the questions of the tools because I don't know which were the goals and objectives of every module and how they related to the different activities and tools implemented”. [EXP_QUESTION]
- “From my point of you an assessment tool is good for designers when they want to design a new MOOC from the beginning. Taking into account these points and designs a high quality MOOC. So the assessment results can help you not to forget”. [D_FOC]

Furthermore, it was clearly supported by almost all participants, that **none of the assessment tools is complete** concerning all assessment elements so **that it could be used** with accuracy in the future in order **to assess the instructional design quality of a MOOC**. Some of the reasons were: (i) some questions were out of scope, (ii) the different level/background of the participants who desire to use these instruments (instructional design experts vs non-experts), (iii) some questions were less focused in knowing the pedagogical design and understanding the underpinning principles of a MOOC:

- “I think they are useful, although and there are some sections, as in the case of OpenupEd tool in: "Checklist 1: Is it a MOOC or not?" that are NOT necessary because it is a MOOC is quite evident”. [EXP_QUESTION]
- “I’d say they helped me realised that the instructional design had taken into account some “basic” elements of any learning design (e.g., stating objectives, defining assessment criteria, etc...). But I see them quite “basic” and no so much focused on MOOCs... Maybe this might be much more useful for novel designers (?)”. [D_QUESTION]
- “I think that the quality assurance spectrum instrument is more focused in identifying if the activities and general proposals that are part of a certain MOOC follow a MOOC philosophy or not. Thus, I think that might be less useful in assessing the pedagogical design of a particular MOOC because the items are more general according to this aspect”. [D_QUESTION]
- “Personally, I think, the most a complete instrument for assessing the quality of a MOOC instructional design is the MOOC Scan. All the dimensions contained go deeper in important issues that can help instructors to think about if the pedagogical structure of the MOOC is aligned with active pedagogies (e.g., problem centred, activation, demonstration, application etc.). Besides, it is worth noting the distinction between the meaning of collective knowledge and collaboration dimensions. On the other hand, the dimension related to the feedback is not very well developed”. [D_QUESTION]
- “In general the tools had some elements in common like the objectives and the context. So there are parts that are very similar. It’s true for instance that the Margaryan’s

instrument (“MOOC Scan Questionnaire”) includes elements about collaborative learning. So, it depends as well to the context of your MOOC. So, in the question whether I would choose the best one or suggesting mixing them etc, I would say to pick elements from all of them and create a new one but leaving out the very general questions like: “Is this effective...?”, or “Does it cope with real problems...?”. [D_FOC]

Last but not least, another finding is that **stating clearly the underlying model** of the quality framework is a very important factor affecting the usefulness of the quality framework:

- “So one thing is that at least you should state clear which the underline model is. Well Margaryan was referring to it and the initial principles and the principles that they added afterwards. So you have to know if you agree or not with that model before applying it in a MOOC. At least to know how much you agree or not. Because maybe you say that you know the model and I think that this particular aspect is not so important for me, so some items won’t be very important for my assessment. So, one thing is that the underlined model of the assessment tool should be clearly stated. Because there is always a model behind”. [EXP_FOC]
- “They rely on underlying assumptions. If you not share those assumptions, the tools (or the part of them related to these assumptions) are not useful”. [EXP_QUESTION]

4.3 T2: Strengths and limitations of the quality frameworks

Referring first to the strengths that the quality frameworks have, although participant did not reach a consensus about which of the quality assessment tools has more strengths, the informants agree in general terms that all of them have **a rational organization** and the questions allow the **self-reflection** of MOOC designers:

- “I think the OpenEd checklist because the questions were well organized, the questions were clear and focused on the content and there were different possibilities when answering”. [EXP_QUESTION]

- “The most useful tool, personally, was the OpenupEd_Quality_Assurance. The items were categorized in a way that helped me to reflect on the nature of the CLatMOOC”. [EXP_QUESTION]
- “The MOOC Scan Questionnaire and the OpenupEd_Quality_Assurance seemed more useful for me regarding the way they formed their items and their more "approachable" vocabulary”. [D_QUESTION]
- “Concerning the *Margaryan’s instrument* (“MOOC Scan Questionnaire”) is more complete in terms of the assessment and learning design, because there are more questions reflecting on the pedagogical design”. [D_FOC]
- “In any case, some questions made me reflect about the quality of some aspects of the course such as the technological support”. [EXP_QUESTION]
- “I would also say that not for MOOC designers but for researchers, it is also good to detect weaknesses and points improve or to research on MOOCs in general”. [EXP_FOC]

Concerning the limitations of the quality frameworks, participants noticed that there are some **ambiguous questions** which were difficult to understand and answer:

- “Some questions are a little bit ambiguous. Mooc scan and QA spectrum instruments only contain closed questions. I think that in general terms will be useful to have a more detailed explanation of some responses obtained from MOOC instructors”. [D_QUESTION]
- “QM also includes questions about it, although the fact it only provides two possible answers seemed too limited to me”. [EXP_FOC]
- “Maybe there are some questions that are not completely clear for the reader”. [EXP_QUESTION]
- “Some questions are difficult to answer if you are not a designer of the course, or you are very acquainted with the platform”. [EXP_QUESTION]
- “There are some questions difficult to answer even if the context is a smallest scale. For instance: “The prior knowledge of each learning objective is described and related to the characteristics of the target groups”. So in this kind of context, you can imagine that it’s impossible”. [D_FOC]

Moreover, participants **weren't satisfied** with the questions referring to the **collaborative activities** and **active learning pedagogies**, supporting that there is a room for further improvement since introducing questions about **group collaboration does not imply** assessing the **quality of collaboration in a MOOC** environment:

- “There were questions in the MOOC Scan Questionnaire about collaborative learning, but there were questions about collaborative learning, whether we have used collaborative learning. But there weren't questions helping you assess the quality of the design in terms of collaboration, for instance. “Are you having group interactions, etc.”, but it doesn't ask you: “Where you promoting positive independence or how you were promoting the positive independence?”, and other things which are related to pedagogical approach. Because the tool was just asking you whether you use or not collaborative learning. If the answer is yes that's good for you. But probably you are introducing collaborative learning which is not well designed and non-productive. So, to the question whether they are perfect, the answer is that they are not and whether they need improvements, the answer is yes and of course they need more in terms of active learning pedagogies and there are many things to be improved. For instance, if I am in a MOOC environment implementing collaborative learning, the groups and the types of groups are very important and there is no question about it”. [D_FOC]
- “No. They ask me whether I was using Collaborative Learning, for instance. But they don't help me assess whether the Collaborative Learning approach I followed had a high quality”. [D_QUESTION]
- “No, because the questions regarding active pedagogies were mainly focused on participation and collaboration, but there are many other strategies that promote active learning and were not evaluated (e.g., inquiry-based learning, problem-solving, role-playing, game-based learning or gamification)”. [EXP_QUESTION]
- “In general the assessment of the quality of the active pedagogies was not highlighted so much. The MOOC Scan Questionnaire achieved the assessment of this aspect in a higher degree than the others, by including many questions regarding collaborative

learning. The other two tools didn't help me to assess the quality of the active learning pedagogies applied". [EXP_QUESTION]

During the focus group, participants stated that it is **very difficult** to design an assessment tool which could **be applicable to all types of MOOCs**:

- "The thing is that for me isn't that easy to find a single instrument that you can use for every MOOC in the world. So, the point is that maybe there are some very generic issues that can be shared from every MOOC. But there are some other issues related to the objectives of the MOOCs, what is the underlying pedagogy model and you can't normally go deep to every single model, or all objectives...". [EXP_FOC]

4.4 T3: Effort required

The effort which was required while applying the quality tools was assessed firstly according to the **less time consuming**, a factor which is affected either by the **comprehensible vocabulary**, or by the **quality tools layout**:

- "Maybe Quality Matters took me a bit longer than the other two... But we are in the 15-20 minutes range, anyway". [D_QUESTION]
- "I guess the less consuming instrument is the QA spectrum because it is shorter and it does not contain open questions". [D_QUESTION]
- "The OpenupEd tool because it's very schematic and clear in tables by dimension, criteria and design of the MOOC". [EXP_QUESTION]
- "The MOOC Scan Questionnaire was the less time consuming one with the least number of questions among the three of them. The same time, the "approachable" vocabulary used for each item reduced the time needed to proceed with the information given". [EXP_QUESTION]
- "For me, Margaryan, because it dealt with the instructional design and was easier for me to answer its questions. The other two had some questions that I did not find easy to

answer (as I was not designer of the course and I have not interacted with the system as an instructor)". [EXP_QUESTION]

- "I agree. For me was that and the vocabulary (Quality Matters). Not the amount of the questions, but the vocabulary. Sometimes I was stacking while trying to understand". [EXP_FOC]

4.5 T4: Elements assessed

Concerning the elements, participants stated that a tool **cannot offer for example assessment**, concerning the **objectives** that a designer sets. This could be covered better through a kind of guidelines, advices, hints, tips which can help a designer to make good decisions before or during the designing process, like the "checklist" that *Canvas Network*²¹ provides the designers with, before starting designing their course in the platform. More specifically on this issue a participant stated that:

- "I can't expect from any instrument to say that this objective is good because it depends on the context, so the instruments partially offer support for the first part by asking: "Did you include the objectives? That I should take into account. And then there were other questions in the assessment tools that had to do with the other part: "Did the objectives have an influence on how the students learnt?", but this question is difficult to answer. And this is a big question that can't easily be answered because I can say if I included or not the objectives but I don't know if they were effective". [D_FOC]

Another issue that occurred while assessing CLAT MOOC, which implements active learning pedagogies, is that apart from the general elements of a MOOC course, some more specific elements which have to do with the different types of MOOCs should also be assessed. Around this issue there were stated ideas such as forming **modular questions with special emphasis in the reflection on pedagogical aspects**. In this way the quality of particular instructional design initiatives could be assessed efficiently:

²¹ *Canvas Network Checklists*: <https://utt.instructure.com/courses/302/pages/course-design-checklist>, Last accessed: April 2018

- “Also what I was missing was that depending on the type of activities that you include in your design, the questions should be different. I mean if you have like forum activities in order to assess the course or if the objectives were met or not you can pose a question like: “How these discussion forums were related to the objectives?” or “How are these activities related to these objectives”. [EXP_FOC]
- “Did you choose specific criteria for forming the groups?”. Maybe it’s not important to know the criteria but check if you are thinking of the criteria. “Have you reflected on the chances of having positive independence in the collaborative activities?”. This is a broad question but at least it makes you reflect on that. So maybe at least it enforces you to check this, if you have thought about it”. [D_QUESTION]
- “Yes, exactly these types of questions are more related. Or maybe a number of things likes: “How many badges are you using?” I use 150. Ok! Maybe this is too much. If we have modular questions depending on the pedagogies and special aspects that you have in your MOOC it could be easier and I can give you questions related to gamification. So, for example for gamification we can ask: “How are the game mechanisms related to the activities or the context in the course?”, “How many game mechanisms did you implement?”. We can create a list if you want, but if you talk with experts on this topic they can provide you with specific questions for each module. That could be a good practice to assess the quality of specific pedagogies of a MOOC course”. [D_FOC]
- “My perception for the collaborative learning, I would expect questions such as: “Did you choose specific criteria for forming the groups?”. Maybe it’s not important to know the criteria but check if you are thinking of the criteria. For instance: “Have you reflected on the chances of having positive independence in the collaborative activities?”. This is a broad question but at least it makes you reflect on that. Because if there is not positive independence the collaboration is not going to happen. So maybe at least it enforces you to check this, if you have thought about it”. [D_FOC]
- “In my humble opinion questions should be: “Did you reflect on the criteria for forming the groups?”. No! They are random, so maybe if you are doing this at random I have to check afterwards if the decision was good or not”. [D_FOC]

Additionally, participants mentioned that in order to have an **overall idea** of their MOOC instructional design quality, we should **take into account some other elements such as:** (i) the results of the instructional design quality assessment, (ii) the students' opinion, (iii) the data analytics acquired from the platform and (iv) feedback from standard questions in the end of the MOOC that will help the designers to assess the instructional design quality of their MOOCs:

- “If the dropout rate or the intention rate of this MOOC is lower than 5%, maybe there was a problem”. Consequently, it is obvious that a complete quality assurance method is needed to assess the instructional design quality of MOOCs”. [D_FOC]
- “Yes and we should also take into account the course analytics in order to re-design. Because otherwise is very difficult taking into account only the general notes of your design. If you don't take into account what happened in the course, it's very difficult to take decisions in order to re-design”. [D_FOC]
- “In that case also you need the data and feedback from the students or from the platform. And see how this matches with design decisions. Which elements are present or not. General design decisions”. [D_FOC]

4.6 Topic 5: Designers' satisfaction

Concerning designers' overall satisfaction about the tools, it was stated **that there are elements that should improve in order to be used effectively for MOOC quality assessment:**

- “I'd say they helped me to realize that the instructional design had taken into account some “basic” elements of any learning design (e.g., stating objectives, defining assessment criteria, etc...). But I see them quite “basic” and no so much focused on MOOCs”. [D_QUESTION]
- “On the other hand, the dimension related to the feedback is not very well developed. There are important aspects regarding the assessment that affects the quality design in a MOOC that are not informed in this instrument”. [D_QUESTION]
- “QM also includes questions about the instructional design, although the fact it only provides two possible answers seemed too limited to me”. [EXP_QUESTION]

As far now as the perspective to use the quality frameworks in the future to assess the instructional design quality of their MOOCs, most of the participants were **in favor**, since they supported that the quality frameworks could **help them to check the quality of some elements in their MOOCs**:

- “Yes, I think that there are useful tools to think about important aspects to pay attention to. To assess a MOOC instructional design I would use the ‘MOOC scan instrument’ because is more oriented in pedagogies and active learning”. [D_QUESTION]
- Maybe I would use the MOOC Scan tool because of what is mentioned in the question 4 (principles of instruction that the tool represents). [D_QUESTION]
- “Maybe I would use them (some questions) to check if I forgot something during the design and implementation of a MOOC”. [D_QUESTION]
- “I would like to use the MOOC Scan Questionnaire and the OpenupEd_Quality_Assurance tools due to their interesting questions”. [EXP_QUESTION]
- “I think I would start using OpenupEd because it focuses on aspects that are unique for MOOCs (and I need support in that part, as I am not used to design MOOCs). Margaryan's is less specific to MOOCs, but includes some questions related to the implementation of the interactive behavior that could be also useful to take into account. Finally, some questions from QM could be added if the MOOC is going to have an institutional support”. [EXP_QUESTION]

4.7 Topic 6: CLAT MOOC assessment

Throughout the evaluative study and the implementation of the quality assessment tools, CLAT MOOC designers and GSIC-EMIC experts realized that **institutional support is an important element to foster the success of a MOOC**:

- “Yes and this is a limitation for MOOCs in general. And the other point is that institutional support wasn’t provided. So, it was part of our context. We knew that it was an experimental MOOC, but if it was a normal MOOC from a university we would

have graded very badly for that because the institution wasn't supporting the students, the teachers or any other who was involved". [EXP_FOC]

Moreover, they supported **that investing time and effort thinking about the learning design and the description of learning activities is not enough to help and support students** during their performance within the course:

- "Probably, in the case of providing more tips or more guidelines to the students in order to help them to continue and to carry out the activities during the MOOC. I think that it's something that is missing in our MOOC. Because we devoted to much time in order to provide an accurate explanation of the activities, but if you add specific guidelines in order to help the students, I don't know maybe things would be different". [D_FOC]

Although in CLAT MOOC, designers employed different techniques to foster the success of the collaborative activities of the MOOC, **more effort is needed to promote students self awareness during the course** (e.g, the use of data analytics for assessment purposes):

- "And we didn't use the analytics provided by the platform in order to inform the students about their engagement during the course, by giving advice to take a look at those analytics, or this document...". [D_FOC]
- "There is a part in the platform where the students can have access to this information. This could be useful but we didn't put effort to inform the students about it". [D_FOC]
- "In general provide good feedback to cope with diversity and heterogeneity of the students in this kind of context. We formed the groups according to some criteria, but we didn't provide them with different kind of feedback". [D_FOC]

Moreover it was mentioned that **it is important** to show on the platforms' home page, **the progress** of the students in the course, maybe through a **progress tool**, so that every time they enter the MOOC environment, they will be able to check what they have done, what assignments they have etc.:

- “Also, in the tools there was one question whether the students were informed about their progress. And as a learner, I remember that I couldn’t have a clear idea of how many tasks I was missing”. [EXP_FOC]
- “Also, I have another comment related to the feedback. I think that we didn’t provide the students with useful tools in order to receive some insights about their progress. So, there is a thing that is missing”. [D_FOC]

It was also stated that one of the CLAT MOOCs’ weaknesses was the **demanding workload**, which maybe was one of the reasons why many students couldn’t deal with, and consequently they dropped out:

- “I don’t remember if in the tools is mentioned the time that the students should devote in each week and if the time mentioned is the same with the real time that have to devote. So it is very important the workload of the MOOC. I think this aspect is referred on the online tool (*Quality Matters*). To check if the time referred in the course is the real time. Because, if you provide too much information to the students for the activity, it takes them a lot of time to read. If you offer 5 sheets of information, the students will need one hour to read the instructions. So, it’s very tricky to achieve the expected time and the time that they need”. [D_FOC]

Furthermore, participants stated that apart from the final questionnaire, asking students’ opinion about the course, there should also be a **questionnaire** send by the automatic system to those students who **dropped out earlier**, in order to find out the reasons why and whether their drop out had to do with the course instructional design weaknesses:

- “Also, I am realizing that the final questionnaire is provided in the end of the MOOC, to those participants who have already completed the course so is should include the ones that have dropped out. Maybe in the middle stage of the course, or maybe when they drop out the course the automatic system sends them a questionnaire or something. I remember in one platform they are already doing this. Maybe Future Learn. When you drop out, they ask you why”. [D_FOC]
-

Last but not least, it was pointed out one of the **main challenges** that MOOC teachers face, which is the **assessment of students' final products** since we talk about a massive scale learning community:

- “Also, we couldn’t assess the student’s products. And we couldn’t provide real assessment for the objectives, after the activities submission and we didn’t also grade the activities. So, in that case we couldn’t assess if the objectives were met or not. So when the certificate was provided it wasn’t like a certification of having achieved all the objectives”. [EXP_FOC]
- “We just took a look whether the students had delivered the assignments. If the students have submitted all the assignments we some comments, we were providing them with the certificate. We didn’t assess the real quality of their products. And I think that in this case it’s so difficult, because you have a lot of students and you need a plan or instruments like a rubric, or a scale that can help you”. [D_FOC]

4.8 Discussion and general recommendations

The evaluative case study provided us with important results around the general topic of quality assurance in MOOCs and more specifically around the quality frameworks and their tools and how could they be improved in order to be better adopted in a MOOC environment, focusing on the quality assessment of the instructional design and the active learning pedagogies. Having an overall look on the results concerning the guidelines needed and the questions format, it was obvious that there are elements to be improved while assessing the instructional design quality of a MOOC. Furthermore, there should be added some more elements assessing the active learning pedagogies, which is important for CLAT MOOC and other similar ones.

Nevertheless, participants stated that it is very difficult to design a quality assessment tool which could be applicable to all types of MOOCs. As a result, it could be useful to have a quality assessment tool which will assess some general MOOC elements, which are common in the majority of MOOCs, and then assess more specific or special ones like collaborative learning

and gamification, through modular questions. For example if a MOOC implements gamification techniques, there could be questions such as: “How are the game mechanisms related to the activities or the context in the course?” or “How many game mechanisms did you implement?”. Also this kind of quality assessment tools could be enriched with a grading system, depending on the importance of the elements. Through the final grade, designers could have a final overall idea about the instructional design quality of their MOOC. Moreover, they could reflect and compare it with the grade of other MOOCs, in order to find out weaknesses and ways to improve the instructional design.

Above all, the most important factor of a quality framework is that it should have an underlying model which should be clearly stated, so that users will be able to check whether this model is suitable for them. In addition to this, brief guidelines are also of great importance, for the efficient use of the tool. Furthermore, the nature of the questions should be open, making the designers to reflect on their decisions. The vocabulary of the questions should be comprehensible, simple and clear, so that users won't spend too much time trying to understand any “hidden messages” behind the questions. For this reason hints and annotations could be useful, like the ones that *Quality Matters* online tool provides (figure 10).

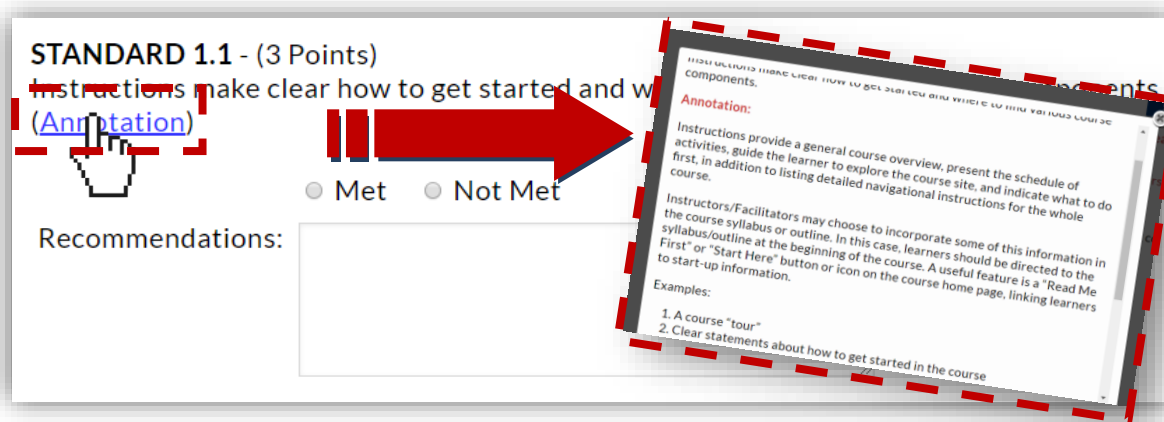


Figure 10: Example of annotation from the Quality Matters online tool

These findings could be useful for an upcoming study on how to improve the specific quality assessment tools or for an initiative to design a new quality framework by interviewing MOOC

experts' opinion concerning the most useful general elements which should be assessed in the instructional design of MOOCs after their implementation.

4.9 Final remarks

In this chapter we primary addressed the second objective of the study; to assess the usefulness of the selected quality assurance methods in terms of evaluating the instructional design of MOOCs implementing active learning pedagogies. Moreover through our findings we can contribute to the MOOCs' research community by providing some recommendations on important elements that a MOOC quality assurance method should have in order to assess the instructional design of a MOOC implementing active learning pedagogies. Furthermore, we can contribute to the GSIC-EMIC research group by providing the assessment of the CLAT MOOC. However, it is important to mention that we didn't intend to provide an overall evaluation of the CLAT MOOC, but a partial assessment in some of its elements while testing the tools, since the main objective of this study was to analyze the frameworks by using the CLAT MOOC as a case study.

This study could be enriched with further findings, if we had been able to address more MOOC designers or the rest RESET project partner universities. However, this is a limitation that occurs due to the restricted timeline of the present work. Moreover, if we had more time, we could interview more MOOC experts one by one, in order to provide us with more specific recommendations on the topic. Last but not least, we could have taken into account MOOC participants' opinion as well, but this is something that needs more time in order to contact them and receive accurate feedback.

Chapter 5: Conclusions and future work

5.1 Conclusions

This study has tackled the initial objectives which were to identify and assess the MOOC quality assurance methods used so far and select the most suitable ones for assessing the instructional design of a MOOC implementing active learning pedagogies. In order to achieve these objectives, we firstly performed an SLR to identify which quality assurance methods of the ones proposed in the literature are appropriate for the assessment in MOOCs implementing active learning pedagogies. According to the SLR findings, we identified 8 quality frameworks which have been used by designers and researchers in order to assess the quality of their online courses or their MOOCs, by applying the quality assessment tools. Afterwards, we organized a set of criteria, since we wanted to select those quality frameworks that focus more on the assessment of the instructional design and active learning pedagogies, like collaboration and gamification. As a result of the process, we selected the three quality frameworks: the Ten-principle framework, the OpenupED Quality Label and Quality Matters. These three frameworks have been further explored by their application to a real case, which has given us the opportunity to explore them in more depth. The real case was the evaluation of the CLAT MOOC, which was considered as the most convenient one, implementing active pedagogies in its design.

The research process has resulted in a number of contributions. Firstly, through the results of the SLR, we provided a report of quality assurance methods used to assess the instructional design quality in MOOCs. These methods are specific quality frameworks, providing their own assessment tools. The list of the quality frameworks can be useful for MOOC instructional designers and experts, who would like to be informed about these methods, or even apply them in their own MOOCs, in order to assess their quality. Secondly, through the findings of the evaluative case study we were able to provide recommendations that the existing quality frameworks can be enriched with; (i) the tools should focus more on the active learning pedagogies elements by probably providing modular questions, in order to be efficiently

applicable and appropriate for these kinds of MOOCs, (ii) the assessment tools should provide guidelines to be aimed to non-experts in instructional design, (iii) the vocabulary at the questions should be simple and comprehensible, and (iv) the underlying model should be stated clearly so that the designers could know beforehand if it appropriate or not for their case.

Moreover, after the analysis of the findings of the evaluative case study, we also provided recommendations on instructional design elements that need improvement on the CLAT MOOC; (i) more effort on guiding and helping the CLAT MOOC students, (ii) embody a progress bar on the homepage of the platform, (iii) not such a demanding workload (eliminate or simplify some assignments), (iv) design of a questionnaire which will be sent by the automatic system to those students who dropped out earlier, in order to find out the reasons why and whether their drop out had to do with the course instructional design weaknesses and, (v) design of an assessment method in order to assess the students' final products, since we talk about a massive scale learning community

All these contributions help start exploring the general research question posed at the beginning of the work: *How can we assess the instructional design quality of a MOOC implementing active learning pedagogies?* To sum up, we can assess the instructional design quality of a MOOC implementing active learning pedagogies, by applying an assessment tool of a quality framework which reports clearly the underlying model, including clear and simple questions which will help the designers to assess the instructional design elements, and which will also include modular questions referring to specific active learning pedagogies elements. The results obtained in this work can be considered as first elements that an enriched framework should contain.

Moreover, throughout this study, CLAT MOOC designers and GSIC-EMIC experts admitted that there is indeed a need of a quality assurance method in order to: (i) detect weaknesses and elements of the course that need improvement, (ii) assess elements that haven't been taken into account while designing, (iii) acquire important information while re-designing a MOOC. Last but not least, the combination of the assessment results with the design analytics can lead

to the overall final MOOC assessment, and designers can end up with more valid and more accurate conclusions about the quality of their MOOCs.

In summary, this research has yielded initial results in answering the research question posed at the outset, and has also helped to confirm the relevance of its motivation. This is the fact that there is a need of investing resources in the issue of MOOC quality assurance, since more and more MOOCs appear constituting an innovative part of online education (Daniel, 2012; Stracke, 2015; Gamage, Fernando & Perera, 2015; Jansen, Rosewell & Kear, 2016). This could be an important factor for the sustainability of enrolled students' learning, as well as their MOOC's credibility and acceptance as a valid entity of learning (Amo, 2013).

5.2 Future work

The research presented in this document has explored the area of quality assurance methods in MOOCs, and its findings have provided initial insights into how these methods can be enriched to include the evaluation of MOOCs implementing active learning pedagogies. This study could be the base for an overall evaluation of the CLAT MOOC since the instructional designers can take into account the findings of the present study and combine them with the other data derived from the platform in order to make an overall quality assessment, something that could not have not be done before easily. This could be done either in case the designers would like to re-design the CLAT MOOC or in case they would like to design another similar MOOC, implementing active learning pedagogies in the future. A line of future work opened by this research is to consider the recommendations derived from the present study, and apply them to the definition of a new, enriched evaluation framework for MOOCs. This new evaluation framework should be then evaluated to assess whether it overcomes the limitations identified in the frameworks that have been assessed in this work.

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Appendix A

A.1 Quantifying the level of accessibility of an online course according to Standard UNE 66181: 2012: (AENOR, 2016)

Level	Hardware Accessibility	Software Accessibility	Web Accessibility
1. Initial	Specific information about accessibility is not provided	Specific information about accessibility is not provided	Specific information about accessibility is not provided
2. Basic	It is stated in the basic information if the online course is adapted to be carried by people with disabilities. And information on the major problems that could be people with disabilities to take the course is provided	It is stated in the basic information if the online course is adapted to be carried by people with disabilities. And information on the major problems that could be people with disabilities to take the course is provided	It is stated in the basic information if the online course is adapted to be carried by people with disabilities. And information on the major problems that could be people with disabilities to take the course is provided
3. Good	The hardware platform has accessibility aids and they are identified and explained	The online learning platform has accessibility aids and they are identified and explained	The online learning platform has accessibility aids and they are identified and explained
4. Very good	Meets requirements of Priority 1 of the Spanish Standard UNE 139801	Meets the following requirements of ISO 9241-171:2008: 8.1.1, 8.1.4, 8.2.4, 8.2.7, 8.3.1, 8.3.3, 8.4.4, 8.4.5, 8.4.9, 8.5.2, 8.5.3, 8.5.4, 8.5.5, 8.5.6, 8.5.7, 8.5.9, 8.5.10, 8.5.11, 8.5.12, 8.6.1, 8.6.2, 8.6.3, 8.6.4, 9.1.2, 9.2.1, 9.2.2, 9.3.2, 9.3.3, 9.3.4, 9.3.5, 9.3.8, 9.3.12, 9.3.14, 9.4.2, 9.4.4, 9.4.6, 9.4.9, 9.4.10, 9.4.11, 9.4.13, 9.4.14, 10.1.1, 10.1.2, 10.1.3, 10.2.4, 10.4.1, 10.5.3, 10.5.4, 10.5.5, 10.5.7, 10.5.10, 10.6.2, 10.6.7, 10.6.8, 10.6.9, 10.7.1, 10.7.3, 10.8.1, 10.8.4, 11.1.2, 11.1.3, 11.1.5, 11.2.1	Meets the compliance level A of WCAG 2.0
5. Excellent	Meets requirements of Priority 2 of the Spanish Standard UNE 139801	Meets the following requirements of ISO 9241-171:2008: 8.1.2, 8.1.5, 8.1.6, 8.2.1, 8.2.2, 8.3.2, 8.3.4, 8.3.5, 8.3.6, 8.4.3, 8.4.6, 8.4.8, 8.4.10, 8.4.11, 8.4.12, 8.5.8, 9.1.1, 9.1.3, 9.1.4, 9.2.3, 9.3.6, 9.3.7, 9.3.9, 9.3.11, 9.3.15, 9.3.16, 9.4.3, 9.4.5, 9.4.7, 9.4.8, 10.3.1, 10.3.3, 10.4.3, 10.4.4, 10.4.5, 10.5.1, 10.5.2, 10.5.8, 10.5.9, 10.6.1, 10.7.2, 10.7.4, 10.8.2, 10.8.3, 10.9.1, 10.9.2, 10.9.3, 11.1.1, 11.1.4, 11.2.2	Meets the compliance level AA of WCAG 2.0

A.2 The 36 finally selected publications (alphabetically reported)

Author	Title	Year	Journal/Proceedings	reftype	URL
Amo, D.	MOOCs: experimental approaches for quality in pedagogical and design fundamentals	2013	Computers & Education	article	url
Blanco, A., F., Sein-Echaluce, M. L., García-Peñalvo, F., J.	Methodological Approach and Technological Framework to Break the Current Limitations of MOOC Model	2015	Journal of Universal Computer Science	article	url
Celik, D., Magoulas, D., G.	Approaches to Design for Learning	2016	15th International Conference: Advances in Web-Based Learning	conference paper	url
Chhabra, I.	Quality analytics for evaluation of dynamic web based learning environment	2014	IEEE International Conference: MOOC, Innovation and Technology in Education (MITE)	conference paper	url
Conole, G.	MOOCs as disruptive technologies: strategies for enhancing the learner experience and quality of MOOCs1	2013	RED - Revista de Educación a Distancia	paper	url
Conole, G.	A new classification schema for MOOCs	2014	The International Journal for Innovation and Quality in Learning	article	url
Conole, G.	The 7Cs of Learning Design – a new approach to rethinking design practice	2014	9th International Conference on Networked Learning	conference paper	url
Daradoumis, T., Bassi, R., Xhafa, F., & Caballé, S.	A review on massive e-learning (MOOC) design, delivery and assessment	2013	8 th International Conference: P2P, Parallel, Grid, Cloud and Internet Computing (3PGCIC)	conference paper	url
Fernández, M., B., R.; Silvera, J., L., S.; Meneses, E., L.	Comparative between quality assessment tools for MOOCs: ADECUR vs Standard UNE 66181: 2012	2015	Universities and Knowledge Society Journal	article	url
Gamage, D., Fernando S. & Perera, I.	Quality of MOOCs: A review of literature on effectiveness and quality aspects	2015	8 th International Conference on Ubi-Media Computing (UMEDIA)	conference paper	url
Guàrdia, L. & Maina, M.	Overcome the challenges of MOOC implementation in five steps: EMMA 5D MOOC Framework	2016	International Conference: ICERI2016	conference paper	url
Hayes, S.	MOOCs and Quality: A Review of the Recent Literature	2015	QAA MOOCs Network	paper	url
Hood, N. E., & Littlejohn, A.	Quality in MOOCs: Surveying the Terrain	2016	BC: Commonwealth of Learning	article	url
Jansen, D., Rosewell, J. Kear, K.	Quality Frameworks for MOOCs	2017	Open Education: from OERs to MOOCs	article	url
Kaushik, A., Kumar, A.	Designing Massive Open Online Courses (MOOCs) in Library and Information Science	2017	International Journal of Information Dissemination and Technology	article	url
Kear, K., & Rosewell, J.	Quality assessment for e-learning: A benchmarking approach (3rd ed.).	2016	European Association of Distance Teaching Universities (EADTU).	manual	url
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Lowenthal, R. L., & Hodges, C. B.	In Search of Quality: Using Quality Matters to Analyze the Quality of Massive	2015	In International Review of Research in Open and Distributed Learning	article	url
Margaryan, A., Bianco & Littlejohn, A.	Instructional quality of Massive Open Online Courses (MOOCs)	2015	Computers & Education	article	url
Mohapatra, S., & Mohanty, R.	Adopting MOOCs for affordable quality education	2017	Education and Information Technologies	article	url

Morris, V., L.	MOOCs, Emerging Technologies and Quality	2013	Innovative Higher Education	article	url
Ossiannilsson, E., Altinay, F. & Altinay, z.	Analysis of MOOCs practices from the perspective of learner experiences and quality culture	2015	Educational Media Material	article	url
Rodrigo, C., Read, T., Lancho, M., S., Paniagua, A.	OpenupEd Label for MOOCs Quality Assurance: UNED COMA Initial Self-Evaluation	2014	International Workshop MOOC	conference paper	url
Rosewell, J.	Benchmarks for MOOCs: the OpenupEd quality label	2015	Enhancement and Innovation in Higher Education	conference paper	url
Rosewell, J., & Jansen, D.	The OpenupEd quality label: Benchmarks for MOOCs	2014	International Journal for Innovation and Quality in Learning (INNOQUAL)	article	url
Salvador, A. C., & Rodríguez-Hoyos, C.	Analyzing MOOCs from an educational perspective in Spain.	2016	International Journal of Educational Technology in Higher Education	article	url
Sánchez-Vera, M. M., & Prendes-Espinosa, M. P.	Beyond objective testing and peer assessment: alternative ways of assessment in MOOCs	2015	RUSC. Universities and Knowledge Society Journal	article	url
Scheffel, M., Drachsler, H., Specht, M.	Developing an Evaluation Framework of Quality Indicators for Learning Analytics	2015	Proceedings of the Fifth International Conference on Learning Analytics And Knowledge	conference article	url
Schoenack, L.	A New Framework for Massive Open Online Courses (MOOCs)	2013	Journal of Adult Education	article	url
Storme, T., Vansieleghem, N., Devleminck, S., Masschelein, J., & Simons, M.	The emerging pedagogy of MOOCs, the educational design of technology and practices of study	2016	Journal of Computers in Education	article	url
Stracke, C. M., Kameas, A., Vassiliadis, B., Sgouropoulou, C., Teixeira, A. M., Carmo Pinto, M., et al.	The Quality of Open Online Education: Towards a Reference Framework for MOOCs.	2017	IEEE Global Engineering Education Conference (EDUCON)	conference article	url
Stracke, C. M.	The Quality of MOOCs: How to improve the Design of Open Education and Online Courses for Learners?	2017	International Conference on Learning and Collaboration Technologies. Learning and Collaboration Technologies	conference paper	url
Swan, K., Day, S., & Bogle, L.	Metaphors for Learning and MOOC Pedagogies	2016	3 rd ACM Conference on Learning	conference paper	url
Tahiri, J. S., Bennani, S., & Idrissi, M. K.	Using an analytical formalism to diagnostic and evaluate Massive Open Online Courses	2015	Intelligent Systems: Theories and Applications (SITA)	conference paper	url
Yousef, A. M. F., Chatti, M. A., Schroeder, U., & Wosnitza, M.	What drives a successful MOOC? An Empirical Examination of Criteria to Assure Design Quality of MOOCs	2014	IEEE 14th International Conference in Advanced Learning Technologies (ICALT)	conference paper	url

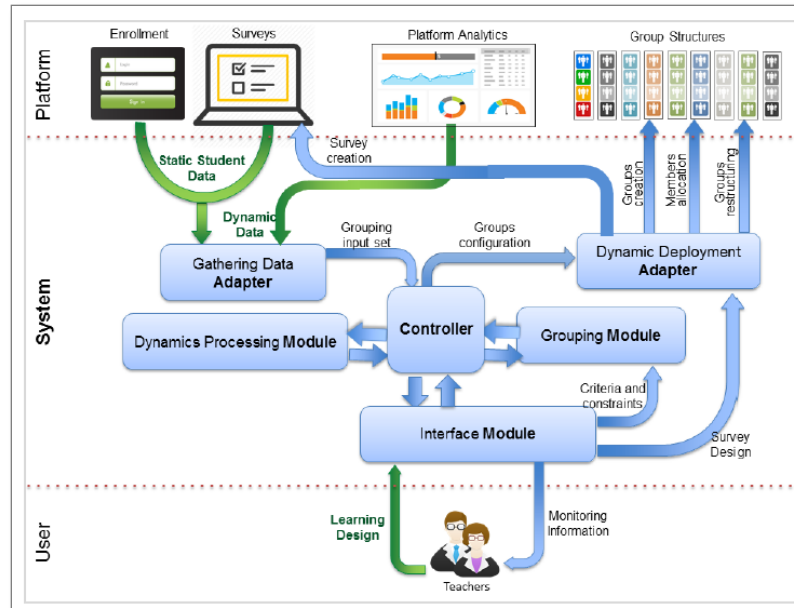
Appendix B

B.1 CLAT MOOC Collaborative activities

In CLAT MOOC the collaborative activities were designed, focusing on the group formation policies which were followed by the designers. All important information was gathered through informal interviews with a PhD candidate and research member of GSIC-EMIC²² research group, as well as from her paper “Supporting Teachers in the Design and Implementation of Group Formation Policies in MOOCs: A Case Study” (Sanz-Martinez, Er, Dimitriadis, Bote-Lorenzo & Martinez-Monés, 2018), which has recently been accepted for publication in the Journal of Universal Computer Science (J.UCS).

CLAT MOOC applies active learning pedagogies, trying to encourage all participants to learn about collaboration, both through individual activities and through group collaborative activities. Furthermore, the instruments that were used in the study make this MOOC really special in terms of instructional design. More specifically, designers iteratively developed a framework, called MyGang (Mooc AnalyTics for Group AssiNGment), through which they aim to organize the available information regarding the issue of managing collaborative groups in MOOCs. It has been developed based on literature review and experts’ opinions, and it has been enriched and evaluated through iterative interventions. The Tool Prototype (MyGang_TP) developed for the study included an early version of the interface module which receives the input (e.g., group size, grouping criteria, etc.) through a configuration file and produces on-demand reports about the groups’ performance.

²² GSIC-EMIC Research Group: <https://www.gsic.uva.es/index.php?lang=es>. Last accessed: April 2018



MyGang_A system architecture for supporting tools to manage groups

The functionalities of the rest of modules were developed in order to satisfy the concrete specifications of this study. The adapters were programmed to meet the Canvas Network platform requirements and the grouping module to implement the group configuration specifications provided by teachers in the design of the GLA of the second week. The specifications to configure the groups included (a) three levels of priority where criteria should be applied, (b) several criteria in each level and (c) the use of both, homogeneity and heterogeneity with respect to the criteria that have been chosen.

B.1.1 Group formation policy

The group formation policies are of great interest since they can contribute in minimizing the potential risks that exist when collaborative learning is promoted in massive scale. The specific group formation policies were used in order to customize the teams for the second week group assignment. The designers used mixed methods approach, with a predominance of the qualitative data, in order to capture better the effects of the instruments examined in the study. Mixed methods allowed the designers to complement and triangulate results (Greene et al., 1989) by using several data sources to collect information to answer the informative questions. This approach was a consequence of their underpinning pragmatic worldview,

centered in the problem and oriented to real world practice (Creswell, 2014). Accordingly, the designers gathered data from seven sources. These data sources came from various types of informants; teachers; students and the researcher, and were interviews, questionnaires, observation, surveys, platform use analytics, etc.

Source	Description
Interviews [X_Int]	Interviews carried out after the use of MyGang_G to: [Dsgn_Int]- Co-design the GLA with the instructors and select the criteria for the group formation. [Feed_Int]- Collect instructors' feedback about their satisfaction with the produced design and its enactment, and critical analysis about the GLA and group formation results.
Learning Design Produced [LDP]	The learning design of the course provides information about how MyGang_DG helped configure the GLA and the group formation policy.
Questionnaire [Quest_X]	Evaluative questionnaire for teachers to assess the utility of MyGang_DG. [Quest_T1]- Filled out by [Teacher1] [Quest_T2]- Filled out by [Teacher2]
Observation [X_Obs]	Researcher observations to determine: [Gen_Obs]- General observations about the achievement of objectives. [Crit_Obs]- To what extent the groups created with MyGang_TP met the criteria and specifications designed by the teachers. [Intg_Obs]- How MyGang_TP was integrated within the MOOC Platform.
Surveys [X_Sur]	Mandatory course surveys, composed of open-ended and closed questions in a 7-point Likert scale. [Welc_Sur]- Used at the beginning of the course to get demographic data and preferences of the students that will be used as grouping criteria. [Satis_Sur]- Used at the end of the course to measure students' satisfaction with the GLA.
Platform use Analytics [Platf_X]	Canvas LMS REST API used to collect data about: [Platf_engag]- Number of page_views, number of submitted assignments and number of posted messages in forums. These data were used to compute the students engagement level (to be used as grouping criteria). [Platf_Monit]- Students participation in groups to identify active teams, active members in each team, etc. used to evaluate the suitability of the GLA designed and the groups formed in second week.
Communications from students to teachers [Com]	Emails and personal messages sent in the MOOC platform from the students to the teachers during the GLA assignment.

Data sources used (coded indicated within brackets) to create the groups and to answer the informative questions

The Group Learning Activity (GLA) was composed of two parts. In the first part, students were required to work individually to review and test five technological tools, one from each different category (a list of categories and tools were provided by the instructors of the course). After testing the selected tools, the student must decide on the one that is the most suitable, in their opinion, to be used for enriching the learning scenario proposed by the teachers in the first week of the course. Then, students were asked to reflect on how this tool could be used to enrich this scenario.

In the second part of the activity, the students were required to work in groups of five and share their work from the first part with group members and justify their choice in a shared Etherpad²³ document. Then, they were asked to argue and discuss in the group forum to reach

²³ Etherpad net: <https://etherpad.net>. Last accessed: May, 2018

a consensus on the tool to be chosen and present it as a group proposal. All groups were also asked to choose a spokesperson that would be in charge of submitting the selected group proposal. The criteria selected by the teachers to create the groups for the activity included three levels of priorities and used both static and dynamic factors as criteria (figure 3). These criteria were meant to be applied to form homogeneous groups in some levels and heterogeneous ones in others. Subsequently, are summarized the criteria applied to form the groups, ordered in three levels of priority:

First level priority criteria. In this level two sets of static student data from the welcome survey were used: the language, which can contain the values “Spanish” and “English”, and the preferred days to work in the course, which can contain the values “from Monday to Friday”, and “Saturday and Sunday”. These two criteria were applied to form homogeneous groups, resulting in four subsets:

- “Spanish” and “from Monday to Friday”, labeled as SP_MF;
- “Spanish” and “Saturday and Sunday”, labeled as SP_SS;
- “English” and “from Monday to Friday”, labeled as EN_MF;
- “English” and “Saturday and Sunday”, labeled as EN_SS.

Once these four subsets of students were formed, the rest of the grouping criteria were applied within each. In addition, all the students that had not filled out the welcome survey were placed in a separate big group labeled *No Questionnaire*, where no criteria were applied.

Second level priority criteria. The teachers chose to use a dynamic factor and student engagement level to be applied to form heterogeneous groups at this level. To measure student engagement, three elements were taken into account: engagement with course contents, engagement with course discussions, and engagement with course assessments, is in line with the criteria proposed by other authors (Ferguson and Clow, 2015). They used the following indicators collected from the platform analytics as the measures for each type of engagement, respectively:

- Number of page views, as a proxy for the engagement with the course content.

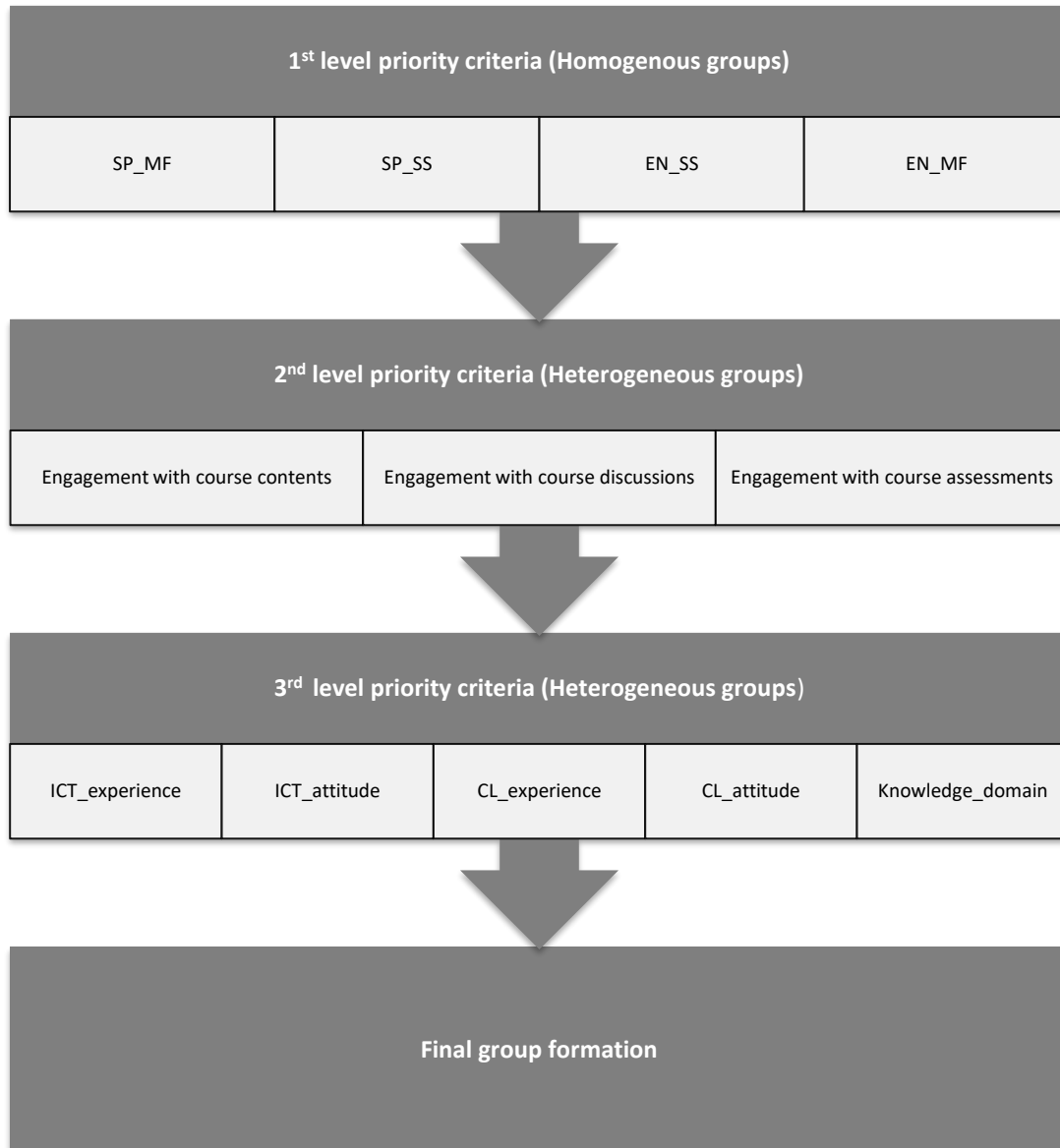
- Number of posted messages in forums, to measure the engagement with course discussions.
- Number of submitted assignments, to measure the engagement with course assessments.

Using these measures, the students from each subset (SP_MF, SP_SS, EN_MF, EN_SS) were categorized into five levels of engagement. Then, in order to form the heterogeneous groups, students belonging to each engagement level were assigned to every group. To choose the concrete student of each level that should be included in a group, we needed to consider the criteria of the third level of priority.

Third level priority criteria. In this level five static student data gathered from the welcome survey were used, i.e., ICT_experience, ICT_attitude, CL_experience, CL_attitude and knowledge_domain. They were applied to form heterogeneous groups. To do so, we applied a Principal Component Analysis (PCA), a statistical procedure used to reduce the dimensionality of a dataset. This way, the teachers obtained a resulting variable that could be integrated with the criteria of the second level, which was intended also for group heterogeneity. This integration was achieved by choosing the students from each level of engagement in a way that maximizes the Euclidean distance with the resulting variable of the PCA.

Consequently in this collaborative activity, after designer's implementation of the three level priority criteria, participants were members of a team. The activity is divided into two main parts: in the first part they had to work individually, while in the second one had to do it in groups. The participants should have submitted both parts of the activity to consider the activity complete in order to obtain the certificate of the course. So, the activity consisted of three main steps: individual inquiry, sharing individual work with the group, and finally, discussion and consensus. All steps were mandatory, apart from the 4th step which was to share the group proposal with the community, a step which was optional. Furthermore, the designers provided the following advice to all participants in case a partner of the team wasn't contributing: *"There is a possibility that some partners cannot be active during a particular task. If something like that happens in your group, do not worry. Usually these problems are very common in a MOOC learning environment. You should face this problem and find the most appropriate solution. Sometimes you will*

need to work a little bit more in order to balance the lack of participation of some members of the group. There is a need for taking notes about all the decisions that you have made using the grouped forums. The instructional designers will take into account these circumstances in order to assess your work. Anyway, you can always communicate with the teachers and share with them your problems and doubts during the enactment of the activities”.



Process of group formation

B.1.2 Designing virtual cohorts

In the final week, participants had to create a Collaborative Learning situation, using the ILDE, applicable to their own teaching practice, to one of their courses. Their designed situation would be peer-reviewed by other participants of the MOOC. More specifically, participants were asked to: (i) create a conceptualization of the design, (ii) author their design, using WebCollage or PyramidApp, (iii) optionally, implement their design (using PyramidApp or Moodle, as illustrated in Week 3 and 4), (iv) create an assessment rubric for their created designs, (v) submit their design project, (vi) review the design of other participants and (vii) check the reviews made to their designs and try to improve them. For all above steps mentioned there was provided a detailed description of what they should do exactly.

For the peer-review step, designers created virtual cohorts, using as grouping criteria the language and the knowledge area. Participants weren't aware of this grouping because they received only the results of the grouping procedure, which was to peer-review the final project of another participant. However, the criteria and the formation of these virtual cohorts was carefully organized since designers and teachers wanted to assign the projects for the peer-review step so that the participants would be able to complete the step and finally assess another project, which was firstly written in their language and secondly, the topic of the project was coming from his knowledge area. The total final submissions were 32, which were thoroughly peer-reviewed from all participants.

B.2 Gamification in CLAT MOOC

In CLAT MOOC all provided quizzes were optional. All information was gathered through informal interviews with a PhD candidate and research member of GSIC-EMIC who is specialized in the area of gamification in MOOCs²⁴. As it has been already reported in table 8, in the end of each week module there were different types of quizzes such as individual, group forum, with timer, with or without attempts etc, the fulfillment of which was ending up in a badge claim (figure 12). The instructional designers decided to form these different types of

²⁴ GSIC-EMIC member: <https://www.gsic.uva.es/personal/alex>. Last accessed:11/05/2018


















quizzes in order to check participants' behavior in different types of quizzes, rules and prerequisites. Moreover, they wanted to check if there is a correlation between badges and drop-out rates. The main research question of this design initiative was: "Are the students who obtain their badges more active in the platform and throughout the course in general?".

Group Forum quizzes were designed based both on the gamified and the collaboration element. In these types of quizzes, team members should discuss in the forum and decide which the right answer is. Afterwards they could submit their correct answers. The quiz system was organized according to the following steps; (1) conditions were specified in Canvas platform, (2) badges were created in *badgr*²⁵ and finally (3) Canvas platform conditions were linked to the *badgr*. Throughout the weeks, participants who had fulfilled the conditions, should go to the badge table in order to claim their badges. After the badge claim, *badgr* was providing them with their badges.

Quiz	Type	Attempts	Timer
1	Individual	3 attempts	-
2	Individual	1 attempt	-
3	Group Quiz Forum	1 attempt	-
4	Individual	3 attempts	-
5	Individual	1 attempt	-
6	Individual	1 attempt	√
7	Group Quiz Forum	1 attempt	-
8	Individual	1 attempt	-

Quizzes in CLAT MOOC

²⁵*Badgr* is a free and open source achievement recognition and tracking system used to issue, organize, and share Open Badges. <https://badgr.com/>. Last accessed: 9/06/2018

Name	Badge
Learner Support	
Get Started	
WEEK 0 SEMANA 0 - Course information and preliminary steps Información sobre el curso y tareas previas	 Welcome!
WEEK 1 SEMANA 1 (12/06 - 18/06) - Warming up and Collaborative Learning Primer Calentamiento e Iniciación en el Aprendizaje Colaborativo	 Quiz 1
 OPTIONAL EXTRA QUIZ FOR A NEW BADGE QUIZ EXTRA OPTATIVO CON MEDALLA  (1)	 Quiz 2
WEEK 2 SEMANA 2 (19/06 - 25/06) - Collaborative Learning and ICT for Students and Teachers (19/June) Aprendizaje Colaborativo y TICs para Estudiantes y Profesores	 Quiz 3
WEEK 3 SEMANA 3 (26/06-02/07) - Designing and implementing Collaborative Pyramids with the ILDE Diseñando e Implementando Pirámides Colaborativas con el ILDE	 Quiz 4
WEEK 4 SEMANA 4 (03/07-09/07) - Designing and implementing Collaborative Jigsaws with the ILDE Diseñando e Implementando Puzles Colaborativos con el ILDE	 Quiz 6
 OPTIONAL EXTRA QUIZ FOR A NEW BADGE QUIZ EXTRA OPTATIVO CON MEDALLA  (2)	 Quiz 5
WEEK 5 SEMANA 5 (10/07-23/07) - My own Collaborative Learning Design project Mi propio proyecto de diseño de Aprendizaje Colaborativo	 Quiz 7
 OPTIONAL EXTRA QUIZ FOR A NEW BADGE QUIZ EXTRA OPTATIVO CON MEDALLA  (3)	 Quiz 8
CLAIM AN EXTRA BADGE + 	 Top Collaborator

Quiz badges in CLAT MOOC

Appendix C

C.1 Online questionnaire²⁶

Questionnaire

After the application of the provided quality assessment tools, please answer the following questions.

Question 1: State your opinion concerning the utility of the provided quality assessment tools.

Question 2: Was it possible for you to assess the quality of the instructional design of the MOOC course by using these tools? Why?

Question 3: Was it possible for you to assess the quality of the active learning pedagogies by using these tools? Why?

Question 4: Which of these tools was more useful for you? Why?

Question 5: Which of these tools was less time consuming while applying?

Question 6: Do the tools have any disadvantages? If yes, which are they?

Question 7: Would you use these tools in order to assess the instructional design of other MOOCs in the future? Which one and why?

Powered by



²⁶ Online questionnaire for the research group participants: https://docs.google.com/forms/d/e/1FAIpQLSeop-rJCajOX_Ga42xu_knNYqBeFS4eNsKEfvsHXcF9K63SSw/viewform?usp=pp_url&entry.846081579&entry.609533283&entry.1944755351&entry.433124664&entry.1475222174&entry.1275881870&entry.1550593223. Last accessed: April 2018

C.2 Assessment tools

C.2.1 MOOC Scan Questionnaire (*Margaryan & Collis, 2005*)

Scoring system	
For Likert-scale items:	
None (0)	
To some extent (1)	= there are serious omissions or problems; the principle is reflected in fewer than 50% of items (e.g. activities or objectives) being evaluated
To large extent (2)	= generally OK, but there are some omissions or problems; the principle is reflected in between 51% and 80% of items being evaluated
To very large extent (3)	= excellent; the principle is reflected in between 81% and 100% of items being evaluated
Not applicable (88)	
No info (99)	= no information in the course environment about this item
For binary items: Yes (1) No (0)	

SECTION 1. COURSE DETAILS

1.1. Course name:

1.2. Course dates:

1.3. Course website:

1.4. Course type: cMOOC xMOOC

1.5. Course platform:

1.6. Course director:

1.7. Date of analysis:

SECTION 2. OBJECTIVES AND ORGANISATION

2.1. Does the course specify the learner population that will engage in the course?

Yes No

2.2. Does the course specify the change that needs to be promoted in the skill set of the learner population?

Yes No

2.3. To what extent are the course objectives measurable?

None To some extent To large extent To very large extent N/A N/I

2.4. To what extent are the course materials well organized?

None To some extent To large extent To very large extent N/I

2.5. Are the course requirements clearly outlined?

Yes No

2.6. Is the course description clear?

Yes No

SECTION 3. FIRST PRINCIPLES

3.1. To what extent are the course objectives relevant to real-world problems?

None To some extent To large extent To very large extent N/A N/I

3.2. To what extent are the problems in the course typical of those learners will encounter in the real world?

None To some extent To large extent To very large extent N/A N/I

3.3. To what extent do the activities in the course relate to the participants' real workplace problems?

None To some extent To large extent To very large extent N/I

3.4. To what extent are the problems ill-structured – ie have more than one correct solution?

None To some extent To large extent To very large extent N/A N/I

3.5. To what extent are the problems divergent from one another?

None To some extent To large extent To very large extent N/A N/I

3.6. Are there examples of problem solutions?

Yes No N/A

3.7. If there are examples of solutions, to what extent do these solutions represent a range of quality from excellent examples to poor examples?

None To some extent To large extent To very large extent N/A N/I

3.8. To what extent are the resources reused from real-world settings?

None To some extent To large extent To very large extent N/I

3.9. To what extent do the activities build upon each other?

None To some extent To large extent To very large extent N/I

3.10. To what extent do the activities attempt to activate learners' relevant prior knowledge or experience?

None To some extent To large extent To very large extent N/I

3.11. To what extent do the activities require learners to apply their newly acquired knowledge or skill?

None To some extent To large extent To very large extent N/I

3.12. To what extent do the activities require learners to integrate the new knowledge or skill into their everyday work?

None To some extent To large extent To very large extent N/I

3.13. To what extent are there activity options for participants with various learning needs?

None To some extent To large extent To very large extent N/I

3.14. To what extent do the activities require participants to learn from each other? None To some extent To large extent To very large extent N/I

3.15. To what extent do the activities require participants to contribute to the collective knowledge,

rather than merely consume knowledge

None To some extent To large extent To very large extent N/I

3.16. To what extent do the activities require learners to build on other participants' submissions?

None To some extent To large extent To very large extent N/I

3.17. To what extent do the activities require participants to collaborate with other course participants?

None To some extent To large extent To very large extent N/I

3.18. To what extent do the activities require participants to collaborate with others outside the course?

None To some extent To large extent To very large extent N/I

3.19. To what extent do the activities require that the peer-interaction groups be comprised of individuals with different backgrounds, opinions, and skills?

None To some extent To large extent To very large extent N/A N/I

3.20. To what extent can the individual contribution of each learner in the group be clearly identified?

None To some extent To large extent To very large extent N/A N/I

3.21. Is there feedback on activities by the instructor(s) in this course?

Yes No

3.22. If there is feedback, is the way feedback will be provided clearly explained to the participants?

Yes No N/A


3.23. Are the peer-interaction groups given specific directions for interaction?

Yes No N/A


3.24. Does each member of a peer-interaction group have a specific role to play?

Yes No N/A

C.2.2 Quality Matters Online Rubric (*online sample, 2016-2018*)

 Standards from the QM Higher Education Rubric, Fifth Edition		
		Points
Course Overview Introduction	1.1 Instructions make clear how to get started and where to find various course components.	3
	1.2 Learners are introduced to the purpose and structure of the course.	3
	1.3 Etiquette expectations (sometimes called "netiquette") for online discussions, email, and other forms of communication are clearly stated.	2
	1.4 Course and/or institutional policies with which the learner is expected to comply are clearly stated, or a link to current policies is provided.	2
	1.5 Minimum technology requirements are clearly stated and instructions for use provided.	2
	1.6 Prerequisite knowledge in the discipline and/or any required competencies are clearly stated.	1
	1.7 Minimum technical skills expected of the learner are clearly stated.	1
	1.8 The self-introduction by the instructor is appropriate and is available online.	1
	1.9 Learners are asked to introduce themselves to the class.	1
Learning Objectives (Competencies)	2.1 The course learning objectives, or course/program competencies, describe outcomes that are measurable.	3
	2.2 The module/unit learning objectives or competencies describe outcomes that are measurable and consistent with the course-level objectives or competencies.	3
	2.3 All learning objectives or competencies are stated clearly and written from the learner's perspective.	3
	2.4 The relationship between learning objectives or competencies and course activities is clearly stated.	3
	2.5 The learning objectives or competencies are suited to the level of the course.	3
Assessment and Measurement	3.1 The assessments measure the stated learning objectives or competencies.	3
	3.2 The course grading policy is stated clearly.	3
	3.3 Specific and descriptive criteria are provided for the evaluation of learners' work and are tied to the course grading policy.	3
	3.4 The assessment instruments selected are sequenced, varied, and suited to the learner work being assessed.	2
	3.5 The course provides learners with multiple opportunities to track their learning progress.	2
Instructional Materials	4.1 The instructional materials contribute to the achievement of the stated course and module/unit learning objectives or competencies.	3
	4.2 Both the purpose of instructional materials and how the materials are to be used for learning activities are clearly explained.	3
	4.3 All instructional materials used in the course are appropriately cited.	2
	4.4 The instructional materials are current.	2
	4.5 A variety of instructional materials is used in the course.	2
	4.6 The distinction between required and optional materials is clearly explained.	1
Course Activities and Learner Interaction	5.1 The learning activities promote the achievement of the stated learning objectives or competencies.	3
	5.2 Learning activities provide opportunities for interaction that support active learning.	3
	5.3 The instructor's plan for classroom response time and feedback on assignments is clearly stated.	3
	5.4 The requirements for learner interaction are clearly stated.	2
Course Technology	6.1 The tools used in the course support the learning objectives and competencies.	3
	6.2 Course tools promote learner engagement and active learning.	3
	6.3 Technologies required in the course are readily obtainable.	2
	6.4 The course technologies are current.	1
	6.5 Links are provided to privacy policies for all external tools required in the course.	1
Learner Support	7.1 The course instructions articulate or link to a clear description of the technical support offered and how to obtain it.	3
	7.2 Course instructions articulate or link to the institution's accessibility policies and services.	3
	7.3 Course instructions articulate or link to an explanation of how the institution's academic support services and resources can help learners succeed in the course and how learners can obtain them.	2
	7.4 Course instructions articulate or link to an explanation of how the institution's student services and resources can help learners succeed and how learners can obtain them.	1
Accessibility and Usability*	8.1 Course navigation facilitates ease of use.	3
	8.2 Information is provided about the accessibility of all technologies required in the course.	3
	8.3 The course provides alternative means of access to course materials in formats that meet the needs of diverse learners.	2
	8.4 The course design facilitates readability.	2
	8.5 Course multimedia facilitate ease of use.	2

C.2.3 OpenupEd Quality Assurance (*tool sample*)²⁷



Quality Assurance processes during the design, development and implementation of MOOCs can be complex. Quality Assurance (QA) on MOOCs cannot be easily standardised as they have several different aims. Even within one MOOC there are no uniform aims between actors involved (institution, the teaching staff involved and the participants). Moreover, MOOCs are designed for various target groups, and even within 'one target group' the motivation and intention of MOOC participants vary a lot.

Note that QA is a systematic process designed to identify, analyse and eliminate variation (defects) in processes and outcomes. The overall aim is to guarantee a high quality of MOOCs.

The quality assurance spectrum in general is characterised by:

Quality Assurance spectrum

Check compliance with quality standards

Checklist

Quality dimensions, for example:

- Is it a MOOC, or not?
- Quality of the design of MOOCs
- Accessibility
- Technical platform and support

Support institutions in quality enhancement

OpenupEd label

Institutional MOOC quality label, feasibility to:

- set relevant goals
- demonstrate quality of performance
- plan for improvement

QA assumes a metric set of standards and best practices. OpenupEd states that quality principles developed for Higher Education (HE) could be used to improve the quality of MOOCs. This ranges from systems which check compliance to norms and often focus on product, to systems that aim at quality enhancement by focusing on process. Most present QA systems for MOOCs are characterised by externally set norms, whereas with the OpenupEd Label, institutions have embedded processes aimed at quality enhancement towards their own objectives.

In this spectrum new OpenupEd partners are expected to achieve the OpenupEd Label within three years after entry. Upon entry the MOOC offering of the institutions is checked with some basic checklists based on several standards and best practices.

On the next page these checklists are presented for the following dimensions:

1. Is it a MOOC or not?
2. Quality of the design of MOOCs
3. Accessibility
4. Technical platform and support for staff and participants

New partners are expected to self-assess their MOOC offering accordingly and submit the completed checklist (with an [official letter](#) for becoming OpenupEd partner).

²⁷ The full downloadable version of the tool in pdf is available here: <http://www.openuped.eu/quality-label/223-mooc-checklists>. Last accessed: April, 2018

Checklist 1: Is it a MOOC or not?

OpenupEd adopted the following definition of a MOOC, as developed by many European MOOC initiatives:

"An online course designed for large numbers of participants that can be accessed by anyone anywhere as long as they have an Internet connection, are open to everyone without entry qualifications and offer a full/complete course experience online, for free."

Table 1. Review "Is it a MOOC or not?"

Levels: NA (Not achieved) ; PA (Partially achieved) ; LA (Largely achieved) ; FA (Fully achieved)

Dimension	Criteria	Is it a MOOC or not?			
		NA	PA	LA	FA
Massive	The (pedagogical model of the) course is such that the efforts of all services (including of academic staff on tutoring, tests, etc.) does not increase significantly as the number of participants increases	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Open	Course accessible to (almost) all people without limitations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	At least the course content is always accessible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Course can be accessed anywhere as long as someone has an internet connection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	No qualifications / diplomas needed to participate in the online course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Full course experience without any costs for participants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online	All aspects of the course are delivered online	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Course – study unit	The total study time of a MOOC is minimal 1 ECTS ((25-30 hours of study)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Full course	The course offers a full course experience including:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	educational content may include Video – Audio - Text – Games (incl. simulation) – Social Media – Animation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	offers possibilities for interaction, such as social media channels, forums, blogs or RSS readers to build a learning community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	participants are provided with some feedback mechanism. Can be automatically generated (e.g., quizzes), only by peers (peer feedback) and/or general feedback from academic staff, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	always includes some kind of recognition like badges or a certificate of completion. A formal certificate is optional and most likely has to be paid for	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

C.3 E-mail inviting participants

Dear participants,

I would like to invite you to this research group which starts today, on Sunday the 1st of April 2018 and finishes on Tuesday the 10th of April 2018. Please find attached:

- A document with all important information about the research group and its objectives (**Research Group_Information Sheet_For participants**). Make sure that you first read this document.
- 2 documents with the 2 quality assessment tools.
- The link of the 3rd online quality tool: https://www.gmprogram.org/review/index.cfm?option=sample_worksheet_reviewer&program=2 (e-mail: valeria@gsic.uva.es, password: gsicuvaes2018).

Important notification about the 3rd quality framework: This quality framework provides its tool only online. But! You can't save individually your responses on the platform, since it is one specific account and you are going to overwrite on someone else's responses. For this reason I would be really grateful in case you want to keep some notes about the tool and its layout, to do it in another document.

At this point I would like to thank you in advance for your participation. Your views will be of great help. Do not hesitate to contact me whether you need further clarification.

Yours faithfully,
Valeria Aloizou

C.4 Information sheet for participants

INFORMATION SHEET FOR PARTICIPANTS

Valeria Aloizou
valeria@gsic.uva.es

Escuela Técnica Superior de Ingenieros de Telecomunicación, Universidad de Valladolid,
Paseo de Belén 15, 47011 Valladolid, Spain

I would like to invite you answer an online questionnaire for master thesis purpose. Before answering the questionnaire, it is important for you to understand why the research is being done and what your participation will involve. Please take some time to read the following information carefully.

I. Background of the study

Massive Open Online Courses (MOOCs) have gained ground in the field of Technology Enhanced Learning (TEL) since they provide a wide range of educational opportunities to a large number of participants around the globe. Since nowadays MOOCs' delivery constitutes an innovative part of modern education, the question of whether or not MOOCs provide good quality instruction is a matter of discussion. Although usually the quality of a course is measured by learners' practices analyses, the focus of this study is to assess the instructional design quality and see what important information can be collected for the success or not of a MOOC. The assessment procedure is going to be applied in a case study and more specifically to a MOOC that has been already implemented by GSIC-EMIC research group. Important conclusions are expected through this procedure since it will present an organized instructional design assessment of a MOOC that was designed based on active learning pedagogies. Therefore, the dissertation could be as well an important contribution, by analyzing and providing the actual results of the MOOC, "Innovative and Collaborative Learning with ICT" in terms of quality.

A Systematic Literature Review has been already conducted in order to search the “Quality in MOOCs terrain. From this Systematic Literature Review were detected some quality frameworks which have been used so far in order to assess the quality of MOOC courses. The first 10 quality frameworks were compared and contrasted according to a set of criteria. Consequently, 3 quality frameworks fulfilled most of the criteria and these are:

1. **The ten-principle framework**
2. **OpenupED Quality Label**
3. **Quality Matters Framework**

The ten-principle framework (Margaryan, 2015): This study presents the methodology and the results of a thorough instructional design analysis of 76 randomly selected Massive Open Online Courses (MOOCs). Researchers assessed the instructional design quality of MOOCs using a set of key criteria based upon the First Five Principles of Instruction which were: Problem-centered, Activation, Demonstration, Application, Integration (Merrill, 2002; Merrill, 2009; Merrill, 2013). However, since Merrill's First Principles of Instruction focus on learning activities, researchers augmented these principles by a set of five further principles focused on learning resources (i.e. course materials), and learning supports (i.e. the processes and procedures such as: expert feedback that assist learners in carrying out learning activities). These additional principles were abstracted from the literature and include: Collective knowledge, Collaboration, Differentiation, Authentic resources and Feedback. A data collection instrument termed *Course Scan* was devised to measure the course design quality in relation to each of the ten principles (Margaryan & Collis, 2005). In this study the researchers used a refined and extended version of the *Course Scan* instrument developed by Margaryan and Collis (2005), which is clearly presented on the appendix of their study. As far as the analysis is concerned, that involved a research on the course description, course materials and resources, learning activity descriptions, learners' submissions and discussions in the course website, to determine if evidence for each of the items of the *Course Scan* (i.e. for first principles of instruction), could be found in each course and to what extent a particular principle was reflected in the course.

OpenupED Quality Label: The OpenupEd Quality Label is intended to encourage quality enhancement for MOOCs and their providers. It was derived from the E-xcellence label²⁸, which provides a methodology for assessing the quality of e-learning in higher education (HE) (Rosewell & Jansen, 2014). OpenupEd aims to be a distinct quality brand embracing a wide diversity of (institutional) approaches to open up education via the use of MOOCs. As a consequence, OpenupEd partners agreed to develop a quality label for MOOCs tailored to both e-learning and open education (Jansen, Rosewell & Kear, 2016). The associated institutional benchmarking with this label is primarily meant to be applied as an improvement tool, comparing institutional performances with current best practices and leading to measures to raise the quality of its MOOCs (Rodrigo, Read, Lancho & Paniagua, 2014). This process is designed to complement both an institutional course approval process, and ongoing evaluation and monitoring of courses in presentation (Rosewell & Jansen, 2014). OpenupEd provides guidance to enhance the quality of MOOCs tailored to the best practices in e-learning and open education. To this end, OpenupEd offers various MOOC checklists and support materials open to anyone. The OpenupEd Label supports institutions in their quality enhancement of MOOC provision, focusing on quality assurance processes in place (Rosewell, 2015). They therefore have developed several checklists that support universities in self-assessing their MOOC development (OpenUp Ed, 2017).

Quality Matters Framework: Quality Matters Framework (QM) is one of the most popular and widely used quality assurance frameworks in the United States (Lowenthal & Hodges, 2015). Quality Matters began under a Department of Education Fund for Improvement of Post-Secondary Education (FIPSE) grant. Quality Matters (QM) is now an international organization focused on improving the quality of online courses at the K-12, Higher Education, and Professional Education levels. There are currently more than 800 QM subscribers (Shattuck, Zimmerman, & Adair, 2014). QM is a peer review and faculty development process that is centered on the following eight general standards: Course overview and introduction, learning objectives, assessment and measurement, instructional materials, learner interaction and

²⁸ E-xcellence in e-learning: <http://e-xcellencelabel.eadtu.eu/>. Last accessed: March 2018

engagement, course technology, learner support, accessibility (Quality Matters, 2016-2018). Each of these general standards has a number of related and more specific sub-standards. While each subscriber arguably could use QM differently, the formal QM process involves taking a course that has been taught before and having it reviewed by three peer reviewers (which must include one master review, one subject matter expert, and one external reviewer), to see if each standard has been met and then revising the course to meet any standards that were not met. It is a widely accepted model for designing quality online courses (Shattuck, 2012). Moreover, there are some studies reporting the results of using the QM in MOOCs as well (Zutshi, O'Hare, & Rodafinos, 2013; Kocdac & Aydin, 2015; Lowenthal & Hodges, 2015).

II. Purpose and objectives

The purpose of the present questionnaire is to **assess the quality tools** that the 3 finally selected quality frameworks provide by **implementing them** on the “Innovative and Collaborative Learning with ICT” MOOC, in order to **assess its instructional design quality**. The assessment of the quality tools will be done individually by all participants, following the questions which are provided subsequently. The final answers will be gathered, will be thoroughly revised and a focus group will be carried out on **Friday the 13th of April 2018** in order to draw important conclusions on the topic.

III. MOOC Course – Instructional Design Overview

“Innovative Collaborative Learning with ICT”²⁹ MOOC was delivered both in English and Spanish. The course targeted innovative pre-service and in-service teachers interested in incorporating collaboration with technology into their own teaching practices. On the table summary data is provided. The course was deployed in the Canvas Network platform, a total of six weeks: five weeks (one for each of five modules) plus an additional week to allow students to complete the peer review of the final project and fill out the final satisfaction survey.

²⁹ Canvas Network: <https://learn.canvas.net/courses/1512>. Last accessed: March 2018.

Concept	Number of Participants
Total Enrolments	759
Welcome Survey	174 (22.9% of the enrolled)
Final satisfaction survey	52 (6.85% of the enrolled)
Certificate	29 (3.8% of the enrolled)

On the *home page* of the course there is a *welcome note* from the instructors, presenting an overview of the course context. On the upper side of the *welcome note* is clearly displayed the language selection. Scrolling down the home page we can see the course structure, according

to which: “Each course module spans a whole week. Before the starting date (12/June) we invite you to visit the contents of the “Week 0” module where you will find additional information about the course, as well as a set of preliminary small tasks that you need to complete before starting with the subsequent modules”. In this part is pretty clear that the participants should go

through *Week 0* before starting their course in order to acquire important information concerning the context of the course. Also, participants should go through preliminary tasks, which are very important for the collaborative activities. We will focus on this later on while analyzing in detail the way that *Week 0* was structured. Subsequently the week modules are

The screenshot shows the home page of the MOOC course 'Innovative Collaborative Learning with ICT'. The page layout includes a navigation menu on the left, a main content area, and a 'To Do' list on the right. Key elements are annotated with dashed boxes and arrows:

- MOOC Course title:** 'Innovative Collaborative Learning with ICT' (highlighted in a red box).
- Language Selection:** 'ENGLISH' and 'ESPAÑOL' buttons (highlighted in a blue box).
- Welcome note:** A 'Welcome!!' message with a brief overview of the course (highlighted in a purple box).
- Course Structure:** A list of course modules, including 'WEEK 0 - Course information and preliminary steps' (highlighted in a blue box).
- Embedded welcome video:** A video player with a play button and 'English transcription' link (highlighted in a green box).
- Week Modules:** A list of course modules (highlighted in an orange box).

Figure 1: Home page of the “Innovative and Collaborative Learning with ICT” MOOC course

presented, followed by an embedded welcome video and its transcription. In that video, MOOC course instructors offer a warm welcome to all participants, introducing themselves and providing them with important information concerning the course and its general layout. The enrolment was closed at the end of the first week to allow the designers to configure properly the groups for the collaborative assignment of the second week. A free certificate was given to the students who completed the mandatory assignments (one per week) in addition to the two surveys.

Week 0 - Course information and preliminary steps: This week consists of course general information; preliminary short tasks; a questionnaire and options for interaction in social networks. In course information part there is a video explaining the main goals of the course, its structure and the different ways in which students can participate and contribute. Furthermore more information is provided including: *course description*; with course dates, workload and requirements, *course objectives*, *course audience*, *certificates*, *badges* and a brief presentation of the instructors. In preliminary short tasks, participants are asked to follow specific steps in order to register in ILDE (Integrated Learning Design Environment), a web-based environment in which communities of teachers can collaborate in order to design their learning scenarios (also known as "learning designs"). This registration is important because participants should use the ILDE many times during the course. ILDE manual and a supportive embedded video are also provided to help the participants complete this preliminary short task. ILDE also provides support to teachers to the whole lifecycle of CSCL activities (conceptualization, instantiation, deployment). In the course, students had the opportunity of performing activities following the whole cycle. The assignment is a questionnaire of 22 questions such as: "In which language do you prefer to carry out the activities of the course?", "Please, let us know your highest level of education", "What is your domain/sector of work/study?", "There are different roles in the course attending to the goals of each student. What type of online student do you think it describes you better?". This questionnaire is very important for the instructors, since is intended to get to know the profile of the participants, their preferences, their level of knowledge, and their potential needs along the course. Through this information, instructors

can later on divide the participants into groups in order to carry out the collaborative activities. This is a reason why it's a compulsory activity in order to acquire the final certificate. The last section of this week, informs the participants how they could socialize online through Twitter and general forums. From the Twitter profile *@CLaTmooc*³⁰ participants could use the hashtag *#CLaTmooc* to publish information about the course (events, updates, etc.). They could publish their messages both in English and Spanish sharing their thoughts, suggestions, material etc. Moreover, participants could use a general forum to post any comment regarding the course (e.g., doubts about scheduling, suggestions for improvements, technical problems, etc.). They could also use the forum to share resources, links, videos, etc., that they thought might be interesting for the course. Finally, participants could give a "like" to the posts of other participants.

Week 1 to Week 5: During these weeks a variety of individual activities, assignments and a collaborative activity was designed under the topics: "Collaborative learning and ICT for students", "Collaborative learning and ICT for teachers" (designing and implementing a Pyramid-based scenario etc.). Complementary resources and open forums were available for the participants for further support. Apart from the activities and the assignments, there were also optional individual and group quizzes for gaining badges each week, so that participants can refresh their knowledge through gamified learning. The weeks were organized as follows:

- **Week 1:** Present the basic concepts of CL in general (not necessarily using ICTs).
- **Week 2:** Present ICT for CL: tools for students (i.e., for carrying out learning activities) and for teachers (i.e., for designing CL situations).
- **Week 3 and week 4:** Illustrate how to design and implement CL situations based on 2 patterns (pyramid and jigsaw) using ILDE. The scenarios to design and implement are provided by the instructors.
- **Week 5:** The participants are devised in order to design and implement their own learning scenarios.

³⁰ CLaTmooc on Twitter: <https://twitter.com/CLaTmooc>

The course is summing up with a final questionnaire of 61 questions, asking participant's opinion about the structure of the course, its activities, the collaboration experience and their final knowledge acquisition. Also, at this point participants can request their course certificate.

IV. Questionnaire

After the application of the quality assessment tools which were provided on the e-mail, all participants are asked to complete the following questionnaire, which is consisted of 7 open questions. Your opinion is of great importance in order to gather vital information concerning the quality assessment tools. You can find the questions below **but!** please make sure that you **will provide your answers on this Google Doc link:** https://docs.google.com/forms/d/e/1FAIpQLSeop-rJCqjOX_Ga42xu_knNYqBeFS4eNsKEfvsHXcF9K63SSw/viewform?usp=pp_url&entry.846081579&entry.609533283&entry.1944755351&entry.433124664&entry.1475222174&entry.1275881870&entry.1550593223

Questionnaire

1. State your opinion concerning the **utility** of the provided quality assessment tools.
2. Was it possible for you to **assess the quality of the instructional design** of the MOOC course by using these tools? Why?
3. Was it possible for you to **assess the quality of the active learning pedagogies** by using these tools? Why?
4. Which of these tools was more **useful** for you? Why?
5. Which of these tools was **less time consuming** while applying?
6. Do the tools have any **disadvantages**? If yes, which are they?
7. Would you use these tools in order to **assess the instructional design** of other MOOCs in the **future**? Which one and why?

All answers are expected until **Tuesday on the 10th of April.**

Thank you very much for your participation!

C.5 Participants' responses on the online questionnaire

Question 1: State your opinion concerning the utility of the provided quality assessment tools. (7 responses)

- i. *These tools can be useful as a kind of "checklist" during the design of the MOOC. But I'm not sure they can be used easily as a way of assessing the quality. Implicitly, answering "yes" to the questions imply a higher quality. But: some of the questions are very difficult to answer "objectively"; and, some of the questions don't apply so much to the MOOC. I still see some value on them to be used as "guidelines" during the design... but not so much as an "assessment" instrument.*
- ii. *In general terms, I have found the three instruments relevant for MOOC designers. I think that these tools might help MOOC designers to pay attention to significant aspects to improve the quality of their MOOC courses. Although "MOOC Scan" is more focused on the quality of pedagogical designs in MOOCs, the three instruments included more or less detailed information about the following topics. -General information of the MOOC -Objectives/competencies/course organization -Pedagogical design/principles/ • Learner interaction • Learner support • Feedback, assessment criteria, monitoring of students' progress QA spectrum and Quality matters also included information about more dimensions related to accessibility, usability and ethical aspects: technical support, learning materials, platform features, students behaviour, data ownership, etc.) And students' workload.*
- iii. *The tools have been quite useful in order to identify several characteristics that should be achieved in a MOOC. These instruments make me realize about many issues that should be taken into account when designing a MOOC. There are some questions I wasn't be able to understand. I missed more questions about the resources of media to engage students in this type of non-formal and open courses.*
- iv. *I think they are useful, although and there are some sections, as in the case of OpenupEd tool in: "Checklist 1: Is it a MOOC or not?" that are NOT necessary because it is a MOOC is quite evident. The sections of these most interesting tools are those that focus on the design MOOC, type of activities, student learning, student interaction, technological tools used ...*
- v. *The creation of quality assessment tools seem a good strategy to help MOOC teachers design and re-design their courses. However, I would prefer something more specific regarding your own MOOC since the options, from my point of view, are too broad. For example, I would recommend to introduce at the begining of the framework, the types of resources and activities that the course implements (similar as one of the frameworks does regarding cMOOC and xMOOC) and depending on this, the options to measure the quality should be different.*
- vi. *To begin with, the three tools, include interesting questions which help you to reflect on many aspects that perhaps while designing you do not pay attention. However, the MOOC Scan Questionnaire and the OpenupEd_Quality_Assurance seemed more useful for me regarding the way they formed their items and their more "approachable" vocabulary.*
- vii. *The QA tools are useful to identify aspects that should be taken into account when designing a MOOC, and to identify possible weaknesses that have to be addressed. For example, in our case, the aspects related to assessment and the institutional support seem to be the weakest aspects. I found QM less useful because it only allows two alternatives: Yes or No (and in many cases, the answer was neither of them). I found it easier to use the likert of Margaryan or the scale by OpenupEd. The items respond to an underlying model of what should appear in a MOOC, and in some cases, these assumptions could be considered not applicable (or not relevant). For example, question 3.7 that asks for different levels of examples (from poor to excellent) could be considered as not relevant depending on the kind of learning objective. However, in general, it is easy to understand (and to share) the underlying assumption that leads to each item.*

Question 2: Was it possible for you to assess the quality of the instructional design of the MOOC course by using these tools? Why? (7 responses)

- i. *I'd say they helped me realized that the instructional design had taken into account some "basic" elements of any learning design (e.g., stating objectives, defining assessment criteria, etc...). But I see them quite "basic" and no so much focused on MOOCs... Maybe this might be much more useful for novel designers (?)*
- ii. *I think that the quality assurance spectrum instrument is more focused in identifying if the activities and general proposals that are part of a certain MOOC follow a MOOC philosophy or not. Thus, I think that might be less useful in assessing the pedagogical design of a particular MOOC because the items are more general according to this aspect. However, this instrument provides valuable information to analyze the assessment and the feedback mechanism used in a particular MOOC (e.g., the frequency of monitoring been planed; the means used by the tutor to provide feedback; the wrap-up activities carried out by the instructors; instruments driven-assessment, etc.). Similarly to Quality Matters instrument it also contains some questions regarding the opportunities to monitor the students' progress within the MOOC. Standards from 2 to 5 of the he quality matters instrument pointed out relevant questions to assess the quality of an instructional design in a MOOC environment. Personally, I think, the most a complete instrument for assessing the quality of a MOOC instructional design is the MOOC Scan. All the dimensions contained go deeper in important issues that can help instructors to think about if the pedagogical structure of the MOOC is aligned with active pedagogies (e.g., problem centered, activation, demonstration, application etc.). Besides, it is worth noting the distinction between the meaning of collective knowledge and collaboration dimensions. On the other hand, the dimension related to the feedback is not very well developed. There are important aspects regarding the assessment that affects the quality design in a MOOC that are not informed in this instrument.*
- iii. *The tools provided in a document (Margaryan and OpenupEd) have allowed me to assess the quality of the course, however, the third tool (online) required me a lot of time to understand the web page and I wasn't be able to see the form of assessing a course.*
- iv. *Yes, it has been possible to assess the quality of the instructional design, with the content and type of activities carried out, structure of the MOOC, and teach students, technological tools used, collaborative learning, P2P...*
- v. *I couldn't answer many of the questions of the tools because I don't know which were the goals and objectives of every module and how they related to the different activities and tools implemented. In any case, some questions made me reflect about the quality of some aspects of the course such as the technological support.*
- vi. *To tell the truth, I am not an expert on the instructional design. In general the three tools attempted more or less to assess the quality of the instructional design of a MOOC and perhaps a bit more the online quality framework with questions stretching the focus on the way the material was organized.*
- vii. *In general, yes. The different frameworks include questions that lead to reflect on this aspect. In the case of Margaryan, the questions reflect their underlying model and whether the instructional design responds to it; in OpenupEdu deals with aspects that are specific to MOOCs (such as the need to consider the diversity of learners). QM also includes questions about it, although the fact it only provides two possible answers seemed too limited to me.*

Question 3: Was it possible for you to assess the quality of the active learning pedagogies by using these tools? Why? (7 responses)

- i. *No. They ask me whether I was using Collaborative Learning, for instance. But they don't help me assess whether the Collaborative Learning approach I followed had a high quality.*
- ii. *All the instruments contained useful information about the MOOC learning design. However, just MOOC scan instrument go deeper in identifying key issues that are related to active learning pedagogies (e.g., if the course activities take into account real-world problems, if the activities take into account learners previous knowledge; if the activities are relevant for learning in a workplace context; if the activities includes significant examples according to the target, if the activities promote the collaboration, if the activities foster the positive interdependence, etc..).*
- iii. *Margaryan included questions about active learning which allow assessing several aspect about the inclusion in the course of this type of pedagogies.*

- iv. *Yes because of the use of collaboration in one of the activities and the use of tools that allow collaboration between participants and P2P*
- v. *No, because the questions regarding active pedagogies were mainly focused on participation and collaboration, but there are many other strategies that promote active learning and were not evaluated (e.g., inquiry-based learning, problem-solving, role-playing, game-based learning or gamification).*
- vi. *In general the assessment of the quality of the active pedagogies was not highlighted so much. The MOOC Scan Questionnaire achieved the assessment of this aspect in a higher degree than the others, by including many question regarding collaborative learning. The other two tools didn't help me to assess the quality of the active learning pedagogies applied.*
- vii. *Margaryan includes questions that help to assess this aspect. It includes questions that help to assess whether the design has taken into account some well known conditions of collaborative work, such as individual accountability, need of interacting, the possibility of defining roles, etc. The other two frameworks are less specific about this issue.*

Question 4: Which of these tools was more useful for you? Why? (7 responses)

- i. *For me, the Quality Matters seems the best one... The questions are more concrete (not always), and it is "self-explained".*
- ii. *It depends on what you want to analyze. I mean, if you want to focus in active pedagogies in MOOCs, "MOOC scan instrument" will be more complete. However, the dimensions related to feedback, monitoring and assessment are underdeveloped in this instrument. Moreover, the workload that the design of a MOOC implies for the student it is not formally developed in this instrument. If you want to analyze more aspects related to the platform usability etc.. probably some dimensions contained in the other two instruments will be more useful.*
- iii. *I think I rather prefer the Margaryan instrument; however I would include in it some questions of the OpenupEd instrument.*
- iv. *Although you can improve the three or maybe mix them, you would choose the tool of MOOC Scan for the principles of instruction it represents*
- v. *I think the OpenEd checklist because the questions were well organized, the questions were clear and focused on the content and there were different possibilities when answering (not like the 3rd one).*
- vi. *The most useful tool, personally, was the OpenupEd_Quality_Assurance. The items were categorized in a way that helped me to reflect on the nature of the CLatMOOC. The MOOC Scan Questionnaire was interesting too, but I feel it can be applied to other learning settings because its items do not help the participant to reflect on the nature of the MOOC itself.*
- vii. *I found Margaryan useful to assess certain pedagogical aspects, and OpenupEd was very useful to assess aspects that have to be taken into account that are specific to MOOCs. QM is more institutional, I found it less useful.*

Question 5: Which of these tools was less time consuming while applying? (7 responses)

- i. *Maybe Quality Matters took me a bit longer than the other two... But we are in the 15-20 minutes range, anyway.*
- ii. *I guess the less consuming instrument is the QA spectrum because it is shorter and it does not contain open questions.*
- iii. *Margaryan*
- iv. *The OpenupEd tool because its very schematic and clear in tables by dimension, criteria and design of the MOOC*
- v. *OpenEd Checklist*
- vi. *The MOOC Scan Questionnaire was the less time consuming one with the least number of questions among the three of them. The same time, the "approachable" vocabulary used for each item reduced the time needed to precede the information given.*

- vii. *For me, Margaryan, because it dealt with the instructional design and was easier for me to answer its questions. The other two had some questions that I did not find easy to answer (as I was not designer of the course and I have not interacted with the system as an instructor).*

Question 6: Do the tools have any disadvantages? If yes, which are they? (7 responses)


- i. *I'm sending my note to you via email...*
- ii. *Some questions are a little bit ambiguous. Mooc scan and QA spectrum instruments only contain closed questions. I think that in general terms will be useful to have a more detailed explanation of some responses obtained from MOOC instructors.*
- iii. *Maybe there are some questions that are not completely clear for the reader (or maybe it is only for me!)*
- iv. *I think so, some sections could be specified more and do more subsections as in section 3 of the tool MOOC Scan*
- v. *The last one only had the possibilities "Met" and "Not Met" .. And I think in many cases there is a need of an intermediate option. Also, as I said before, depending on the goals, activities and resources implemented, the questionnaire should be different.*
- vi. *Personally speaking, the scoring item of the online quality framework was not so useful.*
- vii. *Yes! 1. They rely on underlying assumptions. If you not share those assumptions, the tools (or the part of them related to these assumptions) are not useful. 2. Some questions are difficult to answer if you are not a designer of the course, or you are very acquainted with the platform.*

Question 7: Would you use these tools in order to assess the instructional design of other MOOCs in the future? Which one and why? (7 responses)


- i. *I might use Quality Matters during my design activities (a priori) but not so much to assess the quality of the resulting instructional design...*
- ii. *Yes, I think that there are useful tools to think about important aspects to pay attention to. To assess a MOOC instructional design I would use the "MOOC scan instrument" because is more oriented in pedagogies and active learning. However, I would enrich this instrument with more questions related to feedback, assessment, learners monitoring, and some questions about learning materials.*
- iii. *I think that assessing the quality of a MOOC designed by other people is quite difficult. You need to know and understand anything about the course. This is a very complicated task and these instruments can help to carry it out. However, from my view, these instruments would be very useful when designing a new MOOC in order to take into account every important issue from the beginning of the design process.*
- iv. *Maybe I would use the MOOC Scan tool because of what is mentioned in the question 4 (principles of instruction that the tool represents)*
- v. *Maybe I would use them (some questions) to check if I forgot something during the design and implementation of a MOOC.. In any case, officially I have never been teacher of a MOOC :D*
- vi. *I would like to use the MOOC Scan Questionnaire and the OpenupEd_Quality_Assurance tools due to their interesting questions.*
- vii. *I think I would start using OpenupEd because it focuses on aspects that are unique for MOOCs (and I need support in that part, as I am not used to design MOOCs). Margaryan's is less specific to MOOCs, but includes some questions related to the implementation of the interactive behavior that could be also useful to take into account. Finally, some questions from QM could be added if the MOOC is going to have an institutional support.*

Appendix D


D.1 Focus Group - Participants' List



Universidad de Valladolid



GSIC/EMIC










Focus Group

Focus Group (Data Gathering Technique): Further analysis of important points that occurred from the research group feedback in terms of Master Thesis of the Erasmus+ student, Valeria Aloizou.

13 April, 2018
GSIC-EMIC Lab, Valladolid, Spain

Participants List

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D.2 Focus Group - Transcription

General Question: Which are the most important elements that an assessment tool (for assessing the instructional design) should have in order to be useful?

P.2³¹: I was considering them as a priori. I mean that I already have the design so I use the instruments and I was checking if I am maybe missing something important. That's the way that I understood the instruments. If you are asking what I should look at once the MOOC course is over, then I should look at what the students did. To see if they completed the tasks, whether they dropped out, whether there were complaints in the forums. I mean I should check first at the course data and see the impact of my design decisions. But that was something that was missing in the instruments. The instruments weren't dealing with that part. There are two things. Elements that should be in the design, that are missing, maybe the quality of the design, and then we have the personal (designer's), design decisions. So it's different the question: Did I include the objectives in the design? And this is an objective answer. Yes or No? If the answer is No maybe this is an indicator that the quality is not good. The instruments can't offer assessment about the objectives that a designers sets. Maybe there are kind of guidelines, advices, hints, tips, whatever that can help a designer to make good decisions. But apart from that I can't expect any instrument to say that this objective good because it depends on the context etc.

So the instruments partially offer support for the first part by asking: "Did you include the objectives?" etc. that I should take into account. And then there were other questions that had to do with the other part: "Did the objectives have an influence on how the students learnt?" But this question is difficult to answer. And this is a big question that can't easily answer because I can say if I included or not the objectives but I don't know if they were effective.

P.1: I agree with this and I had the same feeling and especially with the online one (*Quality Matters*), because instructors they can't just answer met or not met if he doesn't take into account the students results and opinions.

Interviewer (question for further clarification concerning the measurements of the tool): I case you needed an assessment tool in order to apply in your MOOC courses; do all of you share the same opinion that scale or Likert scale method will be the best one? Because with answers met/not met is not that clear?

P.2: It depends on the question. For example in the question: "Did you fulfill the objectives? Yes or No?". And then there might be questions that make you reflect on the quality of the objectives. In that case there might be a scale. But I am not so concerned about the data itself. Whether is scale or natural language? The point is the nature of the questions that will help you to reflect and make you realize that maybe you are skipping something. Like: "Try to describe the context of your students". In that case apart from an assessment instrument it could be a design instrument.

P.3: Probably if you want to go a little bit deeper in order to learn about learning design and the context, open questions might be more useful in order to gather more deep information from the teachers. Because sometimes you can put a scale from 1 to 10 but it doesn't mean anything.

P.5: Also what I was missing was that depending on the type of activities that you include in your design, the questions should be different. I mean if you have like forum activities in order to assess the course or if the objectives were met or not you can pose a question like: "How these discussion forums were related to the objectives?" or "How are these activities related to these objectives".

P.3/P.2: In *Margaryan's* ("MOOC Scan Questionnaire") there were these type of questions but the tool was missing the assessment, the evaluation. Because we need an alignment among objectives, activities and assessment and that part was missing.

³¹ Abbreviation used for focus group participants, who were 7 in total.

P.5: Also I want to add that the tools reminded me a lot the Canvas checklist that the platform provides us before designing our course and it was compulsory.

P.2: Yes, I agree and I have put a comment on it. That's why I have answered to the research group questionnaire that they are like "Checklists". Like while I am doing the design please don't forget about these elements.

P.5: I don't have experience with other platforms but I suppose that other platforms provide this kind of checklists in the beginning of the design. These checklists are provided before implementing the course.

P.6: I agree with what was said. So it depends on the objectives but if you are interested on assessing the quality of the MOOC, of your design, if it was successful you need to include some results. So for redesigning the MOOC, maybe it could be useful to have some kind of guidelines or indicators that could help you to assess for example the workload of the students, you need some typical rates and things like that should be also included.

P.5: Yes I agree with P.6. We need some standard questions for the students at the end of the MOOC. That will help us to assess the quality of our MOOCs in the end of the MOOC.

P.6: And also other like standard measurements of success like if the dropout rate or the intention rate of this MOOC is lower than 5%, maybe there was a problem. We don't know what but the designers should reflect.

P.2: Yes, this idea reminds me a lot design analytics. Gathering data of what went on during the course and how these help can you assess the bad design decisions. But the quality can be related to whether the design is complete and whether your design decisions were good or not. And from my point of view the checklists can help you for the first part for the second part I think is a big problem.

Interviewer: So let's say that these tools were important for this first part that you have already mentioned? To check if the course was complete and concerning the other part could be covered in another way.

P.2: Yes I guess so. Because the tools I think they can't tell you whether the decisions were correct or wrong.

General Question: Do you suggest mixing the tools or finally choosing "the best" out of the two and improve it?

P.3: Concerning the *Margaryan's instrument* ("MOOC Scan Questionnaire") is more complete in terms of the assessment and learning design, because there are more questions reflecting on the pedagogical design. But the part referring to the feedback is not that developed. There are only just 2 to 3 questions and the other 2 questionnaires include more questions that refer to assessment issues.

P.2: The one that I preferred was the *Quality Matters* online tool because it provides recommendations and good explanations which they call "*annotations*", which is the idea behind the question and they help you to answer the question. So maybe it is a design instrument rather than an assessment instrument.

P.1: For me *Quality Matters* was well organized. My basic problem, since I am not an instructional designer, was the vocabulary. I devoted to much time to process the information of the questions. However in the other 2 assessment tools I could straight ahead understand of what they are talking.

P.2: Perhaps yes, but my perception concerning the *Margaryan's instrument* ("MOOC Scan Questionnaire") is that there were also questions that I couldn't understand. Concerning the *OpenupEd Quality tool*, I think it was better than the *Margaryan's* from my point of you, but still it has questions that were very broad and general like: "Was it effective...?". That's why I believe that *Quality Matters*. Maybe it's not so MOOC oriented but I felt more comfortable with the questions and maybe this is the reason why I prefer it. But this is a personal opinion.

Interviewer: If the other 2 tools had the same design and philosophy like *Quality Matters* which is an online tool, would be more useful for you?

P.2: In general the tools had some elements in common like the objectives and the context. So there are parts that are very similar. It's true for instance that the *Margaryan's instrument* ("MOOC Scan Questionnaire") includes elements about collaborative learning. So, it depends as well to the context of your MOOC. So, in the question whether I would choose the best one or suggesting mixing them etc, I would say to pick elements from all of them and create a new one but leaving out the very general questions like: "Is this effective...?", or "Does it cope with real problems...?".

P.1/P.3: This is the constructivist approach that's why. Because the point is to cope with real students problems and I felt like that. The questions were referring to the collaboration and other things.

P.2: Also, another thing is that *Quality Matters*, the online one has a scoring system. So each question has a point and in the end a kind of mark. However not all questions were equally important.

P.6: So that's the point, that you can grade the questions. Because sometimes in MOOCs and in general when assessing, there are some topics that are most important comparing to others.

P.3: In the *OpenupEd Quality tool*, I think in some parts they assume a model of a MOOC so I don't like it.

P.5: But it's the same with *Margaryan's instrument* ("MOOC Scan Questionnaire") with collaborative learning. Because there is nothing about it, about gamification, so only collaborative learning.

P.6: You always have a model behind.

P.2: Yes, the point is that there is also a model behind. It's difficult to apply the same instruments to all situations.

P.5: This is a reason why I was saying that depending on the activities for pedagogy approach there should be different questions.

P.2: In this case we could apply it to very specific case. Like this MOOC which was very special.

P.6: So one thing is that at least you should state clear which the underline model is. Well *Margaryan* was referring to it and the initial principles and the principles that they added afterwards. So you have to know if you agree or not with that model before applying it in a MOOC. At least to know how much you agree or not. Because maybe you say that you know the model and I think that this particular aspect is not so important for me, so some items won't be very important for my assessment. So, one thing is that the underlined model of the assessment tool should be clearly stated. Because there is always a model behind.

Interviewer: So, the underling model should be clearly stated in the beginning in order to see if this model is suitable for you. According to your ideas it would be interesting to select elements from all three assessment tools, avoiding the general questions and maybe creating a new assessment tool which would be more useful and finally the grading system is also important...

P.2: I wouldn't say that it's so important. It gave me the impression that it's better, more mature reflecting on the relative importance of the questions.

P.6: You can configure grading systems according to whether the questions are of high importance or not...

Interviewer: Yes maybe the tool could have this kind of grading system will focus more on some points, giving more point to a specific aspect which is more important and providing lower grades to other aspects that are less important. Because for example on the online tool, in the end at least you have this assessment total percentage in order to compare the assessment results of different MOOCs. And maybe for you that you are MOOC designers and you have experience, it might be useful to have a sum up in the end.

All participants: Yes, it could be.

General Question: What takes more time; to understand the tool or to apply it and assess the MOOC? Maybe the tools need more clarified instructions...

P.2: In my case I didn't estimate exactly the time but my perception is that I needed more time to understand the questions sometimes (*the rest participants agree to this point*), because the answers sometimes were yes/no like: "Did you fulfill the objectives?", but in questions like: "Was this effective?", I simply answered I don't know. In general there were questions that sometimes couldn't be answered. Because I didn't have the data to answer the questions...

P.1: I agree. For example, the more reflecting ones. For me was that and the vocabulary. Not the amount of the questions, but the vocabulary. Sometimes I was stacking while trying to understand.

P.6: Also, it depends and on your relation with the MOOC. If you are the designer it's easier because you have the MOOC in your mind and you are applying it. The problem is to understand what is the relation with your design, with your MOOC, etc. But in my case since I wasn't the designer and I was a "bad" student in the specific MOOC course, I couldn't remember many things and I couldn't know the right answer, because sometimes there wasn't a right answer.

Interviewer: I understand what you say because when I was checking the tools while having access in the MOOC course, it was difficult for me to have a clear idea of what is happening for example with the design elements. Because I wasn't the designer as well, so I can understand.

P.1: I have to make a comment on it but later on when we will talk about the MOOC, because I felt the same... I was like P.6, because I was involved in this MOOC and it was the first time that I was approaching a MOOC and I couldn't remember a lot of things. The general feeling, yes. So later that we are going to discuss about the MOOC I can say...

P.3: There are some questions difficult to answer even if the context is a smallest scale. For instance: "The prior knowledge of each learning objective is described and related to the characteristics of the target groups". So in this kind of context, you can imagine that it's impossible.

Interviewer: So, while choosing a tool, it's very important the model of the tool to be clearly stated and then maybe some instructions on how to apply the tool. For example if it has a grade system, to inform you that the grade system works like this and in the end you get this percentage that means that... So, instructions beforehand are also important, right? (*Most participants seem to agree to this point*)

P.6: Yes, but many people don't read instructions. So, let's not overdo it with the instructions.

General Question: The tools are not perfect as they are now, right? Do they need improvements in general or for other special MOOCs like this one?

P.1: It's not like if it is incomplete or complete but it depends on a learning pedagogy that a MOOC follows. Because for a specific MOOC it could be perfect that follows the same pedagogy but it could not be adequate for another one. So perhaps some questions about the learning design might be different.

P.2: There were questions in the *Margaryan's instrument* ("MOOC Scan Questionnaire") about collaborative learning. But there were questions about collaborative learning, whether we have used collaborative learning. But there were not questions helping you assess the quality of the design in terms of collaboration, for instance. "Are you having group interactions, etc...", but it doesn't ask you: "Where you promoting positive independence or how you were promoting the positive independence?", and other things which are related to pedagogical approach. From my point of you *Margaryan's instrument* ("MOOC Scan Questionnaire") was asking you: "Are you using collaborative learning?". If the answer is yes that's good for you. But probably you are introducing collaborative learning which is not well designed and non-productive. So, to the question whether they are perfect, the answer

is that they are not and whether they need improvements, the answer is yes and of course they need more in terms of active learning pedagogies and there are many things to be improved. For instance, if I am in a MOOC environment implementing collaborative learning, the groups and the types of groups are very important and there is no question about it...

Interviewer: So there are things to be improved and added are in terms of active learning pedagogies which is important for this specific MOOC...

P.2: Yes, but there were some questions about gamification in one of the instruments. Like: "Are the badges..."

P.5: Yes, but the badges have a different meaning and it was outside of the MOOC. Like a certificate.

P.2: But again if you include questions about gamification the question might be: "Do you use badges or rewards?". The answer might be yes...

P.5: ...but "How are the badges related to..."

P.2: Yes, exactly these types of questions are more related. Or maybe number of things like: "How many badges are you using?" I use 150. Ok! Maybe this is too much...

P.5: "How many badges do you use per module?"

P.3: In *Margaryan's instrument* ("MOOC Scan Questionnaire") there is missing information about the quality of learning materials in general. And there was a question in the end about the guidelines provided by the teachers during the course that I think is important also.

General question: If "MOOC scan instrument" was improving its "weak" elements by adding some from OpenupEd Quality label, would it be the perfect assessment tool for you?

Interviewer: You have already mentioned though that the best thing would be to take important elements from all three tools and create a new one with a specific model, maybe with a grading system... You have stated pretty clear your opinion. I don't want if you want to add something more...

P.6: The thing is that for me isn't that easy to find a single instrument that you can use for every MOOC in the world. So, the point is that maybe there are some very generic issues that can be shared from every MOOC. But there are some other issues related to the objectives of the MOOCs, what is the underlying pedagogy model and you can't normally go deep to every single model, or all objectives... But if you are focusing on a good collaborative learning you may have these kind of questions, if you are focusing on a good gamification you may have these kind of questions and things like that... If you want to provide a very specific assessment you have to deal with these aspects... Because, for example MOOCs in general are not so good in terms of assessment. In assessing objectives rather than knowing some concepts. We can assess whether they complete the activities but not whether they met the competences. So it has to do with the objectives of your MOOC the instrument should be different. Making a little bit more complex.

Interviewer: To create for example a tool with more general elements which can be applied to almost all MOOCs and then have other parts like: "If your MOOC is like this...", you have to check as well these elements...

P.5: If you implement for example active learning pedagogies should be some questions for this part, collaboration, gamification, etc... like modular questions.

1st Overall two-scale question: Why MOOC designers need an assessment tool to reflect on their MOOC course instructional design? What kind of information can they acquire which is important for them?

P.6: Concerning the checklists they help you to avoid some mistakes before the design, which is already good because we all make mistakes when we design. And afterwards we realize that we have forgotten something.

P.2: Probably we should also take into account and the experience of the designer. So probably for novice designers, these kind of tools are much more useful. Is like the canvas checklist. The first time that you design a MOOC this is very helpful. Having MOOC specific criteria or assets or whatever is even more important. Because you might have an itinerary that ok you have some experience in MOOCs but not in applying collaborative learning, so use this variation, to that you will not skip things.

P.5: But in this case we use the tool as a prior to the implementation. Concerning afterwards, then we will talk about re-designing...

P.1: Spotting the weaknesses...

P.2: In that case also you need the data and feedback from the students or from the platform. And see how this matches with design decisions. Which elements are present or not. General design decisions.

P.5: I would also say that not for MOOC designers but for researchers, it is also good to detect weaknesses and points improve or to research on MOOCs in general.

P.7: From my point of you an assessment tool is good for designers when they want to design a new MOOC from the beginning. Taking into account these points and designs a high quality MOOC. So the assessment results can help you not to forget.

If you are not one of the designers is very difficult to understand every single piece. If you are one of the designers is very difficult not to be biased. So the assessment part for me is tricky. However in the design part, it could be very helpful.

Interviewer: If you want for example in the future to design a MOOC similar to the one assessed, you go back to the assessment results and you check what did you miss, in order to include the missing parts and avoiding the “mistakes” and missing points.

P.3: Yes and we should also take into account the course analytics in order to re-design. Because otherwise is very difficult taking into account only the general notes of your design. If you don’t take into account what happened in the course, it’s very difficult to take decisions in order to re-design.

Interviewer: So the assessment tool along with the data analytics could be a good combination in order to take a final decision about the MOOC and have the final results.

General question: Did you manage to assess any aspect of the instructional design quality of this specific MOOC course?

P.3: Probably, in the case of providing more tips or more guidelines to the students in order to help them to continue and to carry out the activities during the MOOC. I think that it’s something that is missing in our MOOC. Because we devoted to much time in order to provide an accurate explanation of the activities, but if you add specific guidelines in order to help the students, I don’t know maybe things would be different.

P.7: I don’t remember if in the tools is mentioned the time that the students should devote in each week and if the time mentioned is the same with the real time that have to devote. So it is very important the workload of the MOOC. I think this aspect is referred on the online tool (*Quality Matters*). To check if the time referred in the course is the real time. Because, if you provide too much information to the students for the activity, it takes them a lot of time to read. If you offer 5 sheets of information, the students will need one hour to read the instructions. So, it’s very tricky to achieve the expected time and the time that they need.

P.3: Also, I have another comment related to the feedback. I think that we didn't provide the students with useful tools in order to receive some insights about their progress. So, there is a thing that is missing.

P.6: There was a question in one of the tools, whether the participants are guided by. For example it was reflected in one of the questions if there was a flaw. In this MOOC the students had to change environments so often so it was one of the weaknesses. It was a little bit complex and due to that many of them stopped.

Also, we couldn't assess the student's products. And we couldn't provide real assessment for the objectives, after the activities submission and we didn't also grade the activities. So, in that case we couldn't assess if the objectives were met or not. So when the certificate was provided it wasn't like a certification of having achieved all the objectives.

P.3: We just took a look whether the students had delivered the assignments. If the students have submitted all the assignments we some comments, we were providing them with the certificate. We didn't assess the real quality of their products. And I think that in this case it's so difficult, because you have a lot of students and you need a plan or instruments like a rubric, or a scale that can help you.

Interviewer: So you need a tool in order to assess the final products of the students, something which is very demanding because we talk about a massive scale learning community.

P.6: Yes and this is a limitation for MOOCs in general. And the other point is that institutional support wasn't provided. So, it was part of our context. We knew that it was an experimental MOOC, but if it was a normal MOOC from a university we would have graded very badly for that because the institution wasn't supporting the students, the teachers or any other who was involved.

P.3: And we didn't use the analytics provided by the platform in order to inform the students about their engagement during the course, by giving advice to take a look at those analytics, or this document...

P.6: Also, in the tools there was one question whether the students were informed about their progress. And as a learner, I remember that I couldn't have a clear idea of how many tasks I was missing.

P.3: There is a part in the platform where the students can have access to this information. This could be useful but we didn't put effort to inform the students about it.

P.6: Yes, or at least it wasn't provided to the students...

P.5: Also, I am realizing that the final questionnaire is provided in the end of the MOOC, to those participants who have already completed the course so it should include the ones that have dropped out. Maybe in the middle stage of the course, or maybe when they drop out the course the automatic system sends them a questionnaire or something. I remember in one platform they are already doing this. Maybe Future Learn. When you drop out, they ask you why.

General question: Can you provide some questions-examples that could enrich the framework in terms of active learning pedagogies?

P.5: If we have modular questions depending on the pedagogies and special aspects that you have in your MOOC it could be easier and I can give you questions related to gamification. So, for example for gamification we can ask: "How are the game mechanisms related to the activities or the context in the course?", "How many game mechanisms did you implement?". We can create a list if you want, but if you talk with experts on this topic they can provide you with specific questions for each module. That could be a good practice to assess the quality of specific pedagogies of a MOOC course.

P.2: My perception for the collaborative learning, I would expect questions such as: “Did you choose specific criteria for forming the groups?”. Maybe it’s not important to know the criteria but check if you are thinking of the criteria. For instance: “Have you reflected on the chances of having positive independence in the collaborative activities?”. This is a broad question but at least it makes you reflect on that. Because if there is not positive independence the collaboration is not going to happen. So maybe at least it enforces you to check this, if you have thought about it.

P.3: Probably the questions related to these collaborative learning aspects in the *Margaryan’s instrument* (“MOOC Scan Questionnaire”), are more philosophically approaching collaboration, that for me, as a pedagogist are so nice. But maybe for the rest is not that clear, and I agree. And it should go deeper in order to specify some criteria, and could probably be grouped in more special aspects.

P.1: I felt the same and in terms of collaboration the questions were only on the surface. Like ok, I achieved that, you applied collaboration but you can’t understand if it worked with the students. But I liked the questions about the real problems.

P.2: In my humble opinion questions should be: “Did you reflect on the criteria for forming the groups?”. No! They are random, so maybe if you are doing this in random I have to check afterwards if the decision was good or not.

2nd Overall question: It was referred in a comment that one of the MOOC weaknesses were the aspects related to assessment. Why? Did you notice, through this assessment, any other weaknesses concerning the MOOC’s instructional design and active learning pedagogies?

P.7: The certification achievement by only submitting the task is not an assessment measurement. Because when the number of the participants is 100, is impossible to assess the quality part. So we need another kind of assessment, I don’t know...

P.3: Maybe we should take into account different ways on how to regulate the deliverables. Like a self-assessment...

P.5: Also, we have great heterogeneity in MOOCs; we have different profiles of the students so we can design social gamification according to participant’s profile in order to promote engagement.

P.3: In general provide good feedback to cope with diversity and heterogeneity of the students in this kind of context. We formed the groups according to some criteria, but we didn’t provide them with different kind of feedback.

P.2: There were only optional activities but I don’t know if it could be considered as a path...

P.3: It could be...

Discussion about the tools

General question: What is your general opinion concerning your experience of applying the tools in order to assess this MOOC course?

Interviewer: At this point of the focus group the specific question was fully answered and the answers were pretty clear. There was no need for further clarification.

Discussion about the MOOC course instructional design quality

General two-scale question: According to your opinion, after the assessment procedure, what instructional design aspects need improvement in this specific MOOC course? Was this MOOC course successful? Why?

P.3: Concerning the first part of the question, for me, as an expert was successful because it was my first experience in the group just designing and developing material for massive scale classes. So, for me it was a successful experience because I learned a lot. Because I used to have these design elements in paper for my university classes but I know it in this kind of context you have to face different problems. So, collaborating with other experts in terms of active learning pedagogies such as collaboration and gamification, which are the most common criteria and things like that were important for me to be aware of this different situations.

It is important to put more effort in the dissemination and the schedule of the course, because it was something that wasn't so good. The months that the MOOC was carried out was June and July, when teachers are not in schools and not so active. Another thing is to provide students with feedback. I know it is impossible to provide all students with feedback, to assess the quality of the artifacts, because there are many students, but maybe by designing some rubrics or assessment instruments can help to guide the participants. We did our best writing in the forums, but I know that this is a challenge.

P.1: If you only take a look at the numbers, perhaps you can say that it wasn't so successful, but for designing something for the first time, I mean that you realize other things such as the complexity. I would like also to discuss if after applying the tools did we realize that something was missing and that we haven't realized before. I mean did we realize some specific weaknesses because of the tools?

P.2: For me, my perception is that while applying the instruments I realized that the design wasn't that bad. And this is also thanks to Canvas checklist as well which was provided in the beginning. It's also true that many items that were referred to the instruments were well known by us. We have experience in non-MOOC environments so it seemed that we were doing the right things. So, I wonder if the MOOC dimension was more or less lost here. This is the first thing. So, the instructional design wasn't that bad. If we discuss about the effort that we put in doing the design was too much because it took us months to do this.

Then, the success and whether the participants learnt, that is my perception about the measurement of success, is that I don't know because I never looked at the data. The MOOC evaluation might have given some indicators on that but we didn't assess. My intuition is that the MOOC was a little bit of nightmare for the participants because the design was very complex because it involved a lot of tools, with a lot of barriers and workload.

P.3: And maybe this happened because we were two research groups involved in designing this course and each one had special goals.

P.2: But this intuition is not based on the specific assessment tools results... So, the tools were not helpful in realizing these sorts of things.

P.6: There was a question in an assessment tool of whether the participants could follow a kind of flaw in the course without disruption... I think that the design was very complex and the workload for the students was very high. You couldn't keep pace in each module. To understand which were compulsory activities; which weren't; how much did you do; how much was meant to do; so it was difficult to handle in that terms. The design had many tools and many environments as well.

P.2: So there might be some kind of guidelines or advices for the MOOC domain. Guidelines like: "According to the experience of the experts don't use more than 2 different tools", or "Don't divide each module in more than three activities. So in this case this can help you to make the right decisions. Concerning the hours that the students should devote for the workload, we should have reflected on that and the guidelines could have helped. And if I don't have these guide lined I could not assess the quality unless I let the course run and I realize in the end that everybody is complaining about the amount of work that is needed. And for this cause I use the data, and this is design analytics and I realize that it was a bad decision.

P.6: Yes, and the other dimension about the flaw, it has to do with the interface of the MOOC. In order to know what you did, what you achieved and what you were missing, because I wasn't aware of what was happening in the MOOC, I was lost. I needed a more concrete progress line...

P.2: For that case Coursera is better...

P.5: Just one final comment concerning the first scale of this question, we can't assess if students learnt or not but the only measure we have is the dropout rate, and is very high. So, for this reason I would say that it wasn't successful.

P.1: You need to define what it is success... Because for me is a combination of parameters. You cannot say only that they learned but I will forget the 3% that it was active. Because the other percent might wanted to learn but it had other kind of difficulties. So in this case you have to specify what is successful from your point of you, the point of the instructors and after taking into account the numbers, because numbers are numbers you can't reject it and you should also take the feedback from the active participants.

P.5: For me, it should be the dropout rate.

P.7: The reasons for a low participation could be the complexity, the design, the workload and the complexity. So the other success could be that the people who have achieved the certificate have really learned a lot. But it's clear that the workload and the complexity is too high, so perhaps it needs more weeks, so it needs maybe a redesign in terms of participation. The nature of the MOOC itself was complex because the participants should use the ICT tools.

P.1: It has to do with the complexity of the nature of the course, which is Collaborative learning with the use of ICT tools, and also the complexity had to do with the design of the course concerning the progress etc...

P.6: There were some guidelines but it was difficult to follow because of the different environment, the different tasks that you had to follow, to get used to different ways of working, you know... So, that was complex...

P.3: Probably, a MOOC course focusing on design, deployment and all these things is too much in just 6 weeks. Because just one of these items is already a lot...

Interviewer: So, summing up concerning the success... I understand that for the designers and the researchers was successful because it was a good practice for them, however concerning the nature of the course, the activities, the workload, the progress line, the information, the participants rate etc, wasn't that successful...

P.6: For the success you can assess enrollment, drop-out rates, the final questionnaires of the students that finished the MOOC, if they learnt a lot or not...

P.7: Also, one last thing. The welcome survey was in English and in Spanish but the final questionnaires were two. One in Spanish and one in English. Separately. And as a result in order to sum up the data you need to combine the results from both. So, only one final survey...

D.3 Focus Group - PowerPoint slides

The following table summarizes the content of the 20 PowerPoint slides shown in the image:

Slide Number	Topic	Key Content
1	Focus Group	Topic: Quality Frameworks and Assessment Tools. Photo: In discussion after the research group questionnaire submission.
2	Agenda	12:00 - 12:10 Welcome 12:10 - 13:00 Presenting important points from the feedback - Discussion 13:00 - 13:30 Discussion about the tool 13:30 - 14:00 Discussion about the MOOC course instructional design quality 14:00 - 14:30 Summing up
3	To get started...	Voice recording important for transcription. Keeping notes.
4	Presenting important points from the feedback - Discussion	Visuals of a presentation slide and a microphone icon.
5	Point 1: Utility	Useful as a kind of "checklist" for MOOC (difficult to answer only quality of their MOOC design). Good strategy for design. Scales like Likert more than Yes/No. "Approachable" view.
6	Point 2: Most useful tool	Mostly in favor of Open Scan Questionnaire Design. Supporting the idea to use (future users to be OpenupEd_Qualit categorized in a way nature of the CLAS).
7	Point 3: Less time consuming	Mostly supported. OpenupEd Questionnaire Design. Average time: 15-20 min. Best MOOC Scan Questionnaire.
8	Point 4: Tools disadvantages	Some ambiguous questions. Met/Not Met options → No option. Underlying assumption.
9	Point 5: Using the tools in the future to assess the instructional design	"MOOC scan instrument" for feedback, assessment, and some questions about learning materials. OpenupEd_Qualit interesting questions and focuses on 10 aspects.
10	Discussion about the tools	What MOOC design support would be most important to address in the MOOC design process which is important for design?
11	Point 6: Assessing the MOOC (instructional design quality)	"MOOC scan instrument" best regarding the assessment that a MOOC. Some questions make reflections on quality of some aspects of the course or pedagogical support. Morgan → the question (their underlying model) and whether the tool OpenupEd_Qualit consider the diversity of learners.
12	Point 7: Assessing the MOOC (collaborative activities)	The tools don't help to assess learning approach I followed but "MOOC scan instrument" provides issues that are related to the design process but were mainly focused on joint collaboration → also there are many other options to active learning and more not really inquiry-based learning, not issue-based learning or generative.
13	Discussion about the tools	Was referred to a comment that one of the MOOC instructors was the course "blended assessment" why? Did not think through the assessment part afterwards the course on the MOOC? Did not think through the assessment part afterwards the course on the MOOC?
14	Discussion about the tools	What is implemented options concerning user experience of designing the tool to make it easier for MOOC course?
15	Discussion about the MOOC course instructional design quality	Visuals of a checklist icon.
16	Discussion about the MOOC course instructional design quality	Visuals of a person icon with a question mark.
17	Discussion about the MOOC course instructional design quality	Visuals of a person icon with a question mark.
18	Summing up... Something to add?	Visuals of a person icon with a question mark.
19	THANK YOU!	Visuals of a person icon with a question mark.