

# Proposal for design an instrument for video lectures analysis in MOOC

## *Propuesta de diseño de instrumento para analizar vídeo-lecciones en MOOC*

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### Abstract

This article carried out the process of construction and validation of an instrument to assess the structure of video lectures from MOOC. The tool is divided in the parts of the class: opening, core and closure for check how each part contribute to the narrative sequence. The aim of the study is based on the need to made proposals for the production of videos for massive on line courses because the trend is to replicate the traditional teaching models of information transfer. The design process and the theoretical supports that frame of the questions are explained, as well as the result of the assessment of the experts and the piloting of the instrument. In the end, the article offers perspectives for the design of video-lessons and to have instruments that allow teachers and instructional designers of virtual courses to make a checklist to the Storytelling tips and audiovisual narrative that reinforce the discourses contained in the video-lessons. The results of the analysis

identified progress and limitations in the construction of the resources. Based on the findings, reflections are offered on how these resources could be improved. It concludes with a proposal to use the instrument to open new lines of research that support the video lessons production and to give ideas about how use resources of the television streaming like Netflix, in the pedagogical sequences in on- line courses.

**Keywords:** Video Lectures, Video Analysis, MOOC, Online Education, Instructional designer, educational videos.

### Resumen

El artículo presenta el proceso de construcción y validación de un instrumento para valorar la estructura de vídeo-lecciones de cursos masivos en línea, MOOC. El instrumento divide la vídeo-lección en momentos de la clase: inicio, desarrollo y cierre, para revisar de qué manera cada apartado aporta a la construcción de la

narración. La justificación de este estudio se basa en la necesidad de generar propuestas para la producción de vídeos en cursos masivos, toda vez que algunos replican modelos tradicionales de transmisión de información. En la primera parte del texto, se explica el proceso de diseño y los soportes teóricos que enmarcan los bloques de preguntas, así como el resultado de la valoración de los expertos y pilotaje del instrumento y los resultados. Al final, el artículo ofrece perspectivas para el diseño de vídeo-lecciones y para contar con instrumentos que le permitan a los docentes y a los diseñadores instruccionales de cursos virtuales hacer una lista de chequeo de

los principios de Storytelling y narrativa audiovisual que refuerzan los discursos contenidos en las vídeo-lecciones. Se concluye con una propuesta de uso del instrumento para abrir nuevas líneas de investigación que apoyen la producción de vídeo-lecciones y con el planteamiento de ideas para usar elementos de televisión vía streaming como Netflix a las secuencias didácticas de cursos virtuales.

**Descriptor:** Vídeo-lecciones, análisis de vídeos, educación en línea, MOOC, diseño instruccional, video educativo

## 1. Introduction and state of the issue

The design and use of video-lessons has been positioned as the axis of the didactic sequences of the xMOOC, or courses based on content (Raposo, Martínez & Sarmiento, 2015). The video-lesson is defined as an audiovisual piece in which some thematic content is exposed and resembles a master class (Ferrés, 1992, Marqués, 1999). For Biggs (2006) this type of class has an important potential, however, "it requires a concentration that drastically reduces its value if it is not performed properly" (p.129).

Although the first MOOCs that appeared in the educational field were those that focused on connections, they have as principle connectivism and the idea that thousands of people interact with the contents of a course (Downes, 2007, Siemens, 2005) the xMOOC are those that have proliferated on platforms such as Udacity, Coursera, Future Learn, Miriada X, Canvas, Edx, among others. It should be noted that the definition of MOOCs have also added new developments according to the size of the groups, tools and level of interactions, such as those proposed by Clark (2013), who defines 8 types of MOOCs: TransferMOOCs, MadeMOOCs, SynchMOOCs, AsynchMOOCs, AdaptiveMOOCs, GroupMOOCs, ConnectivistMOOCs, MiniMOOCs. Also recently it is spoken of (Small Private on Line Courses), that is very similar to the definition that sets Clark (2013) as Group MOOC.

Similarly, there is talk of another type of technology associated with the use of mobile phones "MOOcast" which proposes to interconnect the content of MOOC courses to mobile communications. With screencast technology, a user can send content from a phone (YouTube or Netflix) on a television. Its key function as a facilitator to access learning contents is probably the most important (Tabuenca, Kalz & Löhr, 2017). Osuna-Acedo, Marta-Lazo & Frau-Meigs (2018) explain that we can already talk about the post-Mooc era with approaches such as the sMOOC (Social Massive Open Online Course), arriving at what they call tMOOC, of knowledge transfer proposing authentic tasks that allow this type of MOOC aimed at the pedagogical transformation. In these latter cases, the MOOC proposals focused on contents are reworked to focus on collaborative work.

For this study we have focused on the construction of an instrument to analyze video-lessons contained in xMOOC. In these, the students relate individually to the resources displayed by the platform and perform automated tests (Clark, 2013). The interaction between the participants is not privileged, but with the resources, so it is interesting to analyze the video-lesson, since it is the almost exclusive means of mediation in this type of courses.

Learning through video has been the subject of various reflections (Giannakos, Sampson, Kidzinski & Pardo, 2016, Mohamed, Amine & Schroeder, 2014, Van Der Sluis, Ginn, Van Der



Zee & 2016). The development of MOOCs has made this type of learning more relevant, so many studies ask to what extent video-lessons affect pedagogical innovation in technology-mediated learning environments or if, on the contrary, they only replicate a transmissive teaching model.

The first part of the article explains the conceptual bases around the use of video in the construction of MOOCs, proposals of narrative lines for its production and the questions posed by the literature review on the transmissionist approach of this type of courses. Then the methodology of construction and validation of the instrument by expert pairs and its subsequent piloting is explained. In the conclusions, new lines of work are proposed based on the use of the tool to generate ideas that allow us to produce powerful and creative video-lessons.

It should be noted that the study focused on video-lessons contained in xMOOC and not in other types of mass courses, since it was sought to observe what happens with audiovisual mediation when the course does not have an instructional design based on connections or interactions with peers, but in the visualization of videos.

The construction of the instrument, presented here, is part of a doctoral dissertation in Communication and Education, carried out between 2015 and 2018, where the content of a video-lessons group of xMOOC of the Miriada X platform is analyzed, results that will be displayed in later articles.

### 1.1. The use of videos in a MOOC

The most used video-lesson types in the xMOOC are the master classes with support in PowerPoint presentations (Atapattu & Falkner, 2016, Guo, Kim & Robin, 2014, Evans, Baker & Dee, 2015). The variety of video lessons has also been configured based on the type of technology used for their production or the place where the recording is made, and are classified into: talking head, those recorded in the classroom, picture in pic-

ture (images with voice over), capture of a tablet (type Khan academy), animation with voice over, chroma or green screen, interview and tutorial (Chauhan & Goel, 2015; Hansch, Hillers, McConachie, Newman & Schmidt, 2015).

The review of literature in specialized databases has made it possible to verify the predominance of studies focused on the observation of user behavior practices in front of video-lessons, type of visual scanning follow-up, analysis of observation patterns and permanence according to the number of repetitions in the viewing of the videos. There is also a tendency to establish ideal characteristics for this type of audiovisual pieces such as duration, preferences and recommendations for visual management. However, there are few contributions related to the narrative structure of the video lessons, in this regard, the Cortes studies (2015) offer a checklist to recognize elements of the Cognitive Load Theory in multimedia spaces. This explains to what extent certain multimedia elements favor learning and an instrument is proposed for the analysis of video-lessons from the point of view of multimedia attributes. Unlike this study, the instrument presented in this article raises the analysis in the way in which the lesson is communicated and the audiovisual narrative structure.

The production of audiovisual resources for MOOCs should focus on an analysis of the possibilities of audiovisual communication applied to the elaboration of didactic contents. These videos should be designed as audiovisual pieces that can provide learning experiences awakening emotions (Gértrudix, Rajas & Álvarez, 2017, Koumi, 2006). In this regard experiences of content production are recognized for this type of courses that include simulated videoconferences, documentaries called reflective, animated narratives and even the use of Chinese fables or oriental stories to design what is defined as learning experiences that seek to contextualize and link the student as an audience that becomes involved in the narrative (Morris, 2017).



Thomson, Bridgstock & Willems (2014), for their part, explain that the narrative must be in a context, have a clear purpose, tell a story and be short and concise. The video must be aligned with a construction of meanings around the learning objective. The material must also be available to be used and reused by as many people as possible.

## 1.2. Learning vs. instructional design in a MOOC

Learning in mass spaces and the appropriate instructional design for this to happen, raises many questions about its effectiveness and quality (Aguaded & Medina-Salguero, 2015, Bartolomé & Steffens, 2015, Zapata-Ros, 2015). In this line, Chiappe, Hine & Martínez (2015) determined that the concept of “mass” generates standardized practices for the design of learning environments that result in the production of courses with very similar structures, centered on a line of time with videos and quizzes. This type of standard architecture may be due to immediate strategies to respond to the high demand of students with low audiovisual production costs.

MOOCs are master classes with a traditional class scheme and most do not represent an innovation in the way a virtual course is organized (Laaser & Toloza, 2017; Leal, 2012). Open knowledge is then caught in an old scheme but sold in a technological scenario that allows it to expose itself as an innovator. This increases the possibilities of overcrowding but not the possibilities of generating authentic learning. Researchers from different parts of the world focus their work on demonstrating that the brain does not learn from discourses (Fink, 2008, Torres, 2017). Thus, the validity of the master class is questioned as monologue of the professor. If we manage to turn the video into an audiovisual language full of possibilities, the pedagogical value of the video-lesson may increase.

In more recent studies, Osuna-Acedo, Marta-Lazo and Frau- Meigs (2018) propose the

use of connections to the narrative of the courses within the Transfer-MOOC. “The tMOOCs are positioned as a disruptive educational alternative and as meeting points between the participants, through which we can access distributed and accessible intelligence” (p.105). In this order of ideas, Marta-Lazo, Valero-Errazu, Gabelas-Barroso (2018) also develop analyzes on the use of Twitter in MOOC courses as a key element in the increase of motivation and development of learning with students. In this type of proposals, the video-lesson is part of a collaborative mechanism and is not exclusively the core of the courses.

Despite the efforts to improve the narrative quality of the videos, standardized online production limits these designs and does not open the possibility for new narrative experiences. This would demand more time, increase costs and generate a flow of course management that does not respond to commercial logic. A standard model of audiovisual production is needed so that mass production can work, however, it puts on the table the challenge of constructing contents that respond to a type of education mediated by ICT that responds to new teaching paradigms.

## 1.3. New narratives for video-lessons

The video lesson can be considered as a video lecture session: therefore, it can be divided into the three key moments of a class: beginning, development and closing. In this structure, the beginning should be marked by attractive elements that call the attention of the audience as the use of questions and challenges and the activation of previous knowledge. Therefore, the first minutes must resort to elements of powerful narration that maintain the motivation, linking the contents of previous classes with the ones in the new segment (Ambrose, Bridges, Di Pietro, Lovett, Norman & Mayer, 2010, Lang, 2016). For the development and closure, the use of metaphors, mood swings, relationship of content with real life events as they are stated in the TED talks, are resources with which we seek to sow an idea in a few minutes



using the quality of the oral discourse (Anderson, 2016). In this sense, the speaker should limit himself to talking about few concepts, reducing their content and integrating it in a personal context, and should arouse the curiosity of the audience with provocative and attractive questions. Anderson (2016, p.1) emphasizes that “speakers often forget that many of the terms and concepts they use are completely unknown to their audience. Metaphors can play a crucial role in the assembly of the pieces, because they reveal the desired shape of the pattern, based on an idea that the listener already understands.”

The production of video-lessons considering them as narrative units that maintain the potential of a story should consider key aspects such as the strength of the interlocutor’s discourse and its wealth to capture the attention of the audience. Thus, it has to be structured in such a way that it allows to move, to excite, to make people laugh and to captivate attention. Bravo (1996) points out as significant elements in a video-lesson, the visual support that is focused on demonstrations and the quality of the speech.

Storytelling tools can help in this improvement of narrative elements of the video-lessons (Díaz-Barriga & Hernández 2010). The meaning of these will be given by the voice and creativity of the teacher (narrator) to create and present a convincing, attractive, seductive and concrete story that stimulates the emotions of the student who acts as a spectator (Edutren, 2017). All these elements are difficult concepts to adopt in academia because one must use verbal economy, coherence, little ambiguity, sensitivity and innovation in television production for courses and not everyone has the talent to tell attractive stories using elements such as fun and/or audiovisual metaphors based on entertainment applied to education (Pastor, 2010, Wakefield, 2009). Undoubtedly, one of the main challenges is to maintain the attention and motivation to avoid student desertion. However, it should be noted that this function does not only refer to the videos, it also implies the training of the teaching

team, not only to produce the contents, but also to manage the courses with a large number of students (García, Rivera & Ramírez, 2014).

## 2. Materials and methods

### 2.1. Design of the instrument

Given the purpose of the study, assessing the structure of video-lessons of mass online courses and the need to analyze that narrative structure and the use of audiovisual resources, an instrument was developed to respond to the different concepts considered and assumed after the literature review. A first draft of the tool was designed and then several versions. Finally, the instrument was constituted by 25 items and four major categories:

- Start of the video-lesson and engagement principles. This includes questions that allude to the way the teacher starts the video. That is, if it raises questions, if it states the objective, if it contextualizes and gives a general framework of the topics that will be addressed in the class.
- Development of the video-lesson and principles of narrative sequences. Here they ask questions that have to do with the way the teacher organizes the course. If he uses examples, mood swings, anecdotes or if he relates the content to real life problems.
- Closure of the class: Conclusions. The questions in this block are related to aspects of the way in which the teacher includes all the content of the video lesson, how it helps the student to organize the content stating the main ideas seen during the talk, and if there are summaries and link to the lesson that will continue.
- Technical aspects and audiovisual narrative support. The questions here refer to whether the video-lesson has a fixed camera, effects of images, moving images and





the role of graphics to support the teacher's argument during the video-lesson.

The instrument has been formed in a first part corresponding to the general characterization of the course in which questions are raised to gather information regarding the name of the course, the University, the learning objective of the course and the module, number of modules, title of the video-lesson, standard duration time, if one can connect with associated social networks,

the student's participation in the content, the type of video lesson (Talking Head, Classroom Recorded in the Classroom, Picture in Picture, Power point with voice over, Capture of a tablet (Khan Academy), Animation with voice over, Chroma or Green Screen, Interview, Tutorial). And the second part is divided into three subcategories: beginning, development and closing of the class. The following charts show the theoretical concepts that frame each block of questions:

Chart 1. Issues related to the start of the class

Questions related to the beginning of the class	Conceptual foundations (where it comes from)	Authors
Does the teacher begin with a question to the audience?	Principles of engagement	Biggs (2006); Lang (2016)
Does the teacher pose a challenge to solve during the video lesson?	Five first minutes of a class	
Does the teacher express the objective of the video lesson?		
Does the teacher relate the topic to a real-life case?	Activation of previous knowledge as a key element to enhance learning	Ambrose, Bridges, Di Pietro, e, <i>et al.</i> (2010).
Does the teacher begin by relating previous knowledge or lessons to the video lesson in a way that connects with the previous content?	Structure of lectures	
Does the teacher break down in a clear and organized way the points that will be developed in the video-lesson?		

Source: Own elaboration

Chart 2. Questions related to the start of the class

Questions related to the development of the class	Conceptual foundations	Authors
Is there evidence of a succession of contents or themes?	Principles of learning	Ambrose, Bridges, Di Pietro, <i>et al.</i> (2010).
Does the teacher use humor twists?	Significant learning	
Does the teacher use personal anecdotes to relate the subject of the video-lesson?		
Are there changes in rhythm in the video?	Connecting the video with emotions	Koumi (2006).
Are there turning points or unexpected events?	Cognitive mechanisms that are favored with edu-entertainment	
Does the teacher give examples of what he is talking about?		

Source: Own elaboration



Tabla 3. Cuestiones relacionadas con el cierre de la clase

Questions related to closing the class	Conceptual foundations	Authors
Does the teacher draw conclusions in accordance with what was stated at the beginning of the video-lesson?	Five last minutes of the class	Lang (2016)
Does the teacher make summaries of what is addressed in the video lesson as a compilation?	Principles of learning	Ambrose, Bridges, Di Pietro, <i>et al.</i> (2010)
Does the teacher mention the points that will be seen in the next lesson?		Biggs (2006)

Source: own elaboration.

Chart 4. Questions related to technical aspects

Questions related to technical aspects	Conceptual foundations	Authors
Are shifts in camera angles evident in the video?	Digital narratives	Díaz-Barriga and Hernández (2010).
This video-lesson has dynamic visual aids? (moving graphics, moving infographics)	Educational video and its didactic value	
Are the images related to the content of what was mentioned by the teacher throughout the video lesson? (they change according to what they are saying and support their argument)	Design and production of MOOC courses	Area (2000).
Is a large variety of images used to support the contents?	Instructional design	Aguaded and Medina-Salguero (2015).
Is the video lesson supported by power point slides?	Visual and auditory experiences in educational videos.	Guo, Kim and Rubin (2014).
The video lesson is supported by slides in programs other than the power point (can be prezzi, slideshare, emaze, videoscribe)	Cognitive Theory of Multimedia Learning	Koumi (2006); Cortes (2015);

Source: own elaboration

For the elaboration of the questionnaire, the Question Pro platform was used, since it provides many tools for the management of information for surveys and instruments of this nature. The instrument is available at the following link: <https://goo.gl/W39xvv>



## 2.2. Validation of the instrument

The validity of the instrument was submitted to expert judgment, peers were selected for their trajectory and publications on the topic of MOOCs. Thus, in the list of reviewers is a doctor in Communication and Education at the University of Santiago de Compostela (exp.1) who has worked in the production of MOOC for the platform Miriada X, a teacher and researcher at the Rey Juan Carlos University (exp.2), and a PhD in Information Sciences from the University of Zaragoza with extensive experience in issues

of media competence and MOOC (exp.3). For the expert judgment, an evaluation guide was designed in which the variables of the research, objectives and expressed needs of the instrument were explained.

## 3. Analysis and results

The results obtained in the validation of the questionnaire are shown in Chart 5, being evaluated in a range of 3 to 1, in which 3 means strongly agree, 2 agrees, and 1 totally disagrees.

Chart 5. Average results of the evaluation of the experts

Expert	It consists of a reasonable number of Questions	The enunciation of the questions is clear	The Questions allow to achieve the objective sought by the instrument	The Questions are significant and demand relevant information for the topic to be discussed	The questionnaire integrates questions about all the dimensions to analyze
1	3	3	2	3	3
2	2	3	2	2	2
3	3	3	2	2	2

  

<b>Coefficient of Proportion by Ranges</b>	0,82	Suitable
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Source: own elaboration

It is assumed as a criterion that a data collection instrument with a Range Proportion Coefficient above 0.75 is valid. The closer the CPR approaches to one (1) the more the validity of the content of the instrument is guaranteed (Ramírez, 2004). As can be seen, the assessment was positive by the experts. After the expert judgment, the instrument was piloted with a group of 10 video lessons from the Miriada X platform, one of the most important platforms for Spanish-speaking universities. Hernández, Fernández and Baptista (2010) state that “in non-probabilistic samples, the choice of elements does not depend on probability, but on causes related to the characteristics of the

research or who makes the sample” (pp. 190). The validation and piloting of the instrument reflected a high internal consistency in its questions and fulfills its objectives.

## 4. Discussion and conclusions

The proposed instrument becomes a tool for the analysis of video-lessons and allows to make a checklist to instructional designers and teachers about the components of this type of pieces since it divides its characterization in the key moments of a class (beginning- development and closure).

The discourse prevails in this type of material, so it is necessary a detailed breakdown of how





the class is conducted and what type of narrative elements it includes. Taking into account that the strength of production depends on the use of Green Screen and support with Power Point (Atapattu & Falkner, 2016, Guo, Kim & Robin, 2014, Evans, Baker & Dee, 2015) the questionnaire allows us to analyze the type of graphics that support the video-lesson, the type of expressions and how it is structured from beginning to end. . Korving, Hernández & De Groot (2016) state that video lessons enriched with images that give meaning to the teacher's speech have a greater chance of being seen. In this order of ideas, the questionnaire not only asks about the type of visual aid, but also the use of it to give value to the professor's discourse. If it's all the same to download a podcast than to watch the video, the graphics are not contributing to the narration.

In this sense, the instrument allows proposing questions on how to awaken the curiosity of students from the use of questions, without incurring excessive production costs and guiding teachers on new proposals to structure the scripts of each class. All this from an interdisciplinary approach to provide greater variety to research on the subject (Veletsianos & Shepherdson, 2015).

The first part of the instrument raises questions about how to start a video lesson, Lang (2016) defines it as the ability of the teacher to use the first five minutes of his class to get the attention of his students. References are made to resources such as questions, connections with the previous class, solving a mystery, present a sequence. Connecting explicitly with the new material to prior knowledge of the course itself is not automatic, we need to help students highlighting these connections (Ambrose, Bridges, Di Pietro *et al.*, 2010) Regarding the development and closing of the video-lesson, the instrument proposes the use of resources such as humor and relate the content of the course with real-life situations. The handling of the emotions and tools of Storytelling will add value to the production of the video-lesson (Díaz-Barriga & Hernández, 2010; Koumi, 2006).

For Laaser & Toloza (2017), the current use of video on LMS platforms is deficient in terms of exploiting its characteristics as a means of communication. "Concepts such as xMOOC and Flipped classroom are not a step forward, but a step back in the development of educational video" (Laaser & Toloza, 2017, p.5). This type of studies evidences the need to structure instructional designs of video-lessons that demonstrate a balance between the quality of the content and the way in which it is told. Among the aspects to be highlighted by the experts was the inclusion within the proposed instrument, questions that inquire about the use of social networks in video-lessons (Marta-Lazo, Valero-Errazu & Gabelas-Barroso, 2018). These items were included in the final version of the questionnaire. The experts also assessed the use of dichotomous questions as it facilitates the completion of the tool.

It is expected, in later studies, to publish the results of the use of the instrument with the total sample of video-lessons, to extend the range of analysis and to delimit more information about production models that include proposals associated with edu-entertainment. This use suggests converting the courses into Netflix-like series and responding to video consumption logic via streaming. It is expected to apply this proposal in complete courses and analyze its effect in the construction of online learning environments.

The expectation is that the instrument can be a first contribution in these transformations and that it is available, in the medium term, to researchers, teachers, platform managers and instructional designers to make checklists of the minimum production and structuring of discourse in this type of audiovisual pieces and achieve changes in their narrative structure.

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