VideoMOOC-PL: A Pattern of Language to support the development of educational videos for the MOOC context

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Videos are important resources for the process of teaching in virtual learning environments and, particularly, in the context of Massive Open Online Courses (MOOC). However, video production for MOOCs still presents several challenges that need to be better investigated. It is because, in general, educators and MOOC teams are still using ad hoc decision-making procedures based on empirical knowledge obtained from their experiences with face-to-face courses or even traditional virtual courses. In addition, since MOOCs are part of the Open Educational Movement, as well as the Open Educational Resources (OER), it is also important to reflect on the construction of OERs in the form of videos for the MOOC context. Considering such context, the main objective of this paper is to present an Educational Design Pattern Language named VideoMOOC-PL. Such pattern language contains fourteen patterns, the patterns are divided into three categories related to video production: pre-production, production, and post-production. The pattern language is expected to offer an attractive alternative to guide MOOC teams in creating OERs in the form of videos to enhance learning experiences, increase student engagement in the course and emphasize self-directed learning, which are requirements for MOOC quality.

1. INTRODUCTION

The creation and adoption of MOOCs can bring many benefits and impact on education, such as put forward diversity in education; enhance student's learning by encouraging and engaging them for lifelong learning; connect with more individuals in informal contexts creating opportunities to transition to formal higher education or lifelong learning activities; force a re-conceptualization of higher education through the use of online study; enhance teachers' skills from developing OERs and adopting learner-centered pedagogical approaches and active learning strategies; among others.

Considering this perspective, several studies have investigated the potential benefits of using videos to support the teaching-learning process in MOOCs. Since click actions, such as pausing, skipping and repeating, may reflect the learner's difficulty in understanding the video content and indicate possible withdrawals from the course (Guo, Kim and Rubin 2014, Li et al. 2015, Santos et al. 2015). Studies involving the use of patterns-based approaches have also been developed to support educators in designing innovative learning experiences in video design, as in the work of Chen and Rabb (2009) who presents a pattern language to support the production of screencast. The works of Mor and Warburton (2016), Fassbinder A. (2018) present some specific patterns to assist in the design of educational videos for the context of MOOCs. However, such approaches do not cover the entire process of educational video design for MOOCs.

Considering this context, in 2017, we began a project aimed to define and validate a pattern language to support MOOC teams in the production of OERs in videos (Fassbinder, 2018). The pattern language structure is based on fundamentals from four main concepts: (i) Massive Open Online Courses; (ii) Educational Videos, (iii)

Open Educational Resources, and (iv) Educational Design Patterns and Pattern Languages as strategies for storing and sharing tacit knowledge.

These four concepts or dimensions guided the development and validation of (i) a life cycle process for the production of OERs in the video, which describes fundamental steps to plan, evaluate and distribute an OER in the form of video; (ii) educational design pattern language for the production of OERs in the form of video for the context of MOOCs, which are based on problems and recurrent solutions to solve the main activities described in the life cycle.

The structure of this paper is as follows: Section 2 presents an educational design pattern language to support the development of OER in videos for the MOOC context. In Section 3, we describe six patterns that are part of the language. Finally, Section 4 wraps up with conclusions and ideas for future work.

2. VIDEOMOOC-PL: AN EDUCATIONAL DESIGN PATTERN LANGUAGE TO SUPPORT THE DEVELOPMENT OF OERS IN VIDEO FOR THE MOOC CONTEXT

VideoMOOC-PL is an educational design pattern language that aims to assist teams during the process of producing educational videos to be used in MOOCs. The language also aims to encourage the creation of video to be made available as open educational resources, contributing to the dissemination of knowledge and expanding access to quality education. Figure 1 provides an overview of VideoMOOC-PL. A total of 14 patterns were firstly identified and grouped into three categories: pre-production, production, and post-production.
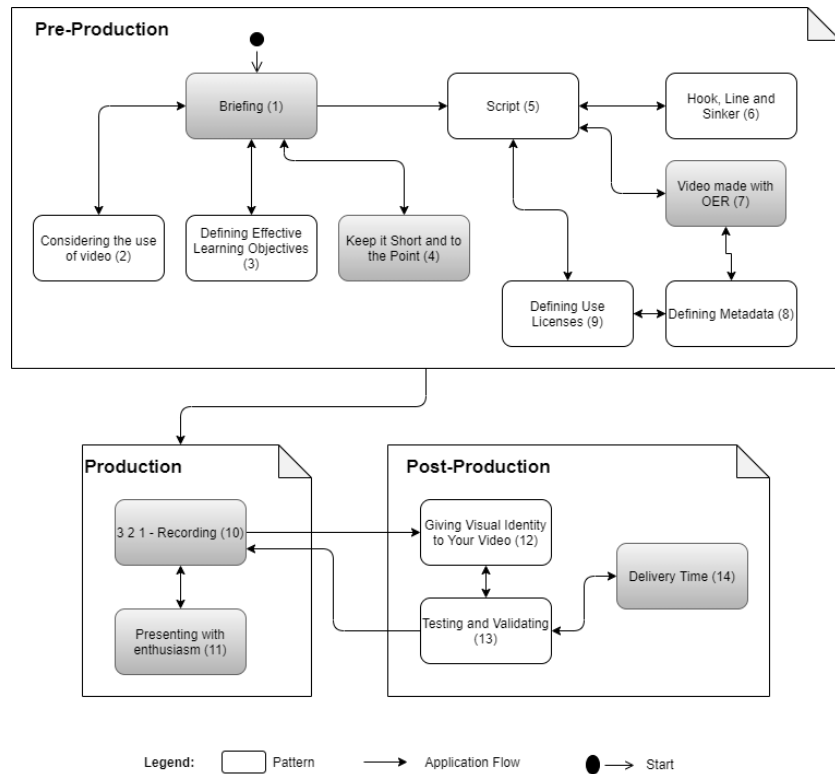

Fig. 1. VideoMOOC-PL graph.

In the next section we present six patterns (gray boxes in Fig. 1) that are part of the language. These patterns were selected due to their importance in the production process of an educational video and due to the limitation of 10 pages.

3. DESCRIPTION OF SIX SPECIFIC PATTERNS

In this section, six specific patterns are detailed. Their description follows an adapted version of the Alexandrian template used by Alexander et al. (1977) and Avgeriou, Papalouros and Realis (2003), and includes the following fields:

- Name - a unique identifier to distinguish the pattern.
- One-liners - a brief explanation of the pattern.
- Illustration - a representative case that helps practitioners in understanding the pattern's meaning.
- Context - A brief explanation of the origins and the context of the problem ro make it more comprehensible. Problem - a brief description of the design problem.
- Forces - are factors or issues influencing the adoption of a suitable solution to the problem.
- Solution - a brief description of the solution proposed by the pattern that addresses the problem.
- Action - a detailed and step-by-step description of the solution.

Pre-Production Patterns:

Briefing (01)
Gather the MOOC team and define the strategies to achieve the learning objectives.

Several factors have motivated teachers, researchers, and other professionals to record educational videos. Personal interest, carrying out a professional challenge (experimentation), meeting an institutional demand, the possibility that they offer to rethink the design of teaching and learning, and increasing students' access to education.

Problem

Even with experience in the production of OER and the production of videos, the first step is always the most complicated, as several professionals may be involved in the production, and a failure in the communication between these professionals can lead to the production of a generic video.

Forces

- It is not easy to start a new project, a new video in this case, when there is not much experience in the subject.

- Past experiences, whether in a face-to-face or formal virtual environment, can negatively impact production.

- Too general briefings may fail to achieve the video's learning objectives.

- In the beginning, reflecting on learning needs and goals is a very important step.

Solution

Therefore, you must outline strategies to elaborate on the learning objectives that must be clearly presented at the beginning of the video and raise the personal, institutional, and technological aspects that can influence the video production.

Actions

Try to identify your motivations, experiences, institutional structure (personal, technological, and financial) and the characteristics of your employees. Try to define a provisional title or theme, instructors involved, general content to be addressed, target audience, a general objective to be reached by the learners at the end of the video and a teaching strategy. All information will be refined during the video planning. Use the briefing map provided in the next link to fill in the initial information for the production of your video: https://docs.google.com/document/d/13jcdmb_kPJEfOUgv8RYOPXLaQAlv3StQ4BJXp4h1WEA/edit?usp=sharing

<div align="center">

Keep it short and direct to the point (04)
Short, independent, but related videos.

</div>

You are producing educational material for your MOOC. This includes all types of content covered during your MOOC, mainly video format materials: which students must follow to achieve the course learning objectives.

Problem

Many online courses are based on delivering content that follows a standard classroom approach. But you know that creating a complete video with extensive content for a MOOC course is very tiring, both from teaching and student learning. You know it's hard to maintain your enthusiasm in a long video and you know that the student's attention will drop dramatically at several points in a single long recording.

Forces

- It is difficult to create videos that hold the student's attention for a long time.

- It is one thing for the teacher to present an expository class in person. Another thing is to record interesting videos that maintain student engagement on online platforms. Training, experience, and creativity are required.

Solution

Therefore, create videos of specific content, breaking very long content into small topics, in which you can feel confident, being watched by your students in full. Make sure that the material is designed within a structure to allow its reuse and adaptation in different contexts. The patterns Video made with OER (07) and Defining use licenses (9), can be used as support to design the video with a structure that allow adaptation and reuse.

Actions

There are no hard and fast rules regarding the exact length of the video. it seems, however, that the way viewers engage with online educational video tends to be different from television or cinema. The

average length of the youtube video is 4 minutes and 12 seconds and 70% of the videos are watched on mobile devices (youtube statistics, 2019). Since viewer abandonment rates are also much higher for online videos than other media, getting to the point quickly is crucial. Therefore, the most important concepts should be presented first, if possible. Where there is a need to convey multiple concepts, try to structure this content around several shorter videos, rather than one long video. This serves to make the public feel that their time is not being wasted, as well as allowing some potential for self-directed learning, offering students options on what to watch and when requirements that are very important for MOOCs and supporting reuse in different contexts.

[This pattern is similar to Short & Sweet by Nicholas Chen, Maurice Rabb (Chen and Rabb 2009)]

Video made with OER (07)
Use/reuse materials that are in the public domain, openly licensed.

Open Educational Resources (OER) are educational content such as images, texts, graphics, etc., which are available on the internet to be used, adapted, and reused by different people and in different contexts. Thus, the use of them can facilitate the production process of your videos.

Problem

You've already created the script and now you need to create the materials that will be part of your video. But creating educational content such as images, text, graphics, audio, etc., can be a lengthy and complex process.

Forces

- There is not always enough time to create all the materials that need to be used in the video.

- It may be easier or more efficient to reuse and adapt existing content than to create new ones.

Solution

Therefore research, use, enhance, recombine open educational resources for your video.

Actions

Use existing content in the form of OER as a way to deliver content and support students in achieving learning objectives. It is also a solution to avoid copyright problems.
Any additional type of contextualization or adaptation of these resources to the context of your video can be done following the licenses of the original resources.
A simple way to search for FIGURES in the form of OER is to access Google (www.google.com.br), enter the search term (example: Flower), choose the option Images, Tools, Rights of use, Marked for reuse (choose the best option, except without a license filter).
A simple way to search for VIDEOS in the form of OERs is to access YouTube (www.youtube.com), enter a search term, search, filters, and choose the "Creative Commons" feature.
Another way is to use the various OER providers, such as:
eduCAPES: https://educapes.capes.gov.br/
Schools on the Network: https://www.escolasnarede.seec.rn.gov.br/
Virtual Interactive Education Network - RIVED: http://rived.mec.gov.br/

More information can be found at https://aberta.org.br/
If you need to create an educational resource, then consider licensing it openly.

[Adapted version from OER-Made MOOC by Aracele Fassbinder, Ellen Barbosa, George Magoulas (Towards an educational design pattern language for massive open online courses (MOOCs). In: Proceedings of the 24th Conference on Pattern Languages of Programs. 2017. p. 1-17.)

Production Patterns

3 2 1 – Recording! (10)
Prepare the equipment to capture images and audio to compose the video

You are about to transpose everything that was planned into an audiovisual language. However, recording a video is to cut out space, choose a certain angle, and capture the images and sounds. Thus, what is watched by people corresponds to the perspective generated by the eyes of those who planned the script and especially those who were behind the camera.

Problem

It is believed that a camera is enough to record an educational video. But several aspects need to be contemplated such as: framing the visual plan, audiovisual language, recording time, visual presentation of the teacher, sound, light, and accompaniment of the pre-produced script. Failure to contemplate these aspects usually leads to long videos with an excess of information and that does not reach the proposed learning objective.

Forces

- Videos with poor framing may leave excessive space around the main subject, causing elements of the scene to distract the student, or else objects are not understood since they are presented in a smaller size than necessary.
- Teachers unsure of unfamiliarity with the environment may forget the text or have problems with improvised lines.
- Unforeseen events can occur due to human errors or technical aspects that were not addressed in the best way.

Solution

Therefore, it is important to prepare the materials that will be used during the recordings, to repeat the recording of the same scene more than once, to use the available technical resources properly, and to follow the script.

Actions

The MOOC team must meet before starting the recording and analyze the script and check what is most important and therefore it should be highlighted in each scene of the video. Filming the scene from several different angles and repeating the recording several times is a smart choice that can favor the quality of the educational video, adding dynamism and rhythm, but it is important to note that excessive movements can impair the student's concentration.
If the video is produced in a recording studio, you will be able to use a resource called teleprompter, which is a device attached to the camera and which displays the text, usually the script, to be read.

This feature can be easily replaced by a multimedia projection or even a sheet of paper with the text positioned next to the camera. The important thing to note is that this feature is interesting because it can help you not forget the text you want to explore in the video, but it should be used with caution, as it considerably reduces the naturalness of speech, an important characteristic for the effective quality of the material.

Lighting is an art and, therefore, an important factor when recording videos. There are many ways to work with artificial lighting, but whenever possible, the best option is to look for places with good natural lighting, since most indoor lighting is designed for the human eye and not for cameras.

Sound capture is most often carried out by microphones embedded in cameras and cell phones, but it is important to note that these are limited and, therefore, whenever possible, audio recording should be done with the support of an external microphone to add clarity and sharpness to the sounds.

To prepare the scenario, if the teacher does not have access to a professional studio, just choose an environment with few visual interferences; that is silent so that no unwanted noises and noises appear and that it has good natural lighting, reducing the need for artificial light. The recording scenario should be visually neutral, preferably with light colors and few decorative elements, because the less interesting but irrelevant material is inserted in the video, the better it will be from a pedagogical point of view.

Present with enthusiasm (11)
Trusting and professional presence need to emerge from the screen and be perceived or believed by the MOOC audience

During the video recording process, one of the main focuses is the presenter, who is responsible for bringing the content produced through his (or her) voice and image alive.

Problem

Even with experience in presenting face-to-face classes, teachers/tutors may feel pressured in front of a camera.

Forces

- The use of teleprompters can make the presenter's speech very mechanical.
- An enthusiastic presenter can impair student engagement.

Solution

It is rare for someone to spontaneously demonstrate a natural affinity for presenting to the camera, without any specific experience, professional development and/or training. Presenting to the camera is a skill that, like any other, needs to be learned, developed, and refined and, in doing so, develops proficiency, presence, and confidence.

Action

Presenting yourself to the camera requires a certain amount of self-awareness, physical awareness, and a certain degree of imperatives related to performance. Complementing these self-awareness skills, confidence, and presence on camera are also derived from the following:
1. be familiar with the basics of the environment and terminology on the camera.

2. detailed, deep and fluent knowledge of materials.
3. adequate adaptation and repackaging of these materials for the context of the cameras.
4. don't worry about trying to speak quickly or slowly. But try to speak naturally detailed preparation and testing.
5. fundamental belief in yourself, not just to speak with the camera lens, but to project someone's personality through that inanimate, intimidating, and unresponsive piece of glass.

You should try to present your own videos, in doing so, you get directly involved in space, walking and talking, physically incorporating yourself and making contact with the environment and reflecting on the concepts of your own experience through the narrative; thus, getting involved with the viewer through his own passion. To maximize engagement, it should feel like you are talking to a student individually and directly, almost like an individual conversation, even though you know the purpose of the video is to communicate with the whole group.

Post-Production Patterns

Delivery time (14)
Make the produced video available in a repository that offers advanced search and feedback tools.

You already have your video ready. Now you need to choose an environment to store it and use it in your MOOC.

Problem

There are many ways to store and make a video available. However, choosing the one that best suits your needs is not a simple task. So how do you make your video available so that you can use it in your MOOC and that it can be used and adapted by others for different contexts?

Forces

- With the availability/storage of your video directly in the provider that will offer your MOOC, it will be used only by people who are written in your MOOC.
- With the availability/storage of your video in an environment that uses some access restriction, it will be subject to use licenses that this environment uses.
- If the environment where you make your video available does not offer the option of filling in the metadata, your video may not be easily found.
- If the environment does not offer tools to track views and comments, you will have no feedback.

Solution

Therefore, you must make your video available in an environment that offers support for filling in the metadata, that supports the collection of data regarding the use of your video, which has no restrictions on access, use or reuse, and that allows the insertion of open licenses of use.

Actions

Try to identify if the platform / provider selected to offer your MOOC, offers support to store your video with tools to support the analysis process, metadata filling, licenses and offers mechanisms for reusing your video.

Many platforms / providers use external environments to store videos. A widely used environment is YouTube (https://studio.youtube.com/).

The reasons that justify the adoption of youtube are (i) free access, without the need for login by the user; (ii) licensing through creative commons; (iii) possibility to embed the video in any other tool or website; (iv) high performance of video display, automatically controlling the best resolution for each person who is watching; (v) native integration with google analytics that provides detailed statistics of access to the video.

But there are also specific environments for providing OER, such as the eduCAPES repository (https://educapes.capes.gov.br/).

4. CONCLUSION AND FUTURE WORK

In this paper, we present an overview of an educational design pattern language to support the development of OER in videos for the MOOC context. The patterns (i) briefing, (ii) keep it short and to the point and (iii) video made with REA, support the analysis and planning phases of the video production. The patterns (i) 3 2 1-recording and (ii) presenting with enthusiasm, support the development phase of the video. Finally, the pattern (i) delivery time, supports the video distribution phase. The complete language, containing all fourteen patterns, can be found on site https://sites.google.com/view/videomooc-pl.

Future works include the refinement and inclusion of new potentially useful patterns and categories into the language and the conduction of experiments to validate the proposed language in real-world contexts of MOOC development and their educational videos.

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REFERENCES

Christopher, Alexander, et al.1977. A pattern language: Towns, buildings, construction (center for environmental structure). [S.l.]: Oxford University Press New York.

Avgeriou, Paris, Andreas Papasalouros, and Simos Retalis. 2003. Patterns for Designing Learning Management Systems. In: EuroPLoP, p. 115-132.

Chen, Nicholas, and Maurice Rabb. 2009. A pattern language for screencasting. In: Proceedings of the 16th Conference on Pattern Languages of Programs. 2009. p. 1-11.

Fassbinder, Marcelo; Fassbinder, Aracele.; Barbosa, E. Ellen. 2018. Rumo à proposição de uma linguagem de padrões de design educacional para apoiar a construção de recursos educacionais abertos na forma de vídeos no contexto dos moocs - 10ª jornada científica e tecnológica e 7º simpósio da pós-graduação do IFSULDEMINAS.

Fassbinder, Aracele. 2018. A contribution to the process of designing for learning in Massive Open Online Courses (MOOCs): tese de doutoramento. Tese (Doutorado) - Universidade de São Paulo, Instituto de Ciências Matemáticas e de Computação.

Guo, Philip J., Juho Kim, and Rob Rubin. 2014. How video production affects student engagement: an empirical study of mooc videos. In: ACM. Proceedings of the first ACM conference on Learning scale conference. [S.l.], p. 41–50.

Li, Nan, et al. 2015. Mooc video interaction patterns: What do they tell us? In: Design for teaching and learning in a networked world. [S.l.]: Springer, 2015. p. 197–210

Mor, Yishay, and Steven Warburton.2016 "Patterns for using video in MOOCs." Proceedings of the 21st European Conference on Pattern Languages of Programs. ACM, New York, NY, USA,[im Druck].

Santos, Ana Moura, et al. 2015. Estratégias para desenho e produção de vídeos para cursos em formato mooc. In: Actas da IX Conferência Internacional de Tecnologias de Informação e Comunicação na Educação, Challenges. [S.l.: s.n.]. p. 828–840.