"Tips for Making a Movie", a Learning Object for Autonomous Learning

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Abstract. The paper accounts for a developmental research in the area of courseware production for personal, and self-directed learning. A complete learning object was developed in the context of a master program in Technology and Digital Art. The aim is to make this course available through an online platform, using existing social networks to add social learning features. It is considered by the authors to be a kind of Personal Learning Environment, with a specific purpose.

Keywords: Learning Objects; Personal Learning Environments; Autonomous Learning; Cinema; Web 2.0

1 Background

The learning object developed was as a final assignment for the class "Concepção de Objectos de Aprendizagem" in conjunction with the class "Realidade Virtual e Aumentada". Both classes are from the masters program "Mestrado em Tecnologia e Arte Digital " at the University of Minho. Its content originates from the course "Curso de Realização Cinematográfica" (2009) designed by Prof. Lia Oliveira.

The main purpose is to make the content of this course available through an online platform and use existing social networks to add social learning features. The theme is cinematography and the subject is cinematic direction, which includes introductions to the cinematic language, screenwriting, digital post-production as well as practical tips and general information regarding video cameras.

The target audience for this Learning Object is wide: thanks to its accessible vocabulary, the provided glossary for terms specific to the subject, it can be of interest to school or university students, adults or senior citizens.

2 Description of Approach Used

Our main inspirational source in developing this learning object is the free online course

by the Stanford University, entitled "Introduction to Artificial Intelligence", described by its authors as a bold experiment in distributed education [1]. The term experimental is probably due to the fact that the use of social networks and online forums (for educational purposes), moderated by Artificial Intelligence algorithms is still in its infancy, subsequently it cannot draw on measured facts to sustain its validity, we can anticipate that in a few years this might change. In further analysis, interconnections between various models can be detected, a Distributed Learning Model [2], a Social Learning Model [3], with, at their base an ADDIE development model [4].

In this context the Social Learning Model refers to the extrapolation of a traditional classroom to an online collaborative platform that increases the student´s engagement by providing social network interaction [5]. Hard (2009) presents three different Social Learning Models, our learning object implements two of those three: the warp-around model and the collaboration model [5].

As for the design of our LO, we follow a specific design philosophy termed as user-centered design (UCD) or pervasive usability. UCD´s focus is on the user's needs [6]. Lin (2005) describes it as "The significant change is the learning paradigms shift - from instructor-centered to learner-centered" [21].

The five steps that constitute the ADDIE model are: analysis, design, development, implementation and evaluation. According to these five ADDIE steps for the development of our LO we went straight to step three since steps one and two were implemented by the actual content creator Prof. Lia Raquel Oliveira. At this third step of the development process we implemented a Learning Authoring Template [7] which we designed from our previous assignment, hereby proving its reusability.

The classic definition of a Learning Object is "any entity, digital or non-digital, that may be used for learning, education or training" [8]. This definition does suffer some criticism [9] for being too broad, thus carving the way for several other definitions, from which we find a few applicable to our LO, such as " each piece of content we store in a larger platform, and the platform itself that can contain other learning objects".

Some of the characteristics [7] we wanted our LO to reflect are: digital and deliverable over the internet, networked environment, re-use-able with different content, interoperable, easily adapted, granularity and durability. In order to make our final decision on which framework or platform to use, we tested a few[1] by using them to actively implement small segments of our content, our initial selection of frameworks and platforms to test were: eXe, RapidIntake, Calugo, Wordpress, and Campus Pack.

From this selection eXe, was the most accessible to developers since it is open source and easy to work with. Nevertheless, we were not satisfied with the options it offers to customize the final look and feel. RapidIntake and Campus pack offer more options, their drawback is that they are proprietary systems which carry a very hefty price tag. Calugo is still in the Alpha stage of its development process, therefore still quite buggy, which makes it not a viable option yet to implement a working LO.

In Wordpress we found all the characteristics we were looking for. Initially Wordpress

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[1] The platforms explored were eXe http://exelearning.org/wiki, RapidIntake http://www.rapidintake.com/, Calugo http://calugo.com/, Wordpress http://wordpress.org and Campus Pack http://learningobjects.com/

was a Blogging framework. Nowadays thanks to a large community of open source developers it has grown to a fully functional Content Management System (CMS) with a proper MySQL database. Compared to eXe, Wordpress does require a little more work and coding skills to achieve a working LO. This extra work does pay off, as the final product can be fully open source, heavily customized and instantly available to the millions of internet users through any web-browser.

The first step we took to implement our LO was to install the Wordpress framework on a web-server owned by us, by doing it this way rather then using an externally hosted implementation, we can guarantee its durability, since we are not dependent on a third party service to keep it running. Quite often it happens that such services close their doors or change their way of operating and as a result its users are subject to loosing their hard work. Even though we rely on external services, like the micro blogging social network Twitter, the social networking service Facebook and the online video hosting service Youtube, the core of this Learning Object does not.

Once the framework installed, we started to design and implement a skeleton by creating all the sections and pages needed. With the skeleton in place, we were able to have a clear view of what was missing in terms of functionality to guarantee a comfortable navigation to all the content to be offered by the learning object. Implementing an easy navigation was achieved by choosing and installing the right Wordpress Theme [coraline], and customizing its CSS and PHP files to our needs. Our next step was to add all the textual and visual content, at this stage we did not add the actual videos instead we used placeholders to mark their locations in the LO. The formatting of all the textual content is a laborious task and requires a lot of attention to detail, by using placeholders for the videos we could concentrate on just this task and not get distracted with the technicalities of embedding and uploading videos.

We noticed that some of the textual content blocks were rather extensive and thus compromising the navigability of the LO, to avoid this we used a Wordpress plugin [10] which makes large text blocks collapsable and expandable by the user. The navigability of the LO was also increased by implementing a Tag Cloud [11] to give emphasis to all frequently used words in the LO.

To be able to embed all the videos pertaining to the LO, we created a dedicated Youtube account to upload all our videos to. Once all videos uploaded we replaced the placeholders with the correct videos. As an extra feature we added an interactive virtual three-dimensional camera, which we developed in Unity 3d, as part of our assignment for the "Realidade Virtual e Aumentada" class. To be able to interact with a virtual 3d object does add a certain value regarding user motivation. This object does compromise the LO´s mobility, something easily remedied by offering a static alternative to users who are not able to run the Unity Webplayer plugin [12] and by doing so we do not compromise the general usability and mobility of this LO as a whole.

2.1 Learning Object Structure

The LO follows the same structure as the original content, as-well as offering the user full control on how to navigate this content (Figure 1). A user can choose to sequentially follow the course by following the numbered sections, or a user can choose to navigate

straight to specific words via the Tag Cloud, or look up a specific term by using the search engine. Also the user can just view the videos on the LO´s Youtube channel. Each video does show to which section it belongs to in the LO, thus offering the user the possibility to consult the accompanying textual content, after or while watching the video.

These features enable the users to explore the learning object in the way they think is most appropriate to their needs.
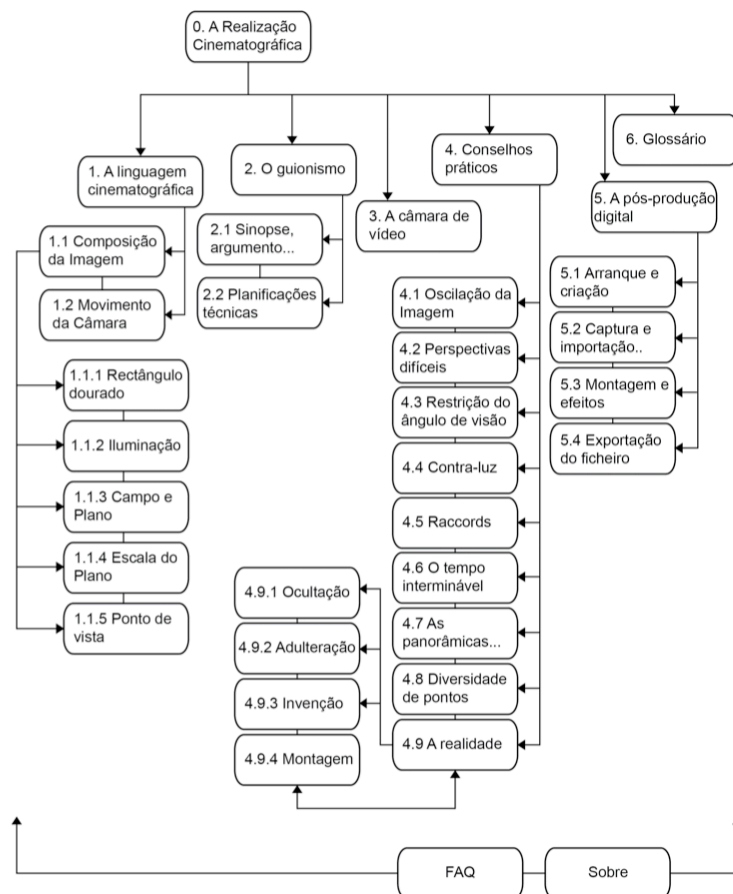

Fig. 1. Learning Object Content Components

2.2   Interface Characterization

For the implementation, as stated above, we opted for a three-column layout: Sidebar-Content-Sidebar. This particular layout was achieved by implementing the Coraline Wordpress theme.

We followed light and clean guidelines [13, 26] to give major emphasis to the principles of shortcuts and coherence, as well as considering the visual weight of the elements and the relationship between them in order to establish a visual hierarchy. Hereby taking into account some principles of perception: proximity, similarity, continuance, and closure. All these are aspects pertaining to the field of visual communication [20].
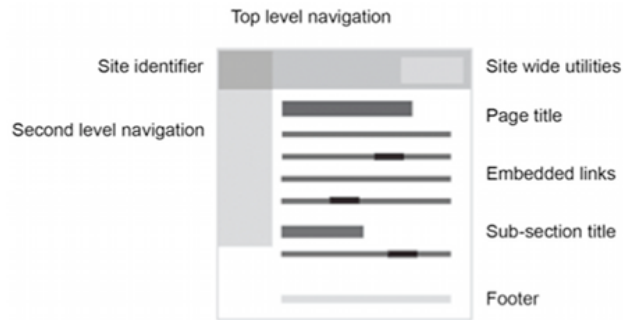

Fig. 2. Generic page hierarchy [20]

As the Stanford Guidelines for Web Credibility [22] points out "People quickly evaluate a site by visual design alone", as such, it is really important to consider the interface design of an online product.The major features of this learning object are highlighted in the next scheme.

Fig. 3. The Learning object layout and its main sections

3   Results of Work Done

In order to evaluate the final result two sets of heuristics were considered: the ones advocated by Nielsen [14] and the ones by Bastien and Scapin [15]. We applied a mixture of both sets, from each set the most useful heuristics to our context, where seven were chosen. They are the following ones.

- Immediate *feedback:* In order to create a more appealing experience, the platform should respond quickly to any user input.
- Use of accessible language: To obtain an intuitive navigation the work should communicate with the user in an effective way. In other words: keep it simple.
- Consistency: Homogeneity of the elements used, according to the specific contexts.
- Prevention of errors: Quality of the error messages and the alternatives given to the user to find himself in any point of his exploration.
- Distinction by location: Association with other items by their localization/organization
- Aesthetic and minimalist design: Absence of non-useful animations, secondary information or unnecessary sections that could compromise the navigation.
- Compatibility: The capacity to maintain the same interface and behavior when using different environments.

The chosen heuristics allow us to conduct a user test during the project ́s development phase. The test consists in the elaboration of one task using the CMS created, and three questions about it, then another task and the same questions referring to the second task. After that, there was four questions about general aspects of the experience. It was done in a quiet room with us and the testers (one at a time). We invited the testers to share their thoughts [16] during the test, because that way we could understand what they were thinking in specific key moments, and that's useful to discover errors we could eventually make.

The sample considered was two men and two women, with the ages between 20 and 40, from non-directly related areas of activity, with a medium degree of technological literacy, and with no previous contact with the project. They're not representative of our main target audience, however they correspond to the rest of the population we wanted to make this course accessible to, so to say, everyone. We chose a relevant range of ages, because that fact reveals different levels of life experiences.

The methods [24, 25] adopted were the participative observation and the inquiry. In the first one we used the recording of videos, the think aloud protocol and annotations on paper as techniques [17, 18, 19]. In the inquiry we chose the semi-structured interview constituted by open, dependent and closed questions with a nominal scale that ranges from 1 to 5.

Based on the interviews we found some aspects that could be improved:

- The tags in the camera are few: This can be easily solved by adding more tags with all the camera's parts discriminated.

- The lack of an introductory text before the camera's object: Include a short text in that place.
- The position of the search bar isn't right, because it isn't easily found: Change the position of that object to somewhere above, in order to be shown since the first contact with this work.

4   Conclusion

As a final conclusion to this assignment, we can iterate several useful findings which can be helpful for future productions involving Learning Objects. Creating worthwhile Learning Objects is definitely something that requires a multidisciplinary team. It is not just a product to be designed by designers or produced by programmers. It is of uttermost importance to have content specialists as well as generalists onboard and direct feedback from representatives of the target group at which the Learning Object is aimed at. Granularity is key for making content easily available through online platforms like our Learning Object. It allows the user to pick and choose which content is most useful to him or her, at any given time. This is also where the functionality of meta- tags and hyperlinks is shown in their best light, these are some of the key-principles and corner stones of the online medium. Granularity is not easily achieved and should not be left to the sole discretion of a graphical designer, but rather it is something to be achieved through tight collaboration between the team members.

It is worth noticing that at the time we started this assignment and took the Stanford Course as our main inspiration, we knew we were on to something, but we did not expect that today that particular project would evolve from one course to a staggering fourteen available courses, we think that this does show that there is an interest in this particular approach.

We also realized that our final product[2] only has the look of our inspiration, as it lacks the algorithms to moderate online social interaction in order to facilitate the personal access of the teacher to classes that consist of thousands of pupils worldwide.

In the context of Personal Learning Environments (PLEs) our Learning Object carries several features that help its integration into a PLE. The built-in social networking features (Youtube, Twitter and Facebook) allow the learners to increase their learning engagement by interacting and collaborating with the course and amongst themselves, thus adding layers of information to the original content. As stated by Jennifer [26] "the learner's role becomes both producer and consumer of knowledge".

The LO also carries all the needed information and links to all the elements to create it, thus offering the learner the ability to reuse the LO ́s structure with different content. The LO itself responds to one of the challenges of the academic institutions that Gillet and Chatterjee [27] highlight. That challenge is to support the students in their informal learning practices and in the construction of their learning environments and networks as a next step in increasing digital literacy.

The LO also offers a high degree of flexibility slowing it to adapt rapidly to a user's

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[2] The learning object is on-line in the following link: http://lodiy.org/

individual needs [28]. Since the LO is online and accessible on various platforms (Laptops, Smart Phones, Tablets, among others) its accessibility [29], aims to encourage mobile learning to occur in any place and at any time without physical location barriers.

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