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Scholars' YouTube channels: content analysis of educational videos

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Abstract — YouTube is a Web 2.0 platform of distributed video sharing, widely used by students, universities and scholars. This article looks into the YouTube channels set by three scholars - Dave Cormier, Wendy Drexler and Michael Wesch -, whose research interests are linked to technology enhanced learning. The focus of analysis is on the sample of videos each scholar uploaded and categorized as "education" in their YouTube channels. The data collected from the content analysis allows to understand what content is being shared and with what approach. The overall results suggest that those scholars who have a channel as personal, or as officially linked to the university, share videos produced as a result of their work as scholars, some of which even share copyright with the institution. All the videos address similar concepts and ideas regarding the integration and use of technology in education, but the approach to present them differs.

Resumo — O YouTube é uma plataforma Web 2.0 de partilha e distribuição de vídeos, amplamente utilizada por estudantes e universidades. Este artigo analisa os canais do YouTube de três académicos - Dave Cormier, Wendy Drexler e Michael Wesch - cujos interesses de investigação se encontram ligados à utilização da tecnologia na aprendizagem. O foco desta análise consiste numa amostra de vídeos categorizados como "educação", publicados nos canais do YouTube dos académicos, os quais foram carregados para o canal pelo próprio autor. Os dados que foram recolhidos da análise de dados permitiram compreender qual o conteúdo partilhado e qual a abordagem que os académicos utilizaram para a fazer. Os resultados sugerem que os académicos com um canal pessoal ou um canal oficialmente ligado à universidade partilham vídeos produzidos no âmbito do seu trabalho docente e de investigação. Alguns dos vídeos partilham direitos de autor com a universidade e todos abordam conceitos e ideias similares no que respeita a integração e utilização da tecnologia em educação, diferenciando-se apenas na abordagem para sua apresentação.

Index Terms — YouTube, Scholars, Higher Education, Technology, Web 2.0.

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The evolution of the web and the emergence of Web 2.0 platforms has enabled new levels of interaction and communication between users, for sharing and creating content online. These new actions are also being potentiated for educational purposes (Garcia-Barriocanal, Sicilia, Sanchez-Alonso, & Lytras, 2011), resulting in an increased demand of the responsibilities of teachers, students and educational institutions. Universities are now facing the need to adapt and enter into the Web 2.0, evolving into a University 2.0 (Unsworth, 2008). Taking advantage of students strong interactions in those online environments, as YouTube or Facebook, universities are trying to move closer to them, establishing their official presence in the same online places. Despite this, many higher education institutions are cautious of the extent that their presence should have in these Web 2.0 platforms. While institutions are reluctant, many scholars are taking initiative in sharing their knowledge, through Web 2.0 tools and in online open environments (Read, 2008), such as blogs, wikis, YouTube, among others.

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This article focuses on the YouTube channels set by scholars as teachers and researchers, where educational videos are openly shared among other content videos. The aim of this article is to contribute towards a better understanding of the content that is being shared in the educational videos published on the YouTube channels, namely of three scholars - Dave Cormier, Michael Wesch and Wendy Drexler. The selection of these scholars was made due to their research concerning the integration and use of technology in education. For this purpose we have analyzed a selection of videos published on the YouTube channels of each selected scholar, which had been categorized as "educational" and afterwards, following a qualitative methodology, we undertook a content analysis of those videos. The article describes the overview of selected YouTube user channels, detailed analysis of the videos and discusses the results obtained.

1 OVERVIEW OF YOUTUBE

YouTube was created in 2005, as a free public access web-platform allowing people to easily upload, view and share video clips (YouTube, 2011a). It allows users to create their own channels through which they can upload and share videos, comment, rate, explore and post related videos, becoming a site where people join and interact (Biel & Gatica-Perez, 2011). Nowadays YouTube is ranked as the third most popular website, with hundreds of millions of users from around the world, exceeding 2 billion views of videos per day, and 35 hours of video uploaded every minute (YouTube, 2011b). As Downes (2008) states, YouTube has marked the transition from static to dynamic Internet, and its advantages are the ubiquity of video formats and the wealth of content of the videos. YouTube accommodates private or amateur videos, as well as advertising and highly-quality professional videos (Juhasz, 2009). All users have the opportunity to freely share videos on YouTube (Yang, Hsu, & Tan, 2010), uploading them under proper categories: Entertainment, News&Politics, Film&Animation, Gaming, Education, etc. However, the most popular are still considered Music, Entertainment and Comedy (Cheng, Dale, & Liu, 2008). As Burke *et al.* (2009) state, the categorization of the videos as "education" is mostly used by government, community agencies or teachers and students themselves.

So, how can YouTube guarantee that the videos have an educational quality? The concerns behind these questions implicated the creation of YouTubeEDU (YouTube, 2011c), launched in March 2009, as a special category of education, intended for uploading educational videos. Its aim was to allow the leading colleges and university partners to publish their videos through customized channels, where they could present their institutions' brands to society (Redecker, Ala-Mutka, Bacigalupo, Ferrari, & Punie, 2009). But to be considered for YouTubeEDU a users' channel should already be established and with a representative amount of educational videos (YouTube, 2011c). And because of the need for institutions to have a previously established channel, the question relating to the criteria for categorizing "education" videos remains: how can YouTubeEDU assure that the videos are in fact educational? The aim of this work is not to answer the proposed question, but to share the reflection made.

2 YOUTUBE IN EDUCATION

YouTube has been used in a variety of teacher-learning contexts (Garcia-Barriocanal, Sicilia, Sanchez-Alonso, & Lytras, 2011; Milliken, Gibson, O'Donnell, & Singer, 2008; Redecker, *et al*., 2009). Apparently, teachers and students make use of it (Downes, 2008) as an educational resource: to present a topic, develop activities in the classroom, produce videos, work with video resources, and also engage their students in learning digital skills (Bonk, 2008; Burke & Snyder, 2008; Snelson & Perkins, 2009). It is also used for online classrooms and distance education courses to establish a sense of classroom community and achieve greater learner outcomes (Burke & Snyder, 2008; Duffy, 2006). Besides, YouTube is considered an innovative way to learn for visually or physically impaired learners (Burke *et al*., 2009).

YouTube videos can inspire and engage learners and support the digital learning style of the *Net Generation (Burke & Snyder, 2008)*. This is considered effective as videos utilize both hemispheres of the brain: the logical and the creative, due to the combination of verbal and visual material (Burke *et al*., Berk, 2009; 2009; Martinez, 2010). This is considered mostly effective for novices and

visual learners. The potential of videos for education is increasing across the sciences, allowing to demonstrate in more detail what is happening in scientific experiments (Wesch, 2009).

2.1 YouTube as an Open Educational Resource

Open Educational Resources (OER) defined as "digitalized materials offered freely and openly to educators, students and independent learners" facilitate access to knowledge (D'Antoni, Savage, & Unesco, 2009). This makes YouTube part of the OER movement, because it makes educational resources accessible through information and communication technologies.

However, there are still challenges. The most important one, as mentioned by Jones & Cuthrell (2011), is the critical selection of appropriate material with clear educational value within the vast open access of most social networking sites. Similarly, Berk (2009) states that choosing videos for classroom use involves several issues, such as selection criteria, types of videos and sources for selecting videos. Among the appropriate selection criteria, the author proposes to take into account the students' characteristics, the message of the video and the video structure, including length, context, characters, actions and visual cues. Also, open access to YouTube does not guarantee constant video availability, meaning that videos can be added and deleted from the site either by "an author" or site administrator at any time (Cha, Kwak, Rodriguez, Ahn, & Moon, 2007). Accordingly, it is important to further explore the use of YouTube videos in education and the content of the videos uploaded by educators under the category "education".

2.2 The use of YouTube in Formal, Informal and Non-formal learning

Over the last few years, several studies have been published describing the use of videos, either in formal education (Berk, 2009; Green *et al*., 2003; Mitra, Lewin-Jones, Barrett, & Williamson, 2010; Reynolds & Mason, 2002), informal education (Bo-Kristensen, Ankerstjerne, Neutzsky-Wulff, & Schelde, 2009; Morrissey, 1991), and non-formal educational contexts (Lewis, 1977). However, the use of videos was reinvented as video-sharing technologies, such as YouTube, emerged.

The new different uses that can be made of videos retrieved from sharing technologies, such as YouTube, to comment or rate, result in an increased possibility of strategies of how to apply these tools in order to optimize learning. Nevertheless, as Beldarrain (2006) notices, the use of video-sharing websites, such as YouTube, for educational purposes is not fully described in the literature. It is, however, recognized that the widespread informal use of such Web 2.0 tools is creating further distance between digitally supported youth culture and the institutional culture of schools (Williams, 2008). Schools should, thus, make an effort to come up to these technologies. The growing competition between schools and other more attractive sources of educational support increases the gap between informal and formal learning, making schools less appealing for students. As Bull states, digital video offers an excellent context for understanding the complexities of integrating informal and formal learning and finding ways that the qualities of both formal and informal media learning contexts can be harnessed in school is a challenge that educators should make a priority (Bull *et al*., 2008).

Therefore, attention should be paid and efforts should be made to incorporate such tools in class, in order to narrow the still existing gap between formal and informal education. The focus of this paper is not to develop such strategies, which are already being worked on by other authors, such as Clark *et al.* (2009), who have studied the potential transferability of skills between informal and formal settings, but to contribute to the understanding of the content that is being shared in YouTube videos that can be used either in informal, formal or non-formal learning, understood here in its broadest sense.

We underline "in its broadest sense", because the notion of "learning" has been frequently wrongly treated as a synonym of "Education" or "School" (Falk & Dierking, 1992, p. 98). Despite of this misunderstanding, we stand in between the points of view of Ainsworth & Eaton (2010) and Falk & Dierking (1992), as they respectively state that "whether learning takes place in a formal setting, such as school, a non-formal setting such as a community or cultural center or an informal setting such as a home, all learning is good, and all learning is valuable" (Ainsworth & Eaton, 2010, p. 12). In addition, "all learning contributes to the individual's growth, not only cognitively, but also

emotionally and socially" (Ainsworth & Eaton, 2010, p. 12), being "learning cognitive information" understood as the acquisition of facts and concepts, "learning affective information" understood as the acquisition of attitudes, beliefs, and feelings, and "learning psychomotor information" the same as the acquisition of a technical skill or procedure (Falk & Dierking, 1992, p. 99).

2.3 YouTube used by Scholars

In a study undertaken by Reuben (2008), aimed at knowing which social media is mostly used by Universities and Colleges, it was possible to understand that over half of those institutions had an official presence in YouTube. According to Young (2008), YouTube wants to be a space to support academia, a place where education can be a strong category, where Universities set their official channels, as they have been doing, giving people the possibility to connect with professors and follow topics which interest them, widening their audiences.

The YouTube website provides opportunity to create and share own production videos (Burke & Snyder, 2008). Professors have also been setting their own user channels, some of which are connected to the official YouTube channel of the universities where they work.

The diffusion of Web 2.0 technology and its use by students is producing changes to which faculty members are adapting, and according to Hartman (2007, p. 4), due to:

> *"a plethora of social networking and resource-sharing sites [that] has appeared over the past few years, including Facebook, Myspace, Flickr, YouTube, LiveJournal, Twitter, and Second Life. Students have increasingly turned to these sites as the nexus of their social and even academic universe. Faculty members are beginning to follow, using these sites as a means of getting to know their students, as a rapid and reliable way to reach students, and as a method for sharing faculty-produced and student-produced content".*

At this time, there has not yet been made a survey to gain knowledge about the content of the videos being created and shared in the YouTube channels of scholars (as focused in this paper), moreover focusing on the sector of scholars involved in the study of technology enhanced education. There are some faculty professors who, on their self-initiative, created web videos, published them on their YouTube channels, some of which having achieved very popular audiences. Young (2008, p. 16) points out two examples of faculty professors with popular audience for their online videos on YouTube: 1) two professors at the University of Minnesota-Twin Cities who by explaining a 3-D mathematical concept, attracted more than one million views; 2) and Michael Wesch, assistant professor of cultural anthropology at Kansas State University, with a video made about "Web 2.0 ...the machine is us/ing us" that has until this date more than ten million views. Wesch himself states that "web video offers a new way for scholars to communicate" and think about their work in different ways (Young, 2008), noting that the video which had so many views was a result of a scholarly article written before, but that in fact might be read only by a small number of people, compared to its video version.

Also, there is another phenomenon happening: through the YouTube channels of anonymous people or through the official channels of several institutions, faculty professors have their conference talks or interviews shared openly, gaining large audiences. Thus, sharing videos on YouTube, educators increase public awareness both of their own teaching practices and the university's departments and programs they belong to (Burke *et al*., 2009).

Accordingly, if YouTube is used purposefully, it can enrich both learning and teaching and actively engage viewers in constructing meanings (Molyneaux, Gibson, O'Donnell & Singer, 2008). Since selecting videos on YouTube with appropriate content and quality is time consuming and challenging (Burke *et al*., 2009, p. 3), the videos produced and uploaded by educators may be considered initially as having predefined educational value. Especially, if they are highly rated and commented on, it may significantly eliminate search options in the future and may initially be considered as having high quality and meaningful content. Besides, most people are said to watch user-generated videos if they know the person or if the subject matter is of interest to them (Molyneaux, Gibson, O'Donnell & Singer, 2008). Accordingly, the videos produced and published by renowned scholars are supposed to attract more purposeful audiences and generate more positive and meaningful responses.

Following the need for further research in understanding how the scholars are using video-sharing websites, our research will focus on YouTube channels of scholars and the content of the educational videos uploaded by them. The detailed information about these scholars will be presented in the following section.

3 THE PRESENT STUDY

Due to the increased open presence of universities and open access to educational materials online, including YouTube, the aim of the present study is to analyze the content of openly shared online videos by scholars, uploaded in their YouTube channels. The YouTube "user channel" (or YouTube channels hereafter) is understood as "a page that gathers all the videos uploaded by the user, and thus facilitates interested people to browse videos of a specific user, uploaded at anytime" (Biel & Gatica-Perez, 2011, p. 4). The scholars were selected according to their research and published works about the use of digital technologies in education. Thus, initially we focused on the following researchers: Dave Cormier, Wendy Drexler, Michael Wesch, Graham Attwell, Steven Downes, and George Siemens. The following search of the YouTube channels associated with these scholars resulted in the final selection of only three of them, due to the larger number of videos and variety of content presented. Only one author, George Siemens, did not have an associated YouTube channel.

The present study followed the descriptive qualitative research methodology. The limited sample of video corpora was collected and investigated with broad questions in mind (Derry, 2007). For this purposes, we followed the basic principles of "grounded theory", allowing us to work from broader perspectives towards a narrower focus, however, without any predefined theory and/or categories (Charmaz, 2006). Accordingly, the main research questions of this study were defined as follows:

(1) What content is being shared in the videos categorized as "Education" in three selected YouTube channels?

(2) What is the relation between the categories of the content of the selected videos shared by each of the three scholars?

(3) What is the relation between the message and the content of the videos?

3.1 Methodology

The final sample selected for the present study included three scholars: Dave Cormier, Wendy Drexler and Michael Wesch, well known for their research in the use of technologies in education:

i) Wendy Drexler (WD) (http://www.yout.goube.com/user/wdrexler): Post Doctoral Researcher and Project Manager at University of Florida College of Education, United States of America (USA), with professional research interests in: Online Networked Learning; Student Construction of Personal Learning Environments; Building Professional Learning Communities; Web Applications in the Classroom (http://wendydrexler.com/index.php?p=1_6_Curriculum-Vitae).

ii) Dave Cormier (DC) (http://www.youtube.com/user/davecormier): an independent educational researcher, online community manager and manager of Web Communications and Innovations at the University of Prince Edward Island. He is a co-founder of Edutechtalk and President of Edactive Technologies, social software consulting firm, and teaches sporadically on a variety of educational topics (UPEI, Canada, 2008).

iii) Michael Wesch (MW) (http://www.youtube.com/user/mwesch): assistant Professor of Cultural Anthropology at Kansas State University (USA), who has been exploring the impact of new media on society and culture, studying "the effects of social media and digital technology on global society" (Wesch, 2011).

The information presented in the YouTube user channels allows to collect various information such as the name, location, age, personal description, and interests, the number of videos uploaded or watched, and links to the user subscriptions, subscribers, and friends. In addition, the comments left under the videos can be read and the statistic information related to each video can also be obtained (Biel & Gatica-Perez, 2011). The present study used this varied information to construct a general overview of the selected channels. The initially collected data included the total number of uploaded videos, number of views, likes, dislikes, comments and favorites related to

each video, numbers of categories and tags. This primary analysis formed the basis for further development of our research (Bauer & Gaskell, 2000; Priest, 1996). All three channels counted 140 videos in total (DC-83; WD-41; MW-16), uploaded under 11 different categories given by the scholars themselves using YouTube functionalities.

In order to reduce the sample of videos and obtain more information, a concomitant reduction was applied as a result of the initial analysis process and data obtained from the videos (Lessard-Hébert, Goyette, Boutin, & Reis, 2008). Therefore, only the videos under the "education" category were selected in accordance with the aim and research questions of the study. A total sample of 46 videos categorized as “education” was defined from the 140 videos uploaded by the scholars. However, it was still considered too big a number of videos to proceed with the detailed content analysis within the limited time frame we had available for the study. To select a small sample of materials, the present study concentrated on the two most viewed videos from the total of 46 videos under the category "education" uploaded by each scholar. This selection was due to the high popularity of these videos, higher quality of the information presented and relation of the content to educational issues. The detailed analysis of the smaller sample allowed to study in more detail the “intention of the communicator” and thus speak from and “insider perspective” when analyzing results (Priest, 1996, pp. 111, 196). Accordingly, the final sample for the present study is composed of six videos in total, the two most viewed videos of each scholar’s YouTube channel, as presented below:

1. Dave Cormier (DC):

1.1. What is MOOC (DC1) – views (6017), likes (31), dislikes (0), comments (9), favorites (62);
1.2. Success in MOOC (DC2) - views (1914), likes (17), dislikes (0), comments (9), favorites (23).

2. Wendy Drexler (WD):

2.1. The Networked Student (WD21) – views (91962), likes (139), dislikes (5), comments (57), favorites (789);
2.2. Welcome to my PLE (WD2) - views (33161), likes (74), dislikes (1), comments (51), favorites (253).

3. Michael Wesch (MW):

3.1. Web 2.0…The Machine is Us/ing Us (MW1) - views (11338644), likes (21789), dislikes (1447), comments (8320), favorites (37359);
3.2. A Vision of Students Today (MW2) - views (4225698), likes (11390), dislikes (1096), comments (9277), favorites (27184).

The data collection was completed on April 25, 2011. All the videos have a length that varies between 3’20’’ and 5’10’’. They are all categorized as “education” and tagged as “MOOC, educational, Web2.0, 21stcenturylearning, connectivism, networked learning, personal learning environment”.

The quantitative data collected at the beginning of our research was particularly useful as initial empirical data, helping us to understand the overview of the selected YouTube channels and to choose those most suitable for the aim of our research. However, as a qualitative research, the present study employed a more descriptive and interpretative paradigm, interpreting phenomena through “what we see in our data” and finding the associated meanings (Bauer & Gaskell, 2000, p. 358; Charmaz, 2006). Therefore, proceeding further with the research, the main focus remained on the qualitative content analysis, to discover conveyed meaning or the latent content of the selected videos and construct the corpus for subsequent discussion (Carmo & Ferreira, 1998; Charmaz, 2006). Accordingly, the dimensions of analysis were specified as the text and images encountered in the videos (Derry, 2007). The repeated words, phrases, thematic units, concepts and ideas encountered in the transcribed text and having common meanings were included into categories (Bauer & Gaskell, 2000; Carmo & Ferreira, 1998; Priest, 1996, p. 112). Video structural features such as cuts, edits, fast motion, sound effects, music, etc., were not focused on, as the present study does not intend to analyze commercial or professional aspects of selected videos (Bauer &

Gaskell, 2000; Kang & Cappella, 2008). Instead, the organization of the general message of the videos was considered.

To simplify the process of collection, storage and codification of the obtained data, the computer software WebQDA (www.webqda.com) was used. It is online distributed software for qualitative data analysis with a collaborative environment, developed by researchers at University of Aveiro. The six videos were uploaded into WebQDA and transcribed. Afterwards, the transcripts were analyzed and coded with support of WebQDA in relation to the words or images of the videos' content. Categories were constantly verified in order to guarantee their similar understanding by all involved in the research process (Priest, 1996). The quantitative results in WebQDA were not considered as measurements, but rather as a process necessary for interpreting and interrelating obtained data (Priest, 1996, p. 112). At a result, all six videos were classified relating to their (i) Message and (ii) Authorship and categorized relating to (iii) Concepts and Ideas.

The message of each video is understood as the way in which the content is presented and organized. It is defined as Tutorial Guide (DC2/7 references), Concept Explanation (DC1/8 references; WD1/5 references; MW1/11 references) or Class Project (WD2/5 references; MW2/1reference). Authorship relates to those who are responsible for the production of the video, either a Single author, or a Shared Authorship - a group of researchers or teachers, a teacher with the students, or other groups. Concepts and Ideas include two main categories (i) Integration of Technology in Education and (ii) Use of Technology in Education. These categories are named as such since they include concepts and ideas mentioned in the selected videos, but happening in different contexts. Thus, the first category includes such subcategories as: (i1) formal learning; (i2) informal learning; (i3) non-formal learning; (i4) traditional vs technology enhanced learning and (i5) Web 2.0. The second category includes such sub-categories as: (ii1) collaboration; (ii2) networking; (ii3) connectedness; (ii4) user created content and (ii5) openness.

The definitions of the subcategories are presented below in order to sustain the understanding of encountered concepts and ideas and address them in the following research analysis.

(i1) formal learning: "takes place within an organized and structured context like formal education and company training, and is intentional from the learner's perspective, normally leading to formal recognition such as diploma or certificate" (Punie, Zinnbauer, & Cabrera, 2008, p. 6).

(i2) informal learning: "is embedded in daily life activities and is mostly non-intentional from the learner's point of view, often related to experiential learning or considered as accidental learning" (Punie, Cabrera, Bogdanowicz, Zinnbauer, & Navajas, 2006, p. 6).

(i3) non-formal learning: "usually takes place outside the traditional systems of education and training and can be intentional for the learner, but usually does not lead to formalized certificates (Punie, Zinnbauer, & Cabreira, 2008, p. 6).

(i4) traditional versus technology enhanced learning: in contrast to traditional classroom instruction, technology enhanced learning "requires that we put students at the center and empower them to take control of their own learning providing flexibility" (Transforming American Education: Learning Powered by Technology, 2010).

(i5) Web 2.0: is a set of Web applications that foster more engaged media consumers, increase user participation, collective intelligence and massive user-generated open multimedia content, such as weblogs, wikis, real simple syndication (RSS), aggregators, social bookmarking, online photo galleries and audio-video casting, and many others (Garcia-Barriocanal, *et al.,* 2011; O'Reilly, 2005).

(ii1) collaboration: the act of working with another or others on a joint project; something created by working jointly with another or others (Dictionary of Education,1973, Vols. XIX).

(ii2) networking: an activity through which individuals establish and develop social ties with other individuals (Jones, Millermaier, Goya-Martinez, & Schuer, 2008).

(ii3) connectedness: a multi-dimensional indicator of a person's overall relationship to the Internet (Leung, 2010, p. 277) or a sense of social belonging (Huang, Chiu, Sung, & Farn, 2011).

(ii4) user created content: "content made publicly available over the Internet, which reflects a certain amount of creative effort" (OECD, 2007, p. 9).

(ii5) openness: availability (physical access), accessibility (usability), acceptability (social empowerment), linked to reproduction, reuse, recombination and publication of content open to a global public, usually inviting revision and commentary (Lane, 2009; UNESCO, 2002).

4 RESULTS AND DISCUSSION

As the result of the content analysis using WebQDA software, three main matrices where created, which helped to answer the research questions.

4.1 Shared Content

The categories selected to compare the content of each video were “integration of technology in education” and “use of technology”. The “integration of technology in education” includes the following subcategories, presented below altogether with the examples from the videos’ content:

(i) formal learning - “You might pay to get the credits from an institution (formal)” (DC1); “a student at 21st century American high school is studying a psychology as part of his Contemporary Issues class (formal)” (WD2); (ii) informal learning - “some information (...) students find themselves according to their interests and needs (informal)” (WD2);

(iii) non-formal learning – “MOOC course” (DC2); “21st century student loves his mp3 player, but there is more on this device than his favorite music. He subscribes to a number of video and audio podcasts that supports his learning (informal, non-formal)” (WD1);

(iv) Web 2.0 tools - “Web tools: Facebook, blog, YouTube videos (Web 2.0 tools)” (WD2);

(v) traditional versus technology enhanced learning - “He attends class three days a week, two days online. He doesn't have a textbook. His teacher almost never lectures (informal; traditional versus technology enhanced learning)” (WD1).

The “use of technology” covers the following subcategories, examples of which are presented as follows:

(i) openness - "The course is open" (openness) (words shown on the video), all work is done in areas where people have access to read, reflect and comment on; the work is accessible; take the course without paying” (words shown on the video) (openness, informal) (DC1);

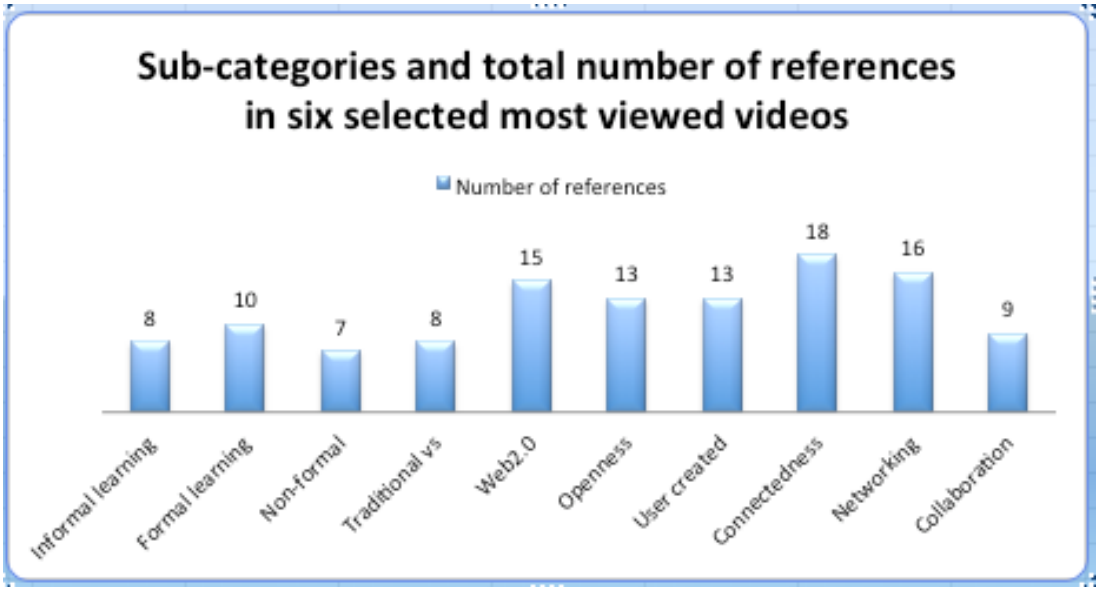
(ii) user as content creator - “Showing how to create a blog (among others, openness).” (MW1);

(iii) connectedness - “Two sites can “mash” data together” (connectedness) (MW1);

(iv) networking - “(...) a digital world; world where Internet connection gives you access to a staggering amount of information” (connectedness) (DC1);

(v) collaboration - “(...) he comments on the blogs (webtools) and offers his own points of view for discussion” (collaboration, connectedness) (WD1).

FIGURE 1
SHOWS THE SUBCATEGORIES AND THE TOTAL NUMBER OF REFERENCES IN ALL SIX SELECTED VIDEOS.



4.2 Differences and similarities among channels

All three scholars in their two most viewed educational videos mention all the defined subcategories of the videos' content.

MATRIX1

INTEGRATION OF TECHNOLOGY IN EDUCATION VS USE OF TECHNOLOGY - 2(3) – 2 VIDEOS 3 REFERENCES

MATRIX	Openness	User Created Content	Connectedness	Networking	Collaboration
Formal	2(3) MW2, DC1	**3**(3) *MW2,WD1,DC1*	3(6)MW2,WD1,DC1	2(4) MW2,WD1(4)	2(4) WD1, DC1
Web2.0 tools	2(6) WD1, WD2, DC1	5(10)MW1,MW2, WD1, DC1,DC2	5(11)WD1,MW1,MW2, DC1,DC2	5(10)MW1,MW2,WD1, WD2,DC2	3(6) MW2,WD1,DC
Trad. vs techn enh educ	2(5) WD1, DC1	4(8)MW2,WD1,WD2,DC1	3(9)MW2, WD1, DC1	4(8)MW2,WD1,WD2,DC1	3(6)MW2,WD1,DC1
Informal	3(4)WD1,WD2,DC1	3(5)MW1,WD1,DC1	3(7)MW1,WD1,DC1	5(7)MW1,MW2,WD1,WD2,DC1	2(5) WD1, DC1
Non-formal	2(5) WD1, DC1	2(3) WD1, DC1	2(5) WD1, DC1	4(5)MW2,WD1, DC1,DC2	2(4) WD1, DC1

Nevertheless, during the process of the videos' content analysis, some similarities and disparities among them were observed. In order to crosscheck the content of all the videos in relation to the particular author of the video, matrix 1 was composed.

Matrix 1 allows observing how many times the subcategories "use of technology in education" and "integration of technology in education" has been combined. For instance, "2(3) MW2, DC1" means that two videos (MW2 and DC1) have three references in total where formal learning and openness have been mentioned simultaneously. The bigger the number of references, the more times the subcategories are mentioned in the videos, and accordingly this content is more highlighted in the video.

The most similar content observed in all videos relates to such subcategories as user-created content, connectedness, networking, and collaboration as well as Web 2.0, informal learning and traditional versus technology enhanced learning. The "Web 2.0" and "traditional versus technology enhanced learning" have the highest number of cross-referencing with other subcategories. Regarding "Web 2.0 tools", the high number of references can be interpreted due to the identification of many fragments of the videos where images of such tools are shown, even when the narrator does not mention them. "Connectedness" and "networking" are the most represented concepts by all the authors throughout their videos when compared with other subcategories. Also, matrix 1 shows that the videos of Wendy Drexler (WD1) and Dave Cormier (DC1) are similar in many aspects of their content since they refer simultaneously to the same subcategories. However, Michael Wesch's videos (MW1 and MW2), in spite of the highest number of views, comments and likes among all the six videos has a limited number of simultaneous use of concepts in each

fragment of his videos. This can be explained by the specific focus of each fragment of his videos on certain concepts such as Web 2.0 tools.

4.3 Message and concepts

Two matrices were created for the analysis of the relation between the message of the video and the two main groups of categories – Use of Technology in Education, and Integration of Technology in Education.

MATRIX 2

MESSAGE AND USE OF TECHNOLOGY

1 (1) - NUMBER OF VIDEOS AND TOTAL NUMBER OF REFERENCES TO THE SUBCATEGORY (IN BRACKETS)

Matriz	Openn...	User Cr...	Connec...	Networ...	Collabo...
Tutorial Guide	1 (1)	1 (1)	1 (4)	1 (5)	0
Concept explana	3 (10)	3 (11)	3 (14)	3 (9)	3 (9)
Class project	1 (3)	2 (3)	1 (3)	2 (4)	1 (1)

MATRIX 3

MESSAGE AND INTEGRATION OF TECHNOLOGY IN EDUCATION

1 (1) - NUMBER OF VIDEOS AND TOTAL NUMBER OF REFERENCES TO THE SUBCATEGORY (IN BRACKETS)

Matriz	Non-for...	Informal	Traditio...	Web2.0...	Formal
Tutorial Guide	1 (1)	0	0	1 (2)	0
Concept explana	2 (6)	3 (8)	2 (7)	3 (11)	3 (7)
Class project	1 (1)	2 (3)	2 (7)	2 (6)	1 (2)

The first overview of these matrices allows us to observe that videos classified as "concept explanation" and "class project" contain all the concepts and ideas within them, while the “tutorial guide” does not mention the concepts of “collaboration” (shown in matrix 2), “formal” and “informal learning”, and “traditional *versus* technology enhanced learning” (shown in matrix 3).

This difference is observed because the “tutorial guide” relates to Cormier’s video (DC2) focusing precisely on the steps that must be taken in order to successfully participate in a Massive Online Course (MOOC). Matrix 2 shows that tutorial guide is coded with "non-formal learning" and "Web 2.0 tools" presenting the evidence that a massive online course (MOOC) happens online and whoever wants can participate and learn without expecting any formal certification.

Concerning matrix 2, there is a prevalence of the concepts “connectedness” and “networking”, justified with Cormier’s (2010) statements in the video itself that in a MOOC an individual needs to connect and network to be able to live the learning experience: “You need a network. You need to follow some other people reflecting on the material and make some connections [...]. Those connections and your comments is what the course is all about”.

On all the videos classified as “concept explanations”, a larger emphasis is given to “connectedness” (matrix 2), and to "Web 2.0 tools" (matrix 3). The “Web 2.0 tools” are presented in these videos as necessary elements supporting learning, connectedness and knowledge

management (Fini, 2009). The “concept explanation” videos are categorized in accordance with all types of learning: non-formal, formal and informal. This can be sustained by the fact that online environments and the use of Web 2.0 tools to learn, facilitate collaboration between users, “collaborative learning, as learning activities where the learning tasks require the learner to interact with their peers in order to achieve the learning outcomes” (Busuttil-Reynaud & Winkley, 2006, p. 29). The “class project” videos are referred less in all the subcategories when compared to “concept explanation” videos, maybe because these videos present class work happening inside the school or university. Accordingly, “non-formal” learning (matrix 3) and “collaboration” (matrix 2) are referred the least in both matrices. However, other concepts as "traditional versus technology enhanced learning ", “network”, “connectedness”, “user created content” are mentioned the highest. Also, "class project" videos highly refer to the use of "Web 2.0 tools", as this is the main characteristic of the new technology-enhanced classrooms and types of work.

Almost all the videos in matrix 3 show reference to the "traditional versus technology enhanced learning" subcategory. Specifically it is observed in Michael Wesch’s video (MW2) comparing traditional with technology enhanced classrooms and in Wendy Drexler’s video (WD1) presenting the teacher who teaches students “how to build the network and take advantage of learning opportunities, how to communicate properly and ask respectfully for help from experts". Dave Cormier (DC1) also describes how a learner would have to contact with information and knowledge before and after the Internet:

> *“when people wanted to know something, being that they could ask someone, buy a book, figure it out for yourself or call a school. If the school offered a course about the thing we wanted to learn about we would go there. We could get access to information about a topic: an instructor would comb through books and journals to pull the information together from a library, and we could find others who are interested in the same topic as we are. The MOOC is built for a world where information is everywhere, where social network is a click away; a digital world; world where Internet connection gives you access to a staggering amount of information” (video DC1).*

The videos “What is a MOOC”, “Networked student” and “Web 2.0 the machine is us/ing us” present Web 2.0 users as creators of content and participants in communities of networks, in online open environments for teaching and learning.

5 CONCLUSION

Hartman (2007) highlights that higher education professors have to share their knowledge and educational resources, by using open and free Web 2.0 platforms. It is assumed that YouTube is a popular example of a platform where scholars, institutions and students have a presence, either as users or creators of content. On the six videos analyzed it was possible to understand that the educational content shared in the videos of the selected YouTube channels, directly relate to the main research interests and work of their authors: teachers and researchers. Despite that similar content was identified in all the analyzed videos, the authors have chosen different approaches to present it. While one of Dave Cormier’s videos is identified as “tutorial guide”, both Michael Wesch and Wendy Drexler have produced videos identified as “class project”. Still, “concept explanation” video is a category common to all three scholars. The class project videos evidence the use and impact on learning, from the learners’ experience, either of formal or non-formal learning.

From this study it is clear that the content of analyzed YouTube videos frequently relates Web 2.0 environments and tools to their use in education. All the videos underline the benefits of technology-enhanced learning as opposed to traditional learning. Furthermore, all six videos relate to an educational context that integrates these technologies. In all the videos the content addresses the point of view of the learning experience mediated by technologies.

It is also clear that the scholars are sharing educational resources, some of which relate to their work as professors, or are produced within the scope of their research. Some of these videos share their copyright with the university to which the scholars professionally belong.

6 Concluding Remarks

This study has several limitations, one of which is the sample size. In spite of the small sample of only six videos, it was possible to understand which educational content is being shared in the videos.

For future research it is suggested: i) to develop similar studies with larger samples; ii) to focus on all the types of videos shared by scholars; and (iii) to analyse and compare all the videos of selected scholars uploaded under the YouTube category “education”.

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