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Interactivity and Annotations for New Teaching Models

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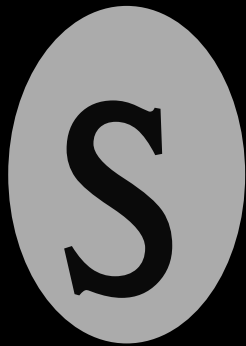
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pecial Topic Issue




MOOCs (Massive Open Online Courses):
Communicative Interactivity and
Multimedia

MOOC (Cursos masivos abiertos en línea):
Interactividad comunicativa y multimedias



Literature and Practice: A Critical Review of MOOCs

Literatura y práctica: una revisión crítica acerca de los MOOC

-  Dr. Andrés Chiappe-Laverde is Associate Professor and Researcher in the Centro de Tecnologías para la Academia at the University of La Sabana (Colombia) (andres.chiappe@unisabana.edu.co).
-  Dr. Nicolas Hine is Professor at the School of Computing at the University of Dundee (Scotland) (nhine@computing.dundee.ac.uk).
-  José-Andrés Martínez-Silva is Assistant Professor and Researcher in the Centro de Tecnologías para la Academia at the University of la Sabana (Colombia) (jose.martinezl@unisabana.edu.co).

ABSTRACT

This article focuses on a review of both literature and practical experiences concerning MOOCs. The literature analyzed was published in peer-reviewed journals between 2007 and 2013. 268 items were selected for this study, of which 100 were analyzed in detail. The issues raised by this analysis were used as the criteria for the analysis of 10 current empirical MOOC experiences. The literature study highlighted the rapid growth in interest in understanding MOOCs and seeking to understand the pedagogic frameworks most relevant to their adoption and the importance of the concept of openness embodied within them. More recently a new emphasis has been emerging where institutional factors, particularly those concerned with financial viability, certification and retention have been highlighted. The analysis of current practice showed that many of the concerns in the academic literature were absent from not only the practices embodied in current MOOC-based learning experiences but seem to have been ignored in the conceptual phase of implementing a MOOC-based teaching model. In practice therefore, most of the current MOOC offer is only a pale reflection of the conceptualization that gave them rise and has been shown to be significant in the literature. In particular the true essence encapsulated in the concept described as Openness has been largely lost in practice.

RESUMEN

Este artículo se enfoca en una revisión tanto de literatura como de experiencias prácticas acerca de los MOOC. Los textos analizados fueron publicados en revistas entre los años 2007 y 2013. Se seleccionaron 268 artículos para este estudio, de los cuales 100 se analizaron en detalle. Los asuntos encontrados en la revisión se utilizaron posteriormente como criterios de análisis de 10 experiencias empíricas sobre MOOC. La literatura estudiada resalta el rápido crecimiento en el interés por comprender los MOOC, sus fundamentos pedagógicos así como la importancia del concepto de lo abierto que se encuentra en ellos. Un nuevo énfasis ha surgido recientemente en la literatura donde los factores institucionales, particularmente aquellos concernientes con la viabilidad financiera, la certificación y la deserción se encuentran resaltados. El análisis de la prácticas actuales muestra que muchos de los temas relevantes expresados en la literatura académica están ausentes no solo de las prácticas relacionadas con las experiencias de aprendizaje basadas en los MOOC sino que se han ignorado como sustento de la implementación de un modelo de enseñanza basada en ellos. Del análisis realizado se concluye que buena parte de la actual oferta de MOOC es tan solo un pálido reflejo de la conceptualización que les dio origen y que se muestra significativa en la literatura. En síntesis, la verdadera esencia del concepto de lo abierto se ha perdido en la práctica.

KEYWORDS | PALABRAS CLAVE

Virtual learning, courses, online education, learning environments, educational technology, didactical innovation, teaching practice, MOOC.

Aprendizaje virtual, cursos, educación en línea, entornos de aprendizaje, informática educativa, innovación didáctica, práctica docente, MOOC.

1. Introduction

One of the emerging international trends in the context of Technology Enhanced Learning (TEL) is the adoption of the principles of the «Open Educational Movement» (Montoya & Aguilar, 2012). This movement is built on principles that assume that knowledge is a common good (Ehlers, 2011), that belongs to humanity as a whole. In principle, therefore education is considered an engine of social development that should tend to encourage the construction and universal dissemination of knowledge, using multiple channels, including of course, those which are supported by ICT (Dans, 2009; Wiley & Hilton, 2009).

The construction of knowledge and its socialization in this context implies extensive collaboration, reuse, remixing, redistributing, inclusion, adaptation, free access and other concepts and processes associated with the notion of «openness» in education (Downes, 2013; McAuley, Stewart, Siemens & Cormier, 2010; Pirani, 2013).

Openness in education, or open education, whilst an evolving phenomenon, is not new, but has its roots in the early twentieth century. A couple of milestones mark the beginning of the movement towards open education: the creation of the International Council for Open and Distance Education in Canada in 1938, and the beginning of the Open University in the UK in 1969. Based on these early initiatives and the emerging literature on the topic, it is evident that the issue of openness has been considered seriously in the field of education for over 70 years (Barth, 1972; Walberg & Thomas, 1972).

Subsequently, adaptation, sharing, remixing and collaboration have emerged within the conceptual framework of open education, drawing on the principles and global influences of the free software movement in the late '70s and '80s and the current Open Educational Movement (Baraniuk, 2007; Wiley, 2008; D'Antoni, 2009; Ramirez, 2013).

As a consequence during the last decade multiple and diverse initiatives concerned with openness in education worldwide have emerged, most of them based on promoting access to Open Educational Resources (OER) leading to the creation, use and cataloguing of digital educational materials such as reusable learning objects, which are a type of OER (Campbell, 2004). Large numbers of teachers worldwide have been trained in these principles and a number of repositories of these materials have been created, accompanied by an equal number of outreach and familiarization strategies within the academic community (Lehman, 2007).

This activity has been built on the expectation that this strategy will bring significant benefits through resource sharing and shared expertise within the academic community and even promote innovation within education. However, a look at the daily life of educational institutions in general (and of course with a few significant exceptions) indicates that the resultant changes in educational practices is minimal (Parrish, 2004).

This has resulted in considerable reflection on the situation and it has been recognized that producing and using OERs is not sufficient to generate educational innovation, nor is enough to implement or manage repositories and give them visibility.

A possible alternative solution is move from OER production to Open Educational Practices (Ehlers, 2011). The idea, whilst in principle simple, is apparently very difficult to implement in practice: rather than focusing on the «openness» of the content the emphasis is on making the practices more open. From this perspective, we could identify one particular and very interesting open educational practice: Open Teaching, which finds a contemporary implementation in the form of MOOCs (Massive Open Online Courses).

Recent research shows that MOOCs are becoming a widely-discussed new phenomenon in education (Martin, 2012). Discussions highlight aspects such as the models of staff/student and student/student interactions and quality assurance related to the current online education practices based in tracking, supporting and personalized feedback may not apply to an open and massive method of learning and teaching (Marcelo, 2008; Jung, 2011). Interestingly, however, whilst many educational institutions debated the effect that MOOCs might have on their practices, the considerations seem generally to have little to do with the pedagogy. At the same time, however, the growth of academic research on the MOOCs in recent years is a clear indication of the interest in the phenomenon and perhaps a sense that there is a need to map what is known about existing distance education practices, looking for incomplete knowledge in this area and to deepen the theoretical and practical implications of adopting the new practices.

2. Method

In order to review the academic progress in exploring MOOCs, an Integrative Review (Whittemore & Knafl, 2005) method was adopted, including two separate but closely-related processes of literature review and data analysis. The review process was

carried out using the approach of Conn et al. (2003). This approach prescribes the creation of the documentary corpus review based on an appropriate selection of databases, establishing criteria for the selection and rejection of texts leading to a process of document reduction and a final reading and re-reading process.

To ensure reliability in the review process, some actions were carried out according to Dennis et al. (1995) where the first action was to explicitly define the purpose of the review. In this case, therefore, the primary purpose of this study was to deepen understanding of MOOCs and distinguish what makes them so interesting and different for the current educational landscape, at least as far as is evident from the academic research that has taken place to date. More deeply then, the review sought to glean various theoretical and practical approaches being applied to MOOC and track the evolution of the conceptual understanding as it has occurred over time.

A consistent strategy intended to constrain the review to the stated objective was developed to include and exclude texts in the review process. Within this strategy it was considered appropriate to include texts and search terms or descriptors in both English and Spanish. A documentary corpus universe was defined which included papers published in scientific journals indexed in the main academic databases: Scopus, ISI web of Knowledge, SciELO, EBSCOhost, ScienceDirect and DOAJ. Google Scholar was used to detect relevant texts derived from blog posts and other secondary sources, published by recognized scientists and academics (Liyaganawardena, Adams & Williams, 2013). This approach yielded a document corpus of 268 texts, from which a random set of 100 items was selected that covered a period of 7 years (2007 to 2013), corresponding to the first appearance of MOOCs in 2008 up to the year of the completion of this review.

These documents were read and topics or concepts that were proposed as categories of analysis related to MOOCs were identified. The following search

descriptors were used: «MOOC», «massive+open+course», «open+course», «massive+course» (in English and Spanish).

To minimize the level of bias in the evaluation of the items, the reading was conducted by two different observers, who separately identified key topics or concepts presented in each text which were compared using the Cohen's Kappa coefficient (Cohen, 1968) from which observational consistency was established (Gordillo & Rodríguez, 2009). In this case the coincidence of this two records was 89% and non-coincidence was 11%. Comparison of such observations

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obtained a kappa coefficient of 0,67, which represents a reliable process.

The analysis of the texts was performed following the guidelines of Thematic Analysis Method (Fereday & Muir-Cochrane, 2006; Tuckett, 2005) which consist of the following: familiarization with data, initial codification, patterns search (themes), reviewing patterns, and writing an interpretation as a final report.

Familiarization with the data was performed by reviewing entries in a field diary in which the MOOC and the titles and abstracts of the selected texts were discussed. Initial coding consisted of attributing labels to emerging patterns in the data to construct the initial categories of analysis and identify others from complementary data. The search and review of patterns was conducted as a process of selection, combination and

elimination based on a preliminary analysis of the data. The process ended with the description of the final categories and the writing of the results.

In addition to the review of the academic literature, an additional follow-up study took place to gain a broader picture of this phenomenon where 10 MOOCs offered on different platforms were studied to determine if what is stated in the literature really is expressed in the current offer of MOOCs.

3. Analysis and results

The initial results emerged from the literature review. This was used in the subsequent analysis and

2014 which showed that in the first three months of the year 25 papers were registered compared with 103 in the whole of 2013, 9 in 2012, and an average of 3 papers from 2011-2008.

The analysis of the content in the literature shows that conceptions about MOOCs are rapidly changing through time. 75% of the papers written in the early years of the existence of MOOCs describe them as learning experiences emphasizing their open components. Openness was the main and most important feature of a MOOC and massiveness was a second level of importance. Downes (2009), Siemens (2009) and Peter & Farrell (2013), show at least five attributes of openness as essential components of MOOCs: free access, adaptation, remixing, sharing and collaboration with these aspects being reiterated in later work by Wiley (2012) and Siemens (2013) and Downes (2013). As an example, Siemens (2009) refers to this as a «course ecology», an alternative perspective to a single and non-modifiable course content or way to interact. No predetermination from a teacher beyond initial guidelines encourages students to create their own networks, their own content, their own learning. A number of other authors highlighted these aspects in their work (Kop, Fournier & Mak, 2011; Anderson & Dron, 2012; Anderson & McGreal, 2012). On the other hand, there was a strong emphasis in the early papers (2008 to 2010) in addressing openness from a technological point of view (Downes, 2009; Fini, 2009; Groom & Lamb, 2009).

This was to seek to ensure that openness was genuinely achievable by addressing topics such as service and system interaction, practices and tools for content creation and remixing, through to content aggregation. For example: «Many people are using blogs, wikis, social networks, messaging systems, etc. The underlying idea is that people are comfortable with tools they consider to be their own, and they may wish to continue to use them when engaged in learning activities» (Fini, 2009: 2). «The central course aggregator listed 170 separate weblogs or similar RSS feeds contributed by students, each of whom used their own blog or website to participate in discussion. [...] Additionally, thousands of comments were contri-

72% of the papers studied make allusion to MOOCs as a disruptive concept from a pedagogical perspective. Due to the special massive and open nature of MOOCs there is a consistent call to propose a different theoretical scenario to that used to currently support online education or blended learning. As a result, connectivism and peer learning, openness and the relationship between MOOCs and content reuse have emerged as topics for additional attention from the theoretical perspective.

yielded insights corresponding to the use of MOOCs in practice.

3.1. Overview of literature

The key characteristic that emerged from the review of the literature was that the analysis of the uptake of MOOCs exposes two broad perspectives, one that characterizes the conceptual evolution of MOOCs and another that describes their pedagogical implications.

3.1.1. A chronological point of view

A first aspect emerging from the analysis was the significant increase in papers published in 2013 (82%), compared to the previous 5 years (18%). This phenomenon was considered to be so marked that further analysis of the a limited search of Scopus involving title, abstract and keywords was conducted in March

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buted to the central Moodle forum, three separate areas in Second Life were contributed, Google Groups were created, a Ning was created, and more. In fact, student contributions to the course continue to this day even though the course was completed in December, 2008» (Downes, 2009).

It is quite interesting to note that in recent years (2011 onwards), there is a shift from studying MOOCs usage behavior to other practical considerations such as their financial viability, sustainability and issues about student retention. Examples of this approach are in Mackness, Mak & Williams, 2010; Koller, Ng, Do & Chen, 2013; Miguel, Caballe & Prieto, 2013. These follow initial work by Schmidt, Geith, Håklev & Thierstein (2009) who explored the institutional relevance of this topic and opened the discussion in the field of open education. The subsequent discussion focuses primarily on the free nature of this type of learning experiences, an aspect that causes great concern for educational institutions that traditionally support its activities from the revenue generated by the value of the material in the programs they offer.

Another major discussion of practical aspects of MOOCs focuses on the alarming retention statistics, as only a minimal percentage of those who start a MOOC end it (Koller & al., 2013; Yang, Sinha, Adamson & Rose, 2013).

Certification was another topic whose incidence has been growing in recent years, with few examples in the publications from the period between 2008 and 2010 appearing consistently between 2011 to 2013 and early 2014 (Bragg, 2014; Miranda, Mangione, Orciuoli, Gaeta & Loia, 2013). It emerged that a large proportion of the MOOC student cohort are not interested in any kind of certificate or gaining academic credits; a topic explored in detail by Gibson (2014) and Pirani (2013). From the institution perspective, the focus on certification is on the risks associated with plagiarism and academic identity substitution (North, Richardson & North, 2014; Young, 2012).

3.1.2. A pedagogical point of view

72% of the papers studied make allusion to MOOCs as a disruptive concept from a pedagogical perspective. Due to the special massive and open nature of MOOCs there is a consistent call to propose a different theoretical scenario to that used to currently support online education or blended learning. As a result, connectivism and peer learning, openness and the relationship between MOOCs and content reuse have emerged as topics for additional attention from the theoretical perspective.

a) Connectivism is presented as related to the very origin of the MOOCs themselves, as the first instances were developed from originators who originally formulated the theoretical principles of connectivism (Nerantzi, 2012; Saadatmand & Kumpulainen, 2014) leading to various discussions about the embodiment of connectivism in the principles underpinning MOOCs (Aguaded, 2013; Clarà & Barberà, 2013; George Siemens, 2013).

However, although the initial foundation of MOOCs is closely related to their connectivist principles, their massiveness necessitated the adoption of peer learning principles because of the implicit difficulties of generating customized facilitation and feedback from teachers within a massive group of students. From this perspective, students play a dual role of learner and teacher within the small workgroup style interactions that may explicitly be structured within the cohort or may arise spontaneously. This perspective suggests that the role of educator is not the exclusive property of the teacher and can therefore move to other people, even to the students themselves, which is clearly a manifestation of its educational foundation located in peer-learning and connectivism (Conole, 2013; Siemens, 2006).

b) Literature shows that the attributes of openness that were explicit and fundamental to the original conceptualization virtually disappear in the recent literature except where it is explicitly mentioned that they are not being taken into account (Gil-Jaurena, 2013; Knox, 2013; Rodriguez, 2013). However, open attributes are still presented as factors with strong potential to cause change in teaching practices. Specifically, the aspect of openness that is not being exploited as originally conceived is the «adaptation», the openness to repurpose and reuse content. According to the above, one of the most important elements behind the idea of «Openness» is «Adaptation» (Hilton III, Wiley, Stein & Johnson, 2010). This aspect, taking into account elements such as remixing, collaboration and open access will inevitably impact on pedagogical practices such as teaching, assessment or feedback.

c) Another topic that consistently appeared in the literature about MOOCs is Open Educational Resources (OER). It seems from the way these resources are related with MOOCs that they are identified as a factor that ensures openness in these learning experiences. The use of OER is associated with adaptation as the main attribute of openness. Since the content can be modified by the student (adaptation of OER), the relationship between them and the content begins to change. Examples of this approach are in (Dara-

doumis, Bassi, Xhafa & Caballé, 2013; Pantò & Comas-Quinn, 2013)

3.2. Overview of experiences

This second phase of the review focused on testing whether both the pedagogical aspects such as handling attributes found in the literature review are found or effectively expressed in selected MOOCs.

3.2.1. The MOOCs designs are platform oriented

One finding from the study has to do with the similarities found in the design of these learning experiences in relation to the platforms through which they are published. This means that most MOOCs offered on the same platform end up looking similar with similar content on cross-wise paths and learning behaviors. This may be because most of the platforms have generated templates or course models that course providers follow when constructing courses. Designs, however, are repeatedly and consistently failing to consider many of the basic principles of connectivism or peer learning. Most of the proposed activities are designed to be resolved individually and little peer interaction is required to learn. Moreover, neither the content or the structure of activities involve the construction or establishment of connections as a main basis for learning.

In most cases, these structures are predetermined and sequential and the student is limited to following obediently the proposed sequence. Only two of the analyzed MOOCs structure the interaction in activities requiring small working groups as the main channel of learning and gaining feedback.

In fact, it can be observed in practice that somehow «mass» has become so important in the MOOC idea that this phenomenon has begun to create course factories (courses very similar to each other). A clear example of this is Coursera (<http://coursera.org>) a «provider» of MOOCs that three years ago had two courses in their portfolio and now offers more than 530 which largely obey the logic proposed by Horton (2006) called WAVWAVWAVAAQ: Watch a Video Watch a Video Watch a Video AND Attempt a Quiz.

3.2.2. Almost total absence of open attributes

The analysis also showed that all MOOCs in the study offer free access and 80% of them have this feature as the main marketing attribute. At the same time though, they are almost entirely devoid of other essential attributes of openness, such as adaptation, remixing, redistributing and collaboration. This suggests «free» can be assumed to imply «open», ignoring fun-

damental principles of Free Software Movement, according to which there is a clear difference between «free of charge» and «free access». In the first «free» is more oriented to free as a gift, which can be used at no cost in its embodied form. The second (which is derived from the open as to open source) has to do with the possibilities of doing more, within prescribed limits, with an open item.

So, whilst access is free, being able to access their content at no cost does not imply the possibility of being able to reuse content in other contexts, modify or combine them with other digital products to create new educational resources.

On further analysis of this point, it emerged that 60% of the MOOCs studied refer to the use of OER as the basis and philosophy of access to the course content. The OER principle is reinforced by explicitly citing that access to the resources is through creative commons licensing. Whilst this is implicit in the labeling of content as OER there is no evidence or suggestion as to how it can be reused. This confirms that both the content and courses suffer from the same defect: the assimilation of the concept of free to only mean free access. Thus what purports to be open content is not in fact open in the OER sense.

4. Discussion and conclusions

A growing level of discussion seems to be taking place within academic and social networks about «the MOOC phenomenon». As a result, numerous initiatives in this area have been spawned at an almost industrial level where previously the model had been institutional.

4.1. A difficult step to take

A rich, original idea that started strongly, with high expectations based on the innovative potential of openness, has, over the years, gradually becoming a mechanical formula with little genuine creativity but more focused on reaching global audiences rather than delivery through traditional academic institutions. It is worrying to see the great difficulty the academy has in transforming the pedagogical discourse around MOOCs to an educational offering and practices that clearly express and demonstrate best practice. In particular there seems to be great difficulty in moving from open content towards open educational practices, as accurately described by Ehlers (2011).

In particular, the emphasis is still largely on the importance of organizing and constructing to the educational content into prescribed learning experiences. We have not yet realized that by explicitly applying

the attributes of the openness to educational practices it is possible to create more interesting spaces that foster true innovation that change the way in which learners and teachers can interact and relate. This may be due in part to the fact that «openness» is still a poorly understood concept. In fact, «openness» is an emerging issue with scant knowledge about it within the educational community and with a small amount of practical experience evident in this area.

Also, part of its emerging nature presents itself because its theoretical evolution as an object of study places many of its principles in a position of permanent searching for validation and discussion and practical experience that feed back into theoretical constructs. In short: it's a little known issue that raises many questions and interesting things to discover.

A second element that contributes to this discussion is that «openness» in education today is a topic related to the use of ICT. In the past, content reuse and repurposing was much less feasible and possible than it is today with electronic versions of content. The emergence of MOOCs is raising awareness of this issue in a way that has previously not been happening.

4.2. The pale reflection of the MOOC

At the very beginning, the MOOC concept and the first practical experiences were developed on a restricted set of open pillars. These pillars served as the core of this concept and were characterized by reuse, remixing, collaboration and sharing in a freely-accessible environment.

In that sense, what can be observed today about the prevalent MOOCs offered through the main specialized portals are a pale reflection of what a MOOC should be. In fact it would not be an exaggeration to suggest that most of the current MOOCs are not MOOCs anymore as few of the open principles survive. This reality confirms David Wiley's concern about the meaning disfiguration of this acronym (Wiley, 2012).

Consideration of the full meaning of the MOOC acronym is really important when designing a course

consistent with its principles in order to address the concerns raised in this paper. Of the four letters that make it up, it is perhaps the first of the «Os» (open) that is the most important to understanding its meaning and implications.

The «C» (course) generates an interesting differentiation from other learning delivery models. Being a course separates them from free access self-learning video tutorials available through the Internet. A course not only has a clear pedagogical purpose but also has provided a curricular structure to achieve its educational purpose, and has constituent components (people, resources, content, assessment, feedback, interaction

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spaces, etc.). All this is present in a MOOC, but is manifested and related in a very different way to that of a «typical» e-learning experience.

The second «O» (online) assumes that all the learning experience is realized through the Internet.

The «M» (Massive) seems to be the most popular feature of this concept but perhaps the most circumstantial. Being one of components that identify them, it may or may not be present. This means that a massive course may have been thought, designed and implemented to address a very large group of students, but the actual existence of such students may be due to factors beyond their design, such as those related to marketing or visibility. In other words, a MOOC is massive not because it has many students, but it was designed in case it might have many students.

In conclusion, therefore, this study has revealed that there is a growing divergence from the concept of a MOOC as defined by the acronym and the principles explored in the academic literature, and the emerging MOOC offerings. This divergence is characterized by practices that are not founded on the pedagogies upon which MOOCs were designed, with the implied danger that the student experiences are likely to be less than optimal. Perhaps this insight goes some way to explain the alarmingly high drop-out rate reported consistently from MOOC providers and should

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Design, Motivation and Performance in a Cooperative MOOC Course

Diseño, motivación y rendimiento en un curso MOOC cooperativo

-  Dr. Carlos Castaño is Senior Lecturer in the Department of Didactics and School Organization at the Universidad del País Vasco (Spain) (carlos.castano@ehu.es).
-  Dr. Inmaculada Maiz is Senior Lecturer in the Department of Evolution Psychology and Education at the Universidad del País Vasco (Spain) (inmaculada.maiz@ehu.es).
-  Dr. Urtza Garay is Associate Professor at the Department of Language and Literature Didactics at the Universidad del País Vasco (Spain) (urtza.garay@ehu.es).

ABSTRACT

MOOCs are seen as the latest evolution in online learning and, since their launch in 2008, they have become an integral part of university course curricula. Despite the social success of these courses, the learning design and efficacy of their results have been questioned. Most current research has focused more on discussing their potential to offer quality, large-scale education worldwide rather than measuring learning outcomes. This paper shows the results of a research study that focused on the pedagogical design of a cooperative MOOC and its influence on motivation and academic results. A Delphi study was used to validate the design, and the motivation variable was controlled using the Instructional Materials Motivation Survey (IMMS). Academic performance was assessed through evidence-based learning. The paper argues that design, which is defined by the students' intensive use of social networks and the activities they carry out in their Personal Learning Environments, has an influence on performance, and the variable that mediates in that relationship is the level of satisfaction with the perception of the design. The academic results obtained and the students' motivation support the use of cooperative MOOCs in university education.

RESUMEN

Los cursos MOOC se han entendido como la última evolución del aprendizaje en red, y desde su nacimiento en 2008 se han puesto en práctica en un buen número de universidades. A pesar del éxito social de estas propuestas, tanto el diseño del aprendizaje como la eficacia de sus resultados han sido puestos en duda. Actualmente la mayoría de las publicaciones se centran más en discutir su potencial para ofrecer educación de calidad en todo el mundo a gran escala que en la medición rigurosa de los resultados de aprendizaje. El presente trabajo muestra los resultados de una investigación centrada en el diseño pedagógico de un curso MOOC cooperativo y su influencia en la motivación y en los resultados académicos obtenidos. El diseño se ha validado a través de un estudio Delphi y la variable «motivación» se ha controlado a través de un instrumento estandarizado (Instructional Materials Motivation Survey, IMMS). El rendimiento académico se ha evaluado a través de evidencias de aprendizaje. Se defiende que el diseño, definido por una utilización intensiva de redes sociales y realización de actividades por parte de los estudiantes en sus Entornos Personales de Aprendizaje, influye en el rendimiento, y es la satisfacción con la percepción del diseño la variable que media en dicha relación. Los resultados académicos obtenidos y la motivación de los estudiantes avalan la utilización de cursos MOOC cooperativos en estudios universitarios.

KEYWORDS | PALABRAS CLAVE

Higher education, learning, motivation, personal learning environments, cooperative learning environments, virtual learning, educational innovation, educational research.

Educación superior, aprendizaje, motivación, entornos personales de aprendizaje, entornos de aprendizaje cooperativos, aprendizaje virtual, innovación educativa, investigación educativa.

1. Introduction and state of the question

MOOCs have featured prominently in the scientific literature recently as a new way to provide training which is attracting millions of students across the world and forcing universities to reformulate their on-line education courses. MOOCs are seen to represent the next evolution in e-learning within a continuum which, according to Conole (2014), spans the earliest movements in multimedia in the 1980s to the MOOC that first emerged in 2008 followed by Learning Analytics two years later. The scale of MOOCs, the speed at which they have grown and the difficult questions they pose are increasingly prominent as the purpose of Higher Education and the very future of the university comes under scrutiny. It clearly indicates that something new is happening, something more than a mere trend. So, this is a subject of particular concern to anybody seriously interested in the digital future of education.

The interest this subject arouses is seen in a body of research centred on various MOOC projects. Works by Liyanagunawardena, Adams & Williams (2013), Castaño (2013) and Karsenti (2013) were systematic studies of investigations into MOOCs between 2008 and 2013. The main lines of research included the pedagogical design of MOOCs, interaction between students and the perspectives for learning and its associated variables (motivation, attitudes and perspectives). Other aspects were cost, universal accessibility to Higher Education and the problem of student drop-out rates.

Many authors state that MOOC are substandard in terms of educational rigour (Vardi, 2012; Zapata-Ros, 2013), and that the current discourse on MOOCs merely reflects strategic, institutional, economic, social and technological concerns whereas there is no real discussion of the courses' pedagogical value (Guàrdia, Maina & Sangrà, 2013: 4).

Despite these criticisms, and the fact that MOOC constitute a type of education that is flexible but not widely standardized (Shirky, 2013), various authors suggest there is a difference between c-MOOC (connectivist) and the more traditional x-MOOC (Downes, 2011; Siemens, 2012a; Rodriguez, 2013), making it impossible to talk of a single pedagogical design. Rodriguez (2012) analysed several courses of both tendencies and established that the difference between the two lies in their theory of learning and pedagogical model.

This initial description was too simplistic and is now more complex. Knox, Bayne, Macleod, Ross and Sinclair (2012) attempted to overcome these deficiencies

by incorporating more interesting and innovative e-learning practices into their «E-learning and Digital Cultures» course, giving preference to content submission to the social networks of the process, the community and learning.

This proposal is in line with Lane (2012) who encountered difficulties in situating her approach within the «Stanford Model» versus the «Connectivist MOOC» debate, and proposed her own task-based project called s-MOOC (skills-MOOC).

This simplistic x-MOOC and c-MOOC classification has been bypassed thanks to alternative descriptions of the nature of MOOCs. Downes (2013) suggests four criteria: autonomy, diversity, openness and interactivity. Going further, Clark (2013) deploys a taxonomy of eight different MOOC types, claiming that they can be located at any point along the spectrum of traditional online courses. Conole (2013) proposes that they be classified as a set of 12 dimensions, which makes MOOC design even more complex.

In this sense cooperative MOOCs try to respond to MOOC student heterogeneity by producing an X-type course that nevertheless incorporates the advantages of connectivist courses (Fidalgo, Sein-Echaluze & García Peñalvo, 2013): intensive use of social networks, creation of learning communities (Alario-Hoyos & al., 2013) and the deployment of PLE, or personal learning environments (Castaño & Cabero, 2013: 102).

The efficacy of online training and MOOCs continue to represent an evolution in e-learning (Conole, 2014), and this theme is well-established in numerous research meta-analyses (Cabero, 2008; Means, Toyama, Murphy, Bakia & Jones, 2010). Although several studies have indicated that the pedagogical foundations of MOOCs are solid according to the various formats they employ (Glance, Forsey & Riley, 2013; Sonwalkar, 2013), the influence of different MOOC designs on learning outcomes has yet to be adequately researched. References to this theme are found in connectivist courses, the only in-depth studies are by Kop & Fournier (2011), Kop, Fournier & Mak (2011) and De Waard (2011, 2013), focussing more on their transformative effects on the conventional structures of knowledge generation than rigorously measuring learning outcomes.

From another viewpoint, some studies point to the potential of MOOCs to spur student autonomy (Kop, Fournier & Mak, 2011; Milligan, Littlejohn & Margaryan, 2014) and develop 21st century competences (Yeager, Hurley-Dasgupta & Bliss 2013; Sangrà & Wheeler, 2013).

Motivation has already been identified by Milligan, Littlejohn & Margaryan (2013) as a variable that enhances participation and academic success among students. Similar studies have recently appeared, such as Cheng (2014) on emotional competence in MOOC students, and Veletsianos (2013) on student learning experiences on MOOCs.

Research has also given rise to more sceptical voices on the use of MOOCs in Higher Education. Some authors show that the advantages of MOOCs are no different from those that were already known from distance learning (Fini, 2009; Yuan & Powell, 2013; Harder, 2013).

It is also known that student dropout rates have increased with the appearance of MOOCs. However, as Liyanagunawardena, Adams & Williams (2013) point out, data on MOOC dropout rates are not readily available. Jordan (2013) examined 24 MOOCs and found that the highest rate of course completion was 19.2% while most barely reached 10%. Liyanagunawardena, Parslow & Williams (2014) show that MOOC students do not typically drop out for financial reasons since they do not pay enrolment or tuition fees; these authors suggest that abandonment has more to do with dissatisfaction at not achieving personal objectives.

2. Research method

The aim of this investigation is to analyse the pedagogical design of a cooperative MOOC and measure its influence on student motivation and academic results. The questions addressed are:

- a) Is there a relationship between academic performance and the pedagogical design of the course?
- b) Is there a relationship between student motivation and the pedagogical design of the course?
- c) Is there a relationship between academic performance and student motivation?

One of the mainstays of this research was the pedagogical design of the course which was cooperative in nature. For the design of the MOOC, we carried out a Delphi double to string study with 53 experts in e-learning and ICTs from European and Latin American universities. We asked them about MOOC types, ways of learning and assessment methods, and the roles and functions of tutors. We took

their responses and resubmitted the design of the course, located on the Chamilo Metauniversity open source e-learning platform under GNU/GPLv3 licensing.

In addition, and to foment interaction between participants, we actively encouraged students to use social networks (Twitter, Skype, blogs, Facebook, LinkedIn, etc.). The platform's technical limitations were overcome by opening a Ning website to allow students to socially interact and discuss their contributions. They did e-activities on a weekly basis, all of which helped participants to construct their own PLE.

The statistical analysis of the data was carried out

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with the SPSS version 22 program. In the data collection process, besides the assessment of the e-activities by the tutors, there was a set of four questions on the course design with responses measured on the Likert scale.

The data on motivation was gathered by means of an IMMS (Instructional Materials Motivation Survey) which the MOOC students completed at the end of the course. This was a Likert-type questionnaire made up of 36 items divided into four categories (attention, confidence, satisfaction and relevance) based on Keller's ARCS motivation model (1987). In this case we took the proposal of Di Serio, Ibáñez & Delgado (2013) with a documented reliability coefficient of 0.96 and adapted it slightly to fit MOOCs.

2.1. Sample

The course was designed for students in the fourth year of a Primary Education degree course at the Universidad del País Vasco, although the very nature of the MOOC meant that it was accessible on the Net to all those interested in this subject, in line with other MOOC experiences (Siemens, 2012b; Knox, Bayne, Macleod, Ross & Sinclair, 2012).

Of the 744 students who enrolled on the MOOC the sample consisted of 186 participants, classified as N in the research. In terms of the dropout rate, 186 students began the course, 25.83% of those who had signed up, and 88 completed the course, 11.82%. Sample attrition was in line with general MOOC drop-out rates although participation was slightly higher than the 10% indicated by Jordan (2013).

3. Analysis and results

We present the analysis of the data yielded by the scales used (IMMS and the scale for the course design) in the order of the research questions posed. The global results of the correlational analysis also come with a study based on the division of the MOOC students into two groups according to age, those who are 31 or under and those over 31, since the first group was formed of undergraduates and the second group was not.

The course design is based on four variables assessed by the participants using the Likert scale applied to these four items: the use of small video packages is a good idea; I was able to control the development of the course with ease thanks to carrying out e-activities; interaction with course colleagues via the network enhances learning; the use of a social network as a course complement has helped me to follow the course.

In reference to the first research question (Is there a relationship between academic performance and the pedagogical design of the course?), a direct relationship between these two factors is observed. The relationship is significant both in the overall result and in the results for the two age groups (table 1). The four items on the scale that relate to the course design were valued positively or very positively by 85% of the students.

The second research question (Is there a relationship between student motivation and the pedagogical design of the course?) emphasises the potential relationship between motivation and course design. The results in table 2 show a direct link between the type of course design and student motivation. The correlational analysis of the total sample is significant in this global aspect and is supported by the significance that emerges for each of the factors (attention, confidence, satisfaction and relevance) on which the level of motivation is based, according to the IMMS scale. These results are significant and they appear in all the factors

and among all the students in the two age groups, just as occurred with the first research question. Thus, we can state that the course design influences student motivation.

Thus we can state that there exists a direct relationship between each of the four factors that measure motivation and course design.

With regard to the attention variable, the results (table 3) confirm that the items related to methodology (items 2 and 8), quality (11, 12, 15, 28 and 29), organization (17, 20 and 31) and use of material (22 and 24), as well as interaction via Internet (19), all positively contribute to student motivation on the MOOC.

In addition, there is an increase in each individual's confidence in learning, as gathered in the second factor on the IMMS scale (items 1, 3, 4, 7, 13, 25, 34 and 35 in table 3)

The same result is found in the factors that correspond to satisfaction and relevance (table 2). According

Table 1. Total sample correlations by age group between performance and design

		PERFORMANCE	DESIGN
PERFORMANCE	Total sample	Pearson's r	1
		Sig. (bilateral)	.264*
		N	186
<=31		Pearson's r	1
		Sig. (bilateral)	.046
		N	96
>31		Pearson's r	1
		Sig. (bilateral)	.442*
		N	83

to the data (table 4), the course design (items 6, 27, and 36) together with the material (9, 16, 18, 23 and 33), and the development of the MOOC (5, 10, 21 and 32) is relevant and satisfactory (14, 26 and 30).

The results for the third research question (Is there a relationship between academic performance and student motivation?) were different in terms of global perspective and age group.

The following results show that although there is no direct overall relationship between academic performance and motivation, there is some significance in the global relationship between performance and one of the IMMS factors, this being student satisfaction (table 5).

This significance is also seen in the students aged over 31 yet it has no correlation in the younger age group, 31 and under (table 5).

These results lead us to state that there is no direct relationship between global motivation and performance, yet there exists such a relationship between

Table 2. Correlations for the total sample and the two age groups between design and IMMS scale factors

			DESIGN	ATTENTION	CONFI.	SATISF.	RELEVANCE	TOTAL IMMS
DESIGN	Total sample	Pearson's r	1	.558**	.363**	.631**	.529**	.588**
		Sig.(bilateral)		.000	.001	.000	.000	.000
		N	85	81	83	84	84	80
	<=31	Pearson's r	1	.595**	.331*	.643**	.595**	.622**
		Sig.(bilateral)		.000	.015	.000	.000	.000
		N	56	54	54	55	55	53
	>31	Pearson's r	1	.613**	.503*	.697**	.439*	.585**
		Sig.(bilateral)		.003	.014	.000	.036	.005
		N	23	21	23	23	23	21

global motivation and one of the factors that constitutes motivation, namely satisfaction. Overall, satisfaction correlates directly to student performance on the MOOC.

Finally, an analysis was made of the mediation of the satisfaction factor in the relationship between course design and performance in the total sample. With the introduction of the mediatory variable (satisfaction) the relationship between the design factor and performance disappears and ceases to be significant, which means that the relationship between design and performance is based on the satisfaction factor because, when it is controlled, the previous relationship is nullified: $b = 0.25^*$ (E.T. = 0.10) / $b = 0.16ns$ (E.T. = 0.12) (* $p < .01$). Hence, satisfaction mediates between design and performance, so the greater the satisfaction with the design of the course, the better the student performance.

4. Discussion and conclusions

MOOCs are defined by the huge number of students

they attract and their heterogeneity, and also by high dropout rates. The study shows that a mixed course design that is cooperative

in nature and which incorporates social networks as a learning strategy can help to reduce this phenomenon (Fidalgo, Sein-Echaluze & García Peñalvo, 2013). These data reinforce the validity of interaction for learning on online courses, as shown in previous research (Vidal & Camarena, 2014).

Course design influences performance since there is a direct significance between both factors in the glo-

Table 3. Items related to the Attention and Confidence factors

IMMS	%					
Items related to the Attention factor (1 strongly disagree, 6 strongly agree).	1	2	3	4	5	6
2. I noticed something interesting when this MOOC first caught my attention.	1.1	11.7	8.2	21.1	30.5	27
8. The MOOC methodology really stands out.	11	0	2.3	17.6	35.2	42.3
11. The quality of the material helped to hold my attention throughout the course.	1.1	2.3	3.5	25.8	48.2	18.8
12. The material is so abstract that it was difficult to keep focussed on it. (Inverted)	11.7	42.3	28.2	10.5	4.7	2.3
15. The videos and texts that were part of the course were not in the least attractive. (Inverted)	24.7	29.4	32.9	10.5	1.1	1.1
17. The way the information is organized helped to hold my attention throughout the course.	1.1	1.1	7.05	29.4	47.05	14.1
19. Interaction with my course colleagues via Internet helped to hold my attention throughout the course.	3.5	8.2	7.05	25.8	38.8	16.4
20. The information I found throughout my learning experience on the course aroused my curiosity.	0	8.2	2.3	14.1	51.7	23.5
22. I found that the number of e-activities I had to do was annoying.	11.7	29.4	34.1	10.5	9.4	4.7
24. Carrying out the e-activities helped to hold my attention throughout the course.	2.3	2.3	7.05	22.3	42.3	23.5
28. The variety of the audiovisual material helped to hold my attention throughout the course.	1.1	1.1	5.8	35.2	38.8	17.6
29. The audiovisual material is boring.	28.2	32.9	25.8	9.4	2.3	1.1
31. There is so much content that it is annoying.	17.6	35.2	24.7	15.2	5.8	1.1
Items related to the Confidence factor						
1. When I first saw this course, I thought I would find it easy.	17.6	16.4	22.3	24.7	16.4	2.3
3. This material was more difficult to understand than I would have liked.	7.05	29.4	15.2	31.7	12.9	3.5
4. Following the presentation of the information, I felt sure I knew what it was that I had to learn on this course.	1.1	3.5	17.6	22.3	43.5	11.7
7. There was so much information that it was difficult to recall the most important points.	3.5	20	28.2	34.1	9.4	4.7
13. As I was working through the course, I felt sure that I could learn from the content.	0	1.1	7.05	21.1	45.8	24.7
25. After working a while on this course, I felt sure that I could pass an exam on the subject.	0	4.7	9.4	32.9	43.5	9.4
34. I could not understand most of the course material.	23.5	45.8	15.2	11.7	2.3	1.1
35. The material was well-organized, which gave me the confidence to believe I could learn from it.	0	1.1	4.7	32.9	41.1	20

bal result and in the characteristics of the pedagogical design proposed (use of micro-content, video micro-packages, intensive social network activity and the carrying-out of online activities within students' own PLE).

Likewise there is a direct link between course design and the four motivational factors on the IMMS scale: attention, confidence, satisfaction and relevance. This connection affects methodology and the quality and organization of the written and multimedia material used on the course as well as the interaction between students. These data reinforce the potential of cooperative designs for learning in Higher Education.

Yet this does not occur when the scale and its four motivational factors correlate to academic performance. There is no global significance between motivation and performance, but we observe that one of the factors on the IMMS scale, satisfaction, indicates that there is a direct link to performance in the global results and in references to students over 31 years old. At a time when universities are rethinking their online training courses, traditional MOOCs may attract new students to university but it is cooperative MOOCs that can increase the level of student satisfaction and help cut dropout rates. Possibly a hybrid design like the one proposed here fits better with the different types of student that take MOOCs (Milligan, Littlejohn & Margaryan, 2013), and enables them to reach their personal objectives (Liyaganawardena, Parslow & Williams, 2014). This would allow universities to offer continuous training and Lifelong Learning with course designs that better adapt to students' needs. Indirectly, it also reveals the capacity of this pedagogical

Table 4. Items related to the Satisfaction and Relevance factors

IMMS	%					
	1	2	3	4	5	6
Items related to the Satisfaction factor (1 strongly disagree, 6 strongly agree).						
5. Carrying out e-activities on this course gave me a feeling of satisfaction at having achieved something.	1.1	2.3	0	14.1	34.1	34.1
14. I enjoyed this course so much that I would like to know more about the subject.	1.1	4.7	9.4	29.4	29.4	25.8
21. I really enjoyed studying this course.	3.5	5.8	5.8	15.2	44.7	24.7
27. The comments I received on completing an exercise, or during my course work, made me feel that my hard work had been worth it.	3.5	7.05	8.2	37.6	34.1	9.4
32. I feel good about having completed the course satisfactorily.	2.3	3.5	2.3	8.2	32.9	50.5
36. It was a pleasure to work on such a well-designed course.	1.1	2.3	5.8	27.7	30.5	35.5
Items related to the Relevance factor						
6. For me the content of the material is clearly related to things I already know.	0	9.4	14.1	28.2	40	8.2
9. There are videos and texts that show me that this material could be important to some people.	0	0	0	5.8	44.7	49.4
10. Completing the e-activities satisfactorily was important to me.	1.1	2.3	2.3	3.5	40	50.5
16. The content of this material is relevant to my personal interests.	1.1	4.7	10.5	18.8	31.7	32.9
18. There are explanations or examples of how to use the knowledge acquired on this course.	0	4.7	3.5	35.2	43.5	12.9
23. The content and audiovisual material on this course give me the impression that they are worth knowing.	0	1.1	4.7	29.4	44.7	20
26. This course was irrelevant to my needs because I already knew most of the content.	45.8	35.2	11.7	4.7	1.1	1.1
30. I can relate the course content to things I have seen or done, or to issues I have thought about in my life.	0	2.3	2.3	27.05	45.8	22.3
33. The course content will be useful for me.	1.1	2.3	2.3	15.2	27	50.5

cal design to develop in students those learning competences that are essential in the 21st century.

Finally, the general sample's level of satisfaction derived from the positive perception of a good course design and the consequent, good academic performance achieved by those students supports the use of massive open online courses in graduate studies.

After the analysis of the mediation of the satisfaction factor in the relationship between the pedagogical design of the course and performance, we observe that the relationship between both ceases to be significant. It is, therefore, the level of satisfaction regarding the pedagogical design of the course that influences academic outcomes. It would be interesting to broaden these results with an analysis of students' learning experiences on MOOCs.

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Table 5. Correlations between performance and IMMS by factors in the two age groups

			PERF.	ATTENTION	CONFL.	SATISF.	RELEVANCE	TOTAL IMMS
PERFORMANCE	Total sample	Pearson's r	1	.025	.048	.244	.166	.085
		Sig.(bilateral)		.827	.667	.025	.130	.453
		N	186	81	83	84	84	80
<=31		Pearson's r	1	.157	.264	.110	.163	.240
		Sig.(bilateral)		.257	.054	.426	.235	.084
		N	96	54	54	55	55	53
>31		Pearson's r	1	.227	.209	.432*	.172	.220
		Sig.(bilateral)		.322	.338	.040	.434	.339
		N	83	21	23	23	23	21

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A Study on the Pedagogical Components of Massive Online Courses

Un estudio sobre los componentes pedagógicos de los cursos online masivos

-  Dr. Manuela Raposo-Rivas is Professor in the Didactics in the School Organisation and Research Methods Department of the Faculty of Education at the University of Vigo, in Ourense (Spain) (mraposo@uvigo.es).
-  Dr. Esther Martínez-Figueira is Professor in the Didactics in the School Organisation and Research Methods Department of the Faculty of Education at the University of Vigo, in Ourense (Spain) (esthermf@uvigo.es).
-  Dr. José-Antonio Sarmiento Campos is Associate Professor in the Didactics, School Organisation and Research Methods Department of the Faculty of Education at the University of Vigo, in Ourense (Spain) (sarmiento@uvigo.es).

ABSTRACT

At the end of the first decade of the 21st century, the rapid growth in the MOOCs offering brought about a new educational landscape, posing new challenges to teaching and learning, mainly due to massive participation, ubiquity and free enrollment. These courses embody a confluence of technological and pedagogical mediations yet to be fully explored. This study, applying an instrument of educational and interactive indicators on a MOOC (INdiMOOC-EdI) designed by the authors, seeks to ascertain the pedagogical components of MOOCs delivered in the Spanish language in order to establish which course features are platform dependent. An exploratory sequential mixed methods study was carried out on a total of 117 courses within 10 different platforms via an instrument developed and validated ad hoc. The data obtained is subjected to a content analysis for a qualitative perspective; while a quantitative perspective is obtained through a statistical analysis complemented with classification algorithms typical in data mining. The results suggest that the different platform providers condition the pedagogical design of the MOOCs in five key areas: learning, activities and tasks, means and resources, interactivity and assessment. It concludes with a series of descriptive, educational and interactive indicators that can be a pedagogical benchmark for future MOOCs.

RESUMEN

A finales de la primera década del siglo XXI, el rápido aumento de cursos MOOC dibuja un nuevo panorama educativo planteando nuevos retos a la enseñanza y al aprendizaje debido, fundamentalmente, a sus características de masividad, ubicuidad y gratuidad. En estos cursos se da una confluencia de mediaciones tecnológicas y pedagógicas aún por explorar en todas sus dimensiones. Este trabajo, utilizando un instrumento de indicadores educativos e interactivos en un MOOC (INdiMOOC-EdI) de elaboración propia, se centra en averiguar qué componentes pedagógicos posee la actual oferta de MOOC en lengua hispana, para poder dirimir aquellos elementos dependientes de las plataformas que los soportan. Para ello se realiza una investigación mixta de tipo exploratoria y secuencial que analiza un total de 117 cursos ubicados en 10 plataformas diferentes, utilizando el instrumento creado y validado a tal efecto. Con la información obtenida se lleva a cabo un análisis de contenido en su vertiente cualitativa, mientras que con la cuantitativa se efectúan análisis estadísticos complementados con algoritmos propios de la minería de datos. Los resultados muestran que las diferentes plataformas condicionan los diseños pedagógicos del MOOC en cinco aspectos fundamentales: el aprendizaje, las actividades y tareas, los medios y recursos, la interactividad y la evaluación. Se concluye con una serie de indicadores de tipo descriptivo, formativo e interactivo que pueden orientar la pedagogía de futuros Cursos Online Masivos Abiertos.

KEYWORDS | PALABRAS CLAVE

Online courses, Massive Online Open Courses, MOOC, open educational resources, instructional design, data mining, content analysis, web-based instruction.

Cursos en línea, Cursos Online Masivos Abiertos, COMA, recursos educativos abiertos, diseño instructivo, minería de datos, análisis de contenido, formación basada en la web.

1. Introduction

MOOCs are a phenomenon of utmost interest to the scientific community due to their exponential growth (Liyanagunawardena, Adams & Williams, 2013; Martínez, Rodríguez & García, 2014; Yuan & Powell, 2013). These courses are a worldwide expanding phenomenon and offer a clear example of disruption (Anderson & McGreal, 2012; Conole, 2013; Vázquez Cano-Lopez & Sarasola, 2013) due to low fees for participants, massive participation and their adaptation to new social needs regarding education. Hence, the disruptive nature of MOOCs can only be verified if taken as experiments to test new methodology, technology and new ways to organize education (Pernías & Lujan-Mora, 2013).

From a pedagogical point of view, the phenomenon can be seen as an 'effervescence' rather than a disruption (Roig, Mengual-Andrés & Suarez, 2014), which must not blind us to the reactions they stir. These courses are hosted by varied and diverse platforms, with different backgrounds and approaches which have given rise to MOOCs based on: web-based instruction, the Connectivist Theory and its pedagogical model (Siemens, 2005); tasks, according to competency-based accomplishments (Cormier & Siemens, 2010) and content (Pernías & Lujan-Mora, 2013; Vázquez-Cano, 2013).

Since the inception of MOOCs, the majority of studies have focused mainly on their concept and history of MOOCs; debating the challenges, possibilities and threats thereof; presenting case studies by examining one or more platforms and courses, and reflecting on student participation (Liyanagunawardena & al., 2013). Thereafter, the focus shifted mainly to the completion rates and course quality per se (Baxter & Haycock, 2014; Halawa, Greene & Mitchell, 2014; Jordan, 2014; Koutropoulos & al., 2012; Rodríguez, 2012) and their pedagogical principles (Glance, Forsey & Riley, 2013; Roig & al., 2014; Vázquez-Cano & al., 2013; Zapata, 2013); design and key components are scarcely addressed.

Despite the lack of consensus on how quality standards should be attained in MOOCs (Haggard, 2013), it is necessary to raise the issue in order to prevent MOOCs from becoming «poor quality video watching sessions of chatting professors which are the basis for a set of self-assessment questions and awarding certificates without prior authentication and no other concern except generating revenue» (Aguaded, 2013: 7-8).

It is therefore important to address what pre-course information is provided, the pedagogical approaches underlying the design, the level of student enga-

gement, the role of course instructors, availability and degree of interaction, resource typology as well as certification structure and process (Vázquez-Cano, 2013; Zapata, 2013).

Research on these training approaches shows that they are founded on a decentralized control over teaching-learning processes (Baggaley, 2014). However, given the accessibility and reach of MOOCs there is almost by definition a wide spectrum of users with a variety of interests and motivations, approaches and learning styles; hence, one of the most difficult challenges is to provide authentic learning experiences, which require the design and development of interactive collaborative processes. Siemens (2005) states that cooperative and collaborative activities as well as interaction with technological resources have a direct impact on students, especially on the way they perceive and process information and on their learning process, thus prompting a new knowledge building approach. Given massive student participation the level of interactivity is addressed through the use of specific Web 2.0 collaborative and communicative tools: chat rooms and forums (Baxter & Haycock, 2014) to discuss concerns and share solutions; blogs, wiki-forums and social networks (Medina-Salguero & Aguaded, 2014), among others, for support and feedback.

Assessment normally conforms to final and summative processes that are determined by the type of accreditation awarded once the MOOCs has been successfully completed. In some cases, the objectives are small-scale goals carried out individually or in pairs which are assessed by means of surveys, questionnaires, quizzes, exams, problem sets and other processes that will automatically generate badges as evidence of learning.

In short, studies have focused on the characteristics of the platform providers and the success or failure of a given course (Fini, 2009) and less on the pedagogical aspects. If we want to maximize learning via analyzing and adapting teaching strategies to individuals, we must critically address the pedagogical design of the MOOCs to identify underlying trends in teaching and learning processes. On the basis of the aforementioned, the objectives of this research are:

- To analyze Spanish-language MOOC offering during a given period in order to establish a profile of the pedagogical components.
- To validate a tool that can guide the pedagogical design of MOOCs.
- To ascertain which components are unique to a MOOC from those dependent on the platform.

- To determine whether the pedagogical components of MOOCs are conditioned by platforms.

2. Material and methods

The purpose of this research¹ is descriptive with an exploratory sequential mixed-methods design (DEXPLOS) (Creswell, Plano, Gutmann & Hanson, 2008; Hernández, Fernández & Baptista, 2010). This design involves an initial phase of qualitative data gathering and analysis followed by another where quantitative data is collected and analyzed, subsequently, we generate another database that integrates both and enables mixture analysis techniques (García, 2011).

Sequential and criteria sampling (McMillan & Schumacher, 2005) for mixed methods (Hernández & al., 2010) is used. The courses were selected according to the following criteria: catalogued in the repository www.MOOC.es; delivered in Spanish; course information available without prior registration; and provide a minimum amount of information to the data collecting instrument.

We therefore focus on ten platforms (Open UGR, Coursera, MiriadaX, Tutellus, Ucam, Udemy, UnedComa, UniMOOC, UNX, UPVX. We discarded Ehusfera (a blog hosting service rather than a MOOC platform) Iversity, CourseSites and edX, among others, given that the reference language is not Spanish. This involved analyzing 117 courses from different fields of knowledge available during the month of March 2014 (table 1). The low percentage of courses from Tutellus and Udemy is mainly due to two factors:

- They included material that did not conform to the MOOC concept, such as conferences, videoconferences or lectures on videos, recycled from different sources within the audiovisual

Platform	N	n (%)
AbiertaUGR	3	3 (100)
Coursera	17	15 (88)
MiriadaX	56	55 (98)
Tutellus*	More than 4000*	9*
UCAM	3	3 (100)
Udemy*	137*	4*
UNED-COMA	2	2 (100)
UNIMOOC	10	9 (90)
UnX	12	10 (83)
UPVX	16	7 (43)

* Courses discarded in the qualitative sample

repository of the institution and now offered as massive courses.

- They provided very limited information to the research instrument without prior registration. Moreover, there was redundant information on how to use the platform and on certification. It was also noted that there was a high degree of repetition, such that regardless of the course, the data provided was

the same.

Consequently, these two platforms were not included in the qualitative sample. Thus, we can state that the remaining 104 courses represent 81.25% of the population.

2.1. Instrument

For massive course analysis we developed INdiMOOC-EdI (Instrument for Educational and Interactive Indicators in MOOCs). It is an ad hoc data sheet that meticulously collects information provided in the full description of MOOCs. The elements that make up this instrument can be organized into four components, with a total of 27 sub-components rated on

Components	Sub-components	Response option
Identification data	Title	Indicate
	Course website	Indicate
	Institution	University, private companies, university-company, personal initiative
	Platform	Open UGR, Coursera, MiriadaX, Tutellus, Ucam, Udemy, UnedComa, UniMOOC, UnX, UPVX
	Field of knowledge	Arts & Humanities, Health Sciences, Science, Legal- Social, Technological, Multidisciplinary
	Teaching team	Tutor (n), technicians (n), access to profiles (not available, indirect- direct access)
	Registration	Fixed registration period, permanently open, closed
	Related courses	Not available, one, several
	Date of completion	Indicate: dd/mm/yyyy
Descriptive features	Importance to the public	Not explicit, explicit
	Target participants	No specified, general public (those interested in the topic), with specific profile
	Prerequisites	No entry requirements, entry requirements
	Course length	Not available, unlimited, limited (XXX weeks)
	Dedication	Not specified, unlimited, limited (XXX hours per week)
	Introduction	Refers to the topic, the content of the course, activities, other
	Introductory video	Available, not available
	Objectives ²	Specific objectives, no objectives
	Operation of the system	Course guidance, platform guidance, not specified
Educational features	Work plan	weekly(closed), modules or lessons (open), not specified
	Modules	Blocks/modules (n), lessons (n)
	Work Method	Indicate
	Assessment	Indicate
	Certification	Charge-bearing, free, both
	Accreditation	Badges, insignias, credits, certificates
Interactive features	Activities	Indicate
	ICT tools	Indicate
	Interactivity	Not specified, peer work -P2P-, collaborative work

various scales (table 2).

To safeguard validity conditions, the first version of the instrument was subjected to the Delphi technique by evaluating the same courses during the same period of time and a pilot study of 15 courses within 5 different platforms. The expert panel (KC) index rated .75, while content validity (IVC) rated .99 which according to Lawshe (1975) is within the standard satisfactory level. Reliability and internal consistency were determined by Cronbach's Alpha statistic after the sample gathering procedure i.e., once questions whose answers were measured on an interval scale were eliminated. The 117 courses obtained an alpha value of .614. Some authors (Huh, Delorme & Reid, 2006; Nunnally, 1967) indicate that an alpha value between .5 and .6 is within the satisfactory standard in the early stages of research or in an exploratory study such as this one. This statistic combines the correlation coefficient of the items that make up the instrument and its dimensionality (Cortina, 1993).

3. Analysis and results

A descriptive analysis of quantitative data was carried out according to the identifiers and descriptive features displayed in table 2, together with a categorical principal component analysis that enables a large set of variables to be grouped in a smaller number of explanatory components that stem from the variance among the original data.

With the qualitative data (interactive and educational features) we conducted a content analysis that deployed five major categories:

- Learning: styles, learning modality taking place and content format: self-directed learning, empirical and inductive learning, learning through observation; lessons, units, pills or modules.
- Activities and tasks: refers to both modality (compulsory or optional, individual or collective) and typology (questionnaires, tests, readings, practical exercises, problem sets, projects, case studies, questions and answers, participation...).
- Means and resources: traditional and technology-based: videos, slideshows, forums, blogs, e-

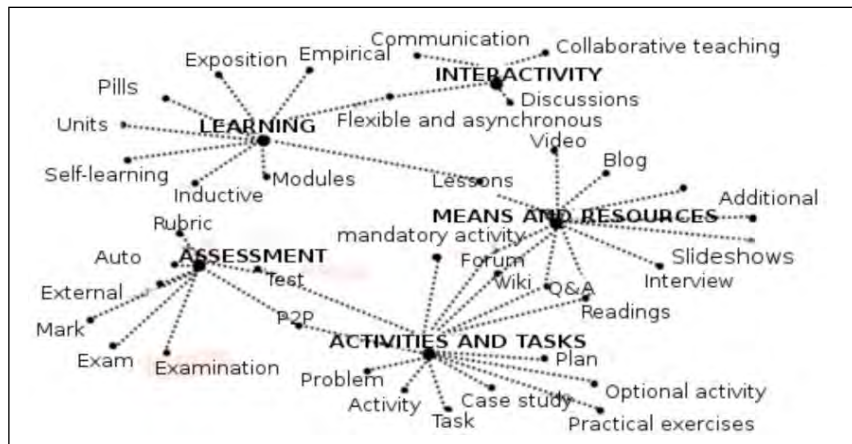


Figure 1: Existing relationship between categories and associated codes.

mails, interviews, readings, optional additional material.

- Interactivity: or interacting with other people; online meetings, debates or discussions in pairs or groups, sharing doubts and knowledge, collaborative work, flexible and asynchronous communication.
- Assessment: existing assessment procedure, not only modalities and instruments, but also grades and endorsement (self-assessment, peer assessment; questionnaires, tests, rubrics, exams, problem solving, –peertopeer); percentage or weighting in the final grade, grading scale, passing grade, minimum percentage; checking student progress and final endorsement.

Figure 1 shows the relationship between categories and associated codes, taking into account that some codes belong to more than one category.

Two algorithms of data mining were applied, which will later be described in detail herein: first, a classification algorithm to discern the impact of platforms on the instructional and communication designs underlying the courses; second, an assessment algorithm to ascertain the degree of information provided by the variable course regardless of the platform provider.

3.1. What profile do Spanish-language MOOCs present?

The analysis conducted with the information compiled reveals that the 98.3% of the courses (n=115) have the title somewhere clearly visible, crucial in order to engage participants' interest, as well as a limited registration period (n=38, 32.5%) or unlimited registration period (n=34, 29.1%). In 38.5% of the cases (n=45) registration was closed during the study timeframe.

A total of 72.6% (n=85) are sponsored by platforms linked to Higher Education; whilst personal initiative (n=13, 11.1%) or private company sponsors (n=1, 0.9%) are less frequent. As far as fields of knowledge are concerned, almost half of the MOOCs relate to Legal and Social fields (n=49, 41.9%), followed by multidisciplinary MOOCs (n=21, 17.9%), Arts and Humanities together with Science MOOCs (n=15 each, 12.8%). The least offered are Technology (n=10, 8.5%) and Health Sciences MOOCs (n=7, 6%).

Courses analyzed, only n=49 (41.9%) of the participants specify course relevance. More than half (n=63, 53.8%) lack addressee information. When addressing target participants, n=34 (29.1%) they note for public at large and n=20 (17.1%) establish a specific profile. In almost 60% of the courses (n=70, 59.8%) there are no prerequisites. Regarding the two last issues there are five important aspects that prompt registration:

- Including an Introduction to the course in the MOOC website. Almost half of the introductions deal with content (n=47, 40.2%), followed by 38.5% (n=45) which focus on the topic, without being too concise. The rest (n=25, 21.4%) address issues such as timing, objectives, using the system, carrying out tasks, etc.

- Having an introductory video, available in practically all of the courses analyzed (n=98, 83.8%).

- Having and defining objectives is omitted in more than half of the courses (n=67, 57.3%).

- MOOC related courses were only available in a small percentage of the courses (n=38, 32.5%)

- Operation of the system is specifically addressed in the platform in most MOOCs (n=91, 77.8%), only in 9.4% (n=11) is this guidance provided via course. In n=14 (12%) it is not specified.

The length of the MOOC analyzed is normally limited to weeks (n=87, 74.4%) ranging from 6 weeks (n=22, 36.7%) to 7-8 weeks (n=19, 31.7%). Thus, unlimited course length is a rare occurrence (n=11, 9.4%). Furthermore, the duration of engagement is specified in n=83 (70.9%), generally ranging from 3 hours (n=28, 46.7%) to more than 5 hours per week (n=19, 31.7%). Less than 2 hours of weekly engagement is infrequent (n=5, 8.3%).

A high percentage (n=84, 71.8%) of courses present the MOOC teaching team in a visible area, with an average of 3 to 4 tutors (M=3.32 and SD=3.148). This information is not displayed in only 17.1% (n=20) and the remaining courses (n=11, 9.4%) provide no information at all.

Regarding course content there is a tendency to adopt an open structure, lessons or modules (n=90, 76.9%) with an average of 8 modules per MOOC. Less frequently (n=22, 18.8%), it appears that the work plan is limited to weeks only in closed structure courses. There is no information available in n=5 courses (4.3%).

As for certification, there is a combination (n=75, 64.1%) of free of charge and charge-bearing modalities. Regarding the type of accreditation, it is normally mixed (n=71, 60.7%), certificates, credentials, badges, medals, and so on.

The content analysis resulting from the five categories (activities and tasks, learning, assessment, interactivity, means and resources) previously mentioned displays the given trend within each platform (figure 2).

Regardless of the number of courses within each platform, it is noted that Coursera offers higher quality information with regard to educational and interactive features, followed by MiriadaX and UNED-COMA. On the other hand, and except in the aforementioned three platforms, it is observed that platforms are more vulnerable to and deficient in features such as means and resources, activities, tasks and assessment.

3.2. Do platforms condition pedagogical designs?

To address this issue a categorical principal component analysis (CATPCA) is carried out, which is non-linear and therefore does not require the strict assumptions of principal component analyses (Molina & Espinosa, 2010), regarding two dimensions as necessary and sufficient to yield representation (figure 3). The data obtained confirms that the amount of variance accounted for by these two dimensions is not high ($s^2=10.64\%$), but underscores a substantial difference among courses within different platforms. In the first dimension the saturating variables are: certification (.943), engagement (.905), dedication_hours (.899), accreditation (.864), registration (-.872) and institution (-.883). The variables that saturate the second dimension are: introductoryvideo (-.717), teaching team (80,625), faculty profiles (.608) and modules (-.629). Although there are variables that do not cluster significantly in any dimension, it is true that the vast majority have opposing values in one or another.

Plotting the two dimensions in a coordinate axis displays how courses are grouped according to the platform provider. The outcome reveals the following facts:

- Some platforms are more extensive than others, for instance UniMOOC is within the values $x=-2$ and

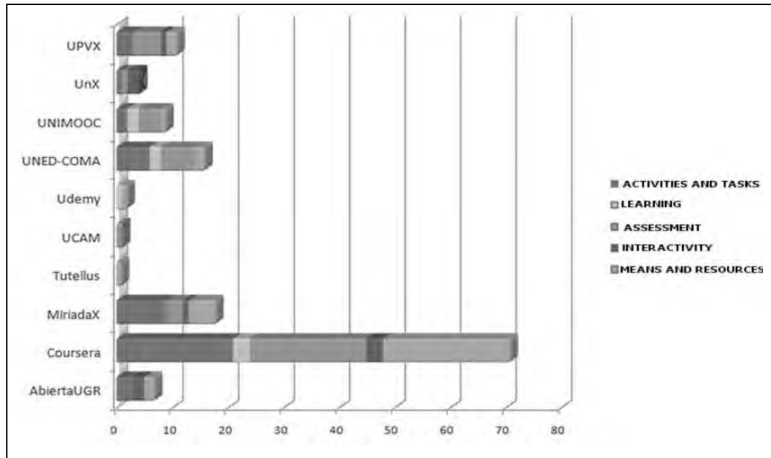


Figure 2: Educational and interactive features related to the platform.

$y=2$, whilst MiriadaX extends from $x=-1$.

- There is certain affinity among platforms, which can lead to conglomerates, inter alia, Coursera and MiriadaX, UniMOCC and UPVX...

- In the sample studied the pedagogical components of each course are fully determined by the platform that hosts them.

To give an in-depth insight, the data collected were subjected to an algorithm classification with Weka software (Hall & al., 2009). Since we are dealing with a collection of automatic learning algorithms for data mining tasks, the platforms under investigation are regarded as the classification variable and producing ten rules that classify 100% of the courses in a platform. The algorithm used was PART (Frank & Witten, 1998), a variant of the C4.5 of Quinlan (1993). As an example we provide a fragment of three rules:

The outcome demonstrates that the relevance of the platform is greater than that of each course when it comes to the pedagogical design. For instance, we observed that in MiriadaX, where more courses were analyzed, both types of certification, dedication and limited course length, together with not displaying related courses, are associated with this platform ($n=55.0$, i.e., all the courses examined).

3.3. Which MOOC components are platform-independent?

To examine what components are more specific to the course than to the platform, the data were subjected to an algorithm implemented in Weka which assesses the rate of each attribute by measuring the information gain³ (Witten, Frank &

Hall, 2011) according to java class platform (table 3).

It is noted that most of the information provided by the variables is related to the platform. The title and interactivity variables do not display any variance; hence it can be attributed neither to course or platform. Figure 4 shows the values obtained through the algorithm once standardized. If negative values are to be taken as typical course variables, the following should be considered: Field, Introductory Video, Introduction, Target participants,

Modules, Objectives, Teaching team, Importance to the public, Prerequisites and Length/weeks. If we increase to a $DT=-1$, the typical course variables would be Weeks and Prerequisites.

4. Discussion and conclusions

An overview of literature addressing MOOCs emphasizes the relevance of pedagogy in MOOCs. The use of the instrument (INdiMOOC-EdI), which enables an analysis of these components, was contemplated and implemented and has been applied to a total of 117 Spanish-language courses.

The study on the data obtained with the aforementioned instrument regarding descriptive, educational and interactive features determines that it can be employed as a benchmark of indicators in order to

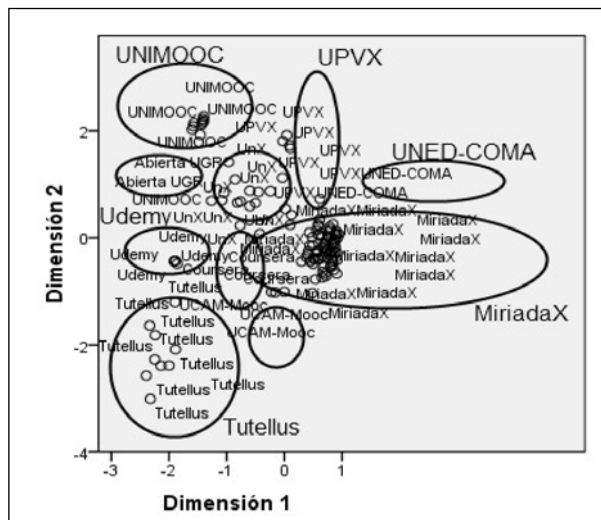


Figure 3: Object points/components labeled by means of platform.

Classification rule

Scheme: weka.classifiers.rules.PART -M 2 -C 0.25 -Q 1; Instances: 117; Attributes: 23

1.- IF CERTIFICATION=both AND DEDICATION=limited(XXX hours per week) AND LENGTH=limited (XXX weeks) AND RELATED COURSES=not specified THEN THE PLATAFORM IS MiriadaX (55.0)

2.- IF CERTIFICATION=both AND DEDICATION=limited(XXX hours per week) AND LENGTH=limited(XXX weeks) THEN THE PLATAFORM IS Courseera (15.0)

3.- IF REGISTRATION=unlimited AND LENGTH=not specified AND INSTITUTION=University-company THEN THE PLATAFORM IS UNIMOOC (10.0)

attain the desirable pedagogical design in a MOOC. Some of the findings affirm, along with Glance & al. (2013), that MOOCs have a sound pedagogical basis and there is no reason to assume that they are less effective than other learning experiences.

Initially the variable course is analyzed; however, the data refer to the support platforms. The information obtained underscores a series of components that are not persistent in the vast majority of the courses analyzed. For instance, platforms do not regard it essential to specify: target participants, prerequisites and a clear and concise introduction about the course content or other related courses. Nonetheless, it does seem necessary to display: an introductory video; objectives, teaching team, length and weekly dedication, operation of the system, means and resources, activities and assessment. It has been shown that assessment is one of the most evident pedagogical benefits of MOOCs (Glance & al., 2013).

The existing profile of Spanish-language MOOCs, drawn from the pedagogical features in more than 70% of the courses examined, includes key features such as displaying the course title in a visible place (98.3%); an introductory video (83.8%); specifically addressing operation of the system (77.8%); an open structure, modules or lessons (76.9%) with an average of 8 modules per MOOC; course length limited to weeks (74.4%); platform provider linked to Higher Education (72.6%), displaying the teaching team in a visible spot (71.8%) and specifying the number of hours of weekly dedication (70.9%).

Although the platform offers the necessary technological support, it is obvious that MOOC proposals should have their own autonomy. Contrary to what is asserted in the study by Roig & al. (2014), which found no significant variance between the pedagogical quality of

MOOC and the platform, it is ascertained that platforms determine the pedagogical design of the courses. The same pattern comprising,

inter alia, activities and materials, learning modalities, assessment proposals, level of interactivity, access and certification is repeated over and over again (as many times as the number of platforms examined). The characteristics of the activities students carry out along with tutor counselling and didactic interventions are key elements in predicting the rate of disengaging and drop-outs (Halawa & al., 2014).

The data implies that platforms condition the pedagogical designs of MOOCs (figure 3), but this does not necessarily imply the existence of a pedagogical model underlying the MOOC proposal. I.e., the platform constrains and restricts online courses, albeit some platforms deploy a degree of flexibility, with fluid boundaries among the different features in INdi-MOOC-Edl.

If MOOCs are regarded as a dynamic and global phenomenon, as an educational response to the emergence and development of movements and online social networks, as a cybernetic alternative to learning without frontiers, as a useful self-directed learning experience, as an extension of the classroom, as a space for free movement of knowledge, as an opportunity for democratization and universal access to specialized content, as a training proposal with pedagogical autonomy..., then let us take advantage of these mentoring platforms whilst MOOCs have not fully matured.

Finally, an exploratory study such as the one carried out provides an outline of the situation, but it is faced with certain constraints that should be addressed in future research, such as an in-depth insight into the field or methodological complementarity. It would be convenient to thoroughly examine a specific course

or courses in specific fields of knowledge; the standpoint in other languages; or if low completion rates

Table 3. Range and selecting attributes via Weka

Attribute	Information Gain	Attribute	Information Gain	Attribute	Information Gain
1.5824	23. Accreditation	0.2265	5. Importance to the public	0.4223	15. Introduction
.6911	11. Dedication hours	0.9231	8. Course length	0	9. Weeks
.3385	17. Objectives	0.4463	4. Field of knowledge	0.8947	13. Faculty Profiles
1.2623	22. Certification	0.1996	7. Prerequisites	0.3837	6. Recipients
.6859	18. Operation of the system	0.9095	24. Related courses	0	1. Title
.2949	12. Teaching team	0.4423	16. Introductory video	0.7933	10. Dedication
1.0486	14. Registration	0	21. Interactivity	0.3762	20. Modules
0.6345	19. Work plan	0.9053	2. Institution		

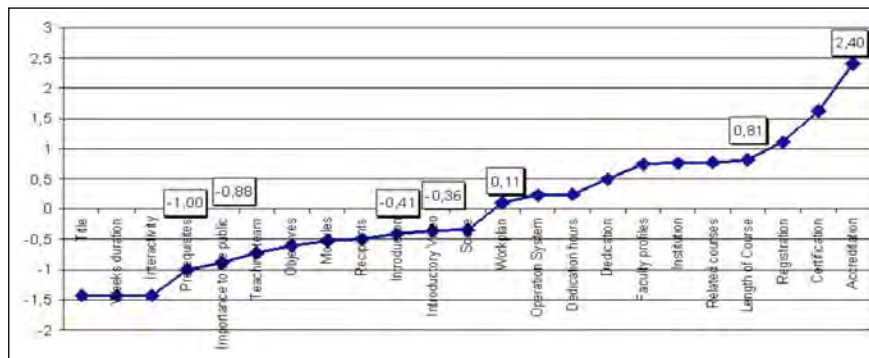


Figure 4: Relationship between course and platform.rma.

can be due to the pedagogical design. As stated by Bartolomé (2013), we still lack a pedagogical framework that will validate that a MOOCs teaches and that a MOOC generates knowledge. Further research is needed for ongoing progress and consolidation. There is as yet the need to debug concepts, models and experiences..., overcome certain difficulties and minimize others; some MOOCs and platforms will lag behind, but many others will continue to be designed, developed and improved for millions of people around the world.

Notes

¹ The study was carried out during the last academic year in response to an institutional innovation project commissioned to the research group which includes the authors of this paper.

² Despite the evident educational value objectives possess, they are included in the descriptive features in order to simply determine whether they are present or not, since according to Roig & al. (2014: 37): 'The existence of explicit learning objectives is associated with a high score in the pedagogical quality of MOOCs'.

³ Information Gain = Class Entropy - Entropy (class / attribute) = Class H-H (Class /Attribute).

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Challenges in the Creation, Development and Implementation of MOOCs: Web Science Course at the University of Southampton

Desafíos en la creación, desarrollo e implementación de los MOOC: El curso de Web Science en la Universidad de Southampton

-  Dr. María-del-Mar Sánchez-Vera is Lecturer in the Department of Didactics and School Organisation at the University of Murcia (Spain) (mmarsanchez@um.es).
-  Manuel León-Urrutia is Researcher of the Centre for Innovation and Technology in Education at the University of Southampton (United Kingdom) (ml4c08@soton.ac.uk).
-  Dr. Hugh Davis is Professor in Education Technologies and Director of the Centre for Innovation and Technology in Education at the University of Southampton (United Kingdom) (hcd@soton.ac.uk).

ABSTRACT

Massive is one of the distinctive features of MOOCs which differentiate them from other e-learning experiences. This massiveness entails certain possibilities, but also some challenges that must be taken into consideration when designing and implementing a Massive Open Online Course, in relation to context, work progress, learning activities, assessment, and feedback. This document presents an analysis of the advantages and disadvantages of the massive aspect of MOOCs, and specifically it narrates the experience of creating a MOOC on Web Science, developed at the University of Southampton (United Kingdom) using the new FutureLearn platform, in autumn 2013. In this document, the importance of Web Science as an emerging field is analyzed and its origins explored. The experience gained from the decisions and the work progress developed for the creation and implementation of a specific MOOC is also shared here. The final section of the paper analyses some data from the MOOC in Web Science, including the participation index, the comments and interactions of some participants, tools used, and the organization of facilitation. Challenges involved in running a MOOC related to course design, platform use and course facilitation are also discussed.

RESUMEN

El carácter masivo es una de las peculiaridades de los MOOC, que lo diferencian de otro tipo de experiencias de aprendizaje en red. Este hecho configura una serie de posibilidades, pero también una serie de retos que hay que tener en cuenta a la hora de diseñar e implementar un curso masivo en red, en relación, por ejemplo, a los contenidos, el proceso de trabajo, las actividades, la evaluación y el feed-back. Este trabajo presenta un análisis de las ventajas y desventajas del carácter masivo de los MOOC y concretamente describe la experiencia de creación de un MOOC sobre Web Science desarrollada en la Universidad de Southampton (Reino Unido) en la plataforma FutureLearn durante el otoño de 2013. Se analiza la importancia del estudio de la rama de Web Science y cómo se originó esta experiencia. También describen las decisiones y el proceso de trabajo desarrollado para la creación e implementación del MOOC en concreto. Se termina este trabajo analizando alguno de los datos que se han obtenido, como el índice de participación (ligeramente elevado respecto a la media de los MOOC), los comentarios de los participantes, la manera de gestionar la facilitación del curso y algunos de los retos que nos encontramos a la hora de gestionar un MOOC, que se relacionan con el diseño del curso, la plataforma que se utiliza y cómo se organiza la facilitación del curso.

KEYWORDS | PALABRAS CLAVE

MOOC, e-learning, facilitation, technology, university, course, Web Science, resources.
MOOC, enseñanza virtual, facilitación, tecnología, universidad, curso, Ciencias de la Web, recursos.

1. Introduction

Massive Open Online Courses (MOOCs) are so far generating more questions than answers in academia. Such questions are often focused on whether they will be viable in the future, why they generate so much interest, and whether they will transform the future of online education. One of the main reasons so many questions have been asked may be found in the fact that such a phenomenon originated as recently as in 2008, when Siemens and Downes conferred a «massive» feature to open online courses. Three years later, Thrun and Norvig developed an Artificial Intelligence MOOC in which more than 160,000 learners signed up, intensifying scrutiny of the phenomenon and its implications.

Martínez-Abad & al. (2014) analysed the impact of the MOOC acronym, in comparison with the word e-Learning, and found that scientific interest in MOOCs is currently central, with a significantly rising rate of publications. Most of them, however, are more informative than scientific, probably because such a phenomenon is still recent. Similar conclusions have been drawn from a previous analysis by the British DBIS (2013), in which a steep increase growing curve has been noticed in the rate of publications on the topic, as well as a growing presence of debates on this matter both in the press and social media.

Projects such as OpenupEd and ECO (<http://ecole-arning.eu>), both fostered by the European Commission, reveal the growing interest that European uni-versities are currently placing in promoting online free education (Scopeo, 2013). Such a trend has also been noticed by Yuan and Powell (2013), who claim the phenomenon is extending worldwide. This article attempts to share the experience of the development process of the first University of Southampton MOOC (UK). The course is entitled «Web Science, How the Web is Changing the World» and it was developed and delivered through a MOOC platform called FutureLearn.

1.1. The challenges of «Massive» in MOOCs

The «massive» nature of MOOCs is perhaps their most distinctive features when compared to other online learning experiences. As Siemens indicates (2012), this «massive» feature became widely discussed when he and Robert Downes delivered a course in which more than 2300 learners subscribed.

Such a high number of learners in a course can contribute to a more effective learning process in several ways:

- Interaction with other learners. This is one of

the traditional features of online learning that MOOCs can enhance significantly. A wider network of learners increases the chances of the creation of enriching connections with others worldwide. As the Scopeo June report suggests (2013), MOOCs afford connections with like-minded individuals with similar interests and professional profiles. New groups can be created from these connections, which can generate new ideas for new projects.

- Enhancing the visibility of an institution. One of the main motivations for universities worldwide in designing and implementing MOOCs is that these can become a powerful marketing tool for potential student recruitment.

- Rethinking the curriculum. As Yuan & Powell indicate (2013), MOOC' popularity could lead HEIs to rethink the elaboration process of the curriculum toward more open and flexible educational models, due to the new «massive» element of these courses.

It is worth noticing that there are certain risks involved for institutions when attempting the creation of such courses, especially if they do not satisfy the innovation and quality requirements set by such institutions.

- The invasion of «package content» The DBIS report on MOOCs (2013) identifies criticism indicating that the spread of MOOCs involves the risk of reproducing online educational models based on «package content» which were common in the 1990s. That is, the emphasis was diverted towards digital resources and their contents, rather than on the educational model and its improvement. Extensive efforts have since been made for more flexible online education that focuses on the process rather than on the product in an attempt to move to a more learner-centric approach. This is why content-centric MOOCs such as xMOOC could set back the progress made in pedagogies underpinning online teaching and learning.

- Assessment difficulties. Because of the high numbers of learners involved, the preference for quiz-like assessments could become a growing trend. Peer assessment as a more flexible option has been practiced for years in contexts such as connectivist MOOCs. However, flaws in this strategy have also been suggested because, as O'Toole indicates, learners are usually provided with templates for grading their peers. Therefore, what is called «peer assessment» should often more accurately be called «peer-grading». A more process-focused assessment is still a major challenge when dealing with such high numbers of students.

- Facilitation challenges. Managing the facilitation of an online course with thousands of learners is far

from simple. Personalised feedback becomes complicated when there is a high diversity in tools and approaches used in such populous learning communities (Prendes & Sánchez, 2014).

As discussed above, massive registration is a MOOC feature, but it is not the only one. Low retention rates are also characteristic. Clow (2013) uses the analogy of «the funnel of participation» to explain the process of loss of students from registration to graduation, the latter having rates of between 5 and 15% (Jordan, 2013; UTHSC, 2013; Daradounis & al., 2013).

1.2. A Web Science MOOC

«Web Science» is a growing field of study in the UK. The University of Southampton offers a Bachelors Degree, a Masters of Science, and a doctoral programme in this area. In November 2013, the «Institute of Web Science» was launched with the aim of fostering interdisciplinary research in this area. Its curriculum focuses on the impact of the Web in all areas of society, and it approaches disciplines such as sociology, economy, law, and computer science in an attempt to understand the Web and how it is changing the world. The University of Southampton Web Science Web site (www.southampton.ac.uk/Web-science) presents the subject as a new discipline that has the objective of promoting understanding of what the Web implies as a sociotechnical phenomenon. Tim Berners-Lee, considered the inventor of the World Wide Web, contributed to the establishment of this discipline and its foundations, recommending the identification of needs and changes that the Web is producing in society. The Web, he asserts, should be studied as a social, communicative, and even philosophical phenomenon (Berners-Lee & al., 2006). In this context, the department of Electronics and Computer Science (ECS) of the University of Southampton, toget-

Table1: Web Science MOOC modules

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
What is Web Science?	Networks	Crime and Security on the Web	Democracy on the Web	Economy on the Web	What is next for the Web?
Introduces the topics of the subsequent weeks, as well as the academic team that has created and will support the course.	This week focuses on networks, their mathematical theories and their application in the study of the Web. Some activities encourage the learners to analyse a small social network. After such an analysis, learners reflect on the characteristics of large social networks such as Facebook, Twitter, and LinkedIn.	In this week, learners reflect on the boundaries of legal, political, and moral correctness, and how blurry these are between the online and the offline.	The central theme in this week is the role of the Web in certain political processes worldwide. Topics like online activism and Open Data initiatives are also discussed in this module.	The fifth week touches on digital economy. The value and quantity of data currently circulating on the Web and social networks in the job market are the main topics in this module.	The course ends with a unit on Web futures, with an emphasis on the Semantic Web and the Web of Things.
11 November 2013	18 November 2013	25 November 2013	2 December 2013	9 December 2013	16 December 2013

her with the above-mentioned Web Science Institute, and the Centre for Innovation and Technologies in Education (CITE), launched a Web Science MOOC that went live on the 18th September 2013 (Davis & al. 2014). It is not a coincidence that the first MOOC produced by this institution is on Web Science, given the prevalence that this field of study is gaining in the institutional agenda of this university (www.southampton.ac.uk/wsi).

Regarding its syllabus and content, the Web Science MOOC is organised over 6 weeks, as shown in table 1.

1.3. Web Science MOOC in FutureLearn

Futurelearn is a private initiative from the Open University in the UK. It operates in a consortium of about 30 institutions, most of them British universities pertaining to the so-called Russell Group. It is a demanding platform in terms of the quality of the materials that it hosts, both pedagogically and technically.

Regarding its pedagogic features, the platform has been inspired on Laurillard's Conversational Framework (2002), a constructivist model that divides the learning process in four stages (discursive, interactive, adaptive, and reflexive). In each of them, the application of learning technologies can play a fundamental role. Although this is attained to a great extent in Futurelearn MOOCs, their structure still contains certain behaviourist elements related to xMOOC, such as

the content sequencing and the quiz-like assessments.

Perhaps the main difference in respect to other platforms is the forum distribution. There is a different discussion forum for each of the course steps, be it a video, an article, or an activity. This way, the discussion threads are not created by the user, but by the educators in the platform.

In order to promote interaction between users, the platform has enabled a system by which they can follow each other, reply comments, vote them (only with positive votes), and rank them in terms of number of votes.

Regarding its assessment system, the platform has recently incorporated a peer review tool, adding it to the existing quizzes.

Another distinctive feature is its user interface, oriented towards a simple and intuitive navigation in order to arrive to a wider target audience. The interface allows the user be aware at all times about their progress by indicating the week in which learners are supposed to be, the week where they actually are, the steps they have completed, and the steps they still have to complete.

For the Web Science course, users were encouraged to use other social media such as Twitter and Google +, although not as the main means of interaction, but as a complement.

2. Method and materials

This article was written by the end of the second edition of the first MOOC at the University of Southampton. It was a six weeks course with a new platform (Futurelearn), and in a relatively new field of study (Web science). Due to this novelty, in many aspects, the education team was unable to predict the course outcomes. The intention here is sharing the experience when dealing with the unknown, present the results obtained so far, and explain how the course was created. Rather than understanding MOOCs as a general phenomenon, it is intended to present what has been classified as an intrinsic case study (Stake, 1994; Buendía & al., 1998).

From its creation to its deployment, the academic and educational team in charge of this project development has divided the work in the following stages:

- Content creation and development. More than 25 staff members of the University were involved in this process, from the dean of the faculty, Wendy Hall, to PhD students. Materials consisted primarily of videos and articles, although some applications and animations were also incorporated. The videos were recorded with TV production means, and hosted in

iPlayer, a video platform that comes from the BBC. In fact, Simon Nelson, the production chief executive of Futurelearn, is a former member of the BBC, and responsible for this format. A relatively high budget was dedicated to the video production, especially compared to that of other MOOC platforms.

- The texts and activities proposed by the academic staff were subject to various control processes before being published. One of the main criteria was that these materials had to be succinct, easy to read on screen, and with a plain language that could be easily understood by non-native speakers. Some external articles and videos were recommended for further study, which involved certain challenges with the copyrights. To address this, the library services of the university helped and advised about the legal issues arising from the release of some of the contents.

- The delivery, the facilitation, and the assessment. One week before the course went live, all materials were ready, although there was some work to be done with the assessment. This is an important part of the interaction between the university and the students, and only a few days before the start of the course, the university came to realise that the only form of assessment available was quiz questions (it was in the second run on the course when peer-review was incorporated as an assessment option in the platform). Formulating the right questions involved an extra effort for the educational team, especially due to the presumed diversity of the learning community. Every question had five options, and each of these options contained feedback, regardless of whether they were correct or not.

3. Analysis and results

The data provided by Futurelearn shows that, from the 13.680 registered users, slightly less than half of them (5487) completed at least one step. Nearly 3000 completed steps in more than one week, which suggests that less than a quarter continued to the second week. A survey conducted by the platform, with 802 participants, shows that the main obstacle for completing the course was lack of time, which coincides with the fact that a small majority of participants were working full time (45%).

It is also worth noticing that the highest proportion of participants were over 46 years old (about 20% between 46 and 55, a similar percentage between 56 and 65, and almost 15% more than 66). Also, a majority held a degree (43%), and nearly a quarter had postgraduate qualifications. More than 40% had participated in an online course before. Regarding their profes-

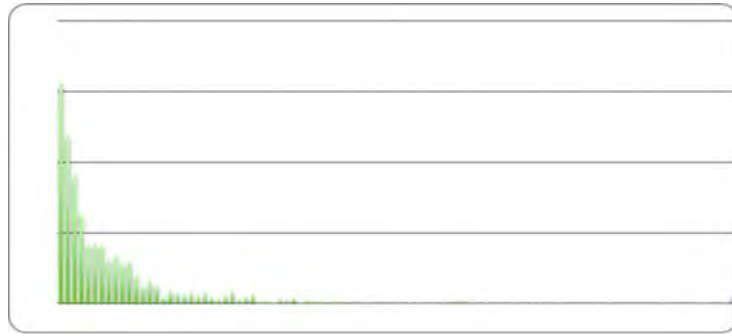
sions, education and computing were the two most frequent areas. Regarding their nationalities, three quarters were Europeans, with a predominance of British (63%). Therefore, it could be suggested that the target audience of this course was from the country where the course was developed, mature, with high qualifications, digitally literate, and familiarised with online learning technologies.

In terms of their expectations, participants had «learning new things» as their main motivation (nearly ninety selected this option), followed by the intention to try out the platform as a teaching method (68 participants). Complementing their studies (21) and improving their professional profile (21) appeared not to be the main motivations of the participants. Their interests were mainly related to the area of science and technology (78), followed by humanities (55), and education (43).

1204 learners completed the course, which results in almost 10% of the overall registrars. This situates this course slightly above the average in terms of completing rates, which some studies suggest to be around 7% (Parr, 2013).

Participation in forums was also relatively high compared to other courses in the same platform. The learning community posted around 19.000 comments only in the Futurelearn platform, and 2.200 learners contributed at least once in these forums. More than 1300 contributed at least twice, some 1050 more than 3 times, and about 660 more than four. Graph 1 shows a descending curve in relation to the number of users (vertical axis) in terms of their number of contributions (horizontal axis). It is worth noticing that there were a significant number of users who contributed frequently. Some of them, 7 in total, made more than 100 comments.

As discussed above, there were different forums for each step. Some of these steps recorded nearly 1000 comments, being the average 151 per forum. As per different weeks, the number of contributions was consistent. Although the first week stood out with nearly 6.500 comments, the subsequent weeks recorded around 2500, except for the last week, with 1.900. The lower figure of last week might be due to



Graph 1: users (y) by number of comments (x).

the fact that it contained 14 steps, as opposed to the 21 on average of the rest of weeks.

In terms of the nature of the comments, it could be highlighted that most of them consisted of direct responses to questions made within the content of the different steps of the course. For example, there was an activity in which an application used browser history data to return the percentage of web-sites visited by the user. In such activity, users were asked to provide a reflection on their frequency of visits different sites. Most comments in that step (1.425), consisted of the actual reflection.

Comments consisting of a direct question to the educators turned out to be a small minority. Despite that, facilitators replied to an average of 40 comments during the course. It should be taken into account that, as opposed to other MOOCs, facilitators did not post comments for livening up the discussions, but for solving doubts, clarifying concepts, and giving support to issues both technical and content related.

Out of the platform, Google+ was the most utilised space, according to the pre-course and post-course surveys conducted by Futurelearn. The community in this space had nearly 800 members. The number of contributions descended steadily as the course went on, but it kept alive as a space of communication between participants and some educators.

4. Discussion and conclusions: three challenges for the Web Science MOOC

Based on the experience gained from this course and the current literature on the topic, three main challenges can be identified in the creation, delivery and management of a MOOC:

4.1. The course design

The pedagogical design of such a course entailed intense planning and coordination of effort at various levels. The platform was new, so much so that it ope-

Table 2. Comments per week

Semana	1	2	3	4	5	6
Comentarios	6.427	2.610	2.745	2.465	2.679	1.901

rated with a beta version at that time. The Web Science MOOC was the first at the University of Southampton, so there was no previous experience to draw from in these kinds of projects. Also, the Web Science Institute is a multidisciplinary department, with subsequent diversity in materials and pedagogical approaches. This situation led to an enriching process, but it required major efforts in planning and establishing the roles of each contributor, something to be considered in future editions of the course.

How the course will be delivered and what interactions will take place are essential considerations for the design of the course. Yang & al. (2013) suggest that social relationships have an influence in the completion rate of the course. Therefore, as Bentley & al. confirm (2014) the social side of the course is of paramount importance for its success, and a design oriented to this end should be created so that learners are motivated to participate in communities formed on these courses.

4.2. The platform requirements

There are many reasons why it is considered convenient to use the services of a platform when developing a MOOC. One of them is visibility, a determining factor that both Edinburgh (2013) and University of London (2013) reports recognise as the main reason for joining Coursera. Another reason is the technological support that they offer. Creating a platform for managing the content of a MOOC may involve a cost that exceeds the budget that many universities allocate to free online learning. Outsourcing these services by using established MOOC platforms is often considered a more affordable option.

However, being part of a platform such as FutureLearn entails certain compromises. For example, the course materials, both written and audiovisual, are subject to demanding quality standards. This elevates the production costs to figures that not all institutions can afford. Another compromise to consider is the distribution of contents and activities, as the platform divides everything into «steps» which are categorised into videos, activities, discussions, and assessments. The course educators need to comply with such a classification, which could conflict with their pedagogical aims at times. The same applies to the assessment, as the only options available are quizzes and peer-assessments the protocol of which only the platform controls. Therefore, a divergence with the pedagogical principles of the platform may require a great deal of creativity and flexibility. It is therefore recommended to combine external social media with the social tools available on the platform.

4.3. The challenges of facilitation

Facilitation is one of the greatest challenges not only in MOOCs, but also in any other online learning experience, as students need continued feedback to support their learning process in a context where high levels of autonomy are required (Sangrá, 2001).

Forums are deemed as important communication and learning tools in MOOCs (Mak & al., 2010). Levels of participation in such forums are often indicators of learners' level of commitment to the course. These participation levels also indicate the liveliness of the learning communities as well as that of the course in general (McGuire, 2013). With these premises, a team of 10 facilitators was established. These were all PhD students at the Web Science Centre for Doctoral Training who were instructed and coordinated in such a way that they could read all comments in the forums, and provide responses when needed. With an awareness of the importance of facilitation strategies in this kind of courses (Marauri, 2013), the following procedure was implemented: a rota with three daily shifts, including weekends, was devised. In each of these shifts, the facilitator would read all comments and indicate in a form which of them had been replied to, and which of them required attention. In a session prior to the course, a protocol was agreed to determine which kinds of actions were going to be taken in different scenarios. One of the main reasons why such a large team was formed is that each of the steps contained a forum, and all of them encouraged learners to participate. Each of the six modules had an average of 20 steps, which generated 120 different interaction spaces in the platform alone. To this we have to add the interactions that occurred in Twitter and Google+. Although there was not an aim of replying to all the nearly 19,000 comments, the facilitation team aimed to go through all of them in order not to leave unanswered questions or doubts. The intention was also to let learners be the drivers of the conversations. It was observed that in very few occasions these interactions went off topic, perhaps because in the platform structure, the content of each step determined the conversation topic. The challenge is fostering participant interaction, and the creation of conversational threads and groups of learners that interact with each other.

4.4. The challenges of the MOOC phenomenon

The traditional challenge of online education, namely activity design, facilitation, assessment, and feedback (Burkle, 2004; Prendes, 2007; Sánchez-Vera, 2010), prevail and even intensify with MOOCs, especially due to their massive size. However, despite their difficul-

ties, MOOCs open a wide range of possibilities, as they are not only about opening up resources, but about the whole educational process. Thus, these courses represent interesting learning and professional training opportunities, and can even be advantageous for their use in Flipped Classroom experiences (Zhang, 2013).

The experience presented here does not represent the end, but the beginning of a promising path towards the improvement and widening of online learning opportunities.


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Annotations and the Ancient Greek Hero: Past, Present, and Future

Anotaciones y el héroe griego antiguo: Pasado, presente y futuro

 Dr. Leonard Muellner is Director for IT and Publications at Harvard's Center for Hellenic Studies in Washington, D.C. (USA) (muellner@chs.harvard.edu).du).

ABSTRACT

Evidence for annotating Homeric poetry in Ancient Greece is as old as the 5th Century BCE, when the «Iliad» and «Odyssey» were performed by professional singers/composers who also performed annotations to the poetry in answer to questions from their audiences. As the long transition from a song culture into a literate society took place in Ancient Greece from the 8th to the 2nd and 1st centuries BCE, annotations were gradually incorporated into written poetic texts. By the 10th Century CE, the quantity of written annotations in the margins of medieval manuscripts has become huge. For the first two versions of «The Ancient Hero», a HarvardX MOOC, it was not possible to implement the set of annotation tools that we requested as a vehicle for close reading and assessment. Using a partial system, we were able to create a semblance of annotations in close reading self-assessment exercises. For the anticipated third version, we expect to have a complete set of textual and video annotation tools developed for HarvardX, including semantic tagging and full sharing of annotations. Such a system, which promises to make the educational experience more effective, will also inaugurate a digital phase in the long history of Homeric annotation.

RESUMEN

Las evidencias de anotaciones en la poesía homérica de la Antigua Grecia se remontan al siglo V (a.C.), cuando ya la «Iliada» y la «Odisea» eran representadas por cantantes profesionales/compositores, que hacían anotaciones en la poesía para responder a los interrogantes de su público. A medida que la transición, desde una cultura de la canción a una sociedad alfabetizada, aconteció en este período de la Antigua Grecia, entre el siglo VIII al I y II (a.C.), las anotaciones se incorporaron poco a poco en los escritos poéticos. La cantidad de anotaciones escritas en los márgenes de los manuscritos medievales se volvió enorme hacia el siglo X. En las dos primeras versiones de «The Ancient Hero» en el MOOC de HarvardX no fue posible utilizar el conjunto de herramientas de anotación solicitadas como medio para una atenta evaluación de las lecturas. Utilizando un sistema parcial, hemos sido capaces de crear aparentes anotaciones en los primeros ejercicios de autoevaluación de lectura. En la tercera versión, disponemos ya de un conjunto completo de herramientas de anotaciones de texto y de vídeo, desarrollados para HarvardX, incluyendo etiquetado semántico y anotaciones compartidas. Dicho sistema nos permitirá una experiencia educativa más eficaz, inaugurando también una fase digital en la larga historia de la anotación homérica.

KEYWORDS | PALABRAS CLAVE

Text analysis, ancient texts, song culture, Greek hero, multimedia annotation, MOOC, self-assessment, tagging ontology, semantic tagging.

Análisis de textos, textos antiguos, cultura de la canción, héroes griegos, anotaciones multimedia, MOOC, autoevaluación, ontología de etiquetas, etiquetado semántico.

1. Introduction

The topic of this paper is annotation in its historical context as a vehicle for research and teaching MOOCs in the humanities, more specifically, past uses of annotation and its present and future uses. In Ancient Greek epic poetry, the poet and the seer, in other words, the persons who 'see' most clearly and whose minds are most attuned to the world, are those who know the connections between the things that are, the things that were before, and the things that will be, so that will be our model to emulate.

2. Annotations as performance in the ancient Greek song culture

Ancient Greece emerges from pre-history as a song culture, a culture of the spoken, performed word. As early as the 8th Century BCE, Greeks had transformed the Phoenician syllabary into a phonemic alphabet and made it thereby easy to learn and to use. Even so, alphabetic writing was not popular among Greeks even into the Classical period, the 5th Century BCE, the time of the Athenian empire. Writing was conceived of as a secondary phenomenon to singing and speaking. For centuries after its invention, it was underutilized and even treated with contempt by a society that could do everything that it wished to with performed, spoken language (Svenbro, 1993).

Just as it took generations for prose to develop out of poetry, so also it took generations for alphabetic writing to become an acceptable part of daily life. A sluggish transitional process began in the 8th Century BCE and continued for centuries. Even though Plato used alphabetic writing in the 4th Century BCE to create a voluminous corpus of written work that has survived apparently in its entirety, he still portrays his revered teacher, Socrates, in the late dialogue «Phaidros» disparaging writing. For Socrates, writing is nothing but a poor reminder of an idea, since letters are silent and cannot respond to anyone's questions (275c-d): the logos of dialogue, of living, face-to-face question and answer, is the only means to true understanding. When alphabetic writing eventually did acquire prestige, it existed alongside the song culture. It did not displace performance traditions, for instance, of Homeric poetry, which thrived at least into the 2nd Century CE (Nagy, 2001).

This cultural state of mind about writing had consequences for the study and use of annotation, because during the transitional period, just as poetry was composed and performed in festivals and in front of crowds, so also were annotations on its interpretation and transmission. We know of figures in the 5th

Century BCE like the rhapsode Hippias of Elis, who boasted that he was able to simultaneously perform and interpret poetry, both the poetry of Simonides and of Homer, as we learn from Plato's «Protagoras» (for instance, at 347b) and the «Hippias Minor» (363c-d; the Greek word for such a performance was «epideixis», a word also used of public oratorical performance). He says there that at the Olympic games he publicly stated his willingness to perform and to answer any question about his performance that the assembled visitors could ask.

The rhapsode Ion, like Hippias the subject of a Platonic dialogue that bears his name, also claims to be an interpreter (Ion, 531c, hermeneus) of poetry able to speak beautifully about its intent. And we have testimony from the 4th Century BCE orator, Isocrates, who complains in his last oration (Panathenaicus, 17-19) about «run-of-the-mill sophists» sitting together in the Lyceum in Athens, where they would recite and comment on the most elegant features of the poetry of Homer and Hesiod, repeating material which they had learned from others. So it is clear that there was a tradition of performed commentary or annotation that accompanied the performance of poetry before there were written texts of poetry with annotations embedded in them.

3. Transition to literacy and written annotations

Even though the transmission of knowledge without writing is a remarkably reliable process in such cultures, eventually writing did become a medium for the sharing and transmission of knowledge. It is not a coincidence that the oldest document written on papyrus that we have from antiquity, was meant to do exactly that, namely the Derveni papyrus roll, generally dated to the 4th Century BCE and unearthed in 1975 near Thessaloniki in Northern Greece as the consequence of a highway construction project. This papyrus was buried with its owner and intentionally burnt with him. It was supposed to have been destroyed, since its destiny was to communicate with higher powers on the other side of death, not to be read by or shared with the poor souls left behind in this world.

Only a fortunate circumstance prevented this carbonized papyrus roll from being burnt up completely and then from completely disintegrating in the temperate climate of Northern Greece. As one might expect from a written document with such a ritual purpose, there are no exegetical annotations on the text of the Derveni papyrus. But once we move to a climate that is friendlier to the preservation of papyrus fibers, the desert climate of Greco-Roman Egypt, and to a culture

in which writing was integrated into daily life practices, we can acquire a better notion of the early history of written annotation. Figure 1, for example, shows two columns of a 2nd Century CE papyrus that was used as a kind of papier mâché for making mummies, from a cemetery in Hawara, about 100 miles south of Cairo.

On each of the columns on this fragment of the scroll, there is a single marginal note in cursive lettering commenting on the text that has been copied in beautiful uppercase letters from the second scroll of the Homeric Iliad. The poetry is discussing whose were the best horses of all the Greeks who came to Troy. It says that the warrior Eumelus had the best horses, and that in addition, Ajax the son of Telamon was the best warrior – that is, he was the best as long as Achilles was angry and not fighting, it adds, because he, Achilles, was much the best warrior; and, in fact, so were the horses that carried Achilles the best. The line with the note to the right of it reads: Iliad II 769: ΟΦΡ' ΑΧΙΛΕΥΣ ΜΗΝΙΕΝ ΟΓΑΡ ΠΟΛΥΦΕΡΤΑΤΟΣ ΗΝ. (while Achilles was angered; in fact he was the best by far).

The marginal note, written in smaller, cursive letters, with spaces between the words (there are no spaces between words in the uppercase letters of the poetic text), says «κοιν(η) φερτερος εν»/ «the standard he was better».

In the highly abbreviated language of such margi-

nal notes, these words mean that the standard (koinē) text of Homeric poetry reads «he was better» in this line, in contrast to the text given in the papyrus itself, which reads «he was the best». So the marginal note records a variant reading of the line, a change that lowers the rhetoric of the verse, calling Achilles better than Ajax – but Ajax has just been said to be the best when Achilles was not fighting, so whether this line says he is better or the best, either way, Achilles is still the best overall.

This kind of annotation, which may be by a second hand and not the original scribe, is consistent with editorial practice that we know of elsewhere in the Hellenistic period. Checking the text against a standard version and preserving rather than suppressing variants was the regular practice, for instance, of the most famous Homeric researcher in the Hellenistic (2nd Century BCE) period in Alexandria, Aristarchus of Samothrace. Usually, he would give the standard (koinē) version in his text and preserve the variant in an annotation, but his successors often promoted his relatively exotic variants to the base text.

For example, among the most famous witnesses of the Homeric text, the 11th Century MS. from the El Escorial Monastery in Madrid, Escorial Omega 1.12, in fact reads the more subtle «ferteros» (better), not «phertatos» (best) here. Aristarchus was head librarian in the Museum of Alexandria from ca. 180-145 BCE. By his time the writing of both texts and comments had

become the norm. Even so, we do have reliable information that it was his editorial practice, as it was also that of others in this time period, to have a professional reader, a so called «anagnōstēs» (reader) whose name was Posidonius, read every line of Homer out

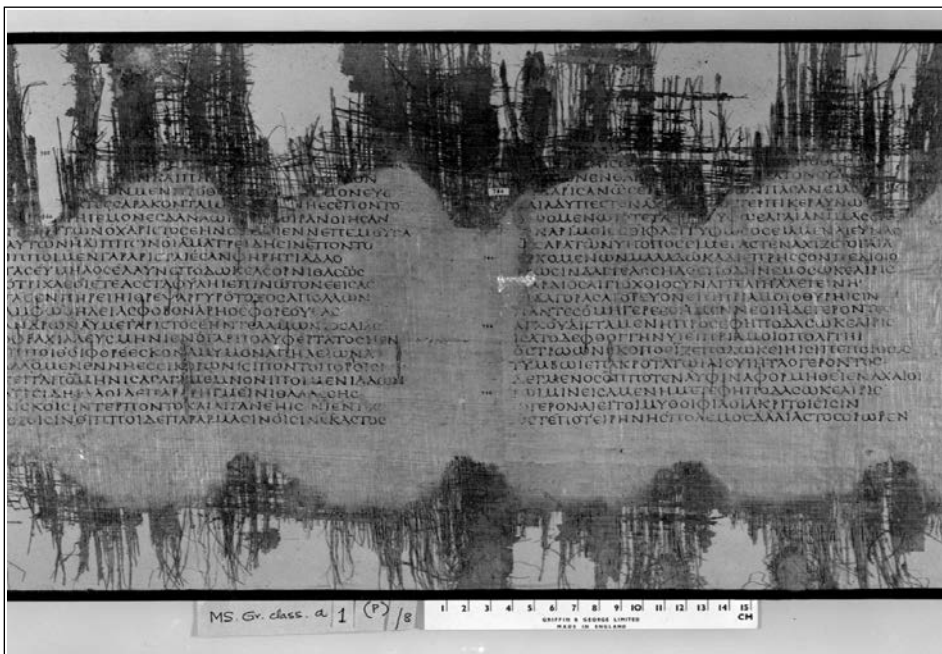


Figure 1: 2nd Century CE: Hawara Papyrus of Homeric Iliad, in Bodleian Library, Oxford (P. Bod. I.1), fragment viii¹.

loud as he was editing the texts. Aristarchus regarded the traditional performance practice of such a person as authoritative, especially for the way that words in the poetry were to be divided and understood (Nagy, 2008). Without word divisions in alphabetic Greek (as we see the text written in the papyrus), there are options about how to divide up and read the words in the poetic line. Clearly, this professional reader/performer was continuing in the authoritative.

Tradition of the rhapsodes and sophists mentioned above, Hippias and Ion and others, though now the performing of the text and its annotation had become the domains of separate individuals. But it is also clear that by Aristarchus' time, the written form of the text is primary even to the «anagnōstēs», who is not a performer but a 'reader.' We also know that Aristarchus physically separated the edition of poetic texts into one scroll and the edition of his annotations into another, into what he called «hupomnēmata», a word that originally meant 'reminders, notes' and then came to mean a separate collection of note (Pfeiffer, 1968).

So effectively we can point to this moment as the transitional stage between annotations in a song culture and purely written annotations that are the vehicle for scholarly publication in the modern academic world. By the time we get to the medieval transmission of the Homeric text, the annotation process has undergone a dramatic development in both quantity and types of annotation and their presentation. Consider an image (figure 2, above) of the eleventh folio (recto) of the 11th Century manuscript of the Homeric Iliad in the Escorial Monastery of Madrid, catalogued as Upsilon 1.1, a page with the text of lines 322-341 of the first scroll of the Homeric Iliad. It represents a fairly «normal» page of one of the dozen best Byzantine MSS. of the Homeric text. The middle of each page of parchment contains about 20 lines of the Homeric text, written in relatively larger letters, and there are annotations in two regions of the page: between the lines, where there are short paraphrases of words that are old or obscure to the current reader and that appear over the words that they explain; and, in addition, all around the outermost part of the page, beginning at the top left, there are notes that are referenced by numerals that appear over words or phrases in each line of the poem, like numbered footnotes, explaining the language or the grammar or the mythology of that particular line, and at times reporting the opinion of other scholars from antiquity as well as citing other texts in support of their interpretation.

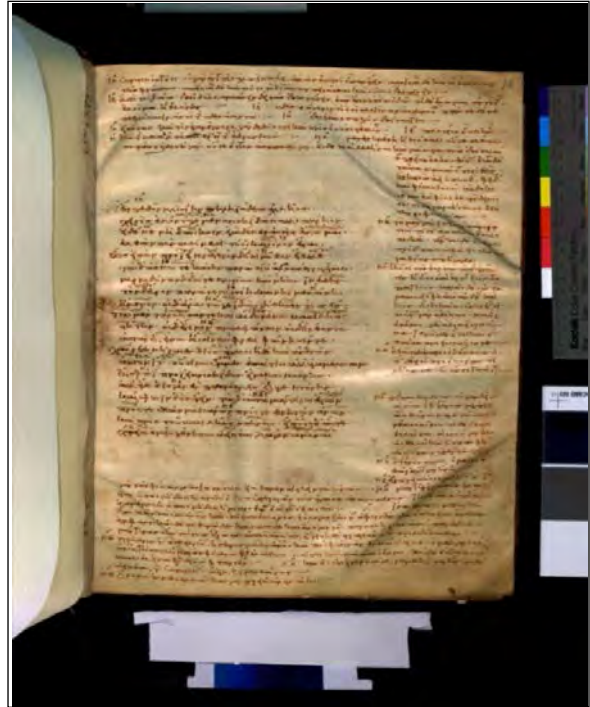


Figure 2: Upsilon 1.1, Real Monasterio de El Escorial, Madrid; folio 11r. contains Iliad 2: 322-341².

Figure 3 is a less «normal» page from the 10th Century MS. called Venetus A, with even more notes on textual matters in the margins to the right and left of the Homeric text in the middle of the page (in other words, it uses an area on the page for a specific kind of annotation that is missing in the later MSS.). In this older form, there are no numbers to connect the text to the marginal notes. Instead, each annotation begins with a word or group of words from the poetic text being commented on in order to make the connection between text and its annotation as explicit as possible. So the tradition of commenting which looks like a weak stream in the 2nd Century CE papyrus from Hellenistic Egypt has swollen to a great river of annotations that Byzantine scribes handed on to us through a process of compilation, copying, and recopying.

The copious notes that they have transmitted explain how to interpret the Homeric text and cite authorities for doing so that date as far back as the allegorical interpreters of Homeric poetry in the 6th Century BCE. They include material that is Aristotelian (4th Century BCE) in conceptual pedigree, as well as the opinions and results of all the researchers on Homer from the learned communities established in Pergamum and Alexandria after the death of Alexander the Great and thereafter, on into the heyday of the Roman Empire.

4. Annotation in a Digital Age: Research, Teaching and MOOCs

There is one striking and crucial fact about these medieval MSS from Byzantium: not only were they created by hand by one scribal artisan at a time, they also could only be read by one person at a time, though they could be heard by more than one if that person read aloud. So the end of the performance tradition plus the end of the Ancient Greek song culture plus the advent of writing effectively reduced access to this river of annotations, making them accessible to a relatively few, especially as compared to the crowds of Greeks attending an Olympic festival where Hippias performed poetry and explained it in public; one can see how eventually, with the advent of the expensive, hand-written single book, poetry became the property of elites, not the general population. In 2005, a team from the Center for Hellenic Studies in Washington DC did the first high-resolution photography of three of these Byzantine MSS. of Homer in Venice, where we photographed the oldest of them, the 10th Century MS. called Venetus A as well as a manuscript that is referred to as the twin sister to Escorial Upsilon 1.1, the so-called Venetus B. Roughly twenty percent of the annotations in these MSS. (and there are other such MSS. extant, in Geneva, in the British Library, and in Florence with different as well as overlapping collections of annotations in each) has never been published even in modern times. Until the CHS team

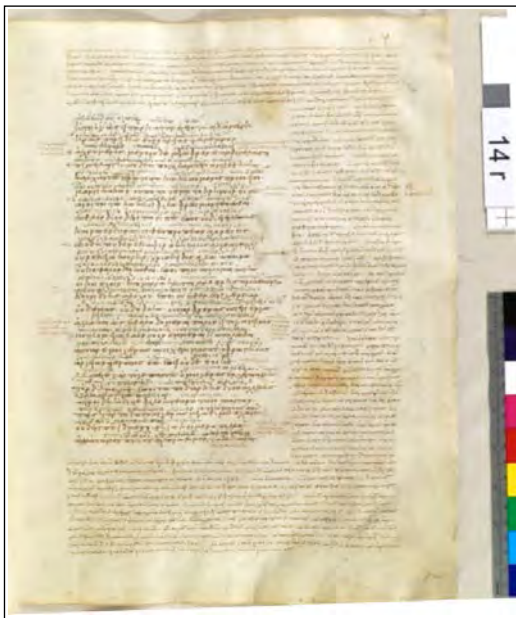


Figure 3: 10th Century CE Venetus A, Biblioteca Marciana Z 454, folio 14r, Homeric Iliad 1.101-125³.

made the photographs and published them on the internet under a Creative Commons license, fewer than 25 people since the 16th Century had ever even looked at the MSS. themselves in Venice, though in 1901 Domenico Comparetti published a facsimile of Venetus A – at most not more than a couple of hundred copies of it exist (Comparetti, 1901). As mentioned above, the Center for Hellenic Studies in Washington has made high-resolution photographs of these medieval manuscripts of Homer available at no cost to the world via the internet on a Creative Commons License. So technology has enabled at least visual access to these ancient annotations. Yet they are not, as you can well imagine, easy to read and understand. Not only is the writing style elliptical and conventional, as in the sample given above, but also the actual writing of the words themselves is compressed and abbreviated, because the scribes had to fit many annotations into limited space. So a large effort is now underway to make machine-readable versions of these annotations, 20% of which have never been published, and to translate them and make them comprehensible to a wider audience. Since 2008, a worldwide project, sponsored by the Center for Hellenic Studies in Washington DC, has been training those among us with the best eyes, the sharpest decoding skills, and the greatest comfort with digital technology, namely young people from age 18-21, to produce digital editions of this massive quantity of material.

This historical example of Homeric annotation and its transformations over time is worth dwelling upon in order to highlight the potential for a new golden age in the democratization of education that the development of digital technology for creating and also sharing annotations offers. That large potential is based on three crucial smaller potentials of digital technology:

a) First, there is the potential ubiquity of free and open access to published research in higher learning, including annotations, that digital technology affords;

a) Second, there is the potential development of protocols and software for federated annotation of the objects of higher learning – in other words both texts and images;

b) Third, there is the ability of digital technology to create conversing communities of learners, researchers, and teachers around the world through cheap and effective communication by way of simple software for asynchronous as well as synchronous sharing of ideas and insights.

These three aspects of the current state of digital technology make our times a potential golden age for

education through annotation. As the historical example shows, annotation of an enduring cultural monument of Western literature, the Homeric poems, has always been and continues to be the vehicle of choice for communicating, sharing, and developing ideas and understanding around it. Even though the advent of alphabetic writing and the eventual suppression of song culture effectively reduced the scope of annotation-sharing, in the Renaissance the advent of the printing press then made it possible to print books of annotations, and libraries, publishers, and bookstores have made it possible to disseminate them relatively widely. But such physical books of annotations have now become more and more expensive to produce and buy. For example, the first volume of a two-volume commentary on the first four books of the *Histories* of Herodotus (in other words, only half of the work) published by Oxford University Press now retails for £238 or \$400. Now, however, with digital technology, we are working to increase access massively, and we can augment the old stream of annotations with new ones created by new communities. Furthermore we can share a growing corpus of annotations to an unprecedented degree, because each of the three potential aspects of digital technology has been at least to some extent realized:

a) For the first, the ubiquity of information technology and free and open access to publication of research that it affords, there is now the Open Access movement and the increasing success of unfettered publication of research in higher learning.

b) For the development of protocols and software for open access, federated annotation of the objects of higher learning through annotation with enhanced technologies such as geolocation, ontological tagging, sharing in social networks, along with powerful pedagogical methods for assessment with rubrics (Cebrian-de-la-Serna & Bergman, 2014), there are now the Open Video Annotation project⁴ and the integration of tools like Annotators into the edX platform that has recently been accomplished (Cebrian-Robles & Desenne, 2014).

c) Lastly, for the ability of digital technology to create communities of learners, researchers, and teachers around the world, there is now the advent of MOOCs, which have arisen in a very short time and have opened universities to modern societies at all levels (Liyanagunawardena, Adams & Williams, 2013; Ebbena & Murphyab, 2014).

MOOCs are a crucial piece in the implementation of this vision of democratized education via annotation. A course called *The Ancient Greek Hero*, CB

22x, has now been offered by Professor Gregory Nagy and a team from Harvard University and the Center for Hellenic Studies twice (March-July, 2013 to 43K participants; again, in September-December, 2013 to 16K participants). A third version is under development and is likely to be offered in September, 2014.

For the first two iterations of *The Ancient Greek Hero*, the pedagogical staff had only a semblance of annotation tools, because at the time the edX platform had a limited implementation of an annotation system for teaching and learning. Despite this, voluminous sources for the *Ancient Greek Hero* project were made available for learners to annotate inside the MOOC. Unfortunately, there was no way for participants to explore their peers' annotations, nor to share or export their own annotations. Secondly, and perhaps more importantly, we worked with the technical team to implement the first phase of a set of tools to enable self-assessment through annotation but not the second phase in the development of those tools. That second phase would have allowed participants to create, retrieve, and share annotated assessments.

Under these constraints, we created self-assessment exercises on the model of an annotation exercise and on the model of an ontological tagging exercise because in fact we had software implementations of neither. All that we had in the way of technology for interactive testing was the ability to mark an answer to a multiple choice question as correct, half-correct, or incorrect, and then to provide information about the possible answers. For each of the twenty-four 'hours' or sections of the course, the instructor, Professor Gregory Nagy, created a Close Reading Exercise based on a focus passage, a translated text of Greek literature usually not more than a page long. The participants were instructed to think of these exercises as a way to learn to read slowly, borrowing that concept from Friedrich Nietzsche's description of philology in the beginning of *Daybreak*, and above all to learn how to read out of the text instead of reading into the text one's own preconceived ideas (Nietzsche, 1982). Each focus passage contained four differently colored, highlighted sections, each with a question linked to it like an annotation that pops up when the user lets the cursor hover over (mouseover) the highlighted text, as in figure 4 below.

When the person taking the exercise clicks on «Reply to Annotation» at the bottom of the Question one/Annotation window, the screen moves down to this section of the online exercise, right after the end of the focus passage, as in figure 5 below.

whom he had courted and married in the proper way. She was the beautiful Kleopatra, |557 whose mother was Marpessa, the one with the beautiful ankles, daughter of Euenos, |558 and whose father was Idēs, a man most powerful among those earthbound men |559 who lived in those times. It was he [= Idēs] who had grabbed his bow and had stood up against the lord |560 Phoebus Apollo, and he [= Idēs] had done it for the sake of |561 Kleopatra's [= Marpessa]. |561 She [= Kleopatra] had been given her name by her mother back then [when she was growing up] in the palace. |562 Her name was the same as the name of the bird, because she was a Ceryon bird, known for her many sorrows [penthos]. |563 She had been seized and carried away by the one who has far-reaching power, Phoebus Apollo. |565 So, right next to her [= Kleopatra], he [= Meleagros] lay down, nursing his anger [kholos] - an anger that brings pains [algea] to the heart [thūmos]. |566 He was angry [kholōusthai] about the curses [ārai] that had been made by his own mother. She [= Meleagros's mother Althaea] had been praying to the gods, |567 making many curses [ārūsthai] in her sorrow [akhos] over the killing of her brother [by her son Meleagros]. |568 Many times did she beat the earth, nourisher of many, with her hands, |569 calling upon Hādēs and on terrifying Persephone. |570 She had gone down on her knees and was sitting there; her chest and her lap were wet with tears |571 as she prayed that they [= the gods] should consign her son to death. And she was heard by a Fury [Erinys] that roams in the mist, |572 a Fury heard her, from down below in Erebus - with a heart that cannot be assuaged. |573 And then it was that the din of battle rose up all around the gates [of the people of Calydon], and also the dull thump |574 of the battering against their walls. Now he [= Meleagros] was sought out by the elders |575 of the Aetolians [= the people of Calydon]; they were supplicating [lissesthai] him, and they came along with the best priests of the gods. |576 They were supplicating him [= Meleagros] to come out [from where he was lying down with his wife] and rescue them from harm, promising him a big gift. |577 They told him that, wherever the most fertile plain in the whole region of lovely Calydon may be, |578 at that place he could choose a most beautiful precinct [temenos] of land, |579 fifty acres, half of which would be a vineyard |580 while the other half would be a field open for plowing. |581 He was also supplicated many times by the old charioteer Oineus, |582 who was standing at the threshold of the chamber with the high ceiling |583 and beating at the locked double door, hoping to supplicate him by touching his knees. |584 Many times did his sisters and his mother the queen |585 supplicate [lissesthai] him. But all the more did he say "no!" Many times did his comrades [hetairoi] supplicate him, |586 those who were most cherished by him and were the most near and dear

Question 1
How is the kholos or 'anger' of Meleagros comparable to the kholos of Achilles?

Apply to Annotation

Figure 4: CB 22.1x, Close Reading Exercise, step 1.

It repeats the highlighted text and the question, and there is a textbox for the participant to write a response to the question that popped up. We wanted the person doing these self-assessment exercises to think through and write out a response to the question, which was not a question of fact but a question of interpretation – in other words, what we asked the participants to do was to create an interpretative annotation on the highlighted text as a way to regulate their own learning by way of technological enhancements (Carneiro, Lefrere, Steffens & Underwood, 2011; Panadero & Alonso-Tapia 2013). In a project like this, that is the kind of writing and thinking that we wanted to stimulate and encourage, in the long historical line of interpretive annotations of Greek poetry. In figure 6, the question asked is about the meaning of the Greek word «kholos» (anger) that occurs in the highlight and that is important in the Iliad as a whole. In point of fact, we had no way to read and respond to any of the participants' annotation-responses. Instead, we thought up a way to make each participant discover how her or his annotation related to the lines of interpretation taken in the textbook and the videos that form the content of the project by Professor Nagy. Such a procedure was consistent with the kind of idealism that we tried to cultivate in this project as a whole: the point was not to get

the right answer, but to learn how to read and to articulate responses to Ancient Greek poetry. In other words, we opted for self-assessment as the tool of choice, in the absence of viable alternatives. First we narrowed down the basic point of the annotation exercise into a key concept, and then we asked the students to choose from among three semantic tags to apply to their response, to choose the one that would best reflect the understanding that they had achieved and articulated through their annotation process. Without a full implementation of annotation tools, we made a multiple-choice list of tags that reflected better and worse

ways of reading or misreading the poetic text.

So to sum up, we asked the participants in our MOOC to annotate a highlighted text and then to tag their annotation from a mini-ontology of semantic tags. Once the participant submitted a choice of tag, she

pleasing [chariento] things that they had offered. But, in any case, he protected them from the evil event. |600 As for you [= Achilles], don't go on thinking [noēn] in your mind [phrenes] the way you are thinking now. Don't let a superhuman force [daimōn] do something to you |601 right here, turning you away, my near and dear one [philos]. It would be a worse prospect |602 to try to rescue the ships [of the Achaeans] if they are set on fire. So, since the gifts are waiting for you. |603 get going! For if you do that, the Achaeans will honor [timein] you - same as a god. |604 But if you have no gifts when you do go into the war, that destroyer of men, |605 you will no longer have honor [time] the same way, even if you have succeeded in blocking the [enemy's] forces of war.

Iliad IX.550-605

QUESTION 1 (3 points) (view log)

Question 1 [Return to Annotation 1](#)

[565 So, right next to her [= Kleopatra], he [= Meleagros] lay down, nursing his anger [kholos] - an anger that brings pains [algea] to the heart [thūmos]. |566 He was angry [kholōusthai] about the curses [ārai] that had been made by his own mother.

How is the kholos or 'anger' of Meleagros comparable to the kholos of Achilles?

Type your response below:

In your response to this first question, how do you understand the meaning of the word kholos? (choose only ONE tag, here and elsewhere):

kholos - a special kind of anger, with dire consequences

kholos - any kind of anger

kholos - either of the above

Final Check You have used 0 of 1 submission(s)

Figure 5: CB 22x, Close Reading Exercise, step 2.

received a visual response: either a pale green check mark or a solid green check mark, or, something that we were forced to accept and unable to do away with, a bright red X. And once the participant submitted electronically their choice of a semantic tag and saw a check mark or an X next to their choice, a complete explanation written by Professor Nagy about the choice of semantic tags appeared, explaining why each one was better or worse than the others and why, and why two betrayed less careful readings or even misreadings whereas one read out of the text what it was telling us. So there was instant feedback from the instructor of the project for each participant about the whole exercise.

The participants soon figured out that we were not able to read their annotations – that was literally true, because the software was unable to retrieve the annotations for the participants or for the pedagogical staff. It is our hope that we will have more complete and sophisticated assessment and feedback tools once we have a fully-fledged annotation system, thanks to the work of Cebrian-Robles and Desenne (2014) in integrating open standards-based tools into the platform of a MOOC system. If participants' annotations had been preserved, and if both we and the participants could have reviewed them, we would have shared the best responses among the participants. Furthermore, we would have guided discussions of them on the forum to which all participants were automatically subscribed. In other words, we could have made them immediately part of the communal learning experience which is such a vital and powerful part of the MOOC concept. In addition, once we create an ontology of semantic tags for all of the source material, we expect to be able to generate much more interesting and complex data about the close readings of each participant. In effect, we can make self-assessment exercises part of all of the reading in the project instead of only a single close reading exercise for each chapter of the textbook. Despite its limitations the annotation and tagging that our exercises have already afforded has been an astonishingly effective way to enhance the reading habits of our participants, as we learned by monitoring the discussion that they shared about their experiences with these tools and by the skills that they continue to practice in a site for alumnae/i of the course⁵. Self-assessment turned out to be a powerful way to learn and practice complex skills like close reading in a huge community as long as there are clear and compelling models that qualify a range of responses for the learners assessing themselves. Our team consciously rejected the approach that other humanities

MOOC have taken, which is to «crowdsource» the assessment process. From our experience teaching people to read texts from a culture that is not their own, that would only encourage people to read into the texts what is familiar from their own cultural backgrounds. So we modeled the process of reading out of the texts instead.

5. Conclusions

The concept of textual annotation has been the essential tool for transmitting knowledge and understanding of Ancient Greek texts in the past. Even with a limited system, our experience with the HarvardX/edX MOOC on The Ancient Greek Hero also shows that annotation stands to flourish for such purposes now in a digital age. Annotation is not only a means to communicate understanding that results from close reading. It also can become a vital way for people to educate themselves in the art of close reading and then to build community as they share readings by annotating. In other words, annotation can become a way for learners in this digital age to become participants in an ancient tradition of sharing knowledge that goes back to the song culture of the 5th Century BCE and, by way of MOOCs, Open Access, and open annotation software, to disseminate humanistic knowledge and skills on a global scale.

Notes

- ¹ Sourcebook of Original Greek Texts Translated into English (<http://goo.gl/WkDGNM>).
- ² The Homer Multitext project seeks to present the Homeric Iliad and Odyssey (<http://goo.gl/CdmwV1>).
- ³ For photographs of Escorial Y1.1. Venetus A. The Homer Multitext Project (<http://goo.gl/EbjjG8>).
- ⁴ Cebrian-Robles, D. & Desenne, P. (2014). Open Video Annotation (<http://openvideoannotation.org>).
- ⁵ Hour 25: A sequel to the Ancient Greek Hero (<http://hour25.heroes.chs.harvard.edu>).

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Usability and Satisfaction in Multimedia Annotation Tools for MOOCs

Usabilidad y satisfacción en herramientas de anotaciones multimedia para los MOOC

-  Dr. Juan-José Monedero-Moya is Associate Professor in the Faculty of Educational Sciences at the University of Malaga (Spain) (jjmonedero@uma.es).
-  Daniel Cebrián-Robles is Industrial Engineer from the Higher Technical School of Industrial Engineering, University of Malaga (Spain) (dcebrian@uma.es).
-  Dr. Philip Desenne is Consultant in the HarvardX Instructional Technology for Annotation at Harvard University, Boston (USA) (desenne@fas.harvard.edu).

ABSTRACT

The worldwide boom in digital video may be one of the reasons behind the exponential growth of MOOCs. The evaluation of a MOOC requires a great degree of multimedia and collaborative interaction. Given that videos are one of the main elements in these courses, it would be interesting to work on innovations that would allow users to interact with multimedia and collaborative activities within the videos. This paper is part of a collaboration project whose main objective is «to design and develop multimedia annotation tools to improve user interaction with contents». This paper will discuss the assessment of two tools: Collaborative Annotation Tool (CaTool) and Open Video Annotation (OVA). The latter was developed by the aforementioned project and integrated into the edX MOOC. The project spanned two academic years (2012-2014) and the assessment tools were tested on different groups in the Faculty of Education, with responses from a total of 180 students. Data obtained from both tools were compared by using average contrasts. Results showed significant differences in favour of the second tool (OVA). The project concludes with a useful video annotation tool, whose design was approved by users, and which is also a quick and user-friendly instrument to evaluate any software or MOOC. A comprehensive review of video annotation tools was also carried out at the end of the project.

RESUMEN

El auge del vídeo digital a nivel mundial puede ser una de las causas del crecimiento exponencial de los MOOC. Las evaluaciones de los MOOC recomiendan una mayor interacción multimedia y colaborativa. Siendo los vídeos unos de los elementos destacados en estos cursos, será interesante trabajar en innovaciones que permitan una mayor capacidad a los usuarios para interactuar con anotaciones multimedia y colaborativas dentro de los vídeos. El presente artículo es parte del proyecto de colaboración, cuyo objetivo principal fue «El diseño y creación de herramientas de anotaciones multimedia para mejorar la interactividad de los usuarios con los contenidos». En este artículo mostraremos la evaluación de dos herramientas como fueron Collaborative Annotation Tool (CaTool) y Open Video Annotation (OVA) esta última desarrollada por el proyecto e integrada en el MOOC de edX. El proyecto abarcó dos cursos académicos (2012-14) y se aplicó un instrumento de evaluación en diferentes grupos de la Facultad de Educación a un total de 180 estudiantes. Se compararon los datos obtenidos entre ambas herramientas con contrastes de media, resultando diferencias significativas a favor de la segunda herramienta. Al concluir el proyecto se dispone de una herramienta de anotaciones de vídeo con diseño validado por los usuarios; además de un instrumento sencillo y rápido de aplicar para evaluar cualquier software y MOOC. Se realizó también una revisión amplia sobre herramientas de anotaciones de vídeos.

KEYWORDS | PALABRAS CLAVE

Usability, satisfaction, design tools, evaluation software, multimedia annotations, educational software, MOOC, university education. Usabilidad, satisfacción, diseño de herramientas, evaluación de software, anotaciones multimedia, software educativo, MOOC, enseñanza universitaria.

1. Introduction

The development of digital video has allowed users greater accessibility; it has made its way into our homes and lives, turning consumer and retail services such as YouTube into a sociological phenomenon. YouTube viewings currently account for an average of 6 million video hours per month¹. Clearly much has changed since the Lumière brothers invented cinema (Díaz-Arias, 2009: 64). This development has provided the gateway for developing technologies that allow users to share and collaborate (Computer Supported Collaborative Learning: CSCL). Such technologies also include collaborative video annotation technologies (Yang, Zhang, Su & Tsai, 2011), which have led to the emergence of innovative social projects where video annotation tools are collectively used (Angehm, Luccini & Maxwell, 2009). The digitization of videos (Bartolomé, 2003) opened up new interactive possibilities in education, along with hypermedia (García-Valcarcel, 2008), and has represented a breakthrough for learning and teaching by leaving behind the passive reading of videos (Colasante, 2011). There is a long history of experimental studies on how to apply videos in education (Ferrés, 1992; Cebrián, 1994; Bartolomé, 1997; Cabero, 2004; Area Moreira, 2005; Aguaded and Sánchez, 2008; Salinas, 2013). In the field of teacher training, there are examples related to the concept of microteaching, which has been questioned due to its reductionist approach to teacher initial training. Nevertheless, it was such an effort to come up with a rather rigorous idea of teaching. Leaving aside the theoretical starting point of this paper, there are some recent studies and developments of video annotation tools that, supported by other conceptions of teaching (Schön, 1998; Giroux, 2001), have shown efficacy in meta-evaluations for initial training (Hattie, 2009). The application contexts of the above studies are many and varied, and address processes such as reflection, shared evaluation and collective analysis of classroom situations. Therefore, they have proven to be effective tools for teachers and teacher trainees to collectively analyse everyday teacher practice (Rich & Hannafin, 2009a; Hosack, 2010; Rich & Trip, 2011; Picci, Calvani & Bonaiuti, 2012; Etscheidt & Curran, 2012; Ingram, 2014). In relation to initial training and the development of reflective skills, Orland-Barak & Rachamim (2009) carried out an interesting review and study by comparing different models of reflection using videos as a support. Rich and Hannafin (2009b) conducted another significant review of technological solutions and the potential of video annotation tools for teaching. They conducted a comparative analysis of

these tools based on the following criteria: how to use, note style, collaboration, safety, online-offline, format, resource import vs. export, learning curve and cost (free/hiring research teams). We then found an even more extensive review (Rich & Trip, 2011), shown in table 1, which was completed by solutions, presented in the last international workshop on multimedia notes 'iAnnote14'².

2. Integrating collaborative annotation tools in MOOC

Video and other related emerging technologies (analysis of big data, ontologies, semantic web, geolocation, multimedia notes, rubric-based assessment, federation technologies, etc.) quickly gained prominence in MOOCs, shaping the core structure of these courses. The appealing and widespread use of videos may have played a role in the boom of MOOCs, prompting a search for new interactive ways to read videos and general contents. It was only recently that MOOCs have incorporated previous experiences and developments on the features of collaborative multimedia annotations; allowing for a more interactive, multimedia learning process, and sharing users' views on these platforms. This has also provided the gateway for a new model of learning community within the MOOC, which can manage a significant flow of meanings extracted from reading contents and from annotations in different codes, namely: video, text, image and sound notes, as well as hyperlinks and eRubrics (Cebrián-de-la-Serna & Bergman, 2014; Cebrián-de-la-Serna & Monedero Moya, 2014).

These notes can be made in different formats and codes showing contents, such as: annotations in videos, texts, images, maps, charts, etc. as well as annotations created by users. The above possibilities open up a whole new line of new technological developments and research on the dynamic narrative of messages, given the speed with which MOOC platforms and courses are being implemented worldwide. Therefore, we need to innovate in the design and content of video tools based on their new interactive possibilities, in order not to replicate mistakes from the past, when, in the early stage of a new technology, the narrative models of preceding technologies would be incorporated without exploring the interactive potential of the new formats. Something similar happened during the transition from radio messages to television messages, as pointed out by Guo, Kim & Rubin (2014), who conducted a study on the video sessions of four edX courses. They checked the different formats used and concluded that recording cannot be extrapolated to

MOOC, because students do not pay enough attention. As a consequence, they suggested a list of recommendations that can be summarized as follows: more interactive and easy-to-edit videos, shorter (6 minutes), and easy-to-share notes. The development of educational software and the possibilities offered by free software have generated a community of developers who share their experience. The fact that these products get feedback from users also constitutes a model of software production; as communities of practice emerge around tools, services and specific platforms such as GitHub³.

The symbiotic relationship between developers and communities of practice has allowed MOOCs to evolve from structured approaches (xMOOCs) to communicative and collaborative approaches (cMOOCs) in their platforms and courses. However, both approaches require new interactive features in the videos. An

example of such features is the project here presented, which has been led by the HarvardX team for integration into the edX MOOC, and whose objectives are as follows: on the one hand, designing high-capacity multimedia annotation tools to create multimedia meaning and sharing it with users; and on the other, competence assessment, self-assessment and peer assessment through eRubrics. In order to quickly introduce these changes of great impact, we must count on assessment strategies for end-users to evaluate tools while they are being developed. Tools must be quick and easy to use, in order to collect data that will guide production (technical and content production), even before the beta version emerges. This is why our GTEA group carries out a design, test and evaluation line for educational software, which aims to find a balance between educational innovation and technological innovation, i.e. between generating new envi-

Table 1. A Comparison of Annotation Tools, by Rich and Hannafin (2009b); Rich & Trip, 2011 and iAnnote14

Tool Name	How to Use	Note Style	Collaboration	Cost	Website
VAST	Independent application	Users select a point in the video and text areas are offered	Not possible	Free	http://www.professional-vision.org
VITAL	Based on website	Users create video clips and reference videos as hyperlinks in a written document	Not possible	Contract / Free	http://vital.ccnmtl.columbia.edu
VideoTraces	Independent application	Users select an excerpt in the video and narrate audio comments	Different users can note down, respond and create a discussion thread	Contract	http://depts.washington.edu/pett/projects/videotraces.html
Video Paper	Independent application; it can be exported to web	Users select an excerpt in the video and associate text to it, by using subtitles with a timed transcript	Not possible	Free	http://vpb.concord.org/
MediaNotes	Independent application	Users select and mark titles and comments on the video and associate default clips to it	Different users can make notes on the same video	\$\$	http://www.bluemangolearning.com/products/medianotes
Studiocode	Independent application	Users create and apply a set of codes to a video sequence	Different users can share and compare notes in a list	\$\$\$	http://www.studiocodegroup.com
Iris	Based on a website	Text, live coding Includes statistical analysis tools	Different users can make notes on the same video	\$\$\$	http://www.therenow.net
Video Ant	Based on a website	Text notes. Tagging not possible	Not possible	Free	http://ant.umn.edu
Viddler	Based on a website	No text nor voice in the video excerpt	Different users can make notes on the same video	Free	http://www.viddler.com
Factlink	Based on a website	Plugin to edit text in any visible page in Chrome	Accessed and shared via Twitter and Facebook	Free	https://factlink.com/in-your-browser
Remark	Based on a website	Video annotations on a «frame»	Different users can edit and share notes	\$\$	https://remarkhq.com
OVA	Web-based and integrated into platforms like MOOC	Multimedia notes on video sequences, with text editors, rubrics, etc.	Different users can make notes on one or more files	Free	http://openvideoannotation.org

ronments and users' usability and satisfaction. The ultimate aim is for new interactive methodologies such as multimedia annotation tools for MOOCs, to be validated by end-users. To do so, we need to create a parallel line of research and evaluation instruments that are reliable and valid for decision-taking when designing educational software. We must take into account all possible elements for software evaluation from the users' perspective (satisfaction, usability, cost, portability, productivity, accessibility, safety, etc.), in order to examine their ease of use (aka usability), regardless of their context, personal differences, different supports (tablets, mobile phones, computers, etc.).

This paper uses the following definition of usability: 'the extent to which a product can be used by certain users to achieve specific goals with effectiveness, efficiency and satisfaction in a particular context of use' (Bevan, 1997). Satisfaction is often seen as a construct within usability studies and instruments, although we believe it is rather the opposite. The ease of use of a tool or service is an element that belongs to the overall user satisfaction. The satisfaction of technological tools and services can even be considered as a sub-category within user satisfaction studies, as shown by studies on students' satisfaction of university life (Blázquez, Chamizo, Cano & Gutiérrez, 2013). This is a live debate, given the massive presence of technological services and resources, and the digitisation that most communication, teaching, research and administration processes have recently gone through within universities. Both usability and user satisfaction are measured by questionnaires completed by users. We can find usability questionnaires in websites and systems (Bangor, Kortum & Miller, 2008; 2009; Kirakowski & Corbett, 1988; Molich, Ede, Kaasgaard & Karyukin, 2004; Sauro, 2011), satisfaction questionnaires, and questionnaires on both usability and satisfaction (Bargas-Avila, Lötscher, Orsini & Opwis, 2009; McNamara & Kirakowski, 2011).

3. Methodology

The present project started from the mutual interest shared by our team and HarvardX Annotation Management in creating tools to facilitate meaning processes based on collective multimedia annotations. The general aim of the project was to create a new tool for multimedia annotations specifically designed to



Image 1. eRúbrica tool integrated into CaTool annotations..

respond to the new features of technological progress (e.g. semantic web, annotation ontology, etc.), as well as to the social practices that are currently being developed by users on the Internet (learning in communities of practice, using mobile devices, collaborative work, communication in social networks, creating eRubrics, etc.). The tool is currently integrated into the edX MOOC, and has been in use since January 2014 in the courses offered by HarvardX⁴. The technological development started from scratch, although it was based on the progress that had been made in the field of multimedia annotations on the Open Annotation Community Group, and taking into account the aforementioned literature as well as other developments by Harvard University. The results presented here are part of a collaborative project and show users' opinions on the usability and user satisfaction in relation to an instrument designed to assess web tools. Such data is often required to design and improve tools. This is why the methodology used in this paper contrasted end-users' usability and satisfaction in the Collaborative Annotation Tool (CaTool) (created by Harvard University, 2012), against the added features of the new tool created by the Open Video Annotation project (OVA).

For methodological purposes, the new added features of video annotation were considered as the independent variable. The development had a dual purpose: to serve as a collective multimedia annotation service, and to integrate the new features into the edX MOOC. The present paper will only show the results of assessing the video annotation features that had been added to the edX MOOC. However, this platform hosted the full-featured OVA video annotation,

text, sound and quality image (the last two in experimental stages).

The study was divided into two parts: a) The first stage during the 2012-13 academic year, where the Collaborative Annotation Tool (CaTool) was trialled on groups of different subjects in the Faculty of Educational Sciences at the University of Malaga (Spain). The usability and user satisfaction instrument that we had already created for other tools was also tested during this stage. b) The second stage during the 2013-14 academic year, where the usability and user satisfaction instrument designed during the first stage was improved and applied to two groups from the Degree of Education that shared the same teacher, methods and tasks; we compared two different annotation tools: CaTool and a beta tool that only had the OVA video annotation feature. In the first stage (2012-13) the Collaborative Video Annotation tool was tested in the class within the Education department and on different types of subjects within the degree programme (core subjects, elective subjects, internships, etc.). The tool was federated by our team, and its combination with other tools, such as eRubric and federation technology, had provided interesting features in practice (see Image no.1). The state of the art in relation to the design, creation and assessment of previous video annotation tools was also collected at this stage.

At the second stage, during the second half of 2013, a new Open Video Annotation (OVA)⁵ was created (image 2), which responded to an interactive and communicative teaching model in the MOOC. The creation and design of this tool was guided by the HarvardX annotation manager, and included the following features: a) Editing entries could be done in a multimedia format (video, text, image, etc.). b) Multimedia annotations could be added within the resource

itself (in the video, image, etc.). c) Annotations could be shared and discussed by a large number of users, so that when someone received a message with a note on it, a simple click would take them to that particular note within the resource. d) Editing tags in a database of ontological annotations was possible. As an option, each entry also had the possibility of geolocating. f) Annotations could easily be shared on social networks. eRubrics could be created when editing annotations.

During the 2013-14 academic year, CaTool and OVA were tested. The test involved the same teacher, methodology, class lab and all the student groups (180 in total) of the mandatory second year technological resources course within the degree of Education in the Faculty of Educational Sciences at the University of Malaga. After this, the enhanced instrument of usability and user satisfaction from stage 1 was used. The first experiment was performed on the CaTool, and the second on a beta tool (a month later); but only on the OVA video annotation feature, and with some limitations (it could only be used with the Chrome browser).

4. Analysis and results

The participant sample consisted of all the students from the aforementioned mandatory course in the Faculty of Educational Sciences who got to work with these tools for the first time. Once they performed the task set by the teacher, they were asked to answer a questionnaire on usability and user satisfaction. The questionnaire consisted of a series of descriptive questions (age, gender, user level, etc.), followed by 26 sentences to be rated on a Likert rating scale of 1 to 5. There were direct sentences (1=the worst; 5=the best) as well as indirect sentences (1=the best; 5=the worst). As for usability, there were 17 sentences: 5 direct and 12 indirect. For user satisfaction there were 9: 7 direct and 2 indirect. The order of the sentences in the questionnaire was random, in order to avoid answering without reading. There was an open question at the end, for students to write free comments. The average response time was 4 minutes. The questionnaire was filled out online by using LimeSurvey, while data was analyzed by using the SPSS (version 20). For analysis purposes, we ensured answers had to be thought through, and sentences could not be rated by simply filling out the questionnaire. To this end, we detec-

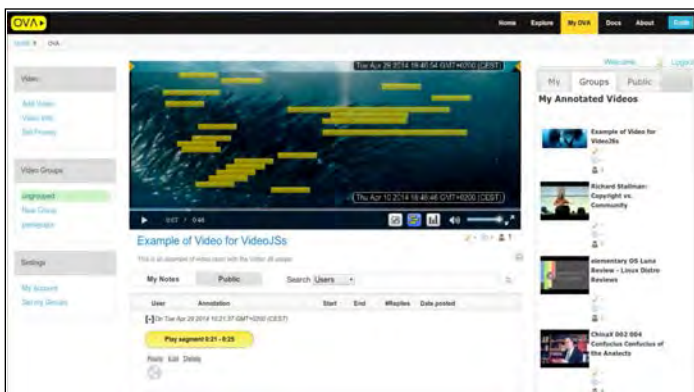


Image 2. Multimedia annotation tool.

ted 16 answers that marked similar values in blocks corresponding to direct and indirect sentences, so they were therefore considered as non-valid answers. We carried out the $y=6-x$ transformation in the values of indirect sentences, so that calculations could not be counteracted.

Significant differences were found in favour of OVA among the means of the questionnaire. When analysing the questionnaire by blocks, significant differences were also found in the usability blocks, but not in the user satisfaction blocks (table 2).

The contrast of the usability and satisfaction instrument between the two tools throws up significant differences in favour of OVA in the following items: 'I found the application to be pleasant', 'I found the application exhausting to use', 'The application does not need explaining to be used', 'I needed help to access the application', 'I ran into technical problems', 'It requires expert help', 'The response time in the interaction is slow'.

Graph 1 shows the histograms of the total scores for each tool. It shows that, from the 105 score onwards, there are more ratings for OVA than for CaTool, while the opposite goes for scores under 105. According to their comments, respondents support the questionnaire results: they consider these tools to be easy, useful and innovative. The negative aspects were mainly attributed to technical issues: Internet access, slow server or browser limitations in the beta version.

5. Discussion and conclusions

The potential of the video digitalizing process has been foreseen for a long time, along with new teaching processes at universities (Aguaded & Macías,

	Levene's test for equal variances		T-test for equality of means			
	F	Sig.	t	df	Sig. (bilateral)	Mean Difference
Total Scores	2.510	.115	-2.507	162	.013	-5.42679
Total Usability (direct)	.008	.927	-2.072	162	.040	-.99107
Total Usability (indirect)	.150	.699	-3.249	162	.001	-3.90000
Total Satisfaction (direct)	.518	.473	-.500	162	.618	-.42262
Total Satisfaction (indirect)	.000	.994	-.408	162	.684	-.11310

(augmented reality, mobile technology, wearable, network capacity, etc.) are forcing universities to respond to new challenges.

MOOC platforms are not immune to these changes, and will soon incorporate experiences and developments in the area of collective multimedia annotations. Innovations find in these massive platforms an ideal setting for developing, testing and experimenting with educational research. Certainly, we consider this new environment as an ideal setting for conducting new experiments, studies and educational projects such as the one put forward here. The present project has shown that collective multimedia annotations are generally highly-rated by students when they are easy to use (as observed in the aforementioned mean differences), and when displaying certain features that are fashionable amongst the young. For instance, features related to mobility, social networks, collective interaction and broadcast of shared meanings, as could be observed in the best rated features and in the open essay answers when the two tools were compared. These features were added to the new Open Video Annotation (OVA) tool, which aims to be in line with university students' symbolic and communicative competence. Students should be therefore more critical and prepared for what Castell (2012: 23-24) defines as mass self-communication. He considers this to be vital in symbolic construction, as it mainly depends on «the created frameworks, i.e. the fact that the transformation of the communication environment directly affects the way in which meaning is constructed».

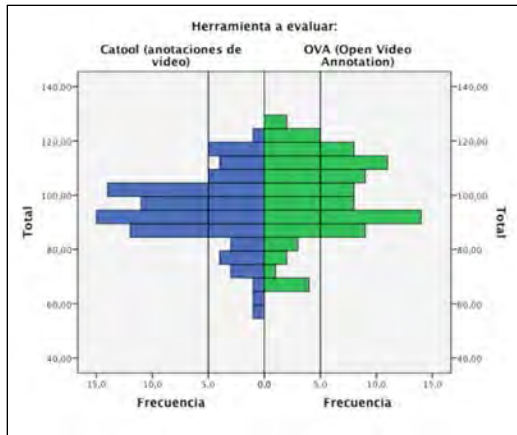
We believe that collective multimedia annotation has many educational possibilities in university teaching. Some of these possibilities go beyond the existing format,

reaching the aforementioned 'created framework' nowadays represented by MOOCs. Their application and research can be interesting in further educational settings beyond those studied in this project, such as:

- a) Blended learning models currently developed at universities, which use materials and resources to sup-

	N	Mean	Standard Deviation	Standard Error	Confidence interval for the mean at 95%	
					Lower Limit	Upper Limit
CaTool	80	94.5375	13.08680	1.46315	91.6252	97.4498
OVA	84	99.9643	14.54900	1.58743	96.8070	103.1216
Total	164	97.3171	14.07812	1.09932	95.1463	99.4878

2008: 687), except that nowadays we look forward to even further possibilities that go beyond past predictions. Socialization and distribution of information, free access to premium content, networks and learning communities to share and generate new ways of learning, the technological development of the Internet



Graph 1. Histograms of total scores on the two tools.

port teaching; b) Learning objects with multimedia annotations and semantic web (García-Barriocanal, Sicilia, Sánchez-Alonso & Lytras, 2011); c) Supervision during the Practicum (Miller & Carney, 2009) with ePortfolios (electronic portfolios), filled with multimedia proof of learning and where the meanings given to annotations can be shared. d. Dissemination of scientific knowledge, as suggested by Vázquez-Cano (2013: 90), by combining the written format with the video-article and the scientific pill. Such combination would provide scientific production with more visibility, broadcast and flow of exchange. All the above contexts and experiences are innovative and consistent with the practice that we wish to widely implement in universities, thus representing a strong leadership in the knowledge society.

Support and notes

¹ The collaborative project was entitled Open Video Annotation Project (2012-2014) (<http://goo.gl/51W37d>) and was made possible through the joint funding of institutions such as: Talentia scholarships and Gtea Group (<http://gtea.uma.es>) PAI SEJ-462 Andalusian Regional Government, University of Malaga and Center for Hellenic Studies –CHS– (Harvard University) (<http://chs.harvard.edu>) (09-07-2014).

² YouTube Statistics (<http://goo.gl/AlYrCL>) (09-07-2014).

³ International Workshop on Multimedia Annotations ‘Annote14’, San Francisco, California (USA), April 3-6, 2014 <http://iannotate.org> (09-07-2014).

⁴ Open Source Platform <http://github.com>.

⁵ The first course using OVA was ‘Poetry in America: Whitman’, in edX Harvard University <http://goo.gl/19bupN> (09-07-2014).

⁶ OVA Tool (<http://openvideoannotation.org>) (09-07-2014).

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A Digital Repository of Filmic Content as a Teaching Resource

Un repositorio digital de contenido fílmico como recurso didáctico

-  Miguel-Ángel Tobías-Martínez is Awardee of the Organization of American States (OAS) in the Master of Science, Management and Technology at the Federal University of Paraná (Brazu) (angelobias@gmail.com).
-  Dr. María-do-Carmo Duarte-Freitas is Professor of the Faculty of Applied Science at the Federal University of Paraná (UFPR) (Brazil) (mcf@ufpr.br).
-  Dr. Avani de Kemczinski is Professor of the Faculty of Computer Science at State University of Santa Catarina (UDESC) (Brazil) (avanilde.kemczinski@udesc.br).

ABSTRACT

The use of video as a teaching resource stimulates the construction of new knowledge. Although this resource exists in several genres and media, the experience of professionals that use this resource in class is not appreciated. Furthermore, online spaces guiding and supporting the appropriate use of this practice are unavailable. In the online learning field, a proposal has emerged for a repository of short videos aimed at instructing how to use them as a teaching resource in order to stimulate the exchange of ideas and experience (fostering and creating knowledge) in the teaching-learning process, which serves as a resource for professionals in the construction of MOOCs (Massive Open Online Courses). A three-stage architecture is methodologically proposed: identification/recognition, dissemination and collaboration in the use of videos as a teaching resource supported by an extensive exploratory research, based on existing educational technologies and technological trends for higher education. And this leads to the creation of a repository of Informational Content Recovery in Videos (RECIF), a virtual space for the exchange of experience through videos. We conclude that through methodologies that facilitate the development of innovative processes and products, it is possible to create spaces for virtual or face-to-face motivational classes (MOOCs) thereby completing an interactive and collaborative learning toward stimulation of creativity and dynamism.

RESUMEN

El uso de vídeos como recurso didáctico estimula la construcción de nuevo conocimiento. A pesar de la existencia de este recurso en diversos géneros y medios, no se valora la experiencia de los profesionales que lo aprovechan en clase y además no se cuenta con espacios online que orienten y apoyen el uso apropiado de esta práctica. En el ámbito del aprendizaje online, surge la propuesta de un repositorio de vídeos de corta duración, con el objetivo de orientar acerca de su uso como recurso didáctico, a fin de incentivar un intercambio de ideas y experiencias (fomentar y crear conocimiento), en el proceso enseñanza-aprendizaje, sirviendo esto como recurso para profesionales en la construcción de los MOOC (Massive Open Online Courses). Metodológicamente se propone una arquitectura en tres etapas: identificación/reconocimiento, diseminación y colaboración, para el uso de vídeos como recurso didáctico, sustentándose en una extensa investigación exploratoria, basándose en las tecnologías educativas existentes y tendencias tecnológicas para la educación superior. El resultado es la creación de un repositorio de Recuperación de Contenido de Información en Vídeos (RECIF), un espacio virtual de intercambio de experiencias por medio de vídeos. Se concluye que por medio de metodologías que faciliten el desarrollo de procesos y productos innovadores, se pueden crear espacios de clases motivadoras, virtuales o presenciales, que completen un aprendizaje interactivo y colaborativo, estimulando la creatividad y el dinamismo.

KEYWORDS | PALABRAS CLAVE

Pedagogical practice, animated movie, object learning, distance education, online learning, MOOC, informational content, exchange content.

Prácticas pedagógicas, películas animadas, objetos de aprendizaje, educación a distancia, aprendizaje on-line, MOOC, contenido informacional, intercambio de contenido.

1. Introduction

The globalisation tendency stimulates the creation of space among Higher Education Institutions (HEIs) to promote partnerships with professors, students, courses and research, further fostering innovation in the Information and Communication Technologies (ICTs). The twenty-first century has stimulated in the whole world the creation of collaborative networks as well as federated networks for research and use of these technologies among universities and study centres. According to Dillenbourg and al. (2009), collaboration plays a significant role in knowledge construction. Collaborative learning describes a variety of educational practices in which the interaction among participants is an important factor in the teaching-learning process.

Nowadays, Universities are being reformed due to the incorporation of Information and Communication Technologies (ICTs), particularly as a consequence of the release and development of Internet 2.0 (Cabero & Marín, 2014; Vázquez-Cano & López, 2014). For this reason, we have experienced a revolution of higher education, an activity that will grow and spread globally as in the case of the MOOC phenomenon (Aguaded & al., 2013; Vizoso, 2013).

Distribution of recorded classes and conferences is widespread in Internet; they are disseminated in Platforms such as Massive Open Online Courses (MOOCs) (Cormier, 2008; McAuley & al., 2010) for the purpose of exchanging information and knowledge. The latter is an evolution of the conventional educational environments of Distance Education with two significant characteristics: a) *Massiveness*, meaning courses for thousands and thousands of people; and b) *open*: integration with social networks. In summary, MOOCs have been established as a progress in the education and training-related areas (Bouchard, 2011; Aguaded & al., 2013). Thus, MOOCs can be considered as a progress with technological and social inclinations, especially in the higher education sphere toward stimulation oriented to innovation and promotion of massive, open and interactive learning, that is to say, the genesis of collective research (Vázquez-Cano & al., 2014; Vázquez-Cano & López, 2014).

The offer of different courses for professional training of individuals is aimed at achieving the mission of training new generations toward a critical and creative appropriation of learning, which means teaching to learn how to be a citizen able to use the technologies as a means of participation and expression of one's opinions, knowledge and creativity.

Search for creative interactive and dynamic lear-

ning is a reason that motivates teachers to always seek for innovative teaching strategies aimed at attracting attention of students for them to attentively experience their own learning process, the nearest possible to their reality (Eishani & al., 2014). This has led to an initiative to use video as an information strategy, working with all the senses through movement, feeling, text and vision. Videos are part of the so-called digital media dealing with issues and topics, in different forms and styles of messages referring to the main daily issues and situations. Videos, being considered as an informational product, transmit information as text, sound and a succession of images giving the impression of movement. The foregoing aspects of videos are important to create signs, meanings and for development of concepts. The objective is to understand and explain the reality, to create values, desires and fantasies, which constitute subjectivities generated by experiences and expectations.

This study intends to present a digital repository of Informational Content in Video to support, facilitate and gather learning objects for the online teaching-learning process. The project under research is the Platform of Informational Content Recovery in Videos (RECIF in Portuguese), which commenced research in 2007, and the first version of the project was implemented in 2010 by the Research Group on Science, Information and Technology of the Federal University of Paraná. Since its creation, this project consists in identifying and gathering content in Video to be used in the classroom.

2. Use of technology to improve educational practices

During the twenty-first century, schools began incorporating technological resources (Feria & Machuca, 2014) and using them to solve problems during pedagogical practice and in social relations. Since that moment, we can enjoy technological interactivity that motivates professionals to select information and access virtual spaces under a pedagogical and significant perspective oriented to the knowledge exchange culture. Learning through the use of tools that stimulate interactivity, the recreational component could be obtained through online games, networked discussions or forums, virtual research, films, blogs or e-mails, that is, access to virtual learning (Almeida & Freitas, 2012).

Barros (2005) presents a discussion on the use and appropriation of technology by professors in their educational practices, demanding new forms to organise the existing structures or even proposing new ones to better respond to the society's emerging issues.

«In general terms, it is being introduced a currently emerging new educational paradigm, whose pedagogical dynamics is characterised by a need to develop in each student the practice of advanced skills through the adoption of large units of authentic contents linked to the introduction of a multidisciplinary curriculum; the evaluation of achievement and/or performance; an emphasis to collaborative learning; the position of the teacher as a facilitator; the predominance of heterogeneous groups, the student learning, assuming a connotation of dynamic content exploration, and the adoption of interactive teaching modes» (Means, 1993).

By virtue of the insertion of TIC in education, there is a need to conceptually understand what educational technology is. Bueno (1999: 87) conceptualises technology as «a continuous process through which humanity moulds, modifies and generates its quality of life. The human being is in a constant need of creation and interaction with nature by producing from the most primitive to the most modern instruments, using scientific knowledge to apply the technique, modify and improve the products inherent to the process of interaction of the human being with nature and other human beings».

Technology identifies with a type of culture, which is related to the social, political and economic moment. Significance must be ascribed to the improvement of pedagogical practice (MacPhail & Karp, 2013), in the training of professionals. The teacher must understand technology as an instrument that participates in the construction of a democratic society. Video is the technological proposal discussed in this article toward the appropriation of its potential and its use in the planning, development and application of teaching situations occurring in cyberspace: «Over a century ago, the cinema has fascinated and moved people around the world. Among those persons who regularly went, are going or will go to watch a movie in a dark room, teachers and students are certainly included» (Napolitano, 2006).

Napolitano (2006) presents problems in the adap-

tation and treatment of video as a pedagogical resource, as shown in figure 1, for it is necessary to select the video based on the technical and organisational possibilities of the exhibition, articulation with the content, discussed concepts, general and specific objectives to be achieved. Therefore, the importance of the filmic analysis and semiotics analysis (search for implied meanings) is the video selection. For using this resource, the teacher needs to be organised for selection and schematisation of the scenes addressing the topic of the discipline, time and school work. As a pedagogical

Use of Internet allows the up-dating, dissemination and virtually instantaneous distribution of the information. It is noted that people have less and less time to learn; and for this reason they need to learn at a faster rate. And the digital repositories, such as the RECIF project, offer to the end user the means to learn rapidly and to share at the same time. Future perspectives are for spaces to become collaborative with a possibility of connection with other associated institutions in any part of the world; in this manner a filmic base is offered for the use of practices in the classroom for higher education.

strategy, it requires experience from the teacher in the manner of conducting activities according to the public and objective desired in the classroom.

According to Rezende & Abreu (2006), the information becomes «all worked, useful, treated data having an attributed or added significant value with a natural and logical sense for the user of those data». The information is described by Le-Coadic (1996) as knowledge inscribed (engraved) in a written way (printed or numerical), verbal or audio-visual. It is a meaning transmitted to a conscious being through a message inscribed in a space-temporal support: print-out, electric signal, sound wave, etc. It is also affirmed that utilising an information product is using such «object» to also obtain an effect that satisfies an information need. This process and connections of data

and information are presented in figure 2.

Teaching with videos requires examining the video content and evaluating its consistency first (figure 2). Consequently, an analysis of semantics and definition of descriptors is required thereby enabling the recovery of information contained in the movie (Chella, 2004). This is also similarly applied to MOOCs (Pappano, 2012; Little, 2013) resulting from conferences and classes taught at institutes. The content analysis, along the sequential study of the video, will allow the search and selective recovery of the information specified by the user.

The principle of semiotics implies an object exploration, and this is solely possible when the concepts of reality and truth are related. However, semiotics (Ranker, 2014) does not directly refer to reality it prefers the analysis through signs and texts (Duarte & Barros, 2005:194)

The use of semiotics in learning means to interpret its flow and, based on the lesson, to identify how the meanings are distributed in and between the modes of representation and communication thereby combining innumerable varieties among teaching, learning, interactions and activities. All this occurs through different means located in different dissemination media (Mavers, 2009; Ranker, 2014). It is worth presenting above the repository project and its dimensions for complementary use in teaching activities.

3. Recovery of filmic informational content

Figure 3 above clearly presents this research methodology, which proposes three stages and shows the explored literature, which supports the architecture proposed intended to use the online filmic resources as a teaching resource.

In the application of the explored literature study, the first RECIF project

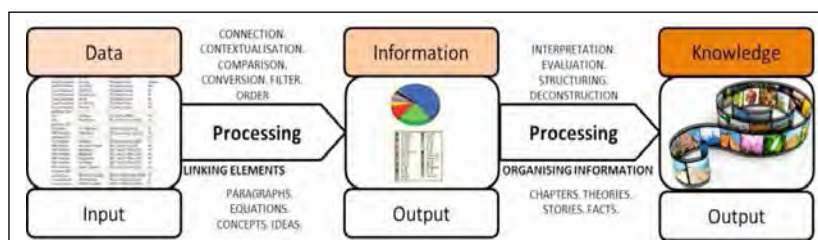


Figure 2: View of RECIF Project under the concepts: data, information and knowledge. (Based on Abreu, 2006; Le-Coadic, 1996).

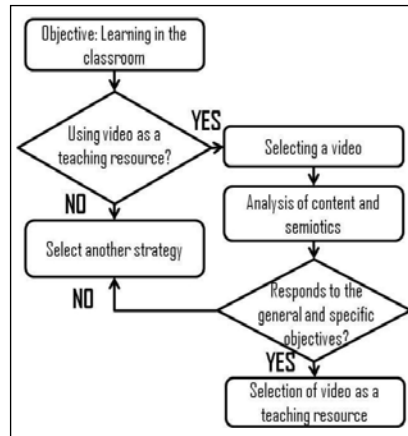


Figure 1: Flowchart showing the selection of a video as a teaching resource. (Based on Napolitano, 2006).

version was released in 2010, it consisted in an interface with sections on how to use a video as a teaching resource; it was static, and videos were not shown; for this reason, an interaction between the information presented and the observer's opinion was not perceived according to the proposal of this research (figure 4: doi.org/tm6).

Offering free and quality information of open access for any person regardless of the country of location constitute aspects that have attracted great interest on MOOCs (Young, 2012; Al-Atabi & DeBoer, 2014)

worldwide, besides no enrolment fee for the course in needed (Liyanagunawardena & al., 2013). How this will be achieved in Brazil? Videos examined in the RECIF project are videos of conferences, symposiums, classes and fragments of commercial movies; however, the copyright law permits the teacher to use filmic fragments if intended for teaching practices. Project RECIF freely offers the methodology of use and orientation on the possible specific fragments of scenes for a class with a declared objective of helping in the recreational process of learning a topic.

In RECIF, the use of social networks is emphasized toward consolidation of these learning communities; the platform allows the teacher to share his experience and even comment the application outcome with peers in networks (Facebook, Google+, among others). Collaboration is achieved in the insertion of associates in the use of already renowned technologies (videos) with new ones (open repositories, RECIF).

The new RECIF project interface (goo.gl/th1-cMm) released in 2014, intends to implement courses with videos in xMOOC format (figure 4: doi.org/tm6; figure 5: doi.org/tm7).

Besides social networks (Nikou & Bouwman, 2014), people involved in the community may contribute in adding

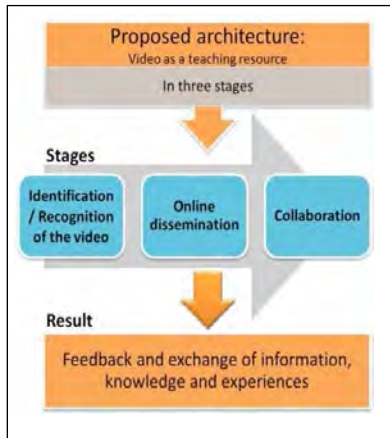


Figure 3: Architecture of methodology proposed.

content to exchange information, thematic materials and learning strategies (Méndez-García, 2013).

The first results of this project were presented

in two monographs: «Digital media: the role of video as a resource of information in the generation of learning», by Alcides (2009) and «Model proposal for recovery of informational content in movies» by Santos (2009). Subsequently, it was implemented just as a platform by means of start-up scientific and technological studies. It should now be prepared to belong to a federated network, which motivates the breadth of this study.

4. RECIF Project and its dimensions

This study includes a proposal for its application in an information system structure gathering film clips. Once these are selected, they are to be used as a teaching-pedagogical strategy to generate learning on a topic. Figure 6 shows this study in the point of view of the information science field.

Figure 6 serves to sustain the use of video as a teaching resource in the classroom and, if compared with figure 2, a relationship of the RECIF Project with the «data-information-knowledge» structure can be observed. And in accordance with figure 6, considering the «video» resource as a strategy in the classroom (table 1: doi.org/tm8) is made to illustrate the information presented for it to be understood and assimilated in this project.

Figure 1 provides an analysis conducted on the RECIF project according to information analysis flow proposed by Baptista and al. (2010: 77), as seen in figure 6. The following subsections will analyse the dimensions of RECIF project regarding its characteristics, both: Operational and Strategic.

4.1. RECIF Project Operational Dimension

RECIF project is a learning tool (Kassim & al., 2014) developed to help teachers to make classes dynamic. It involves a databank with descriptions of film fragments that can be used as a teaching resource by teachers who seek to improve the recreational character of their classes through practical examples or analogies (Santos: 2009). The ways to exchange knowledge through digital media and also the learning theories (Sitti & al., 2013) are constantly transformed. Galan (2003) affirms that online learning is a profession whose own name is unknown (for suffering from an identity crisis) or a thing that becomes something new and better (table 2 doi.org/tm9) summarises the five realities that modify the learning concept, these precepts are confirmed by several authors, among others (Rosenberg, 2005: 5).

Based on the above statement, the RECIF project intends to cover these questions; therefore, it can: filter, catalogue, add, merge and integrate, in an intelligent, reliable and solid manner, movie scenes from different sources of heterogeneous character found at internet. This type of content shall provide a message, analogy or example for learning a discipline.

Rosenberg (2005) confirms that two ways of online learning: online entertainment and knowledge management (Badpa & al., 2013; Ooi, 2014), as a group, can offer better results. The following step is to

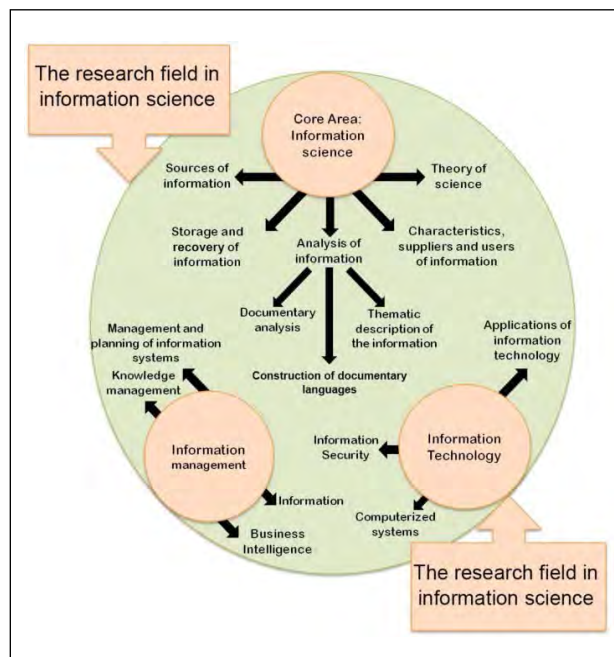


Figure 6: Analysis of information in the context of the RECIF research (Baptista & al., 2010: 77).

unite those dimensions with the traditional approaches of learning in the classroom toward a construction of a complete architecture of learning based on technology.

4.2. Conceptual Dimension of RECIF Project

According to Teixeira (1995), the distinction between real and imagined experience «define» us as individuals producing words, senses and meanings. Individuals of time, culture and communication; individuals creating signs, meanings and preparing concepts, seeking to understand and explain the reality in which they live, by creating values, desires and fantasies. This forms the subjectivity of individuals and generates their own experiences and expectations. Based on the above, the RECIF project has been designed for the individual to create knowledge and, at the same time, share that knowledge in the interface.

In the process of conceptual analysis, the RECIF project deals with concepts, definitions, hierarchies and typologies of information. RECIF is a system that summarises the main information of videos so they can be subsequently used as a teaching resource. RECIF intends to make the information available to users with a focus in education. The purpose is to stimulate and facilitate the use of films as a teaching resource by providing the interested party with motivation and interaction in the learning process.

Use of RECIF project is proposed to cause students to search for information by providing a non-linear learning, but composed of concepts, reflexions and analysis. The use of this resource intends to assist the teacher with time and work for what has been taught at the class may be made available in Internet for consultation out of the classroom environment although it can be used again as reinforcement in class.

The basis of filmic recovery through content consists in identifying metadata that satisfy the needs of the user. For this reason, the basis of this research is the analysis of informational content in filmic scenes toward its accessibility as digital repository. Figure 7 is an adaptation to represent the descriptors of the content management process inherent to the RECIF Platform (Santos, 2009)

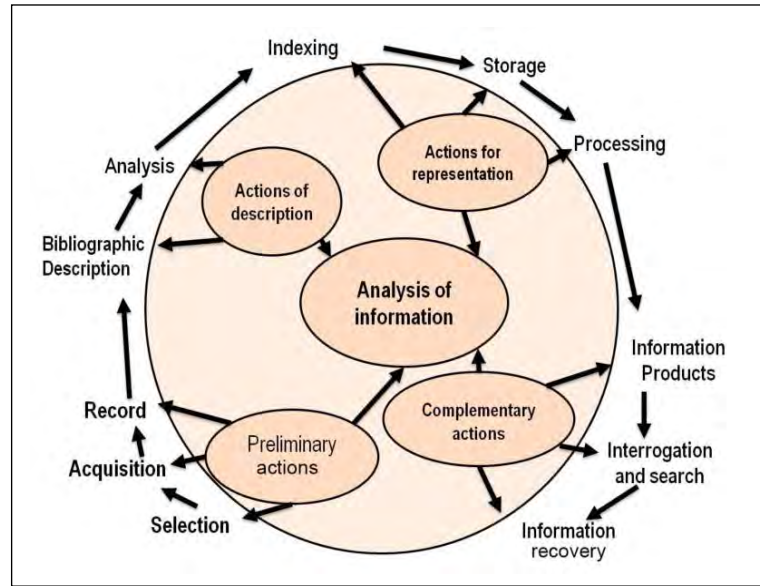


Figure 7: Analysis of information in the context of the information sciences research. (Based on Baptista & al., 2010: 72).

Figure 7 describes the content management process in the RECIF Project; there are four actions to be taken for information analysis: description; representation, preliminary and complementary actions; we can start from any of them according to the topic we want to find or catalogue, related examples:

- If we lack a video for a specific class, based on figure 7, we will identify the action area; and we then note that we must commence from the «preliminary actions» and, in this manner, we will commence searching a video appropriate for the selected topic; and we can pass from this action analysis area to the next ones, according to figure 7 proposed by the authors.

- If we have a video, but we ignore how it must be catalogued, then, we take the «creation actions» by making an analysis of the video, and then, we continue to the «representation actions» area, and we index the content found.

Six theories were proposed in the technology field (figure 3: doi.org/tnb) over the last years. And from the traditional learning theories presented in figure 4 (doi.org/tnc), it could be said that the RECIF project is mainly focused in the theories of the humanistic teaching approaches, that is, the significant learning (the same line of e-learning). In the same manner, significant learning provides relevance to the internal learning variables of each individual and human conduct is considered as a whole. This can be reflected in the RECIF project for the resources are made available and found according to the needs of the Platform users.

For Texeira & al. (2014), the principal learning theories are divided according to the main learning needs: Associationist and Mediational (figure 4).

Implementation of the RECIF project is focused on the type of associationist theories for they mainly seek the reasoning of the individual (the project objective), either an experience or learning through the filmic scenes provided.

4.3. Strategic Dimension of RECIF Project

Spaces in the twenty-first century for exchanging research and materials applied to education fostered the development of repositories of the most different fields for Learning Objects, most of which are available for free.

However, diversification of information is small, especially when evaluating the contents and objects intended for higher education. Given the need to extend opportunities among researchers of this topic, virtual spaces should be identified (Hernández & al., 2014) for exchange of experience and innovation, applicable to higher education based on technologies thereby obtaining an interactive and collaborative learning tool (Leinonen & Durall, 2014).

Information analysis with an emphasis in the strategic dimension has been applied in security issues in the content shared with facility and access to federated platforms with a sole identity and the extension of use of the learning objects developed. Dissemination of federated content implies different safety questions; for this reason, one must belong to web sites of reliable federated content.

The idea of dissemination of projects such as RECIF, as a product, is intended to improve and implant the platform to share experience.

The concept is based on three fundamental ideas:

- It is based on federated (interconnected) networks.
- The dissemination takes place through Internet technology in a computer focused on the user.
- The approach is learning, in the widest sense.

Use of Internet allows the up-dating, dissemination and virtually instantaneous distribution of the information. It is noted that people have less and less time to learn; and for this reason they need to learn at a faster rate. And the digital repositories, such as the RECIF project, offer to the end user the means to learn rapidly and to share at the same time. Future perspectives are for spaces to become collaborative with a possibility of connection with other associated institutions in any part of the world; in this manner a filmic base is offered for the use of practices in the classroom for higher education.

5. Final considerations

As it has been expressed at the beginning of this research, it is concluded that the expected result, that is, sharing of knowledge, information and experience among the users of the proposed architecture, is achieved by means of the identification of the correct material concurrently with its online distribution. In this manner, when video is used, youngsters reflect on the reality experienced and express themselves through language, by handling the signs presented in the selected video and processing information. In the semiotics process, information is used to make generalisations and suppositions. Teachers relate the theory to be transmitted to an analogy through video and the aspects observed in each student as for existences (facts, ideas and sensitivities) which, when been assimilated, generate information and individual knowledge.

New technologies provide applications that create, when used in school learning, a new model of materials for the teaching-learning process. Features provided in federated platforms can work as a «class after a class» in a virtual space where students and teacher get in contact. They also provide a new sense to teaching resources. Federated platforms offer an exchange of opinions where students and teachers can also create their own space related to educational topics. Web sites such as Youtube may help in sharing information taught in class and the opinions of teachers or students on a topic.

This work is intended to present the RECIF project and make it available in a Federated System, which possesses filmic informational content with pedagogical objectives. The project demands an analysis of filmic scenes along with semiotics for extraction of information and implied meanings, and the subsequent organization of that knowledge. In accordance with the proposal in the objective of this work, it was possible to explore the theories implied in the RECIF project, and show how the analysis of its information is conducted in a federated platform intended to recover informational content suitable for learning purposes.

Techniques used for information and knowledge organisation were investigated in the RECIF project (filmic scene as an informational product), content object and the use of video as a digital repository. The project operation was specifically described along with its operational and conceptual scopes. A description was made on how to conduct an information analysis including its relationship with the learning theories that support the project as a method that well managed could become an effective learning tool.

In this study, it is noted that the teaching-learning process is effective when well managed by technological tools, in the special case of federated platforms, offering special resources in the teaching field to contribute to the development of the knowledge of the user, either student or teacher. Therefore, it can also create knowledge by fostering learning in class.

Online technologies, for being used as tools of constructivist knowledge, create an experience on traditional learning, which results to be different in the teaching-learning process, with better results among students. For they stimulate their way of learning; therefore, they learn better and construct their own knowledge.

For this reason, this research contributes with the proposal of an architecture that stimulates teachers, students and researchers in the recovery/collaboration of learning objects. Besides, it can be implemented at a low cost because of its freeware application.

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Analysis and Implications of the Impact of MOOC Movement in the Scientific Community: JCR and Scopus (2010-13)

Análisis e implicaciones del impacto del movimiento MOOC en la comunidad científica: JCR y Scopus (2010-13)

-  Dr. Eloy López-Meneses is Professor of Educational Technologies at the Pablo de Olavide University (Spain) (elopmen@upo.es).
-  Dr. Esteban Vázquez-Cano is Associate Professor at the Universidad Nacional de Educación a Distancia (UNED) (Spain) (evazquez@edu.uned.es).
-  Dr. Pedro Román is Professor of the Faculty of Education at the University of Seville (Spain) (proman@us.es).

ABSTRACT

The emergence of massive open online course (MOOCs) has been a turning point for the academic world and, especially, in the design and provision of training courses in Higher Education. Now that the first moments of the information explosion have passed, a rigorous analysis of the effect of the movement in high-impact scientific world is needed in order to assess the state of the art and future lines of research. This study analyzes the impact of the MOOC movement in the form of scientific article during the birth and explosion period (2010-2013) in two of the most relevant databases: Journal Citation Reports (WoS) and Scopus (Scimago). We present, through a descriptive and quantitative methodology, the most significant bibliometric data according to citation index and database impact. Furthermore, with the use of a methodology based on social network analysis (SNA), an analysis of the article's keyword co-occurrence is presented through graphs to determine the fields of study and research. The results show that both the number of articles published and the citations received in both databases present a medium-low significant impact, and the conceptual network of relationships in the abstracts and keywords does not reflect the current analysis developed in general educational media.

RESUMEN

La irrupción de los MOOC (Massive Online Open Courses) ha supuesto un punto de inflexión en el mundo académico y, especialmente, en el diseño y oferta de cursos formativos en la Educación Superior. Una vez superado el primer momento de explosión informativa, se precisan análisis rigurosos sobre la repercusión del movimiento en el mundo científico con más alto impacto para valorar el estado de la cuestión y las líneas de investigación futuras. El presente estudio analiza el impacto del movimiento MOOC en forma de artículo científico durante el período de nacimiento y explosión (2010-2013) en dos de las bases de datos de revistas científicas más relevantes, Journal Citation Reports (WoS) y Scopus (Scimago). A través de una metodología descriptiva y cuantitativa se presentan los datos bibliométricos más significativos por su índice de cita y repercusión. Asimismo, mediante la metodología de Análisis de Redes Sociales (ARS) se realiza un análisis de co-ocurrencia con representación en grafo de las palabras clave de los artículos para la determinación de los campos de estudio e investigación. Los resultados muestran que tanto el número de artículos publicados en ambas bases de datos como las citas que reciben presentan un índice medio-bajo de impacto y la red temática de interrelaciones en los resúmenes y palabras clave de los artículos publicados no reflejan la crítica actual de los medios divulgativos generales.

KEYWORDS | PALABRAS CLAVE

MOOC, indexations, bibliometrics, scientific journals, network analysis, higher education, JCR, Scopus.
MOOC, indexaciones, bibliometría, revistas científicas, análisis de redes, educación superior, JCR, Scopus.

1. Introduction

Massive open online courses (MOOCs) have been considered as a revolution in the divulgative and scientific literature, with a great incidence on educational and formative context (Martin, 2012; Cooper & Sahami, 2013; Aguaded, Vázquez-Cano & Sevillano, 2013; Vázquez-Cano, López-Meneses & Sarasola, 2013; Yuan & Powell, 2013; Downes, 2013). The latest Horizon Report (Johnson et al., 2013) provides a prospective study of the use of educational technologies and future trends in various countries and especially highlights the impact of MOOCs in today's educational context. Moreover, the Ibero-American Edition oriented to higher education believes that the «massive open courses» will be implemented in institutions of Higher Education within the next four to five years (Durall & al., 2012).

MOOCs have attracted a worldwide interest because of their potential to offer free training accessible to anyone regardless of their country of origin, a previous training without the need to pay for tuition (Vázquez-Cano & al., 2013). Since early 2010, the emergence of these courses has begun to be viewed from a more academic perspective when different prestigious universities began their mass activities; among others: Stanford, Harvard, MIT, and the University of Toronto. There is consensus in the scientific community about the importance and popularity of the movement, mainly by its international scope and the opportunity to offer a diversified Higher Education through prestigious institutions, which even recently was only possible for a small group of people. At the same time, there are discrepancies and doubts about the pedagogical value and future of the MOOC movement in Higher education. The scientific community focus on its impact on the educational and social context from different positions; some of them consider it a destructive development (Touve, 2012), while others see it as a deeply renewing and creative movement (Downes, 2013).

The last two years have seen a peak of over sizing with a high impact and widespread dissemination on media and networks. A Google search on the term MOOC produces more than three million results, whereas a search for more established terms from the scientific literature such as «e-learning» or «mobile learning», generates less than half the results. This gives us an idea of what might be called a «disruptive» event.

In this paper, we analyze the MOOC' scientific impact in two of the most prestigious scientific databases WOS (Journal Citation Reports) and Scimago

(Scopus) to focus on the main implications for future research and the most significant global bibliometric data, with special emphasis on articles, authors, institutions, and the more representative semantic fields according to citations and database impact. Thus, we can also determine the impact on the scientific world and if the results in this area may also be considered «disruptive».

2. The scientific impact of MOOC movement

Arguably, David Wiley (professor at the State University of Utah, United States), with his open education course offered in 2007, created the first MOOC in history. Subsequently, in 2008, George Siemens and Stephen Downes designed the course that is considered the genesis of the MOOC movement «Connectivism and Connective Knowledge (CCK08)». This event, along with the landmark in the autumn of 2011, when 160,000 people were enrolled in a course on artificial intelligence offered by Sebastian Thrun and Peter Norvig at Stanford University through a startup company called «Know Labs» (now Udacity), converted to an MOOC movement, meant a turning point for the academic and scientific community.

From these events, many teachers, institutions, and universities have started to develop plenty of open courses, multiplying exponentially their impact on the learning processes of Higher Education. The academic and scientific world have analyzed the benefits of this training model in numerous publications, mainly in divulgative journals, scattered in blogs, wikis, journals, social networks, and so on. A sign of this is the prolific activity of researchers such as Stephen Downes with a continuous process of open publication (www.downes.ca), Sir John Daniel with his thoughts and research on quality assessment (Daniel, 2012) and George Siemens with his approaches to the movement from the connectivism principles (Siemens, 2013), among many others. The publishing phenomenon in this movement has followed a similar pattern to other «disruptive innovations». For example, the Twitter microblogging phenomenon that first appeared in 2006, only produced three articles until 2007, but in 2011, there were hundreds (Williams, Terras & Warwick, 2013). The MOOC phenomenon presents an opportunity for emerging research in the coming years in three priority research areas: technology architecture (models and tools in the service of masses), pedagogical model's reviews and the principles on which it is based (monetization, assessment, accreditation, etc.), implications for rethinking course offerings, and the educational model of Higher Education.

Today, publishers are beginning to seriously invest in MOOCs and offer publications for the development of courses. The Elsevier publishing group has entered the edX group, and Coursera is negotiating with several publishing groups. This commercial interest may have a negative impact on teaching and monetization aspects that could be seen in the near future (Howard, 2012). On the other hand, research on the development of courses and their principles is limited, due to restrictions for researchers to access to interview students from different platforms or develop surveys on teaching functionality or technological development of the different courses. This is generating many studies by teachers who have designed their own MOOC course or by platforms that assess the impact of their own courses with the corresponding bias in investigations in both cases.

Now that the peak of «excitement» has passed, it is time to analyze the current state regarding the impact of the movement in the scientific community taken as reference two of the most representative data bases in academia and the scientific world: Journal Citation Report and Scopus to verify impact among researchers and the lines of research undertaken. Thus, this analysis could serve as a reference for future researchers to highlight both the benefits and challenges that MOOC movement has to face for its improvement and consolidation in the educational context (Aguaded, Vázquez-Cano & Sevillano, 2013; Touve, 2012).

To date, there are no studies presenting a rigorous analysis on the MOOC movement from the conceptual and bibliometric perspectives. Regarding the analysis of the impact of publications from a bibliometric perspective, there have been some studies examining the impact from a comparative approach with other concepts (Martínez-Abad, Rodríguez-Conde & García-Peñalvo, 2014) or the impact of movement in different databases (Liyanagunawardena, Adams & Williams, 2013). No research has been developed to analyze and assess the implications of the MOOC movement in two of the most prestigious databases with greater global impact in accordance with criteria and variables that allow us to analyze the state of the art, the areas with higher impact, and the main implications for the MOOC movement. For this reason, it

seems appropriate to conduct a study that analyzes the different variables, both bibliometric and semantic, that allow researchers and others interested in MOOCs to have an updated overview of the scientific impact of the movement from different variables and perspectives of study to detect the difficulties and weaknesses, including new challenges.

3. Method

3.1. Objectives

The research aims were twofold:

- To quantify from a bibliometric approach the MOOC scientific production in the form of articles in

We analyze the MOOC' scientific impact in two of the most prestigious scientific databases WOS (Journal Citation Reports) and Scimago (Scopus) to focus on the main implications for future research and the most significant global bibliometric data, with special emphasis on articles, authors, institutions, and the more representative semantic fields according to citations and database impact. Thus, we can also determine the impact on the scientific world and if the results in this area may also be considered «disruptive».

JCR and Scopus databases during the period 2010-2013, according to the following variables: total number of published papers; number of received citations; major citable journals; average citations per year; name, country, and institutional affiliation of the most cited authors; and articles' methodological approach.

- Analyze the key words used in articles to establish the thematic and conceptual implications to better understand the MOOC movement.

3.2. Research design and analysis

This investigation stems from the principles embodied in bibliometric studies in the field of education (Fernández & Bueno, 1998), with the use of descriptive, quantitative, and correlational techniques with the application to the study of semantic keywords with the technique of social network analysis (Knoke &

Yang, 2008) via networks generated in UCINET and visual representation with VOSviewer. The use of databases from a comparative perspective is a research method used in measuring the impact of a term or trend and is usually referenced to three international databases: JCR, Scopus, and Google Scholar (Jacso, 2005; Levine-Clark & Gil, 2009). Recently, the results of Google Scholar have been seriously questioned (Delgado, Robinson & Torres, 2014), and the recovered entries frequently found to incorporate unreliable references. For this reason, this research has been limited to the two databases with greater impact and international recognition, JCR and Scopus (Delgado & Repiso, 2013).

4. Data analysis

For the analysis, we used a technique based on the bibliographic data quantification of articles; with this approach, we obtained several indicators that have been used in other studies in relation to the following: authors, countries, institutions, and subject areas (Davis & Gonzalez, 2003; Chiu & Ho, 2005). Subsequently, we turned to the analysis of keywords frequency (Bhattacharya & al., 2003; Ding, Chowdhury & Foo, 2001) with special attention to the analysis of co-occurrence within the specific research domain of MOOCs. With the same conceptual goal, different areas of study have demonstrated successful implementations (Cahlik, 2000; Neff & Corley, 2009; Viedma & al., 2011).

Initially, the search equation «mooc» or «MOOC» or «massive open online course» was used in both JCR and Scopus databases. With the initial information from both databases, a total of 63 publications in JCR and 180 in Scopus were retrieved, and they were finally reduced to 48 and 111, respectively, by removing books, books chapters, repeated records, irrelevant publications, conference proceedings, and documents that did not fit the purpose of the study or were out of the 2010-2013 interval. We used the automated mechanisms for analysis included in both databases, with representation in figures and tables. Data extraction was performed by direct consultation of the databases according to the following variables: total number of articles and quartile position, MOOC article citations in journals, year/month of publication and average citations per year, authors, authors' institutional affiliation, productivity by country, article's

Table 1. Number of articles in JCR and Scopus

Publication year	Number of articles	
	JCR	Scopus
2010	1	0
2011	4	4
2012	3	13
2013	40	94
Total	48	111

methodological approach (theoretical, quantitative, qualitative, and mixed), and keywords in Scopus and JCR (networks using UCINET and word clouds by generating .txt file (VWoS) and csv (Scopus) and key words visual representation in VOSviewer program).

5. Results

We opted to present the quantitative data of both databases to respond to the first objective of this research. In a second phase, we present graphs of keywords in both databases and their analysis to define the major implications in the study of MOOC movement according to key topics developed until today. Table 1 shows the number of articles published in the 2010-2013 interval in both databases. The articles in Scopus are double in quantity those published in JCR; but the number of articles in relation to other concepts such as «e-learning» in the same period (1243 items) is significantly lower (Martínez-Abad, Rodríguez-Conde & García-Peñalvo, 2014).

The 159 articles were distributed heterogeneously among the different quartiles of databases. Most published articles in both databases are concentrated in 2013 (134%-84.27%) as shown in table 2 (<http://goo.gl/yjS2XK>). The increase in the number of citation of articles in both databases since 2010 is significant, but it continues to have a low incidence, as is shown in table 3 (<http://goo.gl/uny7Eo>); no article reached 5 citations in JCR and Scopus. Table 4 (<http://goo.gl/6cFFJt>) shows the evolution of citations distributed by month. It shows a significant increase in the number of articles published since the second half of 2013 as the MOOC movement generated more interest and data. The year 2013 concentrates almost all citations in the interval studied (84.27%). Table 5 (<http://goo.gl/YSgkzD>) shows that the average number of citations in the past three years increased substantially. In 2013, the average citation was 3.33 in JCR and 7.83 in Scopus, which multiplies 3- and 6-fold, respectively, the citation rates from 2010 to 2012. Despite this increase, it still represents a low rate with respect to the dissemination of informative articles on the MOOC network literature (Google Scholar shows 2125 MOOC citations in the same period).

Table 6 presents the impact of the most cited authors in the two databases, and as can be seen, it is low. For example, Professor Rita Kop (Yorkville University, Canada) with her article «The Challenges to

Connectivist Learning on Open Online Networks: Learning Experiences During a Massive Open Online Course» only receives two citations in each of the two databases, whereas in Google Scholar, this article receives 98 citations. This implies a low effect on high-impact databases.

Table 7 (<http://goo.gl/4Tm3vs>) shows the most active countries during this early period of the movement. It is remarkable that the United States accounts for half of all citations received in both databases. The second country is the United Kingdom but quite a distance behind; Australia, Canada, and Spain occupy the following positions. Other countries are far ahead of those mentioned with an almost symbolic authors' representation in JCR, which does not exceed 2%. In table 8 (<http://goo.gl/y1GHhS>), we can see that American universities are the most representative in the MOOC movement, followed by European, Canadian, and Oceania universities. The role of Spanish universities representing 50% of the European scientific production in JCR and 81.83% of production in Scopus is remarkable.

The methodological approach of the articles is a relevant aspect providing an overview of how the research and reflection on MOOC movement is being addressed at this early stage and expansion. The results show that, even today, the main body of research has focused on the theoretical reflection and essays, with a percentage of 80% in both databases. Table 9 (<http://goo.gl/CTRWFh>) shows the classification of articles according to their methodological approach. Thus, we can see that the ten articles with more citations in both databases have an eminently theoretical approach.

The theoretical approach of the articles with the highest citation index in both databases shows that MOOC research is still at an early stage, and the efforts made to date focus more on the informatics field than on the scientific and academic context (table 10). Some of the biggest names in MOOC research, such as George Siemens, Stephen Downes, and Sir John Daniel who have more than 200,000 search results on Google about MOOCs, have not yet published high-impact articles in these two databases.

The ten journals with the highest citation are published mostly in North American institutions (80%); Canada is represented by the journal «International Review of Research in Open and Distance Learning», one of the most productive in the MOOC movement, Australia by «Distance Education» and the only European journal is the Spanish one, «Comunicar», as you can see in figure 1 (<http://goo.gl/KvMqGE>).

Table 6. Most cited authors

Most cited authors	JCR	Scopus
Skiba D.J.	0	3
DeSilets, Lynore D.	2	2
Kop, Rita	2	2
Abajian, Sean	1	2
Barbera, Elena	1	2
Clara, Marc	1	2
deWaard, Inge	1	2
Forsey, Martin	1	2
Gallagher, Michael Sean	1	2
Glance, David	1	2
Hogue, Rebecca	1	2
Keskin, Nilgun	1	2
Koutropoulos, Apostolos	1	2
Mackness, Jenny	1	2
Rodriguez, Osvaldo C.	1	2

Once the descriptive and quantitative analysis of the impact of MOOC movement in both databases was implemented, we conducted an analysis of the relations established between keywords through a graph representation. We then chose the words «Abstract» and «Keywords» as the basis for obtaining the word network once the article has been uploaded to the archive, and for the development of binary count, we considered a minimum of two items:

- Of a total of 530 terms extracted from Web of Science, the program determined that only 67 terms meet this criterion.
- Of a total of 1,715 terms extracted from Scopus, the program determined that only 323 terms meet this criterion.

After fixing these criteria, the map of keywords was generated. The matrix was previously built in the UCINET program to calculate the nodal degrees of intermediation and closeness of the five most representative concepts and descriptive keywords in both databases; results are displayed in table 11 (<http://goo.gl/4oKw54>). If we take into account all the criteria together, that is, nodal degree, rank, closeness, and betweenness, we find that the most relevant values are concepts related to materials or instruments used: video and educational resources as well as educational learning experience, environment, design, and evaluation. The networks presented in Figures 2 and 3 are the graphical representation of the matrix of relations among keywords in JCR and Scopus, respectively.

In JCR, Figure 2 shows the central position of concepts in the network (Spencer, 2003) and shows a high score of 67% with a total number of 23 nodes. The maximum degree (maximum number of relations of a node in the network) is 3,199 (video), indicating that each keyword is intertwined with an average of 3. The graph density is 0.07, a low value, well away

from the value of 1 (high density). The results show that the aspects with a high standardized range (Nrmdegree: percentage of connections of a node on the total network) and a higher node degree focus on the following items: «educational resource», «openness», «assessment» and «impact».

In Scopus network (Figure 3), the results of the betweenness degree are significant 27,248, providing relevant information regarding the frequency with which a node appears on the shortest (or geodesic) stretch connecting two others; that is displayed when a concept or keyword can be intermediary between others. We have summarized in Table 11 those nodes that have a higher degree of intermediation (≥ 11) and are recurrent in the published articles: «education», «learning», «experience», «environment» and «design». The results of degree of closeness indicate that, in these five major nodes, those aspects that serve to interrelate the dominant categories in the publication of articles indexed in Scopus.

6. Conclusion

The scientific production of high impact on the MOOC movement in 2010-2013 is still in its early stages and undeveloped. The number of articles published in journals indexed in Scopus and JCR is low compared with other emerging concepts and research areas. The impact in Scopus with 111 articles is significantly greater than that in JCR with 48. Additionally, the published works present a medium-low impact index (JCR 3.33 and Scopus 7.83), which implies that these publications are not a referent of reflection for the analysis of

the MOOC movement. This poses a problem for research in MOOCs, mainly because the vision of the movement from the academic world is focusing on the particular interest from certain platforms that use data for advertising or selling the benefits of this type of training without contrast or analyzing critically the data obtained. Moreover, the analysis in blogs and magazines raises the profile of the the MOOC movement, but this is not usually supported by rigorous research methods to better understand the strengths and weaknesses on which the movement is based.

The methodological approach of the ten articles with the highest citations in both databases presents mainly a theoretical approach; by contrast quantitative and qualitative approaches do not exceed 9% of the published articles, making it difficult to conduct a deep

Table 10. Most cited articles in MOOC movement




Article's title	Author	Journal	Year	Citations JCR	Citations Scopus
The Challenges to Connectivist Learning on Open Online Networks: Learning Experiences during a Massive Open Online Course	Kop, R.	International Review of Research in Open and Distance Learning	2011	7	20
Connectivism: Its Place in Theory-Informed Research and Innovation in Technology-Enabled Learning	Bell, F.	International Review of Research in Open and Distance Learning	2011	6	12
A Pedagogy of Abundance or a Pedagogy to Support Human Beings? Participant Support on Massive Open Online Courses	Kop, R.; Fournier, H.; Mak, J.F.	International Review of Research in Open and Distance Learning	2011	6	15
A Revolutionary Journey Into Learning/Education	DeSilets, L.D.	Journal of Continuing Education in Nursing	2013	3	4
Connectivism and Dimensions of Individual Experience	Tschofen, C.; Mackness, J.	International Review of Research in Open and Distance Learning	2012	2	
Using mLearning and MOOC to Understand Chaos, Emergence, and Complexity in Education	deWaard, I.; Abajian, S.; Gallagher, Sean, M.; Hogue, R.; Keskin, N.; Koutropoulos, A.; Rodriguez, O.C.	International Review of Research in Open and Distance Learning	2011	2	4
Navigating the changing learning landscape: perspective from bioinformatics.ca	Brazas, M.D.; Ouellette, B.F. Francis	Briefings in Bioinformatics	2013	1	No Indexado
Are MOOC the future of medical education?	Harder, Ben	British Medical Journal	2013	1	No Indexado
MOOC: An Opportunity for Innovation and Research	Pritchard, S.M.	Portal-Libraries and the Academy	2013	1	No Indexado
Reflections on Stanford's MOOC	Cooper, S.; Sahami, M.	Communications of the ACM	2013	1	No Indexado
Education: will massive open online courses change how we teach?	Martin F.G.	International Review of Research in Open and Distance Learning	2012	No Indexado	16
Will MOOC destroy academia?	Vardi M.Y.	Communications of the ACM	2012	No Indexado	4
Disruption in Higher Education: Massively open online courses (MOOC)	Skiba, D.J.	Nursing Education Perspectives	2012	No Indexado	4

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Evaluation of Digital Didactic Skills in Massive Open Online Courses: a Contribution to the Latin American Movement

Evaluación de competencias digitales didácticas en cursos masivos abiertos: Contribución al movimiento latinoamericano

-  Dr. Erika-Elvira Hernández-Carranza is Professor at the Subsistema DGETI (Dirección General de Educación Tecnológica Industrial) in Michoacán (México) (erikaehc@hotmail.com).
-  Dr. Sandra-Irene Romero-Corella is Professor in the Graduate School of Education of Virtual University of Tecnológico de Monterrey at the Hermosillo Campus (México) (sandrairene61@hotmail.com).
-  Dr. María-Soledad Ramírez-Montoya is Senior Lecturer in the Graduate School of Education, Humanities and Social Sciences at the Tecnológico de Monterrey (Mexico) (solramirez@itesm.mx).

ABSTRACT

The aim of this article is to present an evaluation of digital teaching skills in a project funded by the National Distance Education System (SINED) in Mexico conducted on a Massive Open Online Course (MOOC) which was designed to develop competences in teachers in the distance learning or classroom setting for the integration of open educational resources (OER). The course was conducted by the Regional Open Latin American Community for Social and Educational Research (Clarise), and posed the question: how are distance learning didactic competences using OER developed? The aim was to identify and evaluate how OER were used and the form they took throughout the stages of the open education movement. The study deployed a mixed methodology with instruments such as emailed questionnaires for the MOOC participants, viewing screens in the discussion forums and anecdotal evidence. The results show that MOOC participants were able to develop digital teaching skills, identify how to use OER and how the training process occurs in the open education movement. Constraints to the development of these skills were also seen in the acculturation in the open education movement, as well as limitations on the design of distance learning models that promote these skills and the recognition of informal learning.

ABSTRACT

El objetivo de este artículo es presentar la evaluación de competencias digitales didácticas en el entorno de un proyecto financiado por el Sistema Nacional de Educación a Distancia (SINED) de México, donde se llevó a cabo un curso masivo abierto (Massive Open Online Course: MOOC, por sus siglas en inglés), dirigido a desarrollar competencias en profesores de educación a distancia o presencial para integrar recursos educativos abiertos (REA). El curso se impartió a través de la Comunidad Latinoamericana Abierta Regional de Investigación Social y Educativa (Clarise). Se partió de la interrogante ¿cómo se desarrollan las competencias didácticas en ambientes de aprendizaje a distancia que utilizan REA?, con el fin de identificar y evaluar cómo se usan los REA y cómo se está formando a través de las etapas del movimiento educativo abierto. La metodología empleada fue mixta, con instrumentos de cuestionarios electrónicos para los participantes, rejillas de observación en foros de discusión y registros anecdóticos. Los resultados muestran que los participantes en un MOOC, logran desarrollar competencias digitales didácticas, lográndose identificar claramente cómo se usan los REA y cómo se está dando el proceso de formación en el movimiento educativo abierto; sin embargo, también se denotan limitaciones para el desarrollo de estas competencias, tales como la culturización en el movimiento educativo abierto, el diseño de modelos de aprendizaje a distancia que promuevan las competencias y el reconocimiento del aprendizaje informal.

KEYWORDS | PALABRAS CLAVE

Digital competences, didactic competences, virtual environments, connectivism, open access, OER, MOOC, mixed methodology. Competencia digital, competencia didáctica, ambientes virtuales, conectivismo, movimiento educativo abierto, REA, MOOC, metodología mixta.

1. Introduction

The social and economic changes now in progress have redirected the concept of education and its pedagogical approaches towards a holistic vision that embraces cognitive, factual and axiological aspects (De Pablos, 2010, Selvi, 2010), and this, combined with access to information and the management of knowledge enabled by ICT (Information and Communication Technologies) (Tobón, 2005) requires people to learn digital competences so that they not only get information (Rychen & Salganik, 2001) but also acquire the capacity to select, analyse, process and transform it into knowledge and use it according to the situation, context and personal or social intention (European Commission, 2010).

The capacity to process, relate, search for and express information, and even think in a more fragmented, visual, interactive and rapid way, questions some of the current pedagogical propositions in place in our schools (Pérez-Rodríguez & Delgado, 2012). For citizens of the XXI century, the development of digital competences has become an indispensable strategic function in education, and this concern is increasingly prominent at international forums on the subject (Aguaded, 2011), in which considerable importance is given to the closing of the digital divide by means of the development of competences in the teaching-learning process that involve pedagogical, investigative and instrumental aspects.

It is also necessary to define didactic, investigative and instrumental competences to enable the implementation and functioning of open educational resources (OER) in distance learning settings. This

study specifically examines didactic competences in terms of the knowledge and skills needed to teach, or more precisely, to plan and design learning settings that enable the student to pass effectively through the educational process (Páez & Di-Carlo, 2012) as well as incorporating media and ICT by exploiting their information, communication and motivational features (Marqués, 2011), which assumes the development of skills inherent to teaching, and the acquisition of strategies for implementing such skills in the context of digital competences for planning and design, communication and interaction, instruction and learning, management and administration and ICT usage (Barrón, 2009; Fernández, 2003; Zabalza, 2003; UNESCO 2008; Shaikh & Khoja, 2012).

The digital didactic competences referred to in this research are grouped according to the dimensions that appear in table 1.

The Open Education Movement (OEM) is seen as one of those praiseworthy activities that promotes the democratization of education, which involves open access to educational training via Internet (Ramírez, 2013b) with the aim of enabling access to scientific, academic and cultural information without economic, technical or legal impediment (Max Planck Society, 2003), with the use of OER such as teaching, learning and research materials that can be consulted

Table 1. Classification of digital didactic competences

Digital didactic competence	Actions
Planning and design	<ul style="list-style-type: none"> • Adaptation to new learning modalities both as user and designer of learning scenarios using ICT. • Integration of digital resources as didactic instrument, content and material in curricula. • Selection and objective assessment of digital resources for their use in pedagogical practice contexts: design, implementation and use of technology.
Instruction and learning	<ul style="list-style-type: none"> • Design and production of digital resources for didactic use. • Development of assessment plans using ICT. • Use of ICT to advise, orientate and monitor students. • Initiate interactive debates and maintain them. • Understanding of collaborative, constructive, reflective, active and authentic learning.
Communication and interaction	<ul style="list-style-type: none"> • Understanding the impact and function of ICT in including them in the Knowledge Society. • Knowledge of basic concepts and tools of communication and consulting information on Internet. • Collaboration in virtual academic communities with actors in the teaching-learning process. • Develop learning among equals and social links.
Management and administration	<ul style="list-style-type: none"> • Understanding the legal and ethical aspects associated to ICT through networks: licences, privacy, intellectual property and security. • Self-management for continuous learning and incorporating technologies in the teaching-learning process. • Acquisition of skills for applying the advantages of ICT to teaching-administrative tasks. • Knowledge management.
ICT use	<ul style="list-style-type: none"> • General knowledge associated to ICT. • Managing basic functions of computing and electronic communication devices and operating systems. • Handling basic production tools: word processors, spread sheets, presentations and multimedia elements.

Adapted from Barrón, 2009; Fernández, 2003; Zabalza, 2003; Carmona, Gallego & Muñoz, 2008; UNESCO 2008; European Commission, 2010; Marqués, 2011; Shaikh & Khoja, 2012).

and used without restriction, provided that authorship is respected (UNESCO, 2012; Atkins, Brown & Hammond, 2007).

The OEM framework is in line with the worldwide trend in using ICT as a tool to democratize knowledge. In the Latin American context, this movement has advanced through the efforts of the Regional Open Latin American Community for Social and Educational Research (CLARISE in Spanish), with studies, courses, seminars and the first Massive Open Online Course (MOOC) implemented with the support of the National Distance Education System (SINED in Spanish) on the subject of «Training distance-learning teachers for the development of competences in the use of open education resources» (Ramírez, 2013a).

MOOCs are learning settings in which participants and course materials are distributed on the Web in open format (Rodríguez, 2012), but they are more than just a meeting point, a place to connect students to teachers through a common theme (Siemens, 2004; Siemens, 2006; Popkewitz & Rizvi, 2009); they represent a teaching-learning process based on the Connectivist model (Siemens, 2006; Downes, 2012), a constructivist approach for learning that is centered on the student, who is responsible for connecting and constructing knowledge in the context of groups and networks (Carmona, Gallego & Muñoz, 2008, Tschofed & Mackness, 2012), and which Delors foresaw in 1994 as the adaptation that ICT should make in order to store and circulate information efficiently and on a massive scale.

It is important to note that social and cognitive presence forms part of the student's learning experience in a connected, collaborative setting through networks. In this context, MOOCs act as an environment in which new forms of distribution, storage and recovery of information enable the development of shared knowledge and distributed forms of cognition (Kop, Fournier & Sui-Fai, 2011).

The biggest leap forward for MOOCs occurred in 2012 (Daniel, 2012) when several universities, institutions and foundations launched projects for massive open online courses, mostly free although some were profit-motivated. EDX, Coursera, Udacity, Khan Academy and Udemy were the organizations most notably involved (Chronicle, 2013).

However, and despite the success the MOOCs have gradually gained, there are still questions about the future of education, the value of a qualification and how technology influences the way an educational institution functions. The OEM has questioned university hierarchies' adherence to a fixed course curri-

culum and foresees that they will be replaced by open courses such as MOOCs (Leber, 2012).

A MOOC forms the basis of the study presented in this article, and its aim is to develop digital competences and skills in course design in order integrate OER in distance learning (SINED-Clarise, 2012) settings. The course is supported on Blackboard's CourseSites open platform and was a free five-week online course (March to April 2013) at the end of which students were awarded a certificate on completing all the modules that consisted of activities in which participants learnt: competences for producing open education resources (OER), searching for and using OER, disseminating OER and mobilization (appropriating OER).

MOOCs such as these are the subject of various studies, this one included, in which researchers assess the digital and didactic competences developed by participants through specially designed learning activities.

2. Methodology

This study was carried out using the mixed method (Johnson & Onwuegbuzie, 2004) concurrent triangulation design (Creswell & Plano-Clark, 2011) that enabled the use of qualitative and quantitative approaches in order to confirm and check the validity of the data and corroborate the findings gleaned from the MOOC. The choice of this type of research was due to the need to identify categories, analyse data and the effects arising from the acquisition of didactic competences among the MOOC participants, and to understand the situational and structural contexts. This course was considered a scenario for real, contemporary and holistic research, taking as its sources of information the students, teachers, the work platform and course documentation; the research also made use of techniques for collecting data with qualitative and quantitative instruments: observation, interviews, questionnaires and analysis of important documentation, which were applied simultaneously and over a short time period in order to integrate the results in the data interpretation phase.

The use of the qualitative approach in this study enabled us to understand the nature of the event without manipulating the research scenario, so as to establish the following conditions: 1) to describe the little-known phenomenon of the format of MOOCs for the development of digital competences; 2) to understand the meaning of data such as thoughts, ideas and behaviour before they are converted into numbers; 3) to describe a process, not a product, that is the acquisition of digital didactic competences, information that

could be used to describe the context, participants and activities of interest by means of techniques selected for gathering data, which were: the analysis of course documents and interactivity on the course platform (forums, programs, assessments), interviews with participants and facilitators, field notes, e-mails and questionnaires, combining all these with common propositions in order to check the reliability of the study.

The quantitative approach allowed us to deploy standardized tools such as questionnaires, structured observation and content analysis with pre-established categories in order to obtain a numerical interpretation of the study that enabled us to explain statistically the behaviour, skills and attitudes of the MOOC participants in their acquisition of digital didactic competences. The quantitative aspects reveal how frequently the same perspective or measurement scale was determined by the study participants with regard to the categories proposed (Silva, 2008), which led to the establishment of a general view of the quantities and flows of behaviour without having to intervene in their content.

The study population consisting of 1,126 students from 11 Latin American countries, Spain and Portugal and 58 MOOC teachers officially enrolled on the course. This population constituted the sample of participants for the quantitative data, and a further sample of 15 students and five teachers were selected for the qualitative data. There were three study categories: the participant context, didactic competences and distance learning settings.

Over a period of eight weeks, a series of data gathering techniques were used such as the observation screen, a ledger of anecdotes, a partially structured interview in the form of a questionnaire (Google Drive) conducted online due to the geographic spread and nature of the study population, which contained open and closed question types and multiple choice options. Through observation we were able to investigate the search for digital education resources, the production of didactic resources supported by technology, the supervision provided by the facilitators, patterns of cooperation among students, the acknowledgement, support and encouragement given by facilitators, participants' perception of their level of digital competences, the use of OER and involvement in the open education movement. The interview allowed us to analyse indicators like the level of digital didactic competences (table 1) and involvement in the open education movement, an understanding of the use, production and benefits of OER and the implications of the use of the Connectivist MOOC model, along with its benefits and drawbacks.

We used a spreadsheet to process the information from the online questionnaire, and with the observation tools data were collected in electronic format and subsequently codified and analysed.

In the data analysis, the information gathered was organized in order to establish relations, interpret and extract meanings and conclusions and to demonstrate the importance of the findings (Valenzuela & Flores, 2012), with the aim of validating and testing the reliability of the investigative process using triangulation methodology (Stake, 2007): contrasting observations, interviews, questionnaires, documents and the literature; supporting the results and explaining the development of the digital didactic competences through the use of assessment scales.

3. Results

The data compiled from various sources of qualitative and quantitative information enabled us to analyse the context, digital didactic competences and distance learning settings.

3.1. Context

The corpus of the research consisted of 1,126 participants enrolled on the MOOC from 11 Latin American countries, Spain and Portugal, with ages ranging from 22 to 51; 75% were women and 25% men, all of whom had completed their high school education, and most of them had a Masters and experience teaching students in the classroom or in other hybrid forms of education.

Eighty percent of the participants stated that they had qualifications like diplomas, degrees and masters, and specialized in teaching, educational research, pedagogy and science teaching. Only 20% declared they had no formal academic qualification in teaching.

3.2. Digital didactic competences

a) Planning and design. It was observed through the activities analysed and tested during the MOOC that the use of OER improves curricular planning and design. A noteworthy fact is that the participants declared themselves competent to develop activities such as: defining an objective, strategy, and the intended outcome of using the OER; identifying OER features; drawing up a teaching strategy for incorporating OER in courses or materials; dissemination and implementation of OER.

b) Teaching and learning. When analyzing how the participants produced didactic resources using technology, the results show that the majority believe the objective is important whereas the number of

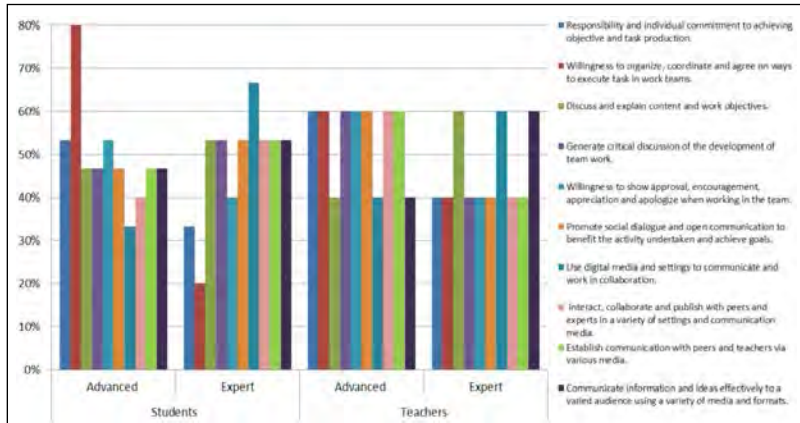


Figure 1. Skills level for communication and interaction in virtual settings.

potential users is not very relevant or totally irrelevant. Other criteria were also used to measure this indicator, such as user type, the type of material used, production, tests and reviews, time, equipment and costs. In terms of the aspects apparent in design learning scenarios with technology, all the students consider that it is important to incorporate ICT.

c) Communication and interaction. The competences that the participants believed they developed best on the MOOC were: learning with their peers, cooperative interaction and, in some cases, social links between students (figure 1).

d) Management and administration: it was observed how collaboration in the development of academic activities was a constant in all participants. When working online all students stated that they used e-mail, followed by social networks, as the main channel for communication in carrying out academic tasks.

In terms of developing the skill of independent learning on the MOOC, most students stated that they did so with help from tutorials and peers. Most teachers emphasised that self-learning is a challenge given the gap that exists between digital literacy and the willingness to learn. In terms of the competence required to solve problems through the use of digital media, the results show that most students developed this process by «searching for, analysing and producing information in databases or folders».

e) Use of ICT. The participants declared that their skills level in ICT use ranged from intermediate to expert (figure 2).

3.3. Distance learning settings

a) The experience of the open education movement. All the participants felt motivated by participating in the open education movement, and had had

some previous experience in virtual learning settings although only 5% had done a MOOC before.

b) Use of Open Education Resources. Concerning the advantages of using OER, the information compiled shows that they develop research and critical thinking as well as greatly motivating student participation. It is also worth mentioning that a small percentage of students believe that OER can impede the teaching process.

On the skills level acquired in the use of OER, most (66%) see the lack of institutional policies at regional and national level as a barrier to OER production and use (figure 3).

c) Participation on the MOOC. The teachers declared themselves partially or totally in favour of Connectivist pedagogical principles. In similar numbers the students indicated that the advantages of MOOCs are that they are student-centered, participation and interaction can take place on various platforms and in different forms, they are accessible and cost-free; they allow autonomy in learning, the establishment of knowledge networks and, to a lesser extent (at 12%), access to various types of content.

For the students, the most relevant contribution of the MOOC was the knowledge they could acquire and personal training (90%) while the least significant factors were organization/participation in events and the socialization of material (53% in each case). The teachers cited the number of participants to attend to and the time factor as hindrances, while the work dynamic and clarity of instructions were the most recurring difficulties for the students.

4. Discussion and conclusions

The data extracted for this study show that MOOC virtual learning scenarios are highly suitable for the design and use of OER to develop digital didactic competences. We base this statement on the following findings:

- OER are digital tools used to innovate educational practice and motivate learning. The MOOC provides participants with the digital tools they need to produce their own designs for teaching through OER. Shaikh & Khoja (2012) state that the use of digital resources as didactic instruments, content and material

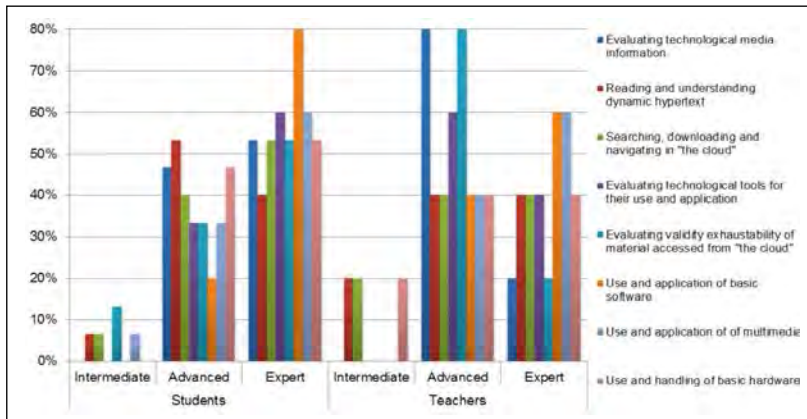


Figure 2. Level of expertise in ICT use (adapted from Gros & Contreras, 2006).

in the curriculum is an essential competence for teachers when planning and designing in virtual settings where, according to Busto-González (2005), the teaching-learning process focuses on the development of competences that generate new knowledge that can be continuously applied to the work and social environment.

- The OER design and production enables the development of new teaching-learning practices within the Knowledge Society. This was evident from the results for the criteria corresponding to the production and assessment of digital didactic resources considered necessary for the design of learning scenarios. According to Gros & Contreras (2006) and UNESCO (2008), digital competences allow the user to develop knowledge, skills and attitudes in order to evaluate the technological tools and material available on Internet that can be used as a support to traditional content formats; Shaikh & Khoja (2012) relate this to cognitive and instructive aspects of teaching.

- Open learning scenarios require superior teaching skills to reach educational objectives. The participants agreed that monitoring and follow-up are essential activities to ensure that students do not drop out of online courses. Shaikh & Khoja (2012) state that the new roles in teaching involve organizing bodies of thought that are comprehensible to everybody in order to motivate students to take control of their own learning processes so that they can achieve their goals.

- MOOCs are suitable settings for encouraging collaborative learning and cooperative interaction. It was observed that the design of the course contributed to the achievement of a level of competence for interacting and promoting synergies between participants. Zabalza (2003) notes that these skills enable the capacity to transmit information in a significant way by

means of healthy, cooperative interactions, the promotion of learning among equals and social links, as well as support for collaborative learning activities in order to establish a learning environment.

- The learning scenarios that include OER allow for the development of competences to promote collaboration in learning, independent learning and problem solving. This was verified by the answers

related to the involvement of participants in collaborative and online activities undertaken on a daily basis. Barrón (2009) and Fernández (2003) state that the didactic skills used in management and administration involve activities ranging from the dissemination and adaptation of administrative actions to the process of knowledge management (the creation and transmission of knowledge) in which, as Carmona, Gallego & Muñoz (2008) indicate, data are transformed into knowledge.

- Skills in ICT use and its implications for the Knowledge Society improve in MOOC settings that use OER. The results show that participants performed the activities proposed on the MOOC by effectively mobilizing the skills needed to use ICT and, as a result, they were able to generate their own OER and disseminate them via mass media on Internet. As Thomas (2011) indicates, in the educational context ICT use means the deployment of basic tools, downloads, searches, navigation, classification, integration, evaluation, communication, cooperation and creation with the aim of improving the quality of and access to education, which includes stimulating production, exchange and access to OER (UNESCO, 2012; Amador, 2013).

- In the Latin American context, massive learning settings are an underused alternative, which hinders the integration of countries into the open education movement. For the majority of participants, attending the MOOC was their first experience of this type of virtual learning scenario, which was clearly appreciated in their opinions concerning how difficult it was to adapt to the course dynamic. In this respect Kop, Fournier & Sui-Fai (2011) state that MOOC act as an environment in which new forms of distribution, storage and recovery of information can potentially deve-

lop shared knowledge and distributive forms of cognition.

- MOOCs demand that participants acquire knowledge and skills in order to understand the Connectivist paradigm that supports it, which is seen in students' opinions on the MOOC's pedagogical dynamic and the complications that arose during the development of the course. Connectivism assumes that access to Web technologies is universal, and at its core is the construction and maintenance of network connections in such a way that, as Siemens (2006) says, the learning process (applicable knowledge) is based on the connection of nodes containing specialist information that resides not only in individuals but also in technological devices that can be accessed at any moment.

Analysing from various qualitative and quantitative aspects how MOOC students are capable of developing digital didactic competences enables us to identify how OER are used and how the process of training develops in the open education movement. In this context, it was deemed important to fix dimensions and indicators to enable us to draw up a didactic proposal for the development of digital didactic competences, which is displayed in the diagram below (figure 4) detailing aspects which this study considered to be important.

This study argues that in the context of massive open online learning settings a course design based on OER can contribute to the development of digital didactic competences that correspond to the four open education movement stages described by Ramírez (2013a), in which training practices can make it possible to produce, select, disseminate and mobilize open online educational activities.

It was also determined that: 1) the more developed the digital competences of the participants in the open education movement, the more successful and enriching the experience in the effective usage of OER, and those with advanced or expert control in ICT use were more capable of managing and designing digital didactic resources; 2) MOOCs represent an alternative distance learning setting that enables users to acquire didactic competences since such courses require them to develop skills in

planning and design, instruction and learning, communication and interaction, and management and administration, all of which are implicit teaching indicators; 3) The OER are teaching-learning tools that mobilize didactic competences that allow users to acquire fully integral digital competences since these require the student to take on instrumental and investigative skills.

We can conclude that the development of digital didactic competences in virtual settings still represents a challenge for those involved in the open education movement: the closing of the digital divide, the development of digital competences, acculturation in the open education movement (opening up the curriculum), the design of more advanced distance learning models, the acknowledgement of informal learning, the replacement of physical for virtual spaces and the widest possible use and dissemination of OER, all of which ought to lead educational institutions to rethink the concept of knowledge for the development of competences that allow students to exercise their intelligence. This vision clearly shows that research in education needs to be a priority on political agendas throughout Latin America in order to explore the benefits that the open education movement can bring.

Finally, these results point to the need for designs in education in Latin America and the intensive dissemination of OER and their induction in curricular planning, not just in the virtual modality but also in the classroom, as a way to draw students into the paradigm of digital competences; this is more a requirement than a necessity for the successful development of 21st century citizens. This article is an invitation to continue analysing the contributions of MOOCs, the open education movement and the development of digital competences for education.

Support and acknowledgments

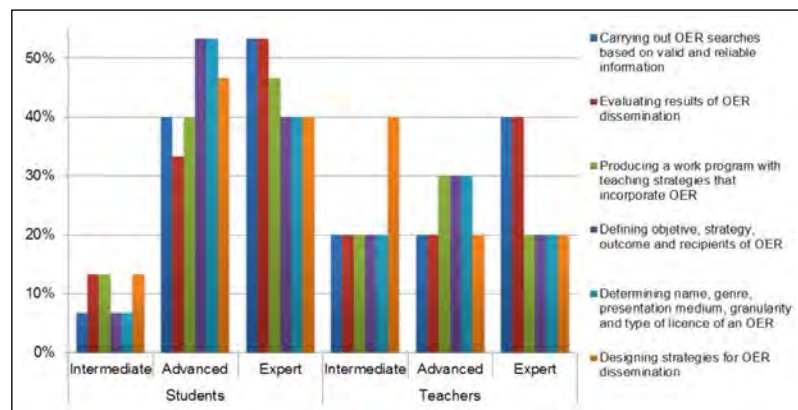


Figure 3. Competence level for OER use (based on the MOOC rubrics).

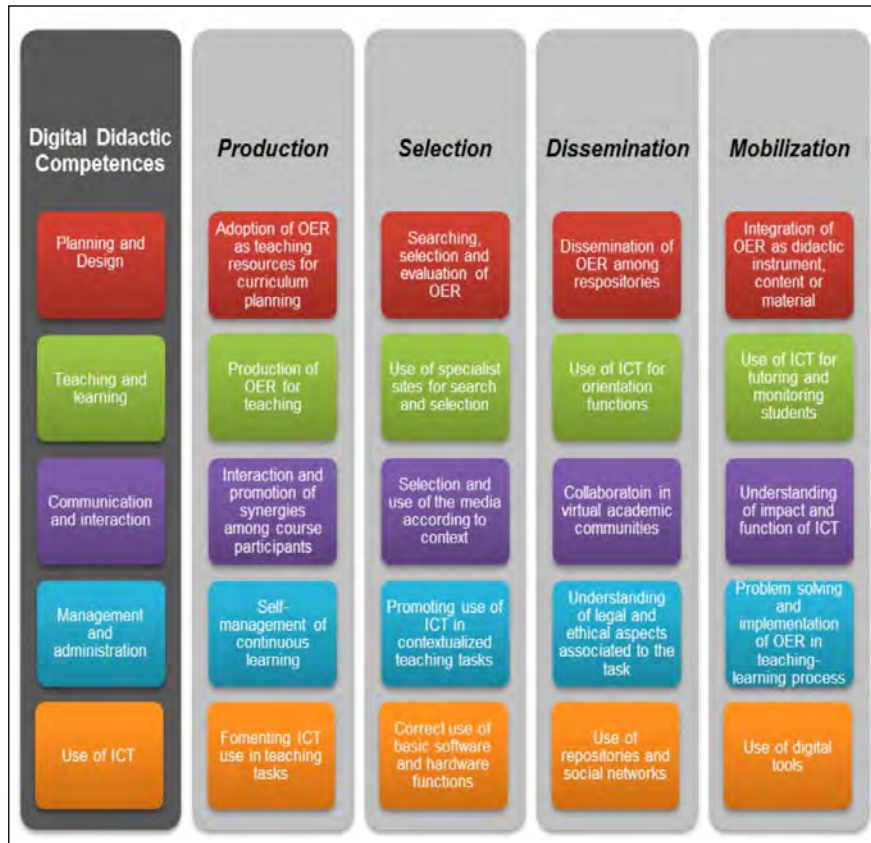


Figure 4. The process of developing digital didactic competences in the open education movement (adapted from Ramírez, 2013a).

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Are MOOCs Promising Learning Environments?

¿Son los MOOC una alternativa de aprendizaje?

 Dr. Antonio Bartolomé is Professor in the Faculty of Education at the Universitat de Barcelona (Spain) (abartolomepina@gmail.com).

 Dr. Karl Steffens is Professor in the Institute of Didactics and Educational Research, at the Universität zu Köln (Germany) (Karl.Steffens@uni-koeln.de).

ABSTRACT

This article reflect upon MOOCs as technology enhanced learning environments. The increase in numbers of Massive Open Online Courses (MOOCs) has been dramatic in recent years. MOOCs may be considered to be a new form of virtual technology enhanced learning environments. Two types of MOOCs may be distinguished: cMOOCs as proposed by Siemens, based on his ideas of connectivism, and xMOOCs developed in institutions such as Stanford and MIT. Although they have received a great deal of attention, they have also met with criticism. The time has therefore come to critically reflect upon this phenomenon. While there is still relatively little empirical research on the effects of MOOCs on learning, this study tries to shed light on the issue from a theoretical point of view. It will first explore positive and negative expectations regarding MOOCs. MOOCs might constitute a good option if they can be delivered on a large scale, and this will only be possible for a few big institutions. There is no empirical research which would uphold the claims concerning their positive effects. It will then review classical and more recent learning theories with respect to their capability to explain the process of learning in order to compare traditional online courses, xMOOC and cMOOC with respect to their potential to support learning and its self-regulation.

RESUMEN

Este trabajo reflexiona sobre los MOOC como entornos de aprendizaje. El número de cursos masivos abiertos y en línea (MOOC) ha crecido exponencialmente en pocos años desde que fueron introducidos. Los MOOC son considerados una nueva forma de entornos virtuales de aprendizaje potenciados por la tecnología. Se consideran dos tipos de MOOC: unos los organizados por Siemens y Downes (cMOOC) y otros los desarrollados en lugares como Stanford, con muchos estudiantes y loables objetivos (xMOOC); estos tienen también sus debilidades. Aunque han sido recibidos con altas expectativas, también han encontrado una fuerte oposición que está aumentando con el tiempo, lo que nos permite estudiar este fenómeno en profundidad. Aunque todavía hay pocas investigaciones empíricas sobre los efectos de los MOOC en el aprendizaje, este estudio trata de arrojar luz sobre el tema desde un punto de vista teórico. En primer lugar exploraremos las expectativas positivas y negativas generadas. Los MOOC pueden constituir una buena propuesta a gran escala, lo que sólo es posible para unas pocas grandes instituciones. No hay estudio de mercado, ni modelo de negocio, ni investigaciones empíricas que permitan confirmar los anuncios de sus efectos positivos. Revisaremos las teorías del aprendizaje recientes y clásicas respecto a su capacidad para explicar el proceso de aprendizaje y compararemos los cursos en línea tradicionales, los xMOOC y los cMOOC en relación a su potencial para apoyar el aprendizaje y su auto-regulación.

KEYWORDS | PALABRAS CLAVE

Connectivism, learning theories, elearning, MOOC, cMOOC, xMOOC, SRL, ODL.

Conectivismo, teorías del aprendizaje, elearning, MOOC, cMOOC, xMOOC, aprendizaje autorregulado, EAD.

1. Introduction

Massive Open Online Courses (MOOCs) in Higher Education have received a great deal of attention during recent years (Karsenti, 2013). Udacity, Coursera and EdX, the main providers of MOOCs in the US, are adding universities as partners at a breathtaking speed; the same is true, although to a lesser extent, for MOOC providers in Europe. OpenupEd, for instance, a pan-European initiative founded in 2013 and supported by the European Commission, is offering courses from a number of European and even non-European higher education institutions. Also, a number of national institutions in Europe have started to offer MOOCs (European Commission, 2014).

Despite public enthusiasm concerning MOOCs, participants in MOOCs seem to meet with serious problems leading to enormous dropout rates. A recent study showed that only 4% of students attending Coursera MOOCs completed their courses (Armstrong, 2014). One of the problems may be that many courses were created without taking into consideration findings of research in the fields of learning and self-regulated learning. In the present article we will therefore first explore the positive and negative expectations that have accompanied the rapid spread of MOOCs.

While other recent works are based on a bibliography review (Hew & Cheung, 2014) or on empirical analysis (Gillani & Eynon, 2014), this study is centred on a reflection on the capabilities of MOOCs from a learning theory point of view. Our aim is to analyse how the contributions from learning theories are being reflected in MOOCs.

2. Background

2.1. Understanding MOOCs: historical key elements

When Stephen Downes and George Siemens attended the Desire21Learn conference, tired of discussing connectivism applications, they wondered whether best way to understand how online learning worked was to participate in online learning (Siemens, 2012a). They therefore designed their first open online course CCK08 «Connectivism and Connective Knowledge». 2300 students signed up, and Dave Cormier and Bryan Alexander therefore called it a «massive open online course» or MOOC (Siemens, 2012b).

However, this was not the first MOOC in history. As Siemens (2012a) indicated, courses of this type had already been offered in 2007 by Alec Couros and David Wiley. Also, similar concepts can be found in studies on open universities, open learning and distance education.

It could be claimed the first MOOC appeared in 1922 (Bartolomé, 2013). The University of New York started its radio courses which were open and massive, and soon universities like Columbia, Harvard, Kansas State, Ohio State, NYU, Purdue, Rufts and many others followed suit. However, these were not courses in the form that Downes and Siemens suggested, but courses more in line with courses that are offered today by Standord, Coursera and similar institutions.

At the moment, two types of MOOCs may be distinguished (Lugton, 2012; Adell, 2013). Quinn (2012) talks about the type of MOOCs which were organized by Siemens, Downes and their «co-conspirators» and which are based on Siemens' ideas of connectivism. On the other hand, there are xMOOCs or simply MOOCs which are based to a large degree on traditional methods of distance education. Some include opportunities for collaboration in discussion forums and peer-based evaluation, a system that was implemented by Coursera.

There are additional criteria to distinguish between different types of MOOCs. Lane (2012) suggested the following classification:

- MOOCs which are based in a network, such as cMOOCs.
- MOOCs which focus on the problems to be solved, such as his own and those of Jim Groom.
- MOOCs focusing on content, such as EdX, Coursera and Udacity.

This is somewhat reminiscent of the classification that was offered by Moodle to design courses using this platform; the distinction is made between themes (content), weekly or Scorm (activities) and social courses (equivalent to cMOOCs).

2.2. Differences between xMOOCs and cMOOCs

It would be wrong to assume that an xMOOC may be converted into a cMOOC simply by introducing activities for collaboration. Siemens (2012a) in his introduction to «MOOC for the win!» makes this point very clear.

He wanted to explore and experiment with new forms of online interaction; the question of whether these new forms might help universities improve their teaching was not of interest to him. He was more interested in offering something in the field of learning and instruction that was similar to what MIT had developed in the OpenCourseware Project.

It was in 2012 that the economic potential of MOOCs was discovered. Cupaiuolo (2012) describes how Thrun arrived at his decision to leave Stanford.

In his course on Artificial Intelligence, 160.000 students from 190 countries were enrolled, while only 200 students were enrolled in the course offered on campus. In addition, the majority of the campus students stopped going to class and continued the course online. Although only a small percentage of students managed to complete the course, in absolute numbers there were still 23.000 successful students.

Some additional data may help to situate MOOCs in the teaching and learning landscape. At the end of 2011, Stanford started its first three MOOCs on computation, and in December of the same year, MIT started MITx (MIT news office, 2011). A month later, Thrun had abandoned Stanford to collaborate with Udacity (Watters, 2012a) which offered his course CS 101: Build a Search Engine (joined by one of the founders of Google). At the same time, Andrew Ng and Daphne Koller created Coursera, and in April 2012, the universities of Princeton, Penn, Michigan, Stanford and the University of California at Berkeley joined Coursera (Kowlich, 2012).

It soon became known that large amounts of money were being invested in the MOOC business. In May 2012, EdX was founded by MIT and Harvard with a contribution of some 30 million dollars by each institution (Watters, 2012b). A month later, Pearson joined Udacity (Udacity, 2012) and in October it was announced that an additional 15 million dollars had been invested. Also in 2012, Banco Santander and Universia in Spain launched MiriadaX, the biggest platform in the Spanish language. However, according to Sangrà (2013) there is no Spanish university among the universities which intend to control the international market, these being Oxford, Cambridge, MIT, Harvard, Stanford, Princeton and Pearson, Google and Walmart.

3. Problems

It seems to us that there are some problems which are genuinely related to MOOCs and which have to do with their creation and maintenance as well as with their acceptance and use.

3.1. Courses or resources

The 1980s and 1990s may be characterized as the time of computer-based instruction (CBI or similar variants like CAI, CAL, and CBL). In spite of the large amounts of funding these projects received, none of these survived long enough to justify the economic investments. In 1994, Philip Barker (personal communication) pointed out traditional classes were less expensive than computer-based courses. Reasons for this were the low rate of re-utilization and the high costs of keeping them updated. In some cases, it was

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not possible to update the course for the simple reason that the people who had participated in its creation were no longer available. This is therefore one of the major problems: to update a complete course is much more expensive than to change smaller units. At the same time, a complete course will need more year-to-year updating.

This problem exists independent of the course, be this open and free or closed and with fees, online or face-to-face. In 2006, the first author was invited by DUOC in Chile as a consultant. One problem he encountered was that material that was created for a course by one lecturer was not used by the others. This constitutes another problem: it is rather unlikely, at least in some cultures that lecturers are willing to integrate learning material in their teaching that was created by a colleague.

The idea of working with educational resources

that can be re-utilized is as old as the computer. As Gibbons and Ot (2002: 28) wrote, «it is possible to create small curricular units which can be combined in different ways to fit different students». Hodgins (2002) suggested the metaphor of Lego building blocks. No matter to which author or definition of learning objects or visions of learning resources we refer, what they all have in common is the modularity of the resources which makes it possible to integrate them in programs which suit different lecturers and different students. Due to their small size, it is also easier to update or replace them.

Taking all this into consideration, it simply does not seem to be a good idea to design complete courses although this may work out in certain circumstances. If there are some hundred millions of dollars which are available for the creation of a course and if there is a large number of students who will take the course, there is no doubt that it will be possible to develop a course of high quality. However, only the most affluent institutions will be able to do so. In other words, MOOCs might constitute a good solution if they can really be scaled up, and this will only be possible for a few big institutions. In times of austerity, this will be almost impossible. Rather, as in other realms of our lives, a reaction to the contrary can be observed; in the food sector, for example, there is a tendency towards «local consumption».

A similar tendency can be seen in regard to MOOCs. Oremos (2013), for instance, talks about SPOCs, «small private online courses», an idea which was suggested by Armando Fox (Fox, 2013). However, the term does not refer to MOOCs for a few, but rather to a new business model. This is clearly explained by Agarwal, president of EdX: «You create a course and then license it to a university or an organization or corporation» (Goral, 2013). As Oremus points out, something similar may happen in the context of a model of a «flipped classroom», or, to generalize this idea, in the context of any model. What we have then is educational material elaborated by tutors and lecturers that can be sold to institutions, companies or even individuals.

What is different is that the material is being sold in the form of courses. This, however, does not solve the first problem we mentioned: difficulties and costs of updating the material. Evidently, this is not a problem in large-scale economies; SPOCs may be sold to any client who is able to cope with the production costs. But then the second problem still remains: will a university lecturer accept the specific selection of contents and modes of presentation as a whole, or will he

prefer to pick some material from different sources and keep this in a space of his own?

Of course, the academic culture of the institution also matters. In recent years, the economic situation in Spain, together with the fact that the mean age of university lecturers has increased, has led to an increase in young lecturers, with short-term contracts resulting in a low level of dedication due to the fact that the teaching job has to be reconciled with other activities. This has limited the role of professors to almost exclusively being the tutor, with little room to design a curriculum or to develop their own material.

3.2. Economic analysis

To return to SPOCs: what we find is not a new proposal or the exploration of new teaching solutions, as Fox maintains, but a new business model which aims at increasing returns. Put bluntly, it is about making money. In a recent study of a MOOC offered by the University of Pennsylvania (Alcorn et al., 2014), 35,000 students who had completed at least one lesson were asked how much they were willing to pay for the course. The results obtained are shown in table 1.

Table 1: Percentages of students willing to pay a specific fee for attending a MOOC

Willing to pay US \$	1	5	10	25	100
Percentage	64	49	44	34	18

The data show that offering MOOCs might represent good business. However, other results from this study are really disheartening: women, jobless people, people from the third world, students without a higher education degree and people older than fifty-one are clearly underrepresented in MOOCs.

In the case of women, the ratio of 55 to 45 in favour of men in the higher education sector in the industrialised countries turns into 65 to 35 when it comes to register for MOOCs. Only 6 % of the students enrolled in MOOCs in the United States are without work. 86 % of the US students who are enrolled in MOOCs have already completed studies in Higher Education while the mean percentage for this in the general population is 32 %. This difference turns into a real divide when we look at MOOC participation in the BRIC countries (79 % versus 5 %) or in developing countries (79 % versus 6 %). This means that MOOCs particularly offer an opportunity for those who already obtain Higher Education degrees. Possibly, the factor that most courses are offered in English plays a role, but this has not been clarified as yet. We agree with Alcorn & al. (2014) that as far as

MOOCs are concerned, at present there is no market study, no business model and no empirical investigation which would uphold the claims that have been made concerning their positive effects.

In the following section, we would like to review theories of learning and of self-regulated learning in order to be able to assess MOOCs with respect to their learning theoretical foundations.

4. Methodology

To allow for a solid reflection on how MOOCs have incorporated learning theoretical aspects, the authors organized a focus group with a collective discussion on MOOCs that developed in two steps. In the first phase, specific learning theories were selected. Also, special attention was given to theoretical approaches to self-regulated learning. In a second step, the concepts of cMOOCs and xMOOCs were reviewed with respect to their potential for incorporating elements from theoretical approaches to learning and self-regulated learning.

4.1. Learning theoretical foundations of MOOCs

In his first presentation of the concept of connectivism, Siemens referred to Driscoll (2000) who defined learning as «a persisting change in human performance or performance potential... [which] must come about as a result of the learner's experience and interaction with the world» (Driscoll, 2000: 11). This definition is quite valuable because it makes a distinction between performance and performance potential thus allowing to distinguish between overt and observable behaviour on the one hand and competences as performance potential for which overt behaviour may be an indicator on the other. At the same time, it seems wide enough to include different approaches to learning. While behaviourist theories of learning focus on observable behaviour, other approaches to learning assume that learning is related to processes that are not directly observable (cognitive and constructivist theories, connectivism).

It would, however, be unwise to completely discard behaviourist theories. Classical conditioning

explains how a formerly neutral stimulus acquires the capacity to elicit an emotional response (Watson, 1913) and there is an increasing acknowledgement of the fact that emotions do play a role in learning. Also, Skinner showed that his theory of operant conditioning lent itself as a basis to develop teaching machines and was also able to explain language acquisition (Skinner, 1957; 1958).

Approaches to learning were also developed in the field of cognitive psychology. The problem with the cognitive approach is, however, that the individual is portrayed as an information processing system, a system without emotions and without the capacity to be

MOOCs are a specific type of online courses. We doubt that making them massive provides any added value, either from the point of view of education, nor from the point of view of psychology. Nonetheless, they constitute a form of virtual TELEs that needs to be studied in a differentiated manner. At the same time, it might be worthwhile to consider alternative forms of online courses, like Small Private Online Courses (SPOCs). One alternative that seems promising to us would be SCOOCs – Small Connectivist Open Online Courses.

conscious of itself. Piaget's theory focuses on cognitive structures and activities, but is not completely oblivious of emotions and consciousness (Piaget, 1947). While in the course of a child's cognitive development, cognitive activities (thinking) turn into operations by acquiring a specific formal structure, children –and adults– also develop structures of content (schemata) in which their knowledge about the world is represented. Knowledge is therefore constructed individually, although there is no doubt that knowledge construction is also a social process.

Recent progress in neuroscience has greatly improved our understanding of human beings and how they learn. Findings from neuroscience show that individual learning is a very complex activity, involving emotional as well as cognitive processes. According to Damasio (1994: 2003), all our cognitive activities are

accompanied by body feelings (somatic marker hypothesis). On the basis of findings in neuroscience, Caine & Caine (1991) suggested 12 principles of brain-based learning.

The most recent ideas on learning were proposed by Siemens. Siemens (2005) introduced the concept of connectivism as a learning theory for the digital age. Basically, his idea is that learning takes place in a community of individuals interested in a specific topic. His works on learning (Siemens, 2005) and knowledge (Siemens, 2006) are certainly some of the most interesting contributions on these topics. Although Siemens suggests connectivism to be a learning theory for the digital age, it may be doubted that is a learning theory. According to Verhagen (2006) it is more of a pedagogical view than a learning theory. Duke, Harper & Johnston (2013) in their critical analysis of Siemens' approach come to the conclusion that connectivism as described by Siemens is «a tool to be used in the learning process for instruction or curriculum rather than a standalone learning theory» (Duke, Harper & Johnston, 2013: 10).

What Siemens is describing is actually a community of people interested in a specific subject. This is reminiscent of ideas other authors have proposed. Ivan Illich (1972), for example, suggested that schools should be abandoned and in their place, knowledge centres should be established. Although schools will probably never be abandoned, the Internet may be viewed as one big knowledge centre. The idea of a community of practice had also been proposed by Lave & Wenger (1991; Wenger, 1998).

In his publication «Knowing knowledge» (Siemens, 2006), Siemens states «Learning is the process of creating networks. Nodes are external entities which we can use to form a network. Or nodes may be people, organizations, libraries, web sites, books, journals, database, or any other source of information. The act of learning (things become a bit tricky here) is one of creating an external network of nodes – where we connect and form information and knowledge sources. The learning that happens in our heads is an internal network (neural) (Siemens, 2006: 29).

From our point of view, learning may certainly be described as the formation and strengthening of neural networks, although the neural activities that go on while somebody is learning are much more complex. The external entities –the sources of knowledge– to which we connect in

order to increase our knowledge are indispensable for learning and may therefore be considered to be part of the learning process.

4.2. Self-regulated learning

Presently, we are observing a gradual shift from teacher-oriented learning to student-oriented learning. In the Bucharest Communiqué which was signed by ministers of 47 European countries in the context of the implementation of the European Higher Education Area (EHEA), it is stated: «We reiterate our commitment to promote student-centred learning in higher education, characterised by innovative methods of teaching that involve students as active participants in their own learning» (EHEA Ministerial Conference, 2012: 2). The advent of MOOCs seems to have come just in time to turn these political ambitions into reality. Self-regulated learning has been listed as one of the key competences for lifelong learning (European Council, 2006).

Models of self-regulation have also been applied to education (see Boekaerts et al., 2000). Although several models have been proposed for self-regulated learning, probably the best known is the one by Zimmerman (2000) who assumes that self-regulated learning takes place in cycles of: 1) forethought, 2) execution and volitional control and 3) self-reflection. It is also recognised, however, that self-regulation addresses not only cognitive activities. Emotional, motivational and behavioural activities in the learning process are also subject to self-regulation. According to Zeidner et al. (2000), self-regulation involves «cognitive, affective, motivational and behavioural components that provide the individual with the capacity to adjust his or her actions and goals to achieve the desired results in light of changing environmental conditions» (Zeidner & al., 2000: 751).

While some learners may have acquired good strategies for self-regulating their learning, others may still be in need to improve these. The development of SRL skills needs scaffolded practice and subsequent fading of the guidance (Beishuizen & Steffens, 2011; Azevedo & Hadwin, 2005).

Table 2: Macro-level phases of learning in different learning theories

	Behaviourism	Cognitivism	Constructivism	Neuroscience	Connectivism
Explore	+	+	+	+	+
Understand			+	+	+
Practice		+	+	+	+
Transfer		+	+	+	+
Self-regulate		?	+	+	+

4.3. A process model of learning

Theories of learning tend to focus on relatively short learning activities. Learning may, however, involve activities that last for a much longer period of time. Learning to walk, learning to speak, learning a second language, learning to play a musical instrument all require longer learning periods. After all, today we are speaking of lifelong learning. However, even if we speak of extended learning periods, these may be broken up into smaller periods at the macro level. We therefore think that long time learning is achieved in cycles of macro level phases of:

- 1) Exploring a specific domain.
- 2) Understanding the domain.
- 3) Practice and rehearsal of domain-relevant skills.
- 4) Application of the acquired knowledge and skills to other domains.

We have tried to assess the learning theories which we referred to in the beginning with respect to the question to what degree they explicitly consider these macro-level phases of learning (table 2).

5. Discussion

When we talk about technology enhanced learning environments (TELEs), we are not only talking about technology. Technology provides digital media which may facilitate learning, but learning is the activity of an individual which in most cases is taking place in a social context (although this may be virtual) involving peers and a teacher or tutor.

Although it is difficult to compare traditional online courses with xMOOCs and cMOOCs, there seem to be some characteristics which allow us to describe differences between the three forms of TELEs. We believe that it is important that TELEs support learning in the four macro level phases of learning which we introduced above (explore, understand, practice and transfer). As far as self-regulation of learning is concerned, we believe that TELEs, particularly if they come in the form of online courses, require a greater competence of self-regulation than traditional face-to-face learning environments. We also believe that cMOOCs support self-regulated learning to a greater extent than other forms of online-based TELEs because we conceive of cMOOCs as communities of learners whose members support each other in exploring and learning about the domain in question.

From our point of view, interaction with learning objects, peers and tutors is also important. In fact, in one of our research projects on self-regulated learning in TELEs (Steffens, 2006; Bartolomé & Steffens, 2006), we discovered that teachers/tutors do matter.

In this project, we evaluated TELEs with respect to their potential to foster self-regulated learning. We categorised the TELEs into three different kinds of TELEs: (1) container systems with tutor, (2) content systems with tutors and (3) content systems without tutor.

Container systems with tutors were TELEs in universities in which students created content with the assistance of a tutor, using digital technologies (digital portfolios, digital videos, learning management systems, blogs). In the content systems with tutors, content was already provided and was being studied in blended-learning courses. Content systems without tutors involved computer programs or online application, which could be studied individually by students, with little or no interactivity with fellow students and coaches. It seems to us that there is some similarity between container systems with tutors and cMOOCs because in both cases, the creation of content and new knowledge is important. Traditional online courses seem more like content systems with tutors because in both kinds of learning environments, content is already provided and is being studied with a teacher or tutor as coach. xMOOCs seem to resemble most content systems without tutors because they usually provide little interaction with peers and tutors.

In our study of TELEs, we found that container systems with tutors were evaluated highest with respect to their capacity to foster self-regulated learning; this was true for self-regulated learning in general as well as for the cognitive, emotional, motivational and social component of self-regulated learning. While the other kinds of TELEs received lower ratings, the content systems with tutors still received good ratings for fostering the emotional and social component of self-regulated learning, while the content system without tutor did well with respect to fostering the cognitive and motivational component of self-regulated learning.

Of course, the TELEs we studied were not MOOCs, but we think it is possible to extrapolate our findings to these kinds of TELEs. On the basis of our knowledge, we have tried to evaluate the concepts of traditional online courses (OCs), xMOOCs and cMOOCs with respect to their potential to support learning in the four macro-level learning phases that we introduced and to foster self-regulated learning. We also assessed their affordances with respect to interaction with learning objects, peers and tutors. Finally, we considered the aspects of formal evaluation and accreditation important. While this seems to be a problem with xMOOCs, it is not relevant for cMOOCs because participants in cMOOCs seem to

Table 3: Assessing the potential of online courses

Facilitate	OC	xMOOC	cMOOC
Exploration	+	+	+
Understanding			+
Practice			
Transfer			
Self-regulation			+
Interact with objects			+
Interact with tutors			+
Interact with peers			+
Formal evaluation	+		
Formal accreditation	+		

be primarily interested in learning, rather than in evaluation or accreditation. Our opinions are documented in table 3.

Online courses, xMOOCs and cMOOCs constitute different types of virtual TELEs. In table 3, we indicated which characteristics each type of virtual TELE is likely to possess. These are therefore characteristics which we consider to be typical of each virtual TELE. For some characteristics, it was difficult to decide whether they are typical of the specific TELE. Any virtual TELE might foster interaction with peers, for instance, but there are probably many virtual TELEs which do not provide this opportunity, while it is a typical characteristic of cMOOCs to support interaction with peers, in fact, this is one of the defining characteristics of this type of virtual TELE. Table 3 also documents our belief that cMOOCs have a greater potential to foster learning and its self-regulation than xMOOCs because they foresee a much higher degree of interactivity with learning objects, peers and tutors. cMOOCs constitute virtual learning environments in which participants are active in acquiring, sharing and creating knowledge while xMOOCs focus on delivering knowledge only.

Characteristics that clearly distinguish traditional online courses from xMOOCs and cMOOCs are the large number of enrolled students and the degree of openness. We do not see any value in massive courses; there are no pedagogical or psychological reasons why a course with 100.000 students should foster learning better than a course with 100 students. And while it is desirable to have open online courses, it is questionable whether MOOCs are really open. Participation in MOOCs may be free of charge, but evaluation and accreditation in general is not. Also, as we

explained in the first part of our paper, MOOCs seem to be more open to individuals who already possess a university degree than to other individuals.

MOOCs are a specific type of online courses. We doubt that making them massive provides any added value, either from the point of view of education, nor from the point of view of psychology. Nonetheless, they constitute a form of virtual TELEs that needs to be studied in a differentiated manner. At the same time, it might be worthwhile to consider alternative forms of online courses, like Small Private Online Courses (SPOCs, Fox, 2013). One alternative that seems promising to us would be SCOOCs – Small Connectivist Open Online Courses.

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Academic Plagiarism among Secondary and High School Students: Differences in Gender and Procrastination

Plagio académico entre alumnado de secundaria y bachillerato: Diferencias en cuanto al género y la procrastinación

-  Dr. Jaume Sureda-Negre is Professor in the Faculty of Education at the University of the Balearic Islands (Spain) (sureda.negre@gmail.com).
-  Dr. Rubén Comas-Forgas is Associated Professor in the Faculty of Education at the University of the Balearic Islands (Spain) (rubencomas@uib.es).
-  Dr. Miquel F. Oliver-Trobat is Lecturer in the Faculty of Education at the University of the Balearic Islands (Spain) (m.oliver@uib.es).

ABSTRACT

This paper analyses the phenomenon of academic plagiarism among students enrolled in Secondary Education and High School. It is a subject poorly studied at pre-university level and very scantily discussed in the Spanish-speaking context. It investigates the frequency of committing plagiarism and the relationship between gender and procrastination and such practices. A questionnaire was administered to a representative sample ($n=2,794$). The results show that plagiarism is certainly present and widespread in the secondary classrooms. Furthermore, it shows that men have significantly higher levels of perpetration than women and than students who tend to leave the tasks until the last moment are more likely to plagiarize. The fruits of this research suggest the need to take into serious consideration the magnitude and severity of the problem identified; secondary schools should urgently plan and undertake measures in order to reduce and prevent the commission of this type of academic fraud. Secondly, results are useful to give clear guidance to teachers about the need for them to follow up and apply an effective control of the writing process of academic essays and tasks by students. Improving IT and library competences of the students has been identified as one of the main strategies needed to effectively address the problem.

RESUMEN

En este trabajo se analiza el fenómeno del plagio académico entre el alumnado de Educación Secundaria Obligatoria y Bachillerato. Se trata de un tema poco estudiado en los niveles preuniversitarios y muy escasamente tratado en el contexto hispanohablante. Se investiga la prevalencia de este fenómeno así como su relación con el género y la procrastinación. Los datos fueron obtenidos mediante la administración de un cuestionario a una muestra representativa ($n=2.794$). Los resultados del estudio muestran que las prácticas constitutivas de plagio están ampliamente extendidas en las aulas de los ciclos educativos medios. Además, se demuestra que los varones presentan niveles de perpetración significativamente superiores a los de las mujeres y que el alumnado que tiende a dejar los trabajos hasta el último momento tiene mayor propensión a cometer plagio. Los frutos de esta investigación sugieren la necesidad de tomar en seria consideración la magnitud y severidad del problema detectado. Los centros de educación secundaria deben proyectar y acometer de manera perentoria medidas en aras de reducir y prevenir la comisión de este tipo de fraudes académicos. Los resultados también hacen recomendable que los docentes hagan un seguimiento y un control efectivo del proceso de elaboración de los trabajos académicos. La mejora de las competencias informacionales del alumnado es señalada como una de las estrategias necesarias para encarar eficazmente el problema.

KEYWORDS | PALABRAS CLAVE

Ethics, secondary education, high school, academic integrity, academic plagiarism, information skills, assessment, school culture. Ética, educación secundaria, bachillerato, integridad académica, plagio académico, competencias informacionales, evaluación, cultura escolar.

1. Introduction

This study addresses the phenomenon of academic plagiarism among students in compulsory secondary education (CSE) and high school. Academic integrity –a value that is undermined by such activities as cheating in exams and plagiarising– is of paramount importance for any education system aiming to educate upright, honest people. The value of integrity is unlikely to be incorporated into the students' axiological scale if school practices suffer from discord between what is preached –we will not find any education institution that defends corruption and deceit in its discourse– and what is done. We will find, as Morey, Comas, Sureda, Samioti and Amengual (2012) suggest, few schools in our country with a clear policy of containment and disapproval of dishonest practices. Incidentally, these practices are not limited to merely copying and plagiarising. In this regard, it is worth recalling the great influence exerted by the hidden curriculum in school practice and the need for coherence between what is proposed and what is practised. The need for the creation of a «culture of honesty and integrity» (Lathrop & Foss, 2005) in schools seems ever more pressing.

Plagiarising, copying, deceiving and cheating in exams are practices that have always been present in the classroom. However, it is in the last few years, due in part to the development and expansion of the Internet, that the phenomenon has taken on a new, greater, more worrying dimension (Comas & Sureda, 2010). Some bibliometric indicators clearly show that interest in the issue has grown considerably in recent years. If we restrict ourselves to the articles indexed in the SCOPUS database, we find that 38 academic articles were published in the period 1999-2003 (7.6 articles per year), 171 in 2004-2008 (34.2 articles per year) and 308 in 2009-2013 (61.6 articles per year). Considering the studies indexed in the academic search engine Google Scholar, we find 68 resources in 1999-2003 (13.6 articles per year), 232 in 2004-2008 (46.4 articles per year) and 525 in 2009-2013 (105 articles per year)¹.

Despite the number of studies carried out, there is no shortage of research gaps. In this regard, the low interest aroused by this issue in secondary education is striking: the vast majority of studies conducted on plagiarism have focused on university settings, as if lower education levels were immune to this phenomenon (Comas, 2009). However, aside from the paucity of studies conducted, there are solid arguments to justify the need to set our sights on this level of education. The fact is that, as Comas (2009) demonstrated by

analysing plagiarism among university students, the roots of this phenomenon stretch down to lower levels of the education system: students do not spontaneously begin to develop plagiarising practices when they reach university. Furthermore, the convenience of researching what happens in secondary and high school in relation to academic plagiarism has been implicitly noted by all of those who advocate that information literacy should form part of the core of school curricula (Julien & Barker, 2009; Williamson & McGregor, 2011). The fact is that plagiarising practices, in addition to undermining academic integrity, reveal a lack of information skills by students as far as the use and ethical and legal communication of information is concerned (Morey, 2011).

Having shown not only the pertinence but also the convenience of studying the issue of plagiarism at pre-university levels, we now describe, albeit briefly, some of the main contributions of the few studies existing on the matter.

Research on academic plagiarism among secondary school students –as in the case of that on plagiarism among university students– has focused on the analysis of the prevalence and extent of the phenomenon and on identifying the explanatory factors for this fraudulent practice (Comas, Sureda, Angulo & Mut, 2011). In 1986, before the use of the Internet became widespread, Dant (1986) showed that up to 50.7% of secondary school students surveyed (albeit in a very small sample of only 309 students from one school) claimed to have copied from encyclopaedias when completing academic assignments. Years later, when the Internet was beginning to receive widespread use, McCabe (2005, cited in Sisti, 2007), with data from more than 18,000 students from 61 US schools, noted that up to 60% of students admitted carrying out some form of plagiarism when drafting and presenting academic assignments. McCabe observed that secondary schools 'are facing a significant problem'. Subsequent studies (Sisti, 2007; Sureda, Comas, Morey, Mut & Gili, 2010; Bacha, Bahous & Nabhani, 2012; Morey, Sureda, Oliver & Comas, 2013) have gauged the magnitude of the problem by showing that, in fact, plagiarism in pre-university education is by no means a trivial issue.

Regarding the causes or factors involved in academic plagiarism, attention has focused on different aspects (Comas & Sureda, 2010): students' personal factors (academic performance, procrastination, gender, motivation, etc.), institutional factors (the existence of academic regulations that address the issue of plagiarism, the ethical culture of the education centre,

the existence and use of detection programmes, etc.), factors linked to teaching (types of assignments that are given, number of assignments given, follow-up on assignments by the teacher, etc.) and factors outside education practice (levels of political corruption, crisis in the system of values, etc.).

In addition to describing and quantifying the practices of plagiarism committed by students in secondary and high school, the present proposal addresses the relationship between these practices and various personal characteristics (gender and procrastination). With respect to the relationship between gender and academic plagiarism, there is a high level of unanimity in the doctrinal corpus regarding the greater prevalence in committing plagiarism among male university students (Athanasou & Olasehinde, 2002; Straw, 2002; Lin & Wen, 2007; Comas, 2009; Brunell, Staats, Barden & Hub, 2011). If we focus on secondary students, this relationship has been very little studied, and the few existing studies suggest the same trend, that is, a higher frequency in the commission of academic plagiarism among men than among women (Schab, 1969; Cizek, 1999). Concerning the academic procrastination factor, understood as the act, voluntary or involuntary, of putting off and delaying certain programmed actions (Klassen & Rajani, 2008), Roig and DeTomaso (1995) reported significant relationships among the following factors for university students: the higher the level of postponement in assignments, the higher the likelihood of perpetration of academic plagiarism. Similar results were obtained by Daly and Horgan (2007) in a study on the profile of university students with the greatest propensity to commit academic plagiarism. Finally, in our country, the contribution of Clariana, Gotzens, Badia and Cladellas (2012) is notable. Using a small sample, they analysed the relationship between plagiarism and procrastination among pre-university students, concluding that there is a moderate, positive correlation between both variables.

The research questions (CI) we aim to answer with this proposal are

- CI1: What is the prevalence of academic plagia-

rism and cyberplagiarism among students in secondary and high school?

- CI1.1: Are there significant differences regarding the frequency of academic plagiarism and cyberplagiarism among these students?
- C.1.2: Are there significant differences in terms of the frequency of academic plagiarism among these students according to gender?
- CI2: Are academic plagiarism and cyberplagiarism related to procrastination?
- CI2.1: Are there significant differences in the

Plagiarising, copying, deceiving and cheating in exams are practices that have always been present in the classroom. However, it is in the last few years, due in part to the development and expansion of the Internet, that the phenomenon has taken on a new, greater, more worrying dimension (Comas & Sureda, 2010). Some bibliometric indicators clearly show that interest in the issue has grown considerably in recent years.

relationship between procrastination and academic plagiarism and cyberplagiarism among these students?

2. Material and methods

2.1. Population and sample

In total, 1,503 students in second-, third- and fourth-year CSE² participated in this study (compulsory education in Spain, with a student mean age of between 13 and 16 years), as did 1,291 first- and second-year high school (baccalaureate) students (post-compulsory education in Spain, with mean ages from 16 to 18 years) in the Balearic Islands. The representativeness of this sample is within a margin of error, calculated for the geographical area of this community, of $\pm 1.7\%$ ³ for an estimated confidence interval of 95% under the most unfavourable condition of $p=q=0.50$. The stratified random sampling was used, considering: a) the three years of CSE and the two years of high school, b) the island of residence (Mallorca, Menorca and Ibiza-Formentera) and c) the ownership of the schools (public and private/government-sponsored).

The fieldwork was conducted by three interviewers previously instructed on how to administer the instrument to participating students in an individual and anonymous way in classroom situations in the presence of a teacher employed by the school.

Data collection was carried out between February and April 2010 for the high school sample and February and April 2011 for the CSE sample. No student refused to participate in the study. However, although 1,302 and 1,515 student surveys were obtained

from the high school (baccalaureate) students» (for the high school sample), which were expressly designed and based on: a) an analysis of the existing literature on the matter and b) the adaptation of various items in the questionnaires of DeLambert, Ellen and Taylor (2003); Finn and Frone (2004); and Comas (2009). The two questionnaires had 10 questions in common, with the CSE questionnaire being longer (it had three more questions) and derived from the high school (baccalaureate) questionnaire. Once the initial questionnaire had been designed,

a validation phase was initiated through, first, the opinion and contributions of eight external experts (three secondary/high school teachers and five university lecturers and national and international researchers, experts in the issue of academic plagiarism), who commented on its viability as well as possible amendments of items to best reflect the aims and dimensions of the study. Second, this questionnaire was administered to two pilot groups of secondary and high school students (46 subjects from the second and fourth years of CSE and the first year

There are three fronts on which schools ought to act to address academic dishonesty: regulations (all secondary schools should incorporate the issue of fraud in their regulations), the adoption of teaching methodologies adapted to the new requirements stemming from the mass use of ICTs in teaching-learning processes and, finally, a strong boost of students' combined digital and information literacy, stressing the ability to «use information efficiently and ethically».

of baccalaureate) to verify that the students understood the items. Plagiarism incidents that occurred in the classroom during the completion of the pilot survey were recorded. This validation phase resulted in the rephrasing of some of the initially proposed items and the precision of the variables to be analysed. Once the final version had been drawn up, the questionnaire was administered to a second pre-test sample of 59 second-, third- and fourth-year CSE students. The internal consistency of the questionnaire was calculated using Cronbach's Alpha, which ranged between 0.73 and 0.84 for the questions comprising the final version of the instrument and the sample as a whole.

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Concerning the characteristics of the subjects in the sample, 54.9% were female and 45.1% male. Student age varied between 12 and 23 years, with a mean age of 15.6 years (a standard deviation of 2.6) and 15-year-old subjects being the most numerous.

The results that are set forth in the present article focus on the analysis of four of the variables addressed in the questionnaire and the ulterior association between these variables (V1 with V2 and V3):

2.2. Source of data and variables

This study was designed on the basis of a self-reporting questionnaire administered to the participants. This type of questionnaire is the most common among studies on academic integrity and has been shown to offer sufficiently accurate estimates (Cizek, 1999; Comas, 2009; Mut, 2012). For data collection, the following instruments were used: the «Questionnaire on academic plagiarism among CSE students» (for the CSE sample) and the «Questionnaire on academic plagiarism among high school (baccalaureate) students» (for the high school sample).

- V1: Self-reported frequency in the commission of different practices that constitute academic plagiarism and cyberplagiarism.

- V2: Gender.

- V3: Index of procrastination.

V1 is based on the answers given by participants in

the study regarding the perpetration of six actions constituting plagiarism (set out independently) in the academic year prior to the time of administration of the questionnaire, that is, actions that took place during 2008-2009 for high school students and 2009-2010 for CSE students. These practices are:

- Action 1: Submitting an assignment written by another student that had already been submitted in previous years (for the same class or a different class).
- Action 2: Copying fragments of texts from websites and -without citing- pasting them directly in a document -in which part of the text was written by the student- and submitting it as a class assignment.
- Action 3: Downloading an entire assignment from the Internet and submitting it, without modification, as student's own work for a class.
- Action 4: Copying fragments from written sources (books, encyclopaedias, newspapers, journal articles, etc.) and adding them -without citing- as parts of the student's own work for a class.
- Action 5: Drafting an assignment wholly from fragments copied literally from websites (with no part of the assignment having actually been written by the student).
- Action 6: Copying parts of assignments submitted in previous years and using them as sections in a new assignment.

For each action, participating students indicated the frequency at which they had performed this practice from the following five options: «Never», «Between one and two times», «Between three and five times», «Between six and 10 times» or «More than 10 times».

As a gauge of V3, which concerns procrastination, we analysed the data regarding two items related to two subjective-scale questions: participants had to rate their degree of agreement with the following statements (between 1 and 10, where 1 represents «Totally disagree» and 10 «Totally agree»): «When I have to do an assignment, I always leave it until the last day» and «When I have to do an assignment, I get to it right away».

2.3. Data processing

The frequency variable for commission of plagiarism (based on the response of participants to six actions constituting plagiarism) was recoded in another variable (index of committing academic plagiarism) by summing up the answers for each student.

Next, for each of the category variables analysed, the frequency and

percentage was calculated. For the scale variables (index of procrastination), the items were recoded, and an index of procrastination derived from this operation was established by summing the two items used in operationalizing procrastination. Next, to establish potential associations between the index of committing academic plagiarism and the characteristics of students or independent variables (gender and procrastination index), a statistical analysis was conducted using comparison of means obtained through the application of a t-test for independent samples (for the association between the frequency of committing plagiarism and the gender variable) and analysis of variance (ANOVA) (for the association between the frequency of commission of plagiarism and the procrastination index).

All of the analyses were conducted using the statistical package SPSS (version 19.0). The data matrix can be found at <http://dx.doi.org/10.6084/m9.figshare.1066207>.

3. Results

3.1 Self-reported frequency of the commission of different types of academic plagiarism

The most common practices (table 1) are so-called «collage plagiarism» (Comas, 2009), that is, drafting an assignment by copying scattered fragments of text, whether from digital sources or written sources, and including them in an academic assignment without citing their origin. Amongst the least recurrent actions, the most outstanding are downloading a whole assignment from the Internet and submitting it as one's own and presenting an assignment written and already submitted by another student in previous years.

If we analyse the data from the measurements (taking into consideration the values 1 to 5 that correspond to the five possible answers), we are able to establish a ranking in which the actions studied are ordered from most to least frequent (table 2).

Going a little further into the exploitation of the

Table 1. Response frequencies for each of the six actions related to academic plagiarism

Action	Never	Between 1 and 2 times	Between 3 and 5 times	Between 6 and 10 times	More than 10 times
Action 1	77.5%	17.6%	3.1%	1%	0.8%
Action 2	18.7%	36.8%	22.8%	10.1%	11.7%
Action 3	82.8%	12.2%	3.1%	1.1%	0.9%
Action 4	27.5%	39.7%	19.2%	6.9%	6.7%
Action 5	56.4%	26.3%	10.9%	4.9%	4.5%
Action 6	62.7%	26%	7.7%	2.1%	1.5%

Table 2. Mean and standard deviation of the responses for each of the six actions related to academic plagiarism

Ranking	Action	Mean	Standard deviation
1 st	Action 2	2.59	1.23
2 nd	Action 4	2.26	1.13
3 rd	Action 5	1.81	1.10
4 th	Action 6	1.54	0.84
5 th	Action 1	1.30	0.65
6 th	Action 3	1.25	0.64

results, we totalled the answers for the three practices considered to be academic cyberplagiarism (actions 2, 3 and 5) as well as the answers for the three plagiarism practices from written sources (actions 1, 4 and 6). Based on this calculation, we estimated and compared the means of each grouping. The academic cyberplagiarism grouping has a mean response of 5.64 with a standard deviation of 2.25, whereas the set of actions corresponding to the plagiarism of written sources has a mean response of 5.08, lower than that of the first group, with a standard deviation of 1.83.

3.2. Association between the level of academic plagiarism and gender

For each action except number 4 (table 3), men have higher mean perpetration rates than women, with an appreciable significant relationship between the commission of plagiarism and gender in four of the six actions analysed.

The same relationship is found if the analysis is established from the association between gender and the sum of the answers given for the various plagiarism actions studied. Thus, from the t-test for independent samples, we also obtain results that indicate that men engage in academic plagiarism practices significantly more often than women do (\bar{x} Women: 10.39; \bar{x} Men 11.33; $t=-6,040$; $gf=2544$; Bilateral Sig. = <0,000).

3.3. Association between the level of academic plagiarism and level of procrastination

From the data resulting from the association between the students' procrastination index and the sum of the six forms of plagiarism analysed in the present study as well as the individual sums of the practices constituting plagiarism of written sources and typical of cyberplagiarism, a significant direct relationship between both groups of variables can be appreciated: the greater

the tendency to procrastination, the greater the tendency to engage in plagiarism (tables 4 and 5).

Individuals who report greater postponement tendencies have higher mean sums of the six actions analysed in the present study if compared with students who have a lower tendency to leave assignments until the last minute.

4. Discussion and conclusions

The results of the present study show that academic plagiarism is widespread among secondary and high school students, with levels practically identical to those for university education. However, the most recurrent practices for secondary and high school students are those that can be considered the least serious. Indeed, although measuring the severity of misconduct is not at all straightforward, it seems sensible to maintain that the seriousness of drafting an assignment from extracts copied without citing, regardless of the source, combined with parts written by the pupils themselves is less serious than submitting completely plagiarised assignments. These results referring to the prevalence of 'low-intensity' dishonest behaviours are along the same lines as those obtained in other studies in higher education settings. For instance, Comas (2009) reached very similar conclusions in his doctoral dissertation studying Spanish university students. Ferguson (2013) analysed the frequency of commission of 20 different practices undermining academic integrity amongst students from four US university campuses and found that the most widespread practices were those considered less intentional by the participants in the study. Similar conclusions were reported in the doctoral thesis of Tabor (2013), who conducted a qualitative study on US university students. Specifica-

Table 3. Values obtained through a t-test for independent samples for the analysis of relationships between the commission of actions typical of academic plagiarism and gender

Action	Gender	N	\bar{x}	t	gf	Sig. (bilateral)
Action 1	Female	1420	1.26	-4.289	2587	<0.000**
	Male	1169	1.37			
Action 2	Female	1420	2.50	-4.821	2587	<0.000**
	Male	1169	2.74			
Action 3	Female	1420	1.16	-7.040	2587	<0.000**
	Male	1169	1.34			
Action 4	Female	1419	2.30	0.780	2582	0.436
	Male	1165	2.26			
Action 5	Female	1414	1.66	-7.177	2573	<0.000**
	Male	1161	1.97			
Action 6	Female	1417	1.51	-1.785	2581	0.074
	Male	1166	1.57			

N = Number of students in the sample; \bar{x} = mean; t = value obtained for each group; gf = degrees of freedom; Sig. (bilateral) = * Significant at 0.05 (bilateral); ** Significant at 0.01 (bilateral).

Table 4. Means of the sum of rates of plagiarism

Sum of plagiarism			Sum of plagiarism of written sources			Sum of cyberplagiarism		
IP ¹	N	Mean	IP	N	Mean	IP	N	Mean
2	91	9.54	2	92	4.80	2	94	4.74
3	113	9.96	3	113	4.83	3	114	5.11
4	220	9.44	4	224	4.50	4	221	4.92
5	321	9.98	5	327	4.87	5	322	5.12
6	466	10.56	6	470	5.01	6	471	5.56
7	449	10.48	7	450	4.97	7	453	5.51
8	392	11.09	8	397	5.29	8	396	5.80
9	273	11.47	9	273	5.25	9	276	6.25
10	406	12.15	10	408	5.62	10	406	6.52

lly, in Tabor's study, students felt that there are different levels of seriousness in plagiarising practices and that the least serious levels are the most recurrent.

As far as the gender variable is concerned, the results obtained suggest a marked prominence of males over females in regard to committing acts constituting academic plagiarism.

It is worth noting that the data obtained in this study reveal a marked relationship between committing plagiarism and procrastinating or postponement behaviours. This close relationship may have a very simple explanation: students who have a greater tendency to leave tasks to the last minute do not have the time to complete the activity required by the teacher on their own; in this case, drafting the assignment using plagiarism practices is their only option. This fact has clear implications concerning: a) students, as it hints at the need to educate students in better management of time and resources, and b) teachers, as it suggests the need for teachers to conduct an efficient follow up on the assigned tasks. The model of the teacher who sets an assignment and does not follow-up on the task in progress, merely waiting for the submission deadline to correct and grade the assignment, increases the likelihood of students leaving the task until the last minute and thereby engaging in the less-than-honourable act of copying (Comas, 2009). It is therefore advisable that teachers plan and carry out regular check-ups on the tasks to follow up on students' progress rather than simply waiting for the result. The reality of plagiarism in secondary education raises the need to adopt preventative measures and to introduce values of academic integrity and honesty into schools.

Fraud in education, as Moreno (1998) so rightly, in our opinion, argues, is the main non-violent or «white collar» antisocial behaviour at school, and school is the «first field for practices of

fraud and corruption».

Dishonest behaviours are learnt and develop in certain settings and contexts, just like any other manifestation of human behaviour. In this regard, if we ask the question of whether schools encourage and promote the developments of academically honest and ethically relevant behaviours, the answer would not reflect well on schools, above all due to the contradiction between

explicit and implicit discourse, between the formal and hidden curriculum.

There are three fronts on which schools ought to act to address academic dishonesty: regulations (all secondary schools should incorporate the issue of fraud in their regulations), the adoption of teaching methodologies adapted to the new requirements stemming from the mass use of ICTs in teaching-learning processes and, finally, a strong boost of students' combined digital and information literacy (So & Lee, 2014), stressing the ability to «use information efficiently and ethically» (Alexandria Declaration, 2005, cited in Wilson, Grizzle, Tuazon, Akyempong & Cheung, 2011).

Notes

¹ Data obtained from SCOPUS and Google Scholar for a search for the term «academic plagiarism».

² Because the data gathered refer to the behaviours carried out in the academic year prior to the administration of the questionnaire, the collection data corresponding to students in the first year were considered irrelevant, as this would have included information regarding the last year of primary schooling.

³ Based on statistical data for academic year 2011-12 from the Ministry of Education, Culture and Sport (2012), which puts the number of students enrolled in the Balearic Islands in the second, third and fourth years of CSE and the first and second years of baccalaureate at 41,236.

⁴ Index of procrastination.

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Table 5. Means of the sums of commission of plagiarism associated with the procrastination index

Summations	gf	F	Sig.
Plagiarism	8	19.27	<0.000**
Plagiarism of written sources	8	9.63	<0.000**
Cyberplagiarism	8	19.25	<0.000**

gf = degrees of freedom; F = Fischer's distribution; Sig. = *Significant at 0.05; **Significant at 0.01

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Internet Use Habits and Risk Behaviours in Preadolescence

Hábitos de uso y conductas de riesgo en Internet en la preadolescencia

-  Dr. Javier Fernández-Montalvo is Tenured Professor in the Department of Psychology and Pedagogy at the Public University of Navarra (Spain) (fernandez.montalvo@unavarra.es).
-  Dr. Alicia Peñalva is Adjunct Professor in the Department of Psychology and Pedagogy at the Public University of Navarra (Spain) (alicia.penalva@unavarra.es).
-  Dr. Itziar Irazabal is Psychologist and School Counsellor in the Education Department of the Government of Navarra (Spain) (itziarirazabal@hotmail.com).

ABSTRACT

A striking increase in the use of new information and communication technology has come about in recent years. This study analysed the characteristics and habits of Internet use in a sample of pre-adolescents between 10 and 13 years of age, enrolled in the 6th grade of primary school in Navarra (Spain). Likewise, the existence of differential patterns in Internet use by sex was analysed, and risk behaviours were detected. The sample was composed of 364 students (206 boys and 158 girls) who were evaluated at their schools. Information about socio-demographic characteristics, Internet use habits, and online behaviours was collected using a data-gathering tool specifically designed for the study. The results demonstrated high Internet use by the adolescents studied. Girls used the Internet more for social relationships, whereas boys tended to use it differently, including accessing online games. Moreover, some risky behaviours were found, including interactions with strangers, giving out personal information, and sending photos and videos. Likewise, behaviours associated with «cyber-bullying» were detected. These results indicate the necessity of establishing prevention programs for safe and responsible Internet use.

RESUMEN

En los últimos años se ha producido un aumento espectacular del uso de las nuevas tecnologías de la información y de la comunicación. En este estudio se analizaron las características y el patrón del uso de Internet en una muestra de preadolescentes de entre 10 y 13 años, que cursan 6º curso de Educación Primaria en Navarra (España). Asimismo, se analizó la existencia de un perfil diferencial en el uso de Internet en función del sexo y se detectó la existencia de conductas de riesgo. La muestra estaba compuesta por 364 estudiantes (206 chicos y 158 chicas), que fueron evaluados en sus centros educativos. Se recogió información sobre las características sociodemográficas, los hábitos de uso de Internet y los comportamientos desarrollados en la Red a través de un instrumento de recogida de datos diseñado específicamente para la investigación. Los resultados mostraron un uso elevado de Internet por parte de los adolescentes estudiados. Las chicas usaban más Internet para las relaciones sociales, mientras que los chicos tendían a darle otro tipo de usos, como el acceso a juegos online. Además, se encontraron algunas conductas de riesgo, como quedar con desconocidos, dar datos personales o enviar fotos y vídeos. Asimismo, se encontraron comportamientos relacionados con el «ciberbullying». Estos resultados indican la necesidad de establecer programas de prevención para el uso seguro y responsable de Internet.

KEYWORDS | PALABRAS CLAVE

New technology, Internet, social networks, preadolescence, use profile, risk behaviours, cyberbullying, gender.
Nuevas tecnologías, Internet, redes sociales, preadolescencia, patrón de uso, conductas de riesgo, cyberbullying, género.

1. Introduction and background

In recent years, there has been a spectacular increase in the use of information and communication technologies (ICT). The Internet has gone from being a limited tool used by groups of scientists and academics to a resource for the general population and, especially, for young people (Estévez & al., 2009; Gallagher, 2005; Holtz and Appel, 2011; Labrador and Villadangos, 2009). Studies show Internet usage rates of more than 90% in teenagers, primarily for the purpose of online communication – communication in real time through the Internet. (García & al., 2013; Gross & al., 2002; Valkenburg & Peter, 2007; Van-der-Aa & al., 2009).

The dizzying advance of new technologies and their use in families has opened a digital gap between adults and adolescents (Aftab, 2005; Echeburúa & al., 2009; Sureda & al., 2010; Thurlow & McKay, 2003). Children become the experts, whereas many parents lack even the most basic knowledge of new technologies (Mayorgas, 2009). As a result, parents worry when they see how their children develop behaviours associated with ICT that are very different from what they would expect. Parents do not understand why their children spend hours in front of a computer screen or a mobile phone. It is hard for parents to understand that instead of playing with friends outside, their children either close themselves up at home and speak with their friends using instant messengers and cell phones or connect to virtual social networks (Echeburúa & al., 2009).

However, parental concern is not always justified. In many cases, it arises more from the lack of knowledge of ICT than from its incorrect use. Thus, it is essential to establish clear criteria regarding the appropriate use of a computer, along with indicators of its inappropriate use. Alarm signals should sound when the adolescent avoids homework and academic performance suffers, when he or she reacts with anger if interrupted or if time limits are placed on computer use, when meet-ups with friends happen less frequently, or when children give up on their real friendships to spend more time in front of a computer connected to virtual friends (Becoña, 2006; Echeburúa & Requesens, 2012; García-del-Castillo & al., 2008; Mayorgas, 2009; Milani & al., 2009; Van-der-Aa & al., 2009).

Some studies performed by the Spanish NGOs *Protégeles* [Protect them] (2002) and *Foro Generaciones Inter-*

activas [Interactive Generation Forum] (Bringué & Sádaba, 2011) have produced some worrying data on the use of Internet by minors. According to these studies, 18% of minors who access the Internet do so specifically to join sex-related chat rooms, 30% of minors who habitually use the Internet have given out their phone number at some time, 14% have arranged some type of meet-up with a stranger, and 44% of minors have felt sexually harassed (Melamud & al., 2009).

However, there appear to be differences related to Internet use arising out of the factor of gender. Different studies demonstrate that boys primarily access video game pages, whereas girls prefer to use the Internet for online communication through social networks (Gentile & al., 2004; Holtz and Appel, 2011; Jackson, 2008; Rideout & al., 2005). It is important to account for these differences in Internet use because in general, it appears that time spent online has a positive correlation with better academic performance (Jackson & al., 2006; 2008). However, some studies note that time specifically dedicated to online video games is related to both poorer academic results (Jackson & al., 2008) and poorer social and familial relationships (Punamäki & al., 2009). These are preliminary results that require greater research. It is necessary to obtain more precise data on the characteristics of Internet use by adolescents, the type of content that adolescents access, and their real knowledge about aspects of ICT, particularly the Internet.

Accordingly, this study's primary objective is to ascertain the characteristics of Internet use in a sample of preadolescents in the 6th grade of primary school. It attempts to determine the real level of ICT penetration, particularly that of the Internet, in this particular age group. Once an Internet use pattern has been established, more specific objectives include determi-

Table 1. Sample Socio-demographic Characteristics

Variables	Total N=364 Mean (SD)	Boys N=206 Mean (SD)	Girls N=158 Mean (SD)	t
Age	11.00 (0.41)	11.05 (0.41)	10.94 (0.40)	2.71*
Variables	Total N=364 N (%)	Boys N=206 n (%)	Girls N=158 n (%)	X ²
High School				
Public	121 (33.2%)	66 (32%)	55 (34.8%)	0.30
Private	243 (66.8%)	140 (68%)	103 (65.2%)	
Location				
Rural	37 (10.2%)	17 (8.3%)	20 (12.7%)	1.9
Urban	327 (89.8%)	189 (91.7%)	138 (87.3%)	
* p < 0.01				

ning whether there is a different use profile based on gender by comparing results for boys and girls for all variables studied. Another goal is to detect the existence of risk behaviours in the sampled subjects. These data allow an evaluation of whether a real problem exists, along with the need to implement specific prevention programs.

2. Materials and methods

2.1. Participants

The study sample is composed of 364 6th grade primary school students at different schools in Navarra. Specifically, 8 schools (4 public, 4 private) located in urban and rural areas participated. These schools were chosen at random and represent the current situation of the Navarra (Spain) school system. After the schools were selected, all students in the schools' 6th grades participated in the study. The evaluation was performed at the beginning of the school year, between September and October 2011.

The following selection criteria were considered: a) enrolled in the 6th grade; b) aged between 10 and 13; and c) voluntarily participating in the study after parents and teachers were duly informed of its characteristics.

With respect to the sample's socio-demographic characteristics (table 1), the median age of the subjects was 11 (range=10-13). 56.6% of the sample was boys (N=206) and 43.4% were girls (N=158).

2.2. Evaluation measures

To gather the necessary information for this study, we made a list of 142 questions pertaining to 11 areas related to new technologies: introduction of ICT in homes, introduction of Internet in homes, the place held by the Internet in the child's daily life, training (either formal or informal) received in ICT, degree of conceptual digital literacy, degree of procedural digital literacy, degree of attitudinal digital literacy, Internet user profiles, mobile-phone user characteristics, access

Table 2. In-home availability and use of ITC

Variables	N	Total N (%)	Boys N (%)	Girls N (%)	X ²
Computer	364				
Yes		355 (97.5%)	198 (96.1%)	157 (99.4%)	3.91
No		9 (2.5%)	8 (3.9%)	1 (0.6%)	*
More than one computer	364				
Yes		236 (64.8%)	131 (63.6%)	105 (66.5%)	0.32
No		128 (35.2%)	75 (36.4%)	53 (33.5%)	
Knows how to use computer	361				
Yes		355 (98.3%)	199 (98%)	156 (98.7%)	0.27
No		6 (1.7%)	4 (2%)	2 (1.3%)	
Has own computer	364				
Yes		107 (29.4%)	62 (30.1%)	45 (28.5%)	0.11
No		257 (70.6%)	144 (69.9%)	113 (71.5%)	
Cell phone	362				
Yes		214 (59.1%)	122 (59.5%)	92 (58.6%)	0.03
No		148 (40.9%)	83 (40.5%)	77 (41.4%)	
Video game console	361				
Yes		351 (97.2%)	202 (98.5%)	149 (97.2%)	3.0
No		10 (2.8%)	3 (1.5%)	7 (4.5%)	
Has home Internet connection	352				
Yes		328 (93.2%)	184 (92%)	144 (92.7%)	1.01
No		24 (6.8%)	16 (8%)	8 (5.3%)	
Knows how to use the Internet	355				
Yes		345 (97.2%)	198 (97.5%)	147 (96.7%)	0.21
No		10 (2.8%)	5 (2.5%)	5 (3.3%)	
Uses Internet	354				
Yes		336 (94.9%)	191 (95.5%)	145 (94.2%)	0.32
No		18 (5.1%)	9 (4.5%)	9 (5.8%)	

* p < 0.05

to and creation of Internet content, and activities carried out online. In general, the questions called for yes/no answers.

2.3. Procedure

Data collection was performed by two professionals from the research team: an educational psychologist and a teacher, both experienced in this type of issue. After the necessary permissions had been granted by the Government of Navarra to enter the schools, the evaluation was performed in a single session. The two aforementioned professionals were present during the evaluation, along with the teacher in every classroom evaluated.

2.4. Statistical analysis

The statistical analyses have been performed using the SPSS program (version 15.0 for Windows). To determine the sample's characteristics, a descriptive analysis was performed (percentages, medians, and standard deviations). The comparison between

groups was performed using a chi square test in the case of categorical variables and Student's T-test in the case of quantitative variables.

3. Analysis and results

3.1. Availability of new technologies and Internet use

Almost the entire sample has a home computer and knows how to use it. The majority also has a video game console and more than half have a mobile phone. Moreover, an Internet connection and Internet use is present for the majority of the adolescents studied.

With respect to Internet use characteristics, the majority of adolescents in the sample use the Internet at home and (for the most part) alone, without any parental oversight (table 3). Webcam use is observed in one-third of the cases, with significant differences according to sex. Girls use webcams with significantly greater frequency than do boys.

One important figure to note is daily Internet use. The majority of the students surveyed go online every day, and few stop during the weekends, which are a period of heavy Internet use. Accordingly, the use of social networks stands out (Messenger, Facebook, Tuenti, etc.) in spite of the fact that the students are below the legal age to access those networks. When the type of people with whom they communicate using these networks is analysed, there are significant differences between boys and girls. The girls use the Internet more for communication with other people, primarily friends and family. The boys use it significantly less than girls for communicating with other

Table 3. Internet Use Characteristics

Variables	N	Total N=364 N (%)	Boys N=206 N (%)	Girls N=158 N (%)	X ²
Who taught you to use it	355				
Family		292 (82.3%)	172 (86.4%)	120 (76.9%)	6.26
Friends		31 (8.8%)	18 (9.8%)	13 (7.6%)	
Teacher		31 (8.8%)	12 (6.1%)	19 (12.2%)	
Others		15 (4.2%)	11 (5.6%)	4 (2.6%)	
Place of Use					
In my home	357	329 (92.2%)	183 (90.1%)	146 (94.8%)	5.14
At my friend's home	357	79 (22.5%)	36 (17.7%)	43 (27.9%)	
At a family member's home	355	92 (25.9%)	51 (25.2%)	41 (26.8%)	
In a public place	357	64 (17.9%)	30 (14.8%)	23 (14.9%)	
At school	356	52 (14.6%)	23 (11.4%)	29 (18.8%)	
Other	357	30 (8.4%)	24 (11.9%)	17 (11%)	
Most often when using the Internet, you tend to be					
Alone	355	257 (72.4%)	142 (69.6%)	115 (76.2%)	6.56
With my father	356	101 (28.4%)	56 (27.5%)	45 (29.6%)	
With my mother	356	120 (33.7%)	62 (30.4%)	58 (38.2%)	
With friends	356	99 (27.8%)	50 (24.5%)	49 (32.2%)	
With siblings	356	120 (33.7%)	58 (28.4%)	62 (40.8%)	
With a teacher	356	12 (3.4%)	10 (4.9%)	2 (1.3%)	
Webcam use	351				
Never		232 (66.1%)	149 (74.1%)	83 (55.3%)	13.5***
Sometimes		114 (32.5%)	50 (24.9%)	64 (42.7%)	
Always		5 (1.4%)	2 (1%)	3 (2%)	
What do you use it for					
Chatting	347	179 (51.6%)	91 (47.2%)	88 (57.1%)	3.42
Downloading music...	349	131 (37.5%)	68 (35.1%)	63 (40.6%)	1.15
Sharing videos, photos...	349	132 (37.8%)	80 (41.2%)	52 (33.5%)	2.16
Messenger	349	126 (36.1%)	50 (25.8%)	76 (49%)	20.2***
Email	349	156 (44.7%)	69 (35.6%)	87 (56.1%)	14.7***
Other	348	176 (50.6%)	102 (52.6%)	74 (48.1%)	0.70
I don't use the Internet	350	13 (3.7%)	7 (3.6%)	6 (3.8%)	0.01
Daily use time on weekdays	331				
Less than an hour		164 (49.5%)	89 (48.4%)	75 (51%)	1.19
Between 1 and 2 hours		66 (19.9%)	36 (19.6%)	30 (20.4%)	
More than 2 hours		5 (1.5%)	2 (1.1%)	3 (2%)	
I don't use the Internet on weekdays		96 (29%)	57 (31.6%)	39 (26.5%)	
Daily use time on weekends	347				
Less than an hour		145 (41.8%)	81 (41.3%)	64 (42.4%)	1.12
Between 1 and 2 hours		118 (34%)	67 (34.2%)	51 (33.8%)	
More than 2 hours		53 (15.3%)	28 (14.3%)	25 (16.6%)	
I don't use the Internet on weekends		31 (8.9%)	20 (10.2%)	11 (7.3%)	
Use of social networks	353	211 (59.8%)	115 (57.8%)	96 (62.3%)	0.74
What social network do you use					
Messenger/Skype	246	127 (51.6%)	68 (50.7%)	59 (52.7%)	0.09
Facebook	248	64 (25.8%)	36 (26.7%)	28 (24.8%)	0.11
Twitter	247	13 (5.3%)	6 (4.5%)	7 (6.2%)	0.36
My Space	248	8 (3.2%)	3 (2.2%)	5 (4.4%)	0.95
Tuenti	248	154 (62.1%)	84 (62.2%)	70 (61.9%)	0.002
LinkedIn	248	2 (0.8%)	1 (0.7%)	1 (0.9%)	0.01
With whom do you tend to communicate most often					
Virtual friends who I know face to face	333	81 (24.3%)	39 (21.2%)	42 (28.2%)	2.18
Virtual friends who I don't know face to face					
	333	37 (11.1%)	27 (14.7%)	10 (6.7%)	5.28*
I don't communicate with anyone	333	63 (18.9%)	51 (27.7%)	12 (8.1%)	20.7***
With my friends	333	237 (71.2%)	115 (62.5%)	122 (81.9%)	15.07***
With my family	333	148 (44.4%)	61 (33.2%)	87 (58.4%)	21.2***
Others	332	16 (4.8%)	9 (4.9%)	7 (4.7%)	0.009

* p < 0.05; ** p < 0.01; *** p < 0.001

people, and communicate to a greater extent than girls with virtual friends whom they do not know face to face.

Thus, it is important to note that the median number of friends that adolescents have on social networks

is 82.4 (SD=74.8), with a significantly higher number ($t=2.89$; $p<0.01$) in the case of boys ($M=96.9$ friends; $SD=82.9$) in comparison with girls ($M=67.8$ friends; $SD=62.1$).

3.2. Internet behaviour

The primary results for online behaviour are shown in table 4.

The primary Internet behaviours involve the development of social relationships. The Internet is used to make plans or hang out with friends, to add them to social networks, to send them messages, or to converse with them in real time.

However, behaviours are also observed that should be highlighted, although they are less frequent: Between 20% and 30% of the sample use the Internet to lie, saying that they are older than their real age or even saying that their physical appearance is different. In fact, 59.8% use social networks while below the legal age of access, thus lying about their real age.

Noticeably risky behaviours are also observed in the results, when taking into account the age of the sample: sending photographs or videos to strangers, adding strangers to friend lists, giving out telephone numbers or other types of personal information, sending photos or videos through the network, or the most dangerous behaviour of all: meeting up directly with strangers. The comparison based on gender reflects significant differences in three of the variables studied. Boys are more likely to meet with strangers, whereas girls use the Internet more to send personal messages to friends and to lie about their age.

Finally, it is important to highlight some observed cases of harassment behaviour. Nine point four percent have received email threats, and 13.7% have been insulted online. Twelve point

three percent note having insulted other classmates while online.

It is worth highlighting that in 13.5% of cases, the Internet is used to speak about things that one would not discuss face to face, and that in 22.2% of cases, it is easier for students to be themselves while online. In both cases, there are significant differences based on gender, with boys using the Internet for such purposes significantly more frequently.

4. Discussion and conclusions

The results obtained in this descriptive study demonstrate that Internet use is extensive among the preadolescents studied. Nearly the entire sample has at least one computer in the home and Internet access. Likewise, in most cases, the daily median Internet use is around an hour. These data coincide with data found in recent studies showing Internet use rates of more than 90% in different samples. The study conducted in Austria by Holtz and Appel (2011), for example, used a sample of 205 students between 10 and 14 years of age and showed that 98% of sampled adolescents had a home computer, with nearly half (48.8%) having one in their bedroom. As in our study, this Austrian study showed a daily median connection time of between 1 and 1.5 hours, without any difference according to sex. Similar results have been found in Spain (Viñas, 2009) and other countries: Holland (Van-der-Aa & al., 2009). Finland (Punamäki

Table 4. Behaviours Related to Internet Use

Variables	N	Total N=364 N (%)	Boys N=206 N (%)	Girls N=158 N (%)	χ^2
Meet or make plans with friends	340	187 (55%)	100 (52.9%)	87 (57.6%)	0.75
Make new friends	346	67 (19.4%)	41 (21.1%)	26 (17.1%)	0.88
Meet in person with a stranger	355	20 (5.6%)	17 (8.5%)	3 (1.9%)	7.07**
Share personal information	352	49 (13.9%)	25 (12.6%)	24 (15.7%)	0.70
Send personal messages to your friends	350	146 (41.7%)	72 (36.4%)	74 (48.7%)	5.36*
Add friends to your social network	346	177 (51.2%)	94 (48%)	83 (55.3%)	1.84
Have a private conversation with a friend	352	147 (41.8%)	75 (37.9%)	72 (46.8%)	2.80
Say that you are older	349	104 (29.8%)	49 (24.9%)	55 (36.2%)	5.24*
Pretend you are someone you are not	348	21 (6%)	9 (4.6%)	12 (7.9%)	1.64
Share others' personal information	353	20 (5.7%)	12 (6%)	8 (5.2%)	0.11
Say that your physical appearance is other than it is	350	80 (22.9%)	42 (21%)	38 (25.3%)	0.86
Give someone else your telephone number	351	105 (29.9%)	64 (32.3%)	41 (26.8%)	1.25
Add strangers to your friend list	345	44 (12.8%)	29 (14.8%)	15 (10.1%)	1.70
Send a photo or a video of yourself to a stranger	345	10 (2.9%)	7 (3.6%)	3 (2%)	0.79
Speak about things you wouldn't face to face	304	41 (13.5%)	26 (15.4%)	15 (11.1%)	9.32**
It is easier to be yourself	297	66 (22.2%)	39 (23.5%)	27 (20.6%)	8.57*
You have insulted someone via the Internet	349	43 (12.3%)	25 (12.8%)	18 (11.8%)	0.07
You have received email threats	350	33 (9.4%)	15 (7.6%)	18 (11.8%)	1.83
You have been insulted via the Internet	350	48 (13.7%)	27 (13.7%)	21 (13.7%)	0.00

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

& al., 2009) and the United States (Gross & al., 2002).

An important aspect to highlight in this study involves the differences found related to gender. Although both boys and girls show high rates of Internet use, there are still significant differences regarding not only the type of content that they access but also their risk behaviours and the precautions that are taken as a result. The results demonstrate that girls are more likely to use the Internet for everything related to social relationships (social networks, email, etc.). Boys tend to use it for different purposes, including access to online gaming. These results support the data from some previous studies (Gentile & al., 2004; Jiménez & al., 2012; Rideout & al., 2005). The difference in the content accessed by each group likely explains the significantly higher use of webcams by girls than by boys.

These differences in usage according to sex are significant. In the study by Punamäki & al. (2009) of 478 preadolescents in Finland, the results show that the greater the amount of Internet use for entertainment purposes (online games and navigation), the poorer the relationship with both friends and parents. That notwithstanding, use of the Internet for communication (email and chat) is related to better friend relationships but poorer parental relationships. This study does not result in those types of conclusions. However, the data found support the need to study the relationship between differential use and the quality of not only social and family relationships but also academic performance.

This study has also found some behaviours that represent an alarm signal related to preadolescent Internet use. Approximately 1 in 10 students use the Web to relate to virtual friends they do not know. This behaviour stands out, particularly in the case of boys, a significantly higher percentage of whom than girls make contact with strangers. Moreover, in some cases (5.6% of the sample) students have even met strangers in person. Fortunately, the great majority of the sample studied does not show these behaviours. Still, the cases found demonstrate the need to implement preventive measures for these ages. Similar results have been found in other studies (Brenner, 1997; García-del-Castillo & al., 2008; Jackson & al., 2006; Jiménez & al., 2012), but it is especially novel to find them in such an early age range.

From a different perspective, some of the behaviours detected in the sample relate directly to «cyber-bullying». The data found are clearly worrying, particularly when one considers the age studied. The spectacular growth of Internet use has transformed many

harassment (bullying) practices into Web-based harassment (cyber-bullying). This type of virtual harassment behaviour is the subject of many new studies (Buelga, 2013; Félix & al., 2010; Perren & Gutzwiller-Helfenfinger, 2012), but it is notable to find them at such young ages. It is difficult to understand that more than 12% of students in the 6th grade of primary school have used the web to insult other classmates, that more than 13% have been direct victims of others' insults and that more than 9% have received threats via email. There can be no doubt that these results should alert the educational community and the family regarding the online behaviours of 11-year-old children. It is surprising, therefore, that in the majority of cases, the Internet is used at home and alone, without any type of parental oversight. Again, these results indicated the necessity of establishing prevention programs for the secure and responsible use of the Internet.

Likewise, it is worth mentioning the use of the Internet for behaviours that would not occur outside of the Internet. The results show that for approximately 2 of every 10 preadolescents studied find it easier to be themselves while online and to speak about things that they would never discuss face to face. The Internet facilitates the creation of virtual relationships with friends and strangers. Anonymity and an absence of nonverbal communication elements make interaction with others easier and make it possible to hide one's identity. The possibility of developing problems, especially for those with difficulty with interpersonal relationships and social anxiety, is thus increased (Carbonell & al., 2012; Chóliz & Marco, 2011; Echeburúa & al., 2009).

This study has some limitations, however. First of all, it is a descriptive study that covers a concrete sampling of students in the 6th grade of primary school in Navarra. It would help to conduct studies analysing broader samples, with a greater age range, thus making it possible to establish specific use patterns for each age group. Second, given their descriptive nature, the results do not allow for uncovering risk factors and specific vulnerabilities for developing problematic behaviours online. It is necessary to design longitudinal studies demonstrating risk behaviours and the consequences arising from those behaviours. Thus, it is possible to develop preventive guidelines for developing safe and healthy online behaviours. Conversely, the results demonstrate differences based on gender. Future studies must account for this difference and carefully analyse the differential behaviours of boys and girls. Finally, it would be helpful to analyse the existing

relationship between Internet use and other variable types such as academic performance or familial relationships, supplementing the study with a qualitative analysis of the topic.

In any case, this study presents an approach to understanding the characteristics of preadolescent Internet use. The results constitute an alarm signal and point to the need to establish preventive programs for safe and responsible Internet use. Used correctly, the Web represents an extraordinary tool for information and communication, but it also poses risks. For this reason, it is necessary to develop guidelines that clearly draw the line between appropriate Internet use, inappropriate Internet use, and abuse (Gallagher, 2005; Tejedor and Pulido, 2012). It is necessary to give Internet use a natural place in a subject's activities, while avoiding the risks and dangers of indiscriminate use. In this environment, the great challenge is to maximise positive effects and minimise negative effects.

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Young Learners' Objectives related to Multimedia Use and Homework Completion

El uso de multimedias en las tareas académicas por los estudiantes

-  Dr. Erdem Öngün is Instructor in the Preparatory School of Kadir Has University (Turkey) (erdem.ongun@khas.edu.tr).
-  Dr. Aşkın Demirağ is Instructor in the Department of Management Information Systems in the Faculty of Commerce at Yeditepe University (Turkey) (ademirag@yeditepe.edu.tr).

ABSTRACT

Individuals of all ages are inevitably affected by today's technology. The main purpose of this study is to explore the objectives of 8th grade students related to the utilization of multimedia instruments ranging from personal computers to the Internet use while they are doing their homework. Specifically, it tries to find out whether there is a significant relationship between «for what purposes 8th graders use multimedia tools» and «which personal traits are reinforced while doing homework with multimedia tools?», where gender differences were also taken into consideration in the analysis of the related items in the questionnaire form. The population of the study is made up of 435 students who were randomly selected from five secondary schools in the city of Istanbul, Turkey. As a data collection method, a questionnaire form with a set of related research questions was used. Findings from the study show that 8th graders in their use of multimedia platforms are provided with a more interactive and independent learning environment where they can find more learning aids while accomplishing their homework objectives. Gender-based evidence from the study shows that digitally, male students are more active and they exploit the fun side of homework more compared to their female counterparts.

RESUMEN

Las personas de todas las edades se ven inevitablemente afectadas por la tecnología de hoy. El principal propósito de este estudio es analizar en los estudiantes de octavo grado la relación entre los cambios experimentados en la utilización de los instrumentos multimedia y el uso de los ordenadores personales e Internet mientras están haciendo sus deberes. En concreto, se trata de averiguar si existe una relación significativa entre «para qué fines los estudiantes de octavo grado usan herramientas multimedia» y «qué rasgos personales se refuerzan mientras hacen los deberes con herramientas multimedia», y esto, teniendo también en cuenta las diferencias de género en el análisis de las partidas recogidas en el formulario de preguntas. La población del estudio se compone de 435 estudiantes elegidos aleatoriamente de cinco escuelas secundarias en la ciudad de Estambul, en Turquía. El método utilizado para la recolección de datos consistió en un cuestionario con preguntas relacionadas con la investigación. Los hallazgos del estudio evidencian que los estudiantes de octavo nivel que utilizan las plataformas multimedia reflejan un ambiente de aprendizaje más independiente e interactivo en el que encuentran un respaldo mayor mientras realizan sus tareas. Atendiendo a la perspectiva de género, el estudio muestra que, digitalmente, los estudiantes masculinos son más activos y desarrollan más el lado divertido de las tareas que sus compañeras.

KEYWORDS | PALABRAS CLAVE

Technology, learning, homework, homework goals, personal traits, multimedia, young learners, statistical analysis.
Tecnologías, aprendizaje, deberes, metas de tarea, rasgos personales, multimedia, jóvenes estudiantes, análisis estadísticos.

1. Introduction

Learning is a multi-faceted and longitudinal process. When we think of real performers and participants of a learning process from a wider perspective, we find teachers and students that are supposed to play collaborative and interactive roles in that process. The environments in which learning and teaching take place and the materials utilised should also be given a great attention. So, what about the question of homework? Often regarded as intermittent task, homework is a reinforcement or extra load on students' shoulders that they have to take home and which they often pretend to do for the sake of their parents' or teachers' satisfaction.

Homework is a valuable instrument that contributes to the development of children's education and knowledge. It can be considered as a sort of out-of-school learning. It is believed that homework has not yet received the serious attention that it deserves in the research literature. School systems have to give serious attention both to increasing awareness of homework motivation and preferences in children and in parents and to equipping both children and parents with the information and techniques necessary to accommodate homework tasks to these preferences as well as their motivation levels and sources (Milgram & Hong, 2000). It is obvious that schools should promote a better understanding of homework. In this respect, homework and its overt, essential role in the instructional process needs to be examined more closely to see whether it is located inside or outside the learning and teaching circle.

The relationship between homework and technological aids has often been neglected. Homework is often perceived as an issue that directly and solely relates to a task to be completed outside school. In that case, its process and completion are little observed. In fact, technological developments provide a wide range of means for facilitating homework completion. Whether new instructional methods change or even broaden children's learning styles is a question often raised by technological advances. The concrete walls of old libraries have fallen and today's libraries offer immense virtual spaces that are full of usable data for learners to prepare their homework or projects. The increasing dominance of information and communication technologies in locations such as homes and schools has also promoted students' use of these tools for their homework. Consequently, a new approach to homework completion has been adopted and it has been affecting all the trends from past to present. This is an issue that supports significant focal points to study

the relationship between technology and homework regarding students' switching goals targeted at homework and also homework planning and organization in which innovative aids are exploited more efficiently. In addition to the importance given to homework, particular attention to young learners' new homework trends would be of a greater concern to study where gender stands out to be more than a demographic value. It might redraw the lines in-between.

2. Literature review

2.1. Homework

Often considered to be extra-curricular activity, homework is a strong tool aiding the advancement of children's education and knowledge. Not having yet received the merited attention in the research literature, homework is a kind of learning often completed outside school. Contrary to widespread popular beliefs, current studies point out that homework is not a single activity assigned to students, it is rather an interaction including many other factors in the process.

As stated by Marzano, Pickering and Pollock (2001), homework and similar activities are instructional techniques that teachers are quite familiar with. In presenting homework to students, teachers provide opportunities for students to deepen their understanding and improve their skills relative to the content. Appropriately used, homework can pave the way to significant improvement in academic achievement.

Yan (2003), in his study on difference of age in understanding the social complexity of the Internet, suggests that children start to understand the Internet as a complicated tool cognitively and socially between the ages of 9 and 12. As students get older, they develop more positive attitudes towards consuming new media technologies. They use especially the internet and other computer mediated tools in doing and organizing their homework. Furthermore, Kupperman and Fishman (2001) point out that as the number of K-12 students who log onto the Internet at home and at school increases, students, families, and schools gain more potential to use this resource in new ways.

Regarding the gender differences in terms of regarding type of homework performances, findings in a study conducted by Altun (2008) demonstrate that students (70%) had positive attitudes towards online homework assignments. In addition to that, male students tend to use online homework assignments more effectively and practically than their female counterparts. On the other hand, the study also shows that female students are more attentive as far as ethical issues are concerned.

Smolira (2008) studied student perceptions concerning online homework assignments in an introductory finance class and found that, in general, students felt that compared to traditional homework assignments that are turned in to the instructor, online homework was more preferable. In addition, the study also found that homework assignments increased students' understanding of the material and the time they spent in preparing for the class. In that context, learners' perceptions of the role of homework and technology are changing. In addition, assignments and responsibilities adopted during this new learning process are also becoming more interconnected. Blended with technology, homework assignments are reshaped in a way that learners enjoy and exploit more aspects of a learning process taken outside school walls. Thus, thanks to multimedia tools, students are encouraged to immerse themselves in a more exploratory activity.

In most learning systems across the world, homework is meant to be a «take away» and «bring it back» task. However, homework is meant to be a positive experience motivating children to learn. Contrary to the popular belief, tasks assigned as homework should not be regarded as a punishment. Over the last ten years, studies on homework have started to concentrate on the relationship between homework and student achievement, and they have made the case much stronger and more effective for assigning homework. The question of whether homework actually enhances students' academic achievement is often supported by various findings. A large number of teachers and parents agree that homework develops students' initiative and responsibility and it also meets the expectations of students, parents, and the public (Milbourne & Haury, 1999). The case against homework displays some global facts. According to this, countries such as Japan, Denmark, and the Czech Republic with the highest scoring students on achievement tests have teachers who give little homework to their students. However, students in Greece, Thailand, and Iran have some of the worst average scores. Teachers from these coun-

tries assign a lot of homework (Bennett & Kalish, 2006). It seems that controversy over pros and/or cons of assigning homework will last a long time and it seems that this issue will further cause different discussions in the literature.

2.2. Technology use and homework

Developments in technology allow people to ascertain whether new teaching methods change or make children's learning style more comprehensive. As a result of computer-assisted learning, as reported in

The increasing dominance of information and communication technologies in locations such as homes and schools has also promoted students' use of these tools for their homework. Consequently, a new approach to homework completion has been adopted and it has been affecting all the trends from past to present. This is an issue that supports significant focal points to study the relationship between technology and homework regarding students' switching goals targeted at homework and also homework planning and organization in which innovative aids are exploited more efficiently.

some studies, there is a change in learning style. Students' use of the internet and other computer-based communication tools for their homework will increase as such tools become more common in homes. The ways families make use of computer technology for educational purposes has already become an area of research. For completing their homework assignments, students have already been using computer technology such as for searching web sites and using CD-ROMs for research projects, communicating with peers and experts through the Internet, and using the computer as a tool for writing and graphs. Using computer technology systematically for homework design provides students with many other exciting possibilities for individualization.

Using technology in the classroom for increasing student achievement is a topic influencing educational

literature today. However, there is little evidence for the improvement in homework assignments resulting from the use of technologies, in both the short- and long-term. In order to provide extra practice to students, regardless of individualized needs for such practices, teachers often assign homework. Homework, in turn, is often regarded by students as nothing more than «busy work» and it is therefore deemed unimportant for their learning. Technology can be used for changing these two types of homework from paper-and-pencil «chores» or «busy work» to motivating learning opportunities which extend classroom learning into the home. In the past, stressing a student's personal abilities and interests with regard to homework has been a slightly worrying task. Most teachers had little time or energy to assign individualized homework assignments which met student needs. In fact, all the students, regardless of their individual instructional needs, were often given the same assignment to complete, which resulted in the «busy work» perception. Instructors can now have the role of «assigner and designer» of the homework rather than «facilitator» in the homework reinforcement process while they are using technology. Instead of asking that all students fulfil a specified generic assignment, the teacher can ask students to use technology to practise the skills or display the knowledge learned. When the use of technology is extended to the home by assigning meaningful homework, three goals are accomplished. Firstly, meaningful homework assignments which were designed to meet the individual reinforcement needs of students are encouraged. Secondly, practice of important technology skills helping students further than the accomplishment of the homework itself is maintained. And thirdly, students are provided with fun and engaging homework activities (Zisow, 2000). In that sense, homework can be likened to a fruitful tree with numerous branches.

For discovering varied information, the internet serves as an effective, direct, and new method. In addition, for personalizing homework and supporting the participation of families in the homework process, the internet can be accessed at the convenience of its users whom it serves as an interactive tool (Salend, Duhaney & Anderson, 2004).

Results from a study on ungraded homework versus graded homework online by Allain & Williams (2006), show that there are no significant differences in conceptual understanding. It was also reported by students that when online homework was graded, they spent more time studying course materials outside of class. As Aksut, Kankilic and Altunkaya (2008) point

out in their study, students have difficulties while they do their homework at Internet cafés. Results from the study also show that their teachers do not have the full ability or the skill to use information technologies. Furthermore, as recently put forward by new regulations, school and public libraries do not fulfil the needs for «performance homework». In light of schools' technological renovation, their study also draws attention to the fact that if intensive training on information and education technology use is given to teachers, their students' homework performance will also be positively affected.

In their study Cakiroglu, Akkan and Kosa (2008) state that although using another person's idea or a part of his or her work and pretending that it is your own was defined as plagiarism, students still did not hesitate to copy and paste from the internet while preparing homework and projects. Excessive and uncontrolled use of such tools carries various risks for both students and parents.

Also described in Kodippili and Senaratne's (2008) study with some interesting findings, such risks should be considered as a failure. This was based on inferences that computer-generated interactive mathematics homework can be more influential than a conventional teacher-graded homework. These inferences can be listed as small sample size, lack of complete random assignment of participants and failure to manage indirect influences. Tutorial help from the school and the effect of gender and age as variables can be considered among such influences. Such obstacles may create doubts as to whether parents or teachers can suggest computer-generated homework preparation without any restrictions. It seems that students enjoy and consume not only innovative instruments but also ones they have fun with. Concluding the subject of online versus traditional homework, Mendicino, Razaq and Heffernan (2009) found that when students are given computer feedback, they learned significantly more than when they are doing traditional paper-and-pencil homework. When the size of the effect is considered, giving web-based homework if students have an access to the equipment needed may be worth the cost and effort. For this, schools which implemented one-to-one computing programs can be given as a good example.

3. Material and method

In the study, a Chi-Square Independence Test was used in order to study the relationship among qualitative variables as the scale for variables is nominal. After the collection of the questionnaire data, related

data for this study were analysed using the Statistical Package for the Social Sciences (SPSS).

3.1. Technique for data collection and the properties of the sample

Students answered a set of questions in the questionnaire which included respectively gender, for what purposes 8th graders use multimedia tools and which personal traits are reinforced while doing homework with multimedia tools; and how well, quickly and punctually they can plan, organize and do their homework. The study sample included 435 8th grade students from secondary schools in the city of Istanbul, Turkey. A more advanced grade was chosen for the study due to the fact that students in this grade are more likely to have better computer literacy. It was also assumed that such students are more likely to benefit from technological tools in a more efficient way.

In terms of gender, in the study, the percentages of male and female students were 48.7% and 51.3% respectively. For data assessment process regarding gender, this ratio is believed to maintain an equally targeted balance in the distribution of participants. The study examined which of the following six positive personality traits were reinforced through the use of multimedia tools for homework: 1) Sharing 2) Collaboration 3) Researching 4) Self-confidence 5) Creativity 6) Communication. Although not shown in tables here, the frequency for each choice has the following results: 92.2% of the students think that using multimedia tools while doing homework helps them gain self-confidence followed by 88.7% for collaboration, 82.1% for communication, 78.4% for sharing, and 75.9% for creativity. 16.1% of students reported that multimedia tools did not help them develop their research skills.

4. Results

4.1. Goals of multimedia use and personal traits reinforced

Findings related to the relationship between the questions «for what purposes do 8th graders use multimedia tools?» and «which personal traits (sharing, collaboration, self-confidence, creativity and communicativeness) are reinforced while doing homework with multimedia

tools?» were given as Chi-Square Test results in table 1 below.

Table 1 shows that there is a significant relationship between chat and sharing at 5% level ($\text{sig} = .006$). This data shows that students are most likely to realize their sharing through chat in an interactive way. In terms of homework requirements whose guidelines were specified by their teachers, students are expected to communicate with their friends in order to exchange valuable information while completing their tasks. This would be a pre-planned conversation. Online chat tools could serve as a valuable asset for collaborative tasks. In that sense, as homework is often considered to be an individual task, the data set above yields results that refute this classical understanding of homework as a single-person task.

As for chat and collaboration, data from table 1 shows that there is significance at 5% level ($\text{sig} = .007$), which can be interpreted as «students tend to collaborate more during chat as they are more likely to be prepared and relaxed».

Data related to the relationship between chat and collaboration supports the data related to the relationship between chat and communicativeness in that a collaborative chat also may help students' confidence level increase. Holding a conversation on an online chat platform might encourage students to express themselves better as there is less social and environmental pressure from their peers or teachers. Thus, gelatophobic (fear of being laughed at) effects are minimized. In other words, when students are immersed in multimedia-aided tasks, they are likely to develop, improve, and demonstrate more of their productive and reflective sides by feeling that they possess more or fuller control over what they are doing. This may result from the fact that when left alone to tackle numerous configurations, younger students are more likely to feel more confident and at ease, and challenged; as the more they explore and exploit, the more they seem to enjoy technological instruments.

Table 1: Relationships between chat and personal traits

	Pearson Chi-Square			Fisher's Exact Test	
	Value	df	Asymp.Sig (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Relationship between chat and sharing	7,505	1	,006	,007	,004
Relationship between chat and collaboration	7,279	1	,007	,009	,005
Relationship between chat and self-confidence	6,754	1	,009	,012	,007
Relationship between chat and creativity	7,655	1	,006	,007	,004
Relationship between chat and communicativeness	26,595	1	,000	,000	,000
N of Valid Cases	435				

As we see in table 1, students' self-confidence increases as they feel more comfortable and liberated in producing more creative ideas during chat.

As for chat and communicativeness, data from table 1 shows that there is significance at 5% level ($\text{sig}=.006$). As doing homework often requires group work as assigned by their teachers, students tend to get themselves involved in interactive communication. Altogether, it can be inferred that online conversation is supportive of interactivity and creativity.

As for the relationship between gaming and personal traits such as sharing, collaboration, self-confidence, and creativity, table 2 provides the related significance levels.

In that sense, it is noticeable that there is a significant relationship between gaming and sharing at 5% level ($\text{sig}=.002$). This means while doing their homework online, students find it as enjoyable and as entertaining as playing games.

It is also seen that data regarding the relationship between gaming and collaboration supports the data related to the relationship between gaming and sharing in that students tend to collaborate online more as a part of their online gaming tools. Team games have become very popular among children. These make their online participation, interaction, and communication more collaborative.

As students use the internet, they happen to find more opportunities for self-realization, which reinforces self-confidence as well. The relationship for this was found significant at 5% level ($\text{sig}=.002$).

Data for the relationship between gaming and creativity ($\text{sig}=.006$) show that as most games include various interactive tools that require development strategies, students' creativity is promoted significantly. A digital game can often be as challenging, time consuming and procedural as homework itself.

It is a well-known fact that homework assignments include various tasks that often require research. For that reason, to better understand the relationship between research and personal traits (collaboration, self-confidence and communication), table 3 provides the related significance levels.

As shown in table 3, data concerning the relationships between research and personal traits such as collaboration, self-confidence and communication show that using multimedia tools with the aim of research

reinforces collaboration and communicativeness, which also help students build more self-confidence for group work and self-regulation as they start searching the information they have been looking for. Put into practice in the elementary classroom, multimedia-assisted homework activities help students in three ways. These are learning self-regulatory and time-management skills, developing self-efficacy, and learning to self-reflect on their performance.

Table 2: Relationships between gaming and personal traits

	Pearson Chi-Square			Fisher's Exact Test	
	Value	df	Asymp.Sig (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Relationship between gaming and sharing	9,532	1	,002	,002	,001
Relationship between gaming and collaboration	11,176	1	,001	,001	,000
Relationship between gaming and self-confidence	9,311	1	,002	,002	,001
Relationship between gaming and creativity	7,414	1	,006	,007	,004
N of Valid Cases	435				

In addition to research and personal traits relationships, data related to the relationship between doing homework and creativity and data related to doing homework and communicativeness show that doing homework using multimedia tools requires the use of multi-skills and this enables students to reveal and improve their personal traits. Collaborative homework assignments support interactivity and creativity. Thus, communication among students is fostered in a creative way.

4.2. Goals of multimedia use and homework processing

Table 4 shows that there is a significant relationship between using multimedia for conducting research and homework at the 5% level. Those who use multimedia tools for research can plan their homework better through digital organizers such as word-processor, paint brush, PowerPoint etc. It should not be forgotten that planning is an essential part of research and exploration, as is homework.

Accordingly, students who use multimedia tools for research can plan their homework significantly better through visual and auditory tools. This is because multimedia resources offer various and numerous applications that are hardly available in traditional homework that is solely dependent on limited aids.

4.3. Relationship between use of multimedia and gender differences

Finally, gender differences often play a discriminatory role in many studies and such differences may

Table 3: Relationships between research and personal traits

	Pearson Chi-Square			Fisher's Exact Test	
	Value	df	Asymp.Sig (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Relationship between research and collaboration	9,819	1	,002	,002	,001
Relationship between research and self-confidence	4,417	1	,036	,048	,026
Relationship between research and communication	8,600	1	,003	,004	,002
Relationship between doing homework and creativity	5,770	1	,016	,017	,010
Relationship between doing homework and communicativeness	4,892	1	,027	,032	,017
N of Valid Cases	435				

reflect interesting results concerning the general perspective of a study.

As in table 5, overall data from the study show that male students use multimedia tools more for fun and gaming. As for personal traits improved by doing homework through multimedia tools, related data shows that male students' collaboration and sharing skills are comparatively more developed. This also supports the finding that male students use multimedia tools predominantly for fun and gaming.

5. Discussion and conclusion

Earliest investigations show that no research found any kind and amount of benefit to assigning homework in elementary school. Furthermore, not even a positive correlation between, having younger children do some homework versus none, or more homework versus less, and any measure of achievement was found (Kohn, 2012). In this respect, multimedia-assisted homework assignment in this study is thought to serve as a new supplementary and interactive tool for young learners rather than an instrument to maintain complete and absolute achievement for the satisfaction of either parents or instructors. This draws a line between the traditional concept and understanding of homework performance and the one supported by highly interactive digital platforms. It is obvious that homework should engage students in independent learning. This could be achieved through pursuing knowledge individually and imaginatively as students investigate, research, write, design, and make. As stated by related research, either in its current format or with some changes, over 70% of students using online homework would be willing to reuse it (Brewer, 2009).

Our study produced a three-dimensional view of the issue of homework. These are young learners' relationship with home-

work, learners' autonomy and gender factors in the related process. Overall data from our study support the assertion that use of multimedia tools helps students develop their independence as a learner when they are given more responsibility for their own learning as students are generally found to be receptive to its use.

Technology acts a catalyst for an interactive and collaborative accomplishment of homework. Multimedia-aided homework performance fosters communication among students through online chat and games. In addition to this, digital organizers and online tools help students both develop and improve exploratory research skills. This data is also supported in a study by Richards-Babb, Drelick and Henry (2011), where they found those students' online homework attitudes were positive in general. A large majority of students view online homework favourably (80.2%), as worth the effort (83.5%), relevant (90.5%), challenging (83.4%), and thought provoking (79.0%). Eggers, Wooten and Childs (2008) also found that fifty-three percent of students believed that online homework use enhanced the quality of their study time and 55% believed that it led to a greater understanding of the topics and problems.

Finally, findings from our study also show that male students use multimedia tools mostly for fun and gaming. Compared to their female counterparts, male students tend to share more by using multimedia tools for doing homework.

However, as also stated in a related study, for both male and female students, online homework provides a time- and cost-effective means to enhance pedagogy in large classes (Richards-Babb & Jackson, 2011).

We have no evidence to support online homework performance over traditional hand-graded

Table 4: Relationship between research and homework planning through visual and auditory tools

	Pearson Chi-Square			Fisher's Exact Test	
	Value	df	Asymp.Sig (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Relationship between research and homework planning through visual and auditory tools	4,503	1	,034	,039	,024
N of Valid Cases	435				

homework. However, the study suggests that in terms of traditional homework, girls do more out of school homework than boys at both 10th and 12th grade (Mau & Lynn, 2000). Therefore, it would be appropriate to remind readers that such a comparison could further highlight the basics of our study. In addition, no data was collected in this study which would provide insight into teachers' and parents' concerns about using online homework. It is likely that teachers and parents would have views similar to or different from those expressed by the students in this study. This study, as limited to a small group of students, was expected to provide enthusiasm and inspiration for related studies in the future from a multi-dimensional point of view.

Note

Extensive dataset as an extension of the current one can be found at <http://dx.doi.org/10.6084/m9.figshare.1097568>.

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Table 5: Relationships between gaming, collaboration and gender

	Pearson Chi-Square			Fisher's Exact Test	
	Value	df	Asymp. Sig (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Relationship between gaming and gender	29,222	1	,000	,000	,000
Relationship between collaboration and gender	6,069	1	,014	,015	,010
N of Valid Cases	435				

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Forms of Media Convergence and Multimedia Content – A Romanian Perspective

Formas de la convergencia de medios y contenidos multimedia: Una perspectiva rumana

 Dr. Georgeta Drulă is Associate Professor in the Faculty of Journalism and Communication Studies at University of Bucharest (Romania) (gdrula@yahoo.com).

ABSTRACT

This paper addresses two types of technological media convergence: media convergence based on mobile technology, and also convergence based on the unification between IT and media industry. These forms are influenced by the multimedia aspects of the content. The research interest in this study is related to media landscape in Romania and its state. Even if many academics and practitioners consider media convergence only at the content level from journalistic perspective, this topic has many more detail aspects and trends. Thus, media convergence in terms of content can be now interpreted together with the user's content and takes into consideration the unification between paid, owned, shared and earned content. This paper proposes a theoretical and practical perspective for the relationship between convergence and multimedia for online media products. This perspective belongs both to media producers and to online consumers of information. The paper is interesting in that it reveals the challenges facing the media industries, and shows approaches of convergence that are related to multimedia for media products. The methodological framework uses the content analysis and the hierarchical cluster analysis to discover different forms of convergence in online media. The main conclusion of this study shows that due to various technologies and their partnerships, convergence can be directed both from the users to the media industry, and conversely.

RESUMEN

Este artículo se centra en dos tipos de convergencia tecnológica de medios: la basada en tecnología móvil, y la convergencia basada en la unificación de las tecnologías de la información y la industria mediática. Estas formas están influidas por los aspectos multimedia del contenido. El interés de la investigación de este estudio se centra en el panorama mediático en Rumanía y en su estado actual. Aunque muchos académicos y profesionales evalúan la convergencia de medios por el contenido desde una perspectiva periodística, existen otros muchos aspectos y tendencias a tener en cuenta. Así, la convergencia de medios en términos de contenido puede ser interpretada junto al contenido del usuario y considera la unificación del contenido pagado, poseído, compartido y adquirido. Este artículo propone una perspectiva teórica y práctica para la relación entre convergencia y multimedia en cuanto a los productos mediáticos on-line. Esta perspectiva se refiere a los productores y a los consumidores de la información. El interés del artículo reside en tanto que identifica los retos de la industria mediática y establece enfoques acerca de la convergencia multimedia para los productos mediáticos. La metodología consiste en el análisis de contenido y en el agrupamiento jerárquico con el objetivo de descubrir diferentes formas de convergencia de medios on-line. La conclusión establece que, gracias a varias tecnologías y sus asociaciones, la convergencia puede dirigirse desde el usuario a la industria y viceversa.

KEYWORDS | PALABRAS CLAVE

Media convergence, mobile media convergence, multimedia journalism, cross-media products.
Convergencia de los medios, convergencia de medios móviles, periodismo multimedia, productos multiplataforma.

1. Introduction and state of the question

This paper shows the mobile convergence and other forms of convergence in Romanian media landscape. The objective of this study is to identify possibilities and limits for convergence in multimedia journalism. It considers both theoretical and practical perspectives for the relationships between convergence and multimedia that addressed the online media. This approach belongs both to media producers, and online consumers of information. The research questions addressed by this study are: Which are the actual forms of convergence in Romanian online media?

Both convergence and multimedia are basically defined as processes of unification. Convergence considers the unification of several media channels through technology in the form of the Internet or mobile technology, while multimedia considers the combined use of several media in the same computer application or document (<http://goo.gl/ml167p>). Generally, it manifests two forms of convergence: one between IT and media channels convergence, and mobile convergence. Defining «media convergence», Jenkins (2001) identifies five separate aspects of it: technological, organic, economic, cultural and global convergence. Many of these aspects are handled on the border between multimedia and convergence.

1.1. Different perspectives and meanings to media convergence

Kopecka-Piech (2012:78) describes in detail the evolution of the concept of media convergence, and mentions the well-known convergence theories generated by Fagerjord, Storsul, Jenkins, Liestøl and Murray. She also mentions the theories related to convergence and multimedia, referred as cross-media / multiple platforms / transmedia / intermedia production theories, and suggested by Aarseth, Appelgren, Bechmann Petersen, Bolin, Brooker, Dena, or Scolari, or the theories of the creative industry, with their creators Deuze and Hartley. But the description and definition of «media convergence» is related to issues considered by this concept.

Thus, Murdock (2000: 36) defines the convergence in the media, determined by the digital evolution, on three levels: technological level (communication systems), the content level (cultural forms) and the economic level (related to companies, employers and the media market). Jenkins (2001; 2006) defines «media convergence», integrated to «convergence culture», as an interaction between new and traditional media. He considers not only the technological shift in convergence, but also its effects on the media industry

and its audiences. As a consequence, convergence is a continuous process and the media product is considered to be subject to permanent change.

Herkman (2012) considers media convergence, from the point of view of inter-media relationships, and underlines that a consequence of the economic convergence is the flow of cross-media products. Thus, convergence means many media products, linked not only «through intertextually», but also in the production, distribution and marketing processes. Lawson-Borders (2006) gives a perspective on convergence in organizations. Thurman and Lupton (2008) refer to multimedia storytelling for news sites as a convergent process, and Thorstern and Singer (2009) refer to content production and convergence. Islas (2009) says that the same content can be found across different media, and considers that convergence is linked to media ecology. He shows that «convergence has imposed deep changes in media companies», due to the way in which the information is consumed.

«Media convergence» is faced with new issues related to Web 2.0, such as user-generated content (UGC). News sites increasingly use this content on different platforms. Deuze (2008), particularly, considers that the actual level of media convergence is the convergence of the «citizen-consumer», which is also the creator of news. This new approach is determined by the changing media consumption habits due to usage of the new technologies.

«Media convergence» described in relation with users/consumer, and in terms of UGC, considers new categories of content. Thus, Schepke (2012) addresses a new form of convergence as a combination of paid, owned, and earned content. This form of convergence combines at least two or more channels of communication, and is characterized by a «consistent storyline, look and feel» (Owyang, 2012).

In any sense we understand media convergence it is based on a technological solution. Current solution is Web Content Management Systems (CMS). This solution has fully harnessed the multimedia content generated by users. CMSs are frequently found as open / free platforms. They are used by an increasing number of news sites, and are oriented to users' necessities. CMS offers all-in-one tools that can be used to combine various technologies, and assure cross-platform and cross-channel compatibilities. CMSs facilitate the collaborative activities. For example, Schulz (2013) shows the open source project called MythTV, which is a multimedia management system that works in client-server architecture, and

allows video streamed sequences or movies to be viewed on various technologies, such as: computers, tablets and smart phones. This system offers a cross-platform solution for multimedia content.

As a consequence of technological convergence, many forms of content convergence have appeared. A common form is based on the relation between news sites, live broadcasts / journals, and social media platforms. This relationship also offers cross-platform content. Thus, social media platforms promote multimedia stories from news sites, and also continue with users' comments and discussions. This new trend is referred as «social media convergence» (Stan-chak, 2010). Social media platforms often used by news sites are Facebook or YouTube, where the convergence between video-sharing, and television sites is encountered.

1.2. Multimedia journalism - Content and media production in convergence

Multimedia journalism is based on media convergence, and is characterized by «interactivity», «collaboration» and «participation» (Deuze, 2004). These aspects of content production and consumption involve all categories of actors, including users. In these conditions, it is talking about «social production». Social production is generally a form of non-commercial production, and can generate convergent products. Also, there are other aspects of media convergence in multimedia journalism, from professionals' perspective. For instance, journalists must write for multiple digital channels, because the multimedia story as a form of convergence is suitable for multiple channels. Quinn (2005), Bull (2010) and Luckie (2012) make references to reporting practices in multimedia journalism, and show how to work across multiple media platforms, by creating and using video, audio, text and pictures for news. Moreover, multimedia content accepts the collaborative activities for writing news.

From the perspective of media product, in order to overcome competition and maintain their audience, the news sites have appealed to increasing amounts of multimedia content, and to social platforms. This content that must address the usability criteria and the users' interests is operated by many platforms and

devices in order to be captured, edited, saved and distributed.

In the opinion of many theorists and practitioners, neither convergence, nor multimedia replace the rules of good journalism. Multimedia and convergence are related in another context that is the evolution of professional practices and job market. Thus, Kolodzy (2006) considers that the style of writing stories is altered by the various multimedia formats, and also by the news distribution on many platforms such as: online,

«Media convergence» faced with new issues related to Web 2.0, such as user-generated content (UGC). News sites increasingly more use this content on different platforms. Deuze, particularly, considers that the actual level of media convergence is the convergence of the «citizen-consumer», which is also the creator of news. This new approach is determined by the changing media consumption habits due to usage of the new technologies.

television, print. Multimedia writing must be adapted to usability rules required by the technological support.

Convergence sustains interactive multimedia storytelling in journalism through multiple types of content. Multimedia stories can be easily shared and distributed on many different platforms with the aim of capturing an audience.

There are thus specialized platforms for materials collection from users, and also social media platforms, such as Facebook and Twitter, for information diffusion. Perrin (2012) says that a successful online multimedia storytelling depends on three factors: writing for multiple channels, working in teams (collaboration) and finding emergent solutions. Writing for many channels is a challenge and a demand for multimedia journalists and refers to convergence aspects. They must know the current technologies and how to use them in storytelling. Perrin (2012: 392) considers that «media convergent journalism is not for the lone fighters» because a multimedia story is non-linear and complex. The information in such a story has a background, a context, and also a path to be read, depending on the users' interests.

In fact, the Web 2.0 opportunities make the border between multimedia and convergence to be very thin. Moreover, the multimedia formats can bring pollution with useless information through information overload, false and redundant information. In order to reduce the effects of these phenomena, users should rely on the journalists' or editor's choices and opinions.

1.3. Relations between media convergence and multimedia

Jinglei (2012) addresses process of unification in convergence as a fusion process. He considers that the

Media convergence represents the unification of various technologies and content of different types. At the same time, multimedia storytelling itself represents a form of convergence between text, audio, photo and video sequences. But multimedia is more than that. It also means a hypertext structure of information and a graphical / visual representation on a screen.

new forms of convergence can be addressed as «multimedia fusion», and they are most closely implicated in editorial guidance, editorial planning and creativity processes. In the media development, Jinglei (2012) identifies five levels of «mature media» which are newspapers, broadcast, television, Internet, and 3G as the representative of mobile media. Each of the five levels is characterized by categories of multimedia information that are combined in a new form that is called «fusion». Fusion has various forms, such as: fusion between TV and magazines, between TV and newspapers, between newspapers and magazines, or mobile newspapers. In fact, the «fusion» processes between information assures the growth of knowledge and the information propagation through various media platforms (Jinglei, 2012). Thus, media convergence based on «fusion processes» generates products which are cross-platform or multi-platforms.

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video sequences. But multimedia is more than that. It also means a hypertext structure of information and a graphical / visual representation on a screen. These characteristics require new approaches in terms of journalistic practices, especially for writing multimedia stories. To create interactivity in a story, journalists must do the hypertext structure and multimedia content in a very intuitive way for the users. Thus, journalists must imagine the structure of information, adapt to the phases of multimedia production, and use many platforms to distribute multimedia news. Opgenhaffen (2011) identifies six such pieces of information and formats of online news: text, picture, video, sound, embedded picture slideshows, and embedded info graphics.

Convergence could be considered the «macro» level of «media fusion», and multimedia aspects, at the «micro level». Thus, the following directions of unification or fusion in convergence, and in multimedia could be presented:

- Convergence involves the economic and technological matters which are situated at «macro» level. Multimedia aspects are addressed more at the content level of a journalistic story.
- Convergence brings into discussion the media companies, and their decisions to create media products. Multimedia brings into attention, the producers and the consumers, and the way they produce, or access the information.
- The convergent journalistic product works across many and various platforms, and has multimedia content.
- News and multimedia stories are created on sites and news portals, and then presented in other forms at television broadcasts and in print; either they are found as text, or as video sequences on the Web, as convergent forms. Thus, people can consume the same news, in different periods of time and using different platforms (Internet, television broadcasts or in newspapers).

Online media reflects the relationships between multimedia and convergence. Consequently, the visual aspect, layout, and structure of information on Web must be considered. So, multimedia information has specific characteristics, but the layout tends to be in accordance with the platform of distribution. Structure of information for a media product is also a

form of convergence with multimedia aspects. The hypermedia structure links parts of various multimedia stories, and different pieces of information coming from different platforms. However, users need information with a constant structure, and interactivity for reading the news. These demands are more difficult to be approached for cross-platform products, because users can have problems to cross or to understand various formats and platforms at the same time.

2. Material and methods

Two methods were considered for this study: hierarchical cluster analysis (HCA) and mobile sites content analysis. This study refers to mobile convergence and also to other forms of convergence in media.

2.1. Mobile media convergence and multimedia

The mobile convergence is approached by the Hierarchical Cluster Analysis (HCA) method. The subject of research is mobile sites, created as a consequence of the convergence based on mobile technologies. The clusters obtained in this method were subjected to a content analysis method to determine the convergent issues.

The Hierarchical Cluster Analysis (HCA), an exploratory method, is used to group the typologies of mobile sites. This method is suitable to identify various aspects of convergence found in the groups of mobile sites. HCA is most useful for a small number of objects, respectively the 28 cases of mobile news sites considered. Each mobile site is described and measured with a set of characteristics that help to create clusters. The solution of grouping used is based on furthest neighbour.

Mobile news sites were selected from the site *sati.ro*, which measures the Internet audience in Romanian virtual space, in August 2013. The mobile news sites are analyzed depending on their type, and are considered aspects of convergence with mobile technology. Thus, 11 mobile sites are designated to television channels and shows, 15 mobile sites are for online publications, and 2 cases are for news agencies or news portals. The coding scheme considers 14 variables that are related to: type of the site (TV, journal, news agency, news portal), category of the information (general news, entertainment, sport, etc), site's performance on market (number of visitors and views), users' reading habits, device access (desktop and mobile), reading mode (browser / apps), reading version (desktop or mobile), multimedia content (topics and format), layout, design and structure, interactivity, and users' participation. All characteristics refer to the

homepage for each mobile site. Groups of mobile sites are created based on similarities / dissimilarities evaluation between their characteristics. Each group reveals an aspect of the media convergence, which is also related to each type of mobile site.

2.2. Media convergence based on the unification between IT and media industry and multimedia

Forms of convergence are approached by the content analysis method. Criteria of coding scheme are: partnerships in the media and IT industries, characteristics of multimedia stories found on various platforms, users' content in news sites and in television shows. Analyzed cases are sites obtained as convergent solution between television news shows and the Internet, and can be exemplified by the *stirilePro TV* or *Antena 1* sites. Unit of analysis are Romanian news sites.

3. Analysis and results

Findings are presented on two types of convergence.

3.1. Mobile media convergence and multimedia

Relationship between convergence and multimedia is materialized in cross-platform products which are the mobile sites. Based on values of characteristics, groups of mobile sites with similar aspects, indicating the convergence based on the combination of platforms features, were established. Thus, convergent aspects of mobile sites were found in regards of site layout and design, multimedia content formats, users' content, users' participation, and traffic indicators.

It was found that mobile sites depend on market indicators such as number of views and number of visitors. Three groups of mobile sites were identified depending on market indicators. The biggest group consists of mobile sites from televisions and online publications. Within this group, the theme of the site is very important in terms of the possibilities of convergence. The second group includes mobile sites in sport (*sport.ro*, *gsp.ro* and *prosport.ro*), and, another group that consists of sites in entertainment (*wowbiz*, *libertatea*, *cancan*), and televisions news (*stirileprotv* and *realitatea.net*). It can be noticed that sport, entertainment and visual news are prone to mobile media convergence. These sites have important traffic indicators on Internet, and also on mobile devices. Therefore, it was shown that the audience migrates from one platform to another which is more comfortable to be read. Also, it can be noticed that news sites with high traffic, have many users on their mobile versions. Sport and tabloid (entertainment) categories of mobile sites have many users than the others. These catego-

ries are on top ranks.

The aspect of convergence which is the multimedia format of the mobile news is manifested in a content that consists more in texts and photos. The analysis found three groups of mobile sites. A group uses only text for the list of their mobile news; another group uses both texts and photos in the list of their news, and a special case, the mobile site of *stirileprotv.ro* where video sequences are also used, in addition to texts and photos.

The layout and design of the sites are also considered for the convergence analysis. Thus, the homepages in the mobile sites in terms of layout and design were analyzed. The largest group of cases is defined by a layout and a design with one column that has a photo to the left and text to the right (mobile sites: *acasa*, *romaniatv*, *wowbiz*, *antena3*, *kanald*, *sport*, *libertatea*, *adevarul*, *hotnews*, and *cotidianul*). The title of the mobile news is also the link (figure 1). A group has the same mobile layout on tablet as the desktop version of the site (*cancan*, *zf*, *gandul*, *descopera*, *gsp*, *prosport*, *mediafax*). Two very small groups, one consists of mobile sites *stirileprotv* and *procinema*, has more than two columns; and another group that consists of mobile sites *primatv*, *capital* and *jurnalul* which have only one column with texts and links, and no photos (figure 2).

The structure of the mobile site refers to the number of items (mobile news – content provided by pro-



Figure 1. Layout with photo, text – title as link.

fessionals) on homepage. Based on this criterion, it was identified that mobile sites consist of 10 to 30 items per page.

Users' content needs also to be considered in media convergence. In this regard, mobile sites were analyzed in terms of user interactions and participation. Most mobile sites have chosen the same forms to have connections with the audience. In terms of these characteristics, there are no relationships between the type of the mobile sites and their connectivity with the audience. Mobile sites were also analyzed in terms of interaction with the users. One group of mobile sites uses on homepage only links to navigate through the site (mobile sites: *realitatea*, *stirileprotv*, *wowbiz*, *acasatv*, *primatv*, *sport*, *libertatea*, *adevarul*, *click*, *jurnalul*, *descopera*, *cotidianul*). Another group also introduces several interactive elements, such as a search box (mobile sites: *procinema*, *al*, *money*, *evz*, *romania libera* and *hotnews*), and the third group enjoys many interactive elements (*gsp*, *prosport*, *cancan*, *gandul*, *zf*, *mediafax*).

In terms of user's participation in mobile media convergence, four groups were identified with an almost equal number of mobile sites. All of them allow participation on Facebook platform with likes and comments. Mobile sites (*money*, *zf*, *cotidianul*, *hotnews*, *antena3*, *click*, *capital*, *acasatv*, *primatv*) allow interactions with users through Facebook and Twitter platforms. The group of mobile sites consisting of *procinema*, *descopera*, *wowbiz*, *romaniatv*, *kanald*, *realitatea*, *stirileprotv*, allows users' comments for mobile news, directly on site and on Facebook platform. Some cases offer all forms of participation, others none.

Topics in the homepages of mobile sites are also considered for analyzing convergence aspects. Thus, it was found that most mobile sites have from 9 to 12 categories of topics (mobile sites: *hotnews*, *mediafax*, *stirileprotv*, *gsp*, *prosport*, *romaniatv*,



Figure 2. Layout with text – title as link.

money, romanialibera, adevarul, evz, gandul). Another group of mobile sites contains from 5 to 8 categories of topics (mobile sites: realitatea, kanald, procinema, descopera, libertatea, click, wowbiz, a1, cancan), and the last group of mobile sites (zf, capital, acasa and primatv) has from 15 to 20 categories of topics.

It can be noticed that groups of mobile sites created, based on different aspects of convergence between different media channels and mobile technology, respect more the usability rules and the users' needs, thus losing the specificity of the media channel. These groups do not depend on the type of media site (television, online publication, news portal) and are more oriented to facilitate the reading of news. Thus, the convergence is directed from media industry to users. But the participatory characteristics of groups of mobile sites involve also the users in convergence processes by providing content.

3.2. Media convergence based on the unification between IT and media industry and multimedia

Considering the first criterion of analysis, it was found that in Romanian media, different industries share the same content on different platforms. Many partnerships have been put in place between media and IT industries, such as Yahoo or Google. Therefore, the site Yahoo News Romania is a provider for most important sites con-

taining general or specialized news, such as realitatea.net, adevarul.ro, hotnews.ro, stirileprotv.ro, or zf.ro. This site also shares links with Facebook pages.

The most cases of media convergence and cross-platform product are identified between television broadcasts and the Internet. Many multimedia stories are found on these two platforms. Here is an example from the news site stirileProTV.ro (<http://goo.gl/G-G667n>) that uses the television news: «The news about weather warnings is found on the stirileprotv.ro site as content registered from television broadcast. This content, when it is used on both technological platforms, can reach more users, in this form of convergence».

Table 1. Mobile sites in different groups of characteristics

	Mobile sites on media types (TV shows and channels / online publications / news agencies and news portals)	Category of information	Market Indicators	Layout and design	Interaction	Participation	Topics	Multimedia format
1	realitatea.mobi	General News	2	1	1	3	2	1
2	m.stirileprotv.ro	General News	2	2	1	3	1	3
3	m.wowbiz.ro	Tabloid	2	1	1	3	2	1
4	m.romaniatv.net	General News	1	1	1	3	1	1
5	m.antena3.ro	General News	1	1	1	1	2	1
6	m.acasatv.ro	Science&Entertainment	1	1	1	1	3	1
7	m.kanald.ro	Science&Entertainment	1	1	1	3	2	1
8	m.procinema.ro	Science&Entertainment	1	2	3	3	2	1
9	m.a1.ro	Science&Entertainment	1	1	3	1	2	1
10	m.money.ro	Economic&Financial	1	1	3	1	1	1
11	primatv.mobi	Science&Entertainment	1	1	1	1	3	2
12	m.sport.ro	Sport	3	1	1	1	1	1
13	m.gssp.ro	Sport	3	2	2	2	1	2
14	m.prosport.ro	Sport	3	2	2	2	1	2
15	m.cancan.ro	Tabloid	2	2	2	2	2	2
16	m.libertatea.ro	Tabloid	2	1	1	1	2	1
17	m.gandul.info	General News	2	2	2	2	1	2
18	m.adevarul.ro	General News	1	1	1	1	1	1
19	m.evz.ro	General News	1	1	3	-	1	1
20	m.click.ro	Tabloid	1	1	1	1	2	1
21	m.zf.ro	Economic&Financial	1	2	1	1	3	2
22	m.jurnalul.ro	General News	1	1	2	2	1	2
23	m.descopera.ro	Science&Entertainment	1	2	1	3	2	2
24	mobile.romanialibera.ro	General News	1	1	1	2	1	1
25	m.capital.ro	Economic&Financial	1	1	3	1	3	2
26	m.cotidianul.ro	General News	1	1	3	1	3	1
27	m.hotnews.ro	General News	1	1	1	1	1	1
28	m.mediafax.ro	General News	1	2	2	2	1	2
	1,2,3 groups of mobile sites with similar values for a characteristic 1 – The largest group.							

Moreover, media companies use the users' content on their news sites, or in television shows. The platform called videonews.ro, associated with television channel Antena3 and site antena3.ro offers videos shown in the news edition of the TV channel. Also, the TV channel uses videos given by users on videonews.ro.

Regarding features of the multimedia stories found on various platforms, it was noticed that it is more difficult to upload video sequences than text or images. This situation can be a limiting context to convergence. A media-sharing platform linked to news site is the solution that has arisen in Romanian online media.

Here are several examples of media convergence based on users' content embodied in the platforms: videonews.ro site (from antena3.ro); «Martor ocular page (from realitatea.net); «Stirile tale» page (stirileproTV.ro); «Hotreporter» section (from Hotnews.ro).

Convergence between news sites and blogs are embodied in platforms such as voxpublica.ro site and pandoras.ro site (from realitatea.net), special section for blogs, called «Adevarul» blogs (from adevarul.ro), or «Puterea Gândului» (from gandul.info) that is a collection of editorials, articles and news items that may be found in the posts of users' blogs.

Convergence between online platforms, and newspapers or magazines is materialized in different news sites and it is reflected by several figures and statistics collected in September 2013. Thus, there are 3,880 registered online publications according to the site reviste.ro, and 285 central online newspapers according to e-ziare.ro site. There are 32 sites viewed under the category of «general news», 13 sites under the category of «local news», 46 sites under the category of «entertainment and tabloids», 10 sites under the category of «sport» and 19 sites under the category of «economic/financial» according to sati.ro site, the Romanian Internet audience site. There are more than 500 online publications, according to zelist.ro site, a Romanian aggregator in online media.

The result of the convergence of online content with television broadcasts can be illustrated by the following figures. The site tvronline.com, a directory of online televisions, has registered live television channels on the Internet. The site has 24 national television channels, and 35 local televisions, in Romanian, with different specialized channels, such as sport, documentary, cartoons and films.

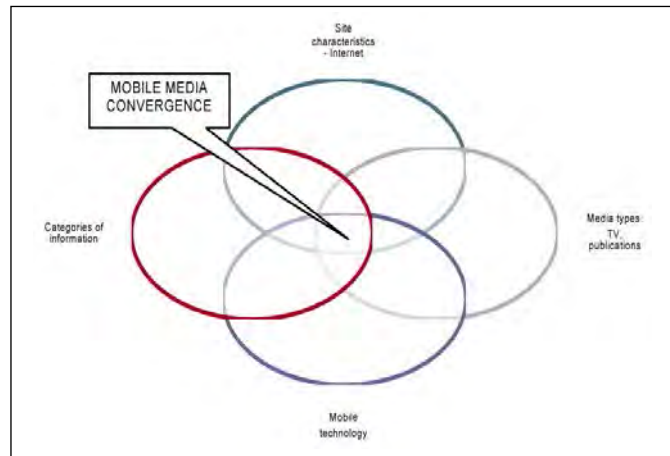


Figure 3. Mobile media convergence.

4. Discussions and conclusions

This study discovers the actual forms of convergence in Romanian online media that manifest as mobile convergence, and IT – media channels convergence. It can be noticed, as a general conclusion that all forms of convergence, even if they have diversified and taken into account other aspects or actors, put together the users' needs for a multimedia content as a unifying element.

The main conclusion of this study shows that due to various technologies and their partnerships, convergence can have very different aspects which are correlated both with content given by media industry and with users' reactions to this content.

4.1. Mobile media convergence and multimedia

The results of the analysis applied present various solutions for the unification of media channels through mobile technology. Due to technological convergence, the content found on the news sites is accessed on mobile devices in a device-specific approach, and in a traditional-desktop approach, or in combination. Media companies have chosen both convergent and cross-platform solutions for their online products. Some new sites adopted the cross-platform solution which is based on the desktop version of the news site for mobile devices, and other have news sites that have mobile versions that are appropriate for a convergent solution. In this case, different media channels (TV, publications, news agencies, and Web sites) are unified through the mobile technology in a specific mode. Science and entertainment mobile sites are more similar regarding layout and design, general news mobile sites are more similar regarding interaction and multimedia format, and sport mobile sites are

similar only through characteristic of topics. Similarities between mobile sites are more evident, based on the same type (television, publications or news portals). In this situation, it can be seen that mobile convergence is working, based on channel type, and characteristics of sites.

Aspects of convergence related to characteristics of mobile sites do not influence the number of views and visitors. But the multimedia stories created by the users are moderated by journalists. Thus the media product combines users' content in a professional format. It can be noticed that sites with many visitors and views on Internet also have visitors and views on mobile devices. Also, sport and entertainment, thematic categories of sites, are the most frequently read on mobile devices. Convergence based on mobile technologies is already implemented in the Romanian online media. But, this technology brings new requirements for multimedia content that must be adapted to a new platform. The Romanian perspective for mobile sites as convergent products shares both the Internet network possibilities and the offers of mobile technologies. This is materialized by the majority of news sites that allow access to the mobile versions of sites from the desktop, and conversely.

Mobile sites in the Romanian media vary a lot from case to case in terms of layout / design, news structure, multimedia format, and users' contributions. This conclusion shows that the convergence between online, traditional media channels and mobile technology is manifested varied. The interests for the convergent media are related with users' needs and their interaction with mobile devices. Thus, media industry and users are actors in the convergent process based on mobile technologies. Figure 3 illustrates as a conclusion, the way in which are created new forms of media convergence through the Internet and mobile technology.

4.2. Media convergence based on the unification between IT and media industry and multimedia

A conclusion has raised regarding media convergence and multimedia journalism in the partnership between IT and media industries in Romania. This conclusion is manifested towards two forms of convergence. One refers to convergence between news sites

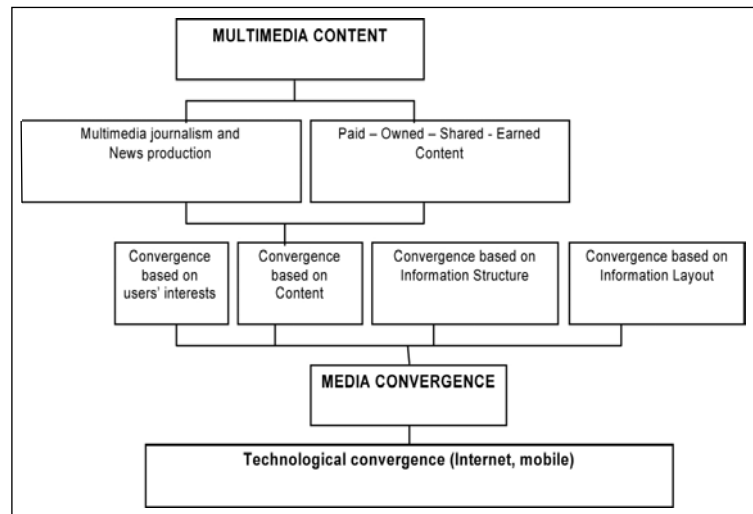


Figure 4. Relationships between media convergence and multimedia.

content, and live television broadcasts or social media platforms. The other form is based on user and professional content in terms of paid / owned and earned content. This partnership is materialized in the news section on Yahoo site in Romanian version, and also the same stories can be found both at televisions channels and on the Internet.

Convergence and multimedia content can be judged at different levels of implementation, and also in terms of journalistic practices, that refer more to solutions that attract audiences, and ensure a greater interactivity for the multimedia content. Developments of media products in terms of convergence are endless.

Aspects of the relationship between convergence and multimedia content accessed by users on cross-platform media products are shown in the figure 4.

Due to mobile technologies, and various partnerships between media and IT industries, convergence is directed from the users to the media industry, and conversely. Thus, in many cases, the multimedia stories created by the users are moderated by journalists and the media product combines users' content in a professional format.

As a final consideration that can generate further discussions and research, it can be said that convergence requires new considerations for the visual aspect and layout of information, structure, and writing for many channels and platforms, even if the usability principles are considered for each channel and platform separately.

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ARG (Alternate Reality Games). Contributions, Limitations, and Potentialities to the Service of the Teaching at the University Level

ARG (juegos de realidad alternativa). Contribuciones, limitaciones y potencialidades para la docencia universitaria

-  Dr. Teresa Piñeiro-Otero is Professor in the Department of Humanities at the University of La Coruña (Spain) (teresa.pineiro@udc.es).
-  Dr. Carmen Costa-Sánchez is Professor in the Department of Humanities at the University of La Coruña (Spain) (carmen.costa@udc.es).

ABSTRACT

Education's gamification has represented an opportunity to boost students' interaction, motivation and participation. ARG (Alternate Reality Games) offer a new highly immersive tool that can be implemented in educational achievements. One of the strongest points of these immersive games is based on applying the sum of students participating efforts and resources (so called collective intelligence) for problem resolution. In addition, ARG combine online and offline platforms a factor that improves the realism on the game experience. In this regard, this present work aims to summarise ARG potentialities, limitations and challenges of these immersive games in higher and further education context. In terms of methodology, this research draws from an appropriate theoretical corpus and, analyses the educational potential of AGR that, in fields like marketing or corporate communication, has already started successfully, but it has still not been studied in depth in education. This study compiles, also, best practices developed in several subjects and academic degrees all around the world and not easily traceable. It concludes that, given the antecedents, potentialities and the exposed analysis, the possibility of incorporating alternate reality games into the university teaching practice in the frame of an educational strategy that determines its aims and more suitable system of evaluation, has to be considered.

RESUMEN

La ludificación de la educación ha representado una oportunidad para fomentar la interacción, la motivación y la participación del alumnado. Los ARG (las siglas inglesas de juegos de realidad alternativa) ofrecen una nueva herramienta altamente inmersiva que puede implementarse en el logro de los objetivos docentes. Uno de sus puntos fuertes consiste en la suma de esfuerzos y recursos (la llamada inteligencia colectiva) aplicada a la resolución de problemas. A esto se añade su combinación de plataformas en los entornos online y offline, lo que favorece el «realismo» de la experiencia. En este sentido, el presente trabajo pretende condensar las potencialidades, limitaciones y retos de los ARG al servicio de la educación universitaria. Basándose, a nivel metodológico, en la elaboración de un corpus teórico relevante y adecuado, analiza el potencial educativo de esta herramienta que, en ámbitos como el marketing o la comunicación corporativa ya ha despegado con éxito, pero que en el área educativa todavía no había sido abordada en profundidad. Recopila, además, ejemplos satisfactorios que se han desarrollado en diversas disciplinas académicas en otros países y que no resultan fácilmente localizables. Se concluye que, dados los antecedentes, potencialidades y análisis expuesto, debe valorarse la posibilidad de incorporar los juegos de realidad alternativa a la práctica de la docencia universitaria en el marco de una estrategia educativa que determine sus objetivos y sistema de evaluación más adecuado.

KEYWORDS | PALABRAS CLAVE

Gamification, immersive games, game-based learning, higher education, competences, co-creation, creativity, collective intelligence. Ludificación, juegos inmersivos, aprendizaje basado en juegos, educación superior, competencias, co-creación, creatividad, inteligencia colectiva.

1. Introduction

In the age of convergence (Jenkins, 2006) methodologies, tools or educational spaces have been involved in a dynamic process of continuous transformation, characterized by greater flexibility and adoption of new technologies, formats and languages.

The concept of literacy has also been redefined. Besides the skills of reading and writing now it also refers to a multifaceted set of practices that apply this knowledge so as to accomplish specific purposes, in specific contexts, strongly influenced by the available technologies (Bonsignore & al., 2011).

These trends have been integrated in the design of teaching strategies to share channels and languages with «digital natives» (Prensky, 2001) in order to achieve a meaningful learning (Gikas & Grant, 2013).

Changes in higher education and the new educational methods emerging in recent decades have aroused the interest of a large number of authors from around the world (Altbach, Reisberg & Rumbley, 2009). Among the teaching methods that have attracted most interest in recent years in educational institutions, public authorities, academia and other entities is Massive Open Online Course (MOOCs). This interest has made The New York Times declare 2012 as the year of MOOCs (Pappano, 2012).

Given the high volume of registrations, these types of courses offer to universities and teachers an intermediate area for the teaching-learning process between the highly organized and structured classical classroom and the open web with a huge volume of extremely fragmented information and chaotic organization (McAuley & al., 2010). Also, as Siemes (2013) highlights, in addition to distribution, the importance of MOOCs lies in autonomy given to students owing to the control over their own learning as well as the use of many tools and technologies during the course deliveries (Siemes, 2013: 8).

In some cases, the design of these courses as well as the participants' use of certain tools, involve the creation of a user community that can get to form a real learning network. These types of Massive Open Online Courses are discursive communities that create knowledge together (Lugton, 2012; Scopeo, 2013; Siemes, 2013).

The popularity of MOOCs led to the adaptation of teaching strategies based on gamification to this new context. The voluntary and autonomous nature that characterizes the enrolment in an open online course involves, more than another mode of instruction, an individual decision to learn and think independently encouraged by the use of digital games as providers of

motivation and external stimulus (Cebrián de la Serna, 2013: 186).

This perspective led Borden, in 2012, to change the typical content of open courses into a learning experience based on the concept of teaching and learning gamification, by creating various alternate reality games (ARG).

This is not the only experience in this sense, in fact, it is worth noting the teaching innovation project The Games Mooc (<http://gamesmooc.shivtr.com>) of Colorado Community College System, which encourages the use of ARG and other type of digital games in MOOCs as well as in other areas of higher education, from the open training of teachers and people interested in their design and development.

These initiatives have linked two leading trends in education today: MOOCs and integration of games in the teaching-learning process. If 2012 was the year of massive open online courses, gamification of higher education is a close reality, according to the prospective issues of Horizon Report Higher Education 2014.

This work is an approach to the use of ARG in education, the features of their use with teaching purpose and their potential. To this end, we have undertaken an exhaustive literature review of the state of play as well as some of the initiatives successfully developed.

2. Alternate Reality Games (ARG). Definition, characteristics, scope

Alternative Reality Games are an emerging genre of immersive interactive experiences where players collaboratively locate clues, organize scattered information and solve puzzles to advance the storytelling that combines both real and online environments (Doore, 2013).

The first far-reaching ARG was used for the advertising campaign of the film «Artificial Intelligence: AI» (2001) by Steven Spielberg. Under the name of «The Beast», this ARG launched in 2001 in the United States began with hidden clues in the movie posters that attracted the public's curiosity and led to an expedition through the real and online world, in order to have information related to the film (Valencia, 2013). Beyond that, their use with transmedia universes has increased in order to: build loyalty, entertain and amuse, create «engagement» or make the project profitable (Scolari, 2013, Dena, 2008).

Marketing and corporate communications are other areas where they have been used successfully. The game dynamics allow the participation of the public, who are introduced into the story and enjoy it

thanks to an experience linked to the brand (Tuten, 2008; Estanyol, Montaña & Lalueza, 2013).

However, depending on the structure, it would be a crossmedia storytelling because games are about finding clues, solving puzzles and getting information from an initial clue «rabbit hole», so that there is a necessary circuit from one content to another (from some information to another, so it is required to access all the content).

One of the keys to this game is its leitmotif: «This is not a game». This implies that realism / authenticity is one of the main points, so all platforms that are used must be active (websites, e-mail addresses, phone numbers, QR codes, etc.). It refers also to the continuation of the game in the real world, which is one of the most important defining features.

«In game genre terms, ARG are a subset of pervasive games, because their multiplatform distribution of content spills into players' everyday lives via SMS messages, phone calls, email and social media or chances to meet non-player characters (NPCs) face to face» (Hansen, Bonsignori, Ruppel, Visconti & Krauss, 2013: 1530)¹.

This offline-online combination also helps the immersion process of participants, who «live» adventure directly (Arrojo, 2013).

This is conditioned by one of the distinctive features regarding other games, duration. While gaming lasts minutes or hours (or you can continue the game on different days), ARG provide a more or less continuous experience during weeks and months, where participants star in an adventure besides living their life.

Another main point is collaborative storytelling dynamics. «We suggest that ARG are a form of collective storytelling. Although game designers hold most of the story in hand, players have much influence on how the story unfolds. Because players discuss the game in public forums, game designers adjust the story and clues based on player feedback. As a result, the story co-evolves between the groups» (Kim & al., 2009)².

Designers and producers of ARG (the so-called puppetmasters) construct storytelling in collaboration with users and players, as it develops. «A successful ARG, then, is not simply the result of an audience doing the right thing at the right time but, instead, it is

a dynamic and mutable interplay between producer and player, one that relies on the overlapping literacies of each» (Bonsignore & al, 2012: 2)³.

Collaboration also occurs among players, so some authors (McGonigal, 2007, Jenkins, 2006) think it is a practical example of «collective intelligence» (Lévy, 2007) based on the exchange of information and help through network. «Many game puzzles can or must be solved only by the collaborative efforts of multiple players, sometimes requiring one or more players to «get up from their computers to go outside to find clues or other planted assets in the real world» (Brackin & al, 2008: 5)⁴.

Alternative Reality Games are an emerging genre of immersive interactive experiences where players collaboratively locate clues, organize scattered information and solve puzzles to advance the storytelling that combines both real and online environments

Basically, it is a practice of co-creation, that is, collective creation also in line with the principles of the Web 2.0. «In comparison to the static Web 1.0 that focused on information, this new concept of the Web [2.0] is focused on the user and the tools for creation, production and dissemination of content by a community of interagents» (Costa-Sánchez, Piñeiro-Otero, 2012: 186).

This group collaboration generates the formation of a community around the game, joining forces and resources in order to achieve a goal. Establishing a community requires the completion of three stages (McGonigal, 2007): 1) collective knowledge; 2) cooperation and 3) coordination. These stages correspond to three ARG design elements: 1) content massively distributed; 2) ambiguity in meaning and 3) respond capacity in real time, three requirements to be considered when creating it.

In short, the defining characteristics of ARG are: 1) Expansion of the game into reality and the combination of offline and online platforms at the service of adventure (we live in real places, with channels and platforms that exist and are available, with fictional characters in the real world, etc.). 2) On the basis of the above, the ability of players to get immersed. 3)

The dynamics of the game involve researching and solving a mystery, so one needs to gather information, find clues and solve puzzles. It is based, therefore, on discovering and creating knowledge. 4) The storytelling is collaborative, so that puppetmasters are adding or modifying the story according to the response of players. 5) Collaboration also occurs when solving the game, with participants helping each other, so it is considered an example of practical application of «collective intelligence».

Higher education must adapt to technological and social context in which students live. The classroom as a teaching and learning space should not ignore what happens outside. The integration of social media in teaching is an interesting opportunity at the service of motivation, participation and creation of shared knowledge. Gamification, meanwhile, is an upward trend in various fields because it promotes an active role in players-participants, collaboration in problem solving with available resources and motivation to achieve goals.

The popularity of ARG over the last few years has led to the delimitation of subtypes of such games according to some features both convergent and divergent. Convergent to all the games that belong to the same type of ARG and divergent if compared to other sub-genres.

In this regard, the International Game Developers Association (IGDA) proposes a classification of ARG taking into account the context of other similar games and their purpose. This proposal classifies ARG into five categories, which include training-education (Barlow, 2006). Also Brackin & al. (2008) pay special attention to these ARG in their classification as part of non-commercial typology.

3. An approach to educational ARG

Over recent decades, researchers have paid particular attention to how digital games influence learning processes and their effects on the overall educational process (Gee, 2004; Kafai, 1998; Prensky, 2001;

Squire & Jenkins, 2003). For several authors (Prensky, 2007), the educational setting has changed in terms of context and also the profile of the agents involved in it, so that in the new educational model that promotes independent learning, the old teaching dynamics must amend.

Most studies conducted in an educational context have demonstrated positive results concerning gamification of the teaching-learning process in terms of increased motivation and task commitment as well as enjoyment around them (Hamarri & al., 2014: 4; Cebrián, 2013). Cebrián (2013: 192) also stresses the ability of the game to encourage digital literacy by enabling the individual to encode-decode his storytelling, and deepen communicative, creative and recreational skills.

In the last decade there have been several considerations of the educational benefits of ARG, mostly Anglo-Saxon. The importance of social web and its tools, the ubiquity of Internet thanks to mobile technologies and the increasing use of multimedia content in general, have led teachers and trainers to adopt new strategies using ICT to attract the attention of students and increase their level of commitment to their own education and training process. Educational ARG have common elements with other types of games, but promote a non-traditional product that goes beyond formats, platforms and languages to be as simple and complex as knowledge (IGDA, 2006: 19). These immersive games are a powerful tool that has become a teaching tool in the third millennium (ARGology, 2009; McGonigal, 2011).

In primary and secondary education there some initiatives of educational ARG such as HARP (2006), Ecomuve (2009) and, in Latin America, Mentira (2009) can be highlighted. These games for primary and secondary education have been designed by experts from Harvard University, University of Wisconsin, MIT and the University of New Mexico (Center4-Edupunx, 2012). In Europe, the EMAPPS Project (2005), an educational ARG project developed by various entities and funded by Sixth Framework Programme stands out.

ARG have an additional advantage: they can adapt their story to different contexts, age groups, locations, subjects and disciplines, as well as learning objectives (Connolly, 2009). This ability to be adapted allows the creation of ARG by external academic institutions, to be used by various schools in different school contexts. The changes introduced by players can be adapted to the global story and we can point out differences of use in terms of the required results (Whitton, 2008).

The academic nature of these initiatives advances the important weight that educational ARG have for higher education. Alexander, a pioneer in the integration of these games in teaching strategies, started using ARG for teaching Arts in 2002, just a year after the premiere of «The Beast» (ARGology, 2009).

Initiatives like «Blood on the Stacks» (2006), «World without oil» (2007), «The Great History Conundrum» (2008), ARGOSI (2008), «Just Press Play» (2011), «EVOKE» (2010) or «The Arcane Gallery of Gadgets» (2011) are some of the ARG that have been successfully implemented in the context of higher education.

4. Potential of ARG integration in higher education

Alternate Reality Games combine the features of gaming and social software and, therefore, the teaching potential of both tools (Lee, 2006). They are collaborative, players must work together to solve puzzles, they are active and experimental and provide real contexts and objectives for the activity in the real and virtual world (Whitton, 2008; Lee, 2006).

However, ARG offer additional learning benefits. First, players are not limited by the possibilities of an avatar or a fictional character but are their own agents and use their own experience and knowledge to move forward in the game. Tests and puzzles make participants cooperate and they do not have predefined safe spaces that set the time and logistical limits of gaming.

Due to this cooperation among participants Brackin & al. (2008) refer to the social network as the backbone of ARG. Lee (2006) also stresses that these games feature changing situations that require quick decisions, while the regular delivery of tests stimulates reflection (Moseley, 2008).

In regard to primary and secondary education, authors such as Turner and Morrison (2005) have explored the use of ARG as pedagogical tools, seeking greater engagement and involvement of primary and secondary students in their own learning process. ARG are an integral part of a distinct class that provides students the opportunity for personalized learning,

matching their proficiency and understanding (Center4EduPunx, 2012).

In the context of higher education, we can approach the potential of ARG in teaching and learning on the basis of the work of several authors, among them Moseley (2008) and Fujimoto (2010).

An ARG requires that its public follows each of the activities and collaborate and interact with other users-participants (De Freitas and Griffiths, 2008). Besides greater involvement of students in their own learning process, taking an active role in the creation of content may affect the design of the game world (Whitton, 2008). Such interference of players in game results - following Moseley- means a higher level of commitment and participation.

It is collaborative learning. In many cases, the community of players becomes a support network where most experienced players help new ones (Whitton, 2008). This kind of peer-to-peer education community becomes more important in those contexts where students have followed different personal and educational paths, since the divergence of knowledge and skills complement each other to achieve the objectives (Dunleavy, Dede & Mitchell, 2009; De Freitas and Griffiths, 2008). As Hernández, González and Muñoz (2013) point out collaboration and learning may arouse interesting personal and social opportunities, while generating deep impact that requires a review of the pedagogical, organizational and technological elements within a particular virtual environment for learning.

It is a learning process from situation, while ARG create a context of real life, which is based on problem solving (Whitton, 2008; Moseley, 2008; Moseley & al. 2009). ARG also provide a multimodal and multimedia learning, which makes players move through various platforms, formats and languages.

5. Dealing with the design of an educational ARG

One of the most challenging aspects when designing an educational ARG is to create a credible setting, suitable for learners, which makes them commit to the experience. As Fujimoto (2010) points out, if the game setting is seen as educational this will not only entail the rejection of some players, it will also make it lose its recreational nature to become school work. If the main feature of an ARG is precisely its «non-game» nature, in education an oxymoron occurs: it must be credible and fun, entertaining but promoting commitment to some activities.

There are three components in any ARG: exposition, interaction and change (Phillips, 2006). Beyond

these components, it is difficult to determine what form, structure or what elements an educational ARG should contain. As Fujimoto (2010) notes there are countless games and game rules, ranging from something as simple as a treasure hunt to something more complex, as an educational experience based on problem solving.

Davies, Kriznova and Weiss (2006) suggest some guidelines for ARG design in order to promote progress, imagination and curiosity: 1) players must be able to perceive the ARG outcome; 2) the main goal and sub goals should be challenging; 3) it must involve mental activity; 4) at the beginning of the game, the end must be uncertain; 5) the ARG should require that the player develops strategies to succeed; 6) it should offer different paths to reach the goal; 7) the game must have appropriate tests and obstacles meeting maturity and prior knowledge of the players.

Dealing with the design of an educational ARG is difficult, as its structure must involve players so to encourage them to participate and complete the experience, while they should complete the learning goals. Some of the barriers identified by Balanskat (2008) for the effective use of ARG include access to new technologies among the participants in the project, teacher training, safety issues, difficulties to combine games and school curriculum goals or lack of assessment of social skills.

6. Discussion and conclusions

Higher education must adapt to technological and social context in which students live. The classroom as a teaching and learning space should not ignore what happens outside. The integration of social media in teaching is an interesting opportunity at the service of motivation, participation and creation of shared knowledge (Menéndez and Sánchez, 2013: 156). Gamification, meanwhile, is an upward trend in various fields because it promotes an active role in players-participants, collaboration in problem solving with available resources and motivation to achieve goals (McGonigal, 2011).

In the context of the European Higher Education Area, ARG are a useful tool in the acquisition of skills, understood as the proven ability to bring into play knowledge and skills, personal, social and methodological capacity. ARG are also beneficial in meeting European Parliament requirements for responsibility and autonomy (European Parliament, 2007). Many of the transversal competences (instrumental, personal or systemic) are related to the operating dynamics proposed by ARG: problem solving and decision making,

teamwork, individual learning, use of ICT, ability to apply theoretical knowledge in practice and communication skills, for instance. These types of immersive games are based on three elements: convergence, participatory culture and collective intelligence, becoming illustrative examples of the new media ecology described by Jenkins (2006).

In terms of specific skills of the Degree in Audiovisual Communication, designing an ARG can be a useful task for students (not just experimenting) when implementing creative strategies and using ICT in a communication campaign, as already happens in marketing and film promotion. Students must learn to apply their knowledge, improve their social and communication skills and they are expected at university to develop their values and attitudes so as to succeed in the workplace (Teichler, 2007).

Apart from the potential benefits enumerated above, creating surprise and mystery, stimulating commitment and -given the use of ICT and 2.0 tools- extensive access without too many production costs should be added/considered

In Spain, there are no studies on the use of these types of games as a teaching tool at university, reflecting that it is not a standardized activity. Designing an ARG is an arduous task that can make teachers reject its use. In this sense, authors like Carson, Joseph and Silva (2009) have proposed the use of mini-ARG to achieve specific and concrete objectives. This work reflects on ARG as a new option when raising content and educational methodology in higher education. It emphasizes its adequacy for teamwork, since they favor the assignment of objectives, the setting of dynamics to achieve them, collaboration among participants, the overcoming of small puzzles (which can be associated with the subject content) and a high degree of involvement in the experience. In any case, as an educational tool, it should be part of the education planning process to ensure the achievement of its objectives and provide for a system to value the extent of compliance with the goals (Chin, Dukes & Gamson, 2009; Connolly, 2009).

Notes

¹ «In game genre terms, ARG are a subset of pervasive games, because their multiplatform distribution of content spills into players' everyday lives via SMS messages, phone calls, email, and social media or chances to meet non-player characters (NPCs) face-to-face» (Hansen, Bonsignori, Ruppel, Visconti, Krauss, 2013: 1530).

² «We suggest that ARG are a form of collective storytelling. Although game designers hold most of the story in hand, players have much influence on how the story unfolds. Because players discuss the game in public forums, game designers adjust the story and

clues based on player feedback. As a result, the story co-evolves between the groups» (Kim & al., 2009).

³ «A successful ARG, then, is not simply the result of an audience doing the right things at the right time but, instead, it is a dynamic and mutable interplay between producer and player, one that relies on the overlapping literacies of each» (Bonsignore & al., 2012: 2).

⁴ «Many game puzzles can or must be solved only by the collaborative efforts of multiple players, sometimes requiring one or more players to «get up from their computers to go outside to find clues or other planted assets in the real world» (Brackin & al., 2008: 5).

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The Undesired Effects of Digital Communication on Moral Response

Efectos no deseados por la comunicación digital en la respuesta moral

 Dr. Isidoro Arroyo-Almaraz is Senior Lecturer at the Universidad Rey Juan Carlos (Spain) (isidoro.arroyo@urjc.es).

 Dr. Raúl Gómez-Díaz is Head Teacher in the Department of Philosophy at the Salvador Allende Secondary School (Spain) (raul.gomezdiaz@educa.madrid.org).

ABSTRACT

The current paper is based on the hypothesis that communication through the new digital technologies modifies the moral response of users, and therefore reduces social capital. This approach has been contrasted by designing and conducting an experiment (N=196) using our own adaptation of the Spanish version of the Defining Issues Test on subjects who have been socialized by Internet and who constitute the representative samples of this study. This test on paper was adapted to our research following an expert validation procedure and then transferred onto two types of digital audiovisual formats. Finally, The use of digital communication technologies and students' fluid intelligence response were evaluated in order to establish whether their response was significant and if it modified moral response. The results confirm the hypothesis and show that the quality of moral response decreases when digital technologies are used instead of pencil and paper. This difference is greater when virtual images of people designed by animation are used rather than visual images of real people. In addition, the results show that fluid intelligence mitigates these modifications.

RESUMEN

Se investiga cómo la comunicación mediada por tecnologías digitales modifica la respuesta moral de los usuarios, y por tanto, varía el capital social. Se diseña y realiza un experimento con 196 sujetos que se sirve de una adaptación de diseño propio del «Defining Issues Test» en papel, a partir de la versión española, sobre una muestra representativa del universo de sujetos que se han socializado con Internet. Se valida la adaptación del test sometiéndolo a juicio por un panel de expertos, se amplía el mismo a otros dos formatos digitales audiovisuales diferentes: con imágenes reales de personas o con imágenes virtuales de personas a través de animación, y se comprueba si la inteligencia fluida de los sujetos es significativa en la modificación de la respuesta moral. Los resultados confirman las hipótesis y demuestran que la calidad de la respuesta moral disminuye cuando se usan tecnologías digitales respecto a cuando se usa papel y lápiz. Esta diferencia es mayor cuando se usan imágenes virtuales de personas a través de animación que cuando se usan imágenes audiovisuales de personas reales. En todos los casos la inteligencia fluida es un atenuante de estas modificaciones.

KEYWORDS | PALABRAS CLAVE

Digital communication, audiovisual communication, on-line morality, moral development, moral dilemmas, digital literacy, social capital, citizenship.

Comunicación digital, comunicación audiovisual, moralidad on-line, desarrollo moral, dilemas morales, alfabetización digital, capital social, ciudadanía.

1. Introduction

This research seeks to discover, measure and assess the undesired effects on moral response when digital technologies are used to communicate. This study does not examine the ethical implications of subjects' digital behaviour in terms of identity, authorship, participation, credibility, privacy and community membership (Rundle & Conley, 2007), rather the aim is to evaluate the influence that digital communication tools might have on moral response by their very nature and the way they are used. The study analyses the causal relationship between the alteration in moral response and the variable that consists of digital communication versus pencil and paper communication.

The vitality of the Internet, the emergence of the 2.0 and 3.0 networks and the massive, widespread use of digital information and communication technologies have armed all of us users with instruments that have vastly increased our capacity to communicate. This means that it is important to assess not only the evident advantages but also to be aware of the negative effects on moral cognitive capacities and the consequent decrease in social capital that subjects, and the social networks in which they are integrated, could suffer.

While there is more than one concept of social capital (Bourdieu, 1980; Putnam, Leonardi & Nonetti, 1993; Coleman, 2001) and no unanimously accepted restriction on the use of this notion (Annen, 2003; Portes, 2000; Durston, 2000), all authors emphasise the difference between social capital and physical and human capital, in that social capital is specific to individuals and, as such, participants in social networks.

It is also agreed that social capital can also have negative effects, by fomenting inter-group rivalries (Durston, 2000), restricting participants' freedom and hampering outsiders' access (Portes, 2000) or undermining individual motivation in communities (Heinze, Ferneley & Child, 2013).

The development of digital communication technologies has led to a proliferation of a wide variety of digital communities and a taxonomy of collaborators that is both open and highly unpredictable. Researchers have observed how digital technology has helped increase the social capital within these communities at very little cost (Shim & Eom, 2009) and how the benefits influence participants' commitment to a digital community (Heinze, Ferneley & Child, 2013). We propose the revival of what was initially meant by social capital in the analysis and expectations of success in educational institutions (Coleman, 2001; Ramírez-Plascencia & Hernández-González, 2012) in order to study the negative impact of activities media-

ted by digital technologies on the modification of the links between students, and between students and the institution, as actors within these communities that, by their nature, contain predictability, trust, regulation and coherence.

This is particularly significant when we consider the social skills acquired by those subjects already socialized and intellectually mature, surrounded by the ever-present network of networks.

Normally the voices raised in alarm against this digital imperialism are dismissed as apocalyptic, retrograde or reactionary. Nevertheless, there are authors who have developed a deep knowledge of, and who were present at, the founding of digital communication systems (Lanier, 2011); who have charted their emergence as writers in the specialist press (Carr, 2011); who have studied how these technologies have been incorporated in education (Buckingham, 2008; Gardner, 2005; Palfrey & Gasser, 2008); or who simply use their press platforms as observatories (Frommer, 2011) and advise us to exercise caution.

Probably the most complete set of warnings came in the qualified responses posted in 2010 on «edge.org» in response to the question posed that year: «How is the Internet Changing the Way You Think?» (Brockman, 2011). The alert was based on knowledge, reflection and caution and urged that it was important to understand to what extent the advantages of incorporating digital communication technologies could also contain within them certain, as yet unseen, disadvantages.

This admonition is well argued by Prensky (2012) or in international programmatic documents (UNESCO, 2005; Rundle & Conley 2007). Being aware of the hybrid nature of all human actions, perhaps there is no other external object quite like these digital tools, hardware and software, capable of usurping more capacity as moral agent in collaboration with «humanware». Neither should we underestimate the neurological changes that digital communication activities can cause (Wolf, 2008; Small & Vorgan, 2008; Watson, 2011).

These warnings are by no means redundant; they do not take up the cause against the mass communication media initiated by influential 20th century authors (McLuhan, 1993; 2009), warning of the coming of the society of the spectacle (Debord, 1999 a; 1999 b), or the transformation that the subject undergoes (Sartori, 1998). Today, these authors do not perceive a dystopian future like the one that some sociologists wished to avoid (Beck, 1998; Jonas, 1995). They are aware of these criticisms (and in some cases they use

them as a starting point) but they remain cautious in their pronouncements and assume that digital communication technologies are here to stay.

This research uses an unusual perspective in its analytical framework. It is not enough to examine the linguistic, technological, interactive, ideological or aesthetic dimensions of the production and reproduction of digital messages (Ferrés & Pisticelli, 2012). Without neglecting concern about why institutional policies agree on common objectives or why schools and families echo the need to digitally educate our youngsters (Aguaded, 2011), we would have to consider, before we contemplate digital equality (Gozálvez, 2011), the possible changes that occur in the moral cognition of digital environments. And this is pressing, as the role of the new communication media in civic education and political activity becomes greater, and it is no longer appropriate to see the media from the learning-service perspective (Middaugh & Kahne, 2013).

The general aim of this research is to determine if the moral response among young people socialized in the omnipresent digital media remains intact or undergoes changes as the sole result of using communication media. The specific objectives are: first, constructing a definition of morality that is procedural, and establishing a diagnostic procedure that enables us to measure any possible modification in moral response as a consequence of communication mediated by digital technologies; second, to design and carry out an experiment on a significant sample of young people socialized in the digital world and who have no academic specialization or particular attributes in the use of these digital technologies.

A diagnostic tool was designed with the aim of confirming or refuting the following hypotheses: first, moral response changes with the use of digital communication media; second, this possible alteration is influenced by exposure to virtual images of people in animated form as opposed to images of real people; third, the subject's fluid intelligence is relevant in terms of the possible effect on moral response provoked by digital communication.

2. Material and methods

This causal, experimental investigation follows a procedure that is empirical, transversal and prospecti-

ve, and it is measured quantitatively. First, we take Kohlberg's (1992) idea of morality as a starting point; second, we design a diagnostic tool to carry out an experiment on a substantial sample; third, we provide quantitative results that are statistically analysed on which to base conclusions.

2.1. Morality: reflection and universalizability

The capacity of a judgement to raise itself to a universal category (that is, its universalizability) and the habit of judgement, guarantees a moral response that can be considered worthy of transmission to others; it

The general aim of this research is to determine if the moral response among young people socialized in the omnipresent digital media remains intact or undergoes changes as the sole result of using communication media.

renders the individual less capable of a desire for wrongdoing and prevents him from making an exception of himself. All attempts to base universal ethics on material instincts have failed, and so far there has been no opportunity for a set of ethics to emerge that has its root in what occurs in our brains (Cortina, 2011). Neither can we deduce any universal ethics from in phylogenetic or ethnographic research since this would presume falling into the trap of the naturalist fallacy that attributes pseudo-sacred character to something that exists.

If we have known since Aristotle that it is in the habit of judgement that the capacity to distinguish right from wrong resides, it was Nietzsche who showed us that good and evil also have their own genealogy. To make our experiment efficient across beyond social, cultural and professional differences, and also to apply it to various contexts, we use procedural ethics based on Kantian tenets that do not aim to frame rules or codes but capture the universal condition of the rules. We subscribe that the rule will have to emerge from sociability, publicity, impartiality, altruism and coherence (Arendt, 1995; 2003).

2.2. The diagnostic method

Our concept of moral judgement as a consequence of the habit that pursues universality is consistent

with theorists of moral development such as Piaget (1974) and Kohlberg (1992). Kohlberg expertly developed Piaget's epistemological procedures by extending to morality the procedure that Piaget applied to the categories of space, time and cause, etc. Hence, cognitive development is not necessarily paired with moral development, it merely enables it. So the very habit from which moral judgement proceeds has to be exercised, with the supposition that the superior cognitive development that fosters it is already given (Kohlberg, 1992; Hersh, Reimer & Paolitto, 2002).

Kohlberg's diagnostic approach adapts a method from clinical practice in order to understand the moral state in which a subject finds himself. To do so, the interviewee is given some moral dilemmas which are relevant to the subject, and the method follows the reflections that the subject uses to justify his position with regard to the dilemma. After repeating this semi-structured interview over several years with the same group of young people, Kohlberg and his collaborators were able to state that moral development in all individuals can be categorized in the six hierarchical moral states they discovered.

Each moral state involves qualitative differences in the way of thinking, and coalesces with other states within a fixed hierarchical sequence; the six states range from the pre-conventional state (egocentric, the result of a moral heteronomy guided by avoiding punishment and winning the prize) to the post-conventional level that pursues validation of universal principles and commitment to others.

The main criticisms of Kohlberg's thesis centre on the rigidity of the system of states that the subject must fit into and the likely instability of the procedure, given the importance that it would have in any analyst's interpretation. Although Kohlberg convincingly countered these criticisms, we refer to the revision of some of his ideas by his followers which came to be known as neo-Kohlbergianism (Rest, Narvaez, Bebeau & Thoma, 1999; Rest, Narváez, Thoma & Bebeau, 2000), and the Defining Issues Test (D.I.T.) produced by James Rest (1979; 1986).

Rest and his team improved the theory and procedure, and provided an objective tool to measure morality in subjects. They emphasise moral schemas rather than moral states, although in essence the hierarchical organization is the same. This enables us to test the individual who, after being presented with a moral dilemma, must evaluate incomplete lines of reasoning in various behavioural options proposed in relation to this dilemma, and which the subject evaluates from his own moral schema. The analyst does not intervene

other than to check the correctness of the procedure or interpret, but tabulates and establishes a diagnostic based on the computed data.

The D.I.T. contains six dilemmas each requiring three reflective moments in sequence. On the first reflective level, the subject has to propose a general solution to the dilemma. On the second, the subject must evaluate in order of importance 12 items related to the dilemma. In the third instance, the subject selects four questions from the 12 in order of importance, to then decide on the protagonist's behaviour in relation to the dilemma.

After tabulating all these results, we obtain a dominant moral schema for the subject's thinking. And the test's reliability is backed by numerous studies across different countries, cultures and contexts (Luna & Laca, 2010). The procedure of our experimental design is:

a) Following the recommendations of a panel of experts consisting of eight secondary school teachers of various subjects (Philosophy, English language and translation, and Technology, among others) the wording of the Spanish version of the D.I.T. by Pérez-Delgado (1996) was updated and the translation of several phrases changed to minimize the errors which arose in some items that were expressed as questions but were rewritten in the affirmative form. To improve the test's usability it was decided that all the questions would be answered on the same sheet that contained the dilemma and not on a separate piece of paper (figure 1).

b) From our D.I.T. version, the six dilemmas were transferred onto two other formats that differed from the version on paper: the format that we call real audiovisual is a spoken audiovisual of the dilemma read out in the style of a news broadcast, with a neutral background and a single image of the speaker in a middle ground shot; there is no musical accompaniment or shot changes or camera movements; and the format we name virtual audiovisual is formed of a presenter in human animation form speaking in a news reporting style made with «iClone v2. Real Time 3D Filmmaking» animation software (Reallusion, 2007); there is music, shot variation and camera movements. We also posted the respective questionnaires of each dilemma on-line with the use of the «Google-Drive» app.

c) We set up «blogs» on «Google's» «Blogger» platform with the videos and questionnaires distributed in different combinations for each of the sample groups. As a result, each group views two of the six dilemmas in the real audiovisual format and completes their corresponding «online» questionnaires, two

dilemmas in the virtual audiovisual format with their «online» questionnaires and two dilemmas in pencil and paper format.

2.3. The sample

The population universe consists of subjects born after the emergence of digital technologies in Spain

DILEMMA 6. Title: **The High School newspaper**

Alfredo: a student in the fourth year of secondary education at the "Velázquez" High School wants to publish a newspaper so that all students can express their opinions, photocopying articles to be written for the school's website. He wants to write about politics, sports, young people and their world and the environment, but most of all, he wants to criticise some of the school rules, such as one which bans students from attending class wearing any form of headwear like caps or hats. After he formulated the idea, he went to see the Principal to ask permission. The Principal agreed, on condition that Alfredo submit all articles for his approval before publication. Alfredo agreed and showed the Principal the articles which he duly approved, and Alfredo published two monthly editions of the newspaper. The Principal did not expect the newspaper to be so successful among the students. The students were so impressed by its content that they have started to organize protests against the rule on headgear in class and other measures. The students' parents objected and urged the Principal to stop publication. As a result of the tumult caused by Alfredo's articles, the Principal ordered Alfredo to stop publishing the newspaper, citing the fact that the newspaper was disrupting the school routine.

Should the Principal ban the publication of the newspaper?
(mark one of the three options with an "X")

Yes, he should		I can't decide		No, he shouldn't	
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Read the following statements and select **by marking with an "X" (very important, important, quite important, not very important, not at all important) according to the importance you give each one**

Nº	QUESTIONS	Very important	Important	Quite important	Not very important	Not important at all
1	You must take into account whether the Principal is more accountable to the students or to the parents.					
2	You would have to decide if the Principal authorized publication of the newspaper for a long period of time or only promised to approve it each time it was ready for publication.					
3	The students would protest even more if the Principal stopped publication.					
4	The Principal could have the right to give orders, like these, to the students when the proper functioning of the school was under threat.					
5	The Principal is free to say "No" in this case.					
6	The banning of the newspaper enabled the Principal to avoid any indepth discussion of important problems.					
7	The order could have made Alfredo lose confidence in the Principal.					
8	It would be important to know if Alfredo really is loyal to his school and a good citizen for his country.					
9	It would be necessary to consider what effects the ban on the newspaper would have on the education of the students' critical thinking and on their values.					
10	It would be necessary to think about whether Alfredo was violating the rights of others by publishing his own opinions.					
11	The Principal should not let himself be influenced by angry parents when it is he who best knows what is happening.					
12	Perhaps Alfredo is using the newspaper to create discontent and rancour.					

Now write the number of four of the statements from the list above that you consider the most important

The most important		The 2nd most important		The 3rd most important		The 4th most important	
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Figure 1. Example of this study's version of the dilemma and questionnaire updated and adapted from the D.I.T. (The videos of this dilemma in their real and virtual audiovisual versions are available on <http://goo.gl/xtKtL3> and <http://goo.gl/Vy7of8>).

who are accustomed to taking classes in which both printed material and digital technologies are used, who are nondigital technology experts in terms of usage and training, and are old enough to display all the states of moral development. The universe is limited to young people of both sexes, over 14 but under 18, in pre-university education and who are not taking professional courses linked to digital technologies.

The sample was taken from a secondary school in the town of Fuenlabrada, near Madrid, with 233 students that matched these requirements and which, in terms of yearly pass rates, graduation and university places gained, is similar in academic achievement to any other educational centre in the Autonomous Community of Madrid.

These students were given the Raven (2001) progressive matrices test measured on the Standard scale for fluid intelligence (the capacity to think and reason abstractly) which yielded a mean of 49.46 and a standard deviation of 5.842 (the measures proposed for these ages in Spain have a mean score of 47.89 with a standard deviation of 6.19), so the sample was deemed to be adequate.

For the experiment to run smoothly and to enable subsequent comparisons, it was decided to divide the subjects into eight randomly selected groups, from classes in the three years prior to university entrance.

The sample initially consisted of 196 students who performed the experiment in the computer rooms at the school. A total of 184 students completed the test, and after eliminating unavoidable registration errors, 160 were found to have answered the questions on all the dilemmas, with an equal spread among the groups and by gender. Having no data on similar experiences to work on, and given the complexity of the procedure, we consider the figure of 81.6% of participants to be a success, similar to what was expected and acceptable.

3. Analysis and results

The results were significant in terms of scales of incoherence, according to the support they used to resolve the moral dilemmas. Incoherence is defined (Rest, 1996) as a lack of congruence between the levels of reflection that the subject is faced with. The subject shows incoherence when, at the end of the questionnaire for each dilemma, he or she selects in order of importance the four questions (from the 12) that enable them to define the conduct of the protagonist of the dilemma and which are not among the questions given greater importance on the previous level.

Rest and collaborators (1986) proposed eliminating questionnaires with one dilemma that contains more than eight incoherencies, or which revealed incoherencies in two or more dilemmas. The different quantitative levels of incoherence are established in the following way: when the item chosen as the most important does not correspond to any of the items selected from among the 12 as being most significant in the previous stage of reflection, it is computed as 1 point of incoherence. If the second of the four options in importance selected does not have any other item (except the first) considered more important, it does not count as incoherent but if it had one, it would be deemed to be another point of incoherence. If the same happens with the third, another point; and if the fourth also has another option ahead of it (besides the items chosen in first, second and third place) another point is added. So each questionnaire for each dilemma can score a maximum of four points in incoherence when none of the four options chosen and graded in terms of importance is congruent with the evaluation made immediately above on each of these options. The maximum incoherency would be 24 and the minimum 0.

The statistics show a mean of 7.72 incoherencies per individual and a standard deviation of 4.63. The spread of incoherencies per dilemma and individual varies slightly from 1.04 to 1.44, so the different content in the dilemma can be discarded as an influence on the subjects' incoherencies. Likewise, the number of incoherencies has no significant variances in terms

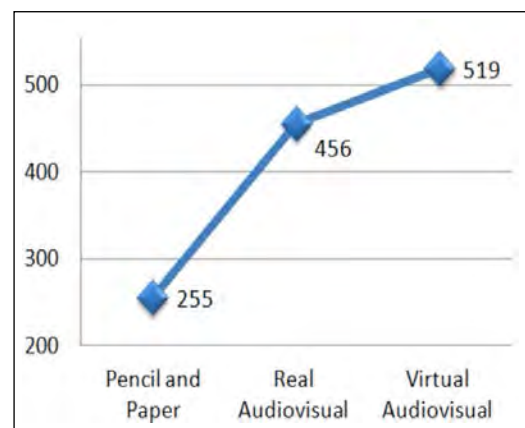


Figure 2. Total incoherencies among the 160 participants.

of belonging to a particular group or gender. By contrast, the spread of incoherencies is highly significant with regard to the communication medium used to transmit the dilemma and to the completion of the

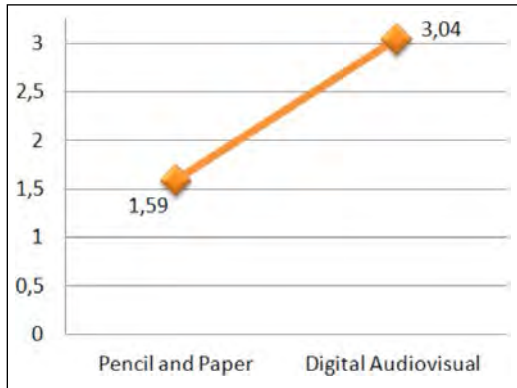


Figure 3. Incoherencies by dilemma and subject.

questionnaire (figures 2, 3 and 4).

For each incoherence that appeared in the pencil and paper format there were 1.8 incoherencies in the real audiovisual «online» format and 2.0 incoherencies in the virtual audiovisual «online» format (figure 2). Compared overall, for each dilemma and subject we find that incoherencies multiply by 2 when we use «online» audiovisual digital communication to apply the test (figure 3).

The ANOVA ($\alpha=0.05$) test to contrast the dependent viability (virtual audiovisual/-real audiovisual/pencil and paper) produces this result: $F=10.42 >$ critical value $F_c=3.47$ and ANOVA ($\alpha=0.05$) which corroborates that the student distribution in their groups that has had no influence, and generates $F=1.19 <$ critical value $F_c=2.66$; the correlations between the different groups of the sample have the same positive values from, 0.57 to 0.99, and with the mean value of 0.89; and the analysis of the correlations of the incoherencies according to the communication medium used varies from 0.44 to 0.65.



Figure 4. Incoherencies by dilemma and subject.

What is also significant is the difference between the appearance of incoherencies when a real person (real audiovisual) is used to present the dilemma in the audiovisual format or when the speaker appears as a news presenter designed by animation software (virtual audiovisual), with even more incoherence when in virtual audiovisual format (figure 4).

It was found that the fluid intelligence in each subject, as measured by the Raven test, manifests a negative and moderate correlation with respect to the total appearance of incoherencies, with a Pearson r value of 0.42 (figure 5).

4. Discussion and conclusions

The moral response of our subjects is modified when communication is mediated by digital communi-

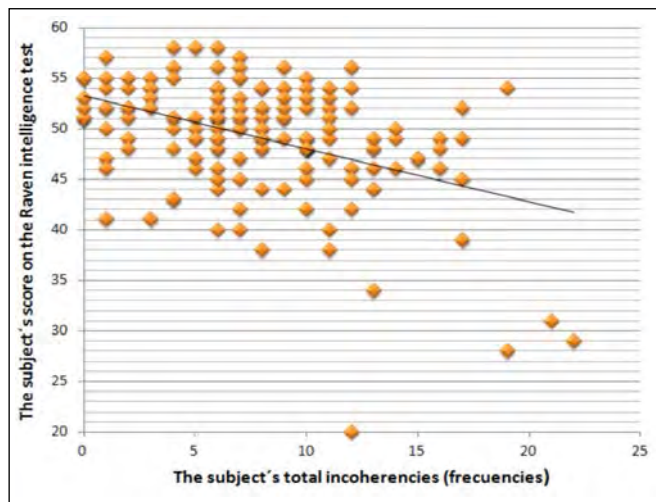


Figure 5. Dispersion of the incoherencies displayed and the Raven intelligence score for each subject.

cation technologies. The moral response of individuals is of inferior quality (less reflective and with a lower capacity to rise to the universal category) when we use digital communication technologies (to transmit content and extract responses) than when we use the traditional procedure of pencil and paper.

Since all moral response requires coherence to be considered as such, when incoherent it will be less moral given that we have conceived morality as constituted by reflection and universalizability. Reflection demands maintenance of judgement over time, and universalizability is relevant since it does not make judgement dependent on the person who judges or who executes the action. Coherence in each judgement does not determine the moral tenor but it does determine its moral condition.

The audiovisual content in which animated images appear representing virtual people extracts a moral response that is even more incoherent (less reflective, less capable of universalizability) than when the audiovisual content shows real people presenting moral conflicts. The individuals' fluid intelligence in our sample is a mitigating circumstance of this modification of the moral response in terms of the communication medium used.

Therefore, the formats and digital media tend to devalue the moral response of our subjects, and the use of virtual images of people instead of real people has an even more negative influence on the quality of the moral response. It was found that a subject's sense of commitment when clicking on the mouse is much less than when ticking a box with pencil on paper. The click of the mouse is easier, the body uses less intensity to carry out the action, the mind decides on something with less sense of responsibility.

Remember that our sample is composed entirely of young people with no academic specialization, and who were born in an era when Internet was starting to form part of our everyday lives; young people who hardly read content that it is nondigital. Yet they show greater respect for the written word on paper than the digital version.

These results cannot be contrasted with previous research that used D.I.T. since those tests were applied to experiments on paper, «online» but not audiovisual (Xu, Iran-Nejad & Thoma, 2007; Jacobs, 2009; Clark, 2010; Palacios-Navarro, 2003). Our procedure is in line with other investigations whose starting point is communication mediated by digital technologies and which examine the social capital of individuals and their digital communities (Heinze, Ferneley & Child, 2013; Shim & Eom, 2009).

The results of our research take on meaning in this field of investigation in which new digital tools become instruments for citizen learning and empowerment (Gozálvez, 2011; Ferrés & Pisticelli, 2012; Middaugh & Kahne, 2013; Buckingham & Rodríguez, 2013), since our findings point to a negative effect on social capital that hitherto had gone unobserved.

It is common to see in early research into social capital (Bourdieu, 1980; Coleman, 2001; Putnam, Leonardi & Nonetti, 1993) that intergroup confidence is an important factor for analysis, that the rules and the acceptance of these rules are crucial and that the benefits that bind the community together are forged by reciprocal expectations. Our research adds factors that could diminish social capital (Durstun, 2000; Portes, 2000; Heinze, Ferneley & Child, 2013), that

the digital technologies of communication reduce the coherence of the moral response. That is, they limit the commitment that the social actor establishes with rules and the expectation of complying with them.

Future research based on these conclusions might want to improve the diagnostic tool we have used (incorporating more variables such as the possible audiovisual «framing» effect (Sádaba, 2001), and make it more versatile, reliable, refining it for use with other populations; they could also broaden the universal population (transversally and longitudinally), situations (other settings: metaverses, avatars...; other digital devices: tablets, cell phones...; other contexts: testing individually, with confidence groups...).

Many believe that there can never be a definitive truth in ethics, but that is not entirely true since coherence is the «*conditio sine qua non*» of ethics. Unstable moral conduct, or incoherent morality, is not moral, which is not to say that it is immoral. The distance between what is good about a quality and how far one is from possessing that quality is not the same. Besides, moral competence underlies the action, and if it not so, the action becomes unstable, changeable, capricious, prone to manipulation and unconscious.

In another way, an accommodating morality is a moral response. As long as the setting does not change, the moral decision remains constant with what has been decided beforehand. But this research concludes that digital media also dilute any possible accommodation of thought in the context.

The discussion of the results of this research suggests we need to reflect on decisions for education in terms of digital communication media, as others have done (García-Canclini, 2007; Gozálvez, 2011; Ferrés & Pisticelli, 2012; Middaugh & Kahne, 2013), and that education needs to recover for the screens and clicks (with the fingertip or the mouse) that commitment which students still show when faced with the written word on paper, the understanding they cultivate from the written word as opposed to the audiovisual, the consistency in thought that is revealed when using pencil and paper. If we do not exercise caution, a mass invasion of decision-making by digital communication media could cause techno-cultural incoherence in all those human aspects susceptible to change when using digital forms of communication (human relations, consumption, «online» democracy, distance learning, etc.)

There are no blind dynamics at work in human intention, nor is there in the technologies that surround us. Knowing that the compass needle faces north enables us decide our route, not towards the horizon indi-

cated by the needle but towards the destiny we choose. Without discarding any of the advantages of digital communication technologies, just as we have done with the compass needle, it is we ourselves who decide what to leave behind and what to place before us.

Thus, the field of applications that emerges from the interpretation and discussion of the results of this experiment needs to be considered from a double perspective: better knowledge of the undesired effects that communication mediated by digital technologies can cause, and the configuring of systems for consultation, relating and participation for users in which those possible undesired effects are foreseen, considered, minimized or nullified. If the digital technologies are here to stay it is because they contribute definite advantages to our everyday lives. But even our comfortable home sofa has to be used in moderation because it can seriously affect our health.

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Cyberbullying through Mobile Phone and the Internet in Dating Relationships among Youth People

Ciberacoso mediante teléfono móvil e internet en las relaciones de noviazgo entre jóvenes

-  Dr. Mercedes Durán is Lecturer in Social Psychology at the Department of Social Psychology of the University of Seville (Spain) (mduransegura@us.es).
-  Dr. Roberto Martínez-Pecino is Senior Lecturer in Social Psychology at the Department of Social Psychology of the University of Seville (Spain) (rmpecino@us.es).

ABSTRACT

Cyberbullying is a phenomenon that has been extensively analysed amongst adolescents. However, in Spain, there have been few studies of young adults and particularly of their romantic relationships in the digital context. This study analyses cyberbullying in romantic relationships in mobile and digital exchanges between partners, in a sample comprising 336 students using quantitative methodology. The results show that 57,2% of the sample admit to having been victimised by their partner by mobile phone and 27,4% via the Internet. The percentage of victimised males was higher than that of females. 47,6% affirmed that they had bullied their partner by mobile phone and 14% over the Internet. The percentage of males who did so was higher than that of females. The regression analyses showed correlation between having been victimised by a partner via one of these media and having experienced cyberbullying in other by means of the same technological medium. The effects of this interaction highlight that males victimised through the use of mobile phones or the Internet are involved, to a greater extent than victimised females, as the perpetrators in this phenomenon. The results suggest modernisation in the types of violence that young adults experience in their relationships.

RESUMEN

El ciberacoso es un fenómeno ampliamente analizado entre adolescentes, sin embargo en España ha sido poco estudiado entre jóvenes y particularmente en sus relaciones de noviazgo. Empleando una metodología cuantitativa este estudio analiza el ciberacoso mediante el teléfono móvil e Internet en las relaciones de noviazgo en una muestra compuesta por 336 estudiantes universitarios. El análisis de resultados indica que un 57,2% declara haber sido victimizado por su pareja mediante el teléfono móvil, y un 27,4% a través de Internet. El porcentaje de chicos victimizados fue mayor que el de las chicas. Un 47,6% declara haber acosado a su pareja a través del teléfono móvil, y un 14% a través de Internet. El porcentaje de chicos que lo ejerció fue superior al de las chicas. Los análisis de regresión muestran la relación entre haber sido victimizado por la pareja a través de uno de estos medios y el ejercicio del ciberacoso hacia la pareja mediante el mismo medio tecnológico. Los efectos de interacción ponen de manifiesto que los chicos victimizados a través del teléfono móvil o de Internet se implican, en mayor medida que las chicas victimizadas, como agresores en este fenómeno. Los resultados sugieren una modernización en los tipos de violencia que experimenta la juventud en sus relaciones de pareja.

KEYWORDS | PALABRAS CLAVE

Cyberbullying, victimization, youth, partner, dating relationships, mobile phone, Internet, violence.
Ciberacoso, victimización, jóvenes, pareja, noviazgo, teléfono móvil, Internet, violencia.

1. Introduction

The phenomenon of bullying has had major social repercussions and it is beginning to extend beyond face-to-face bullying through the use of information and communication technologies. This is known as cyberbullying (Avilés, Iruña, García-Lopez & Caballo, 2011; Ortega, Calmaestra & Mora-Merchán, 2008). Cyberbullying is an extremely important phenomenon with significant risks for the health of victims (Ortega & al., 2008). Existing studies have tended to focus on the adolescent population in the context of school, leaving out other major age groups, such as young adults, and contexts, such as romantic relationships, in which this phenomenon could occur (for a review Garaigordobil, 2011). Young adults are heavy users of new technologies, particularly the Internet (Government delegation for domestic violence, 2013) and mobile phones (Bernal & Angulo, 2013; Cuesta, 2012; Livingstone & Haddon, 2009). This article analyses cyberbullying through the use of mobile phones and the Internet, in which young adults are involved in their romantic relationships. We analysed the incidence in a sample of young university students, looking at the differences and influence of gender and the relationship between having previously been victimised by a partner by means of either of these two technologies and the involvement in cyberbullying as a perpetrator.

1.1 Information and communication technologies, cyberbullying and romantic relationships

The Internet and information and communication technologies (ICT) are very present in people's lives (Bautista, 2012). Currently, around 52% of the European population uses online spaces (Eurostat, 2014). In the case of young adults, this use is even higher than in the older population (Martínez-Pecino, Delerue Matos & Silva, 2013). Internet use by young Europeans has increased to 75% (Livingstone & Haddon, 2009). Mobile phone use has also increased. For example, in Europe there are 106 telephone lines for every 100 inhabitants (EuroStat, 2014). These data show the presence and importance of these technologies in our society.

Despite the numerous benefits of ICT (Abeele & De Cock, 2012; Livingstone, 2008), its rapid and constant growth has also led to problems (Cabello, 2013; Sahin, 2010), particularly for young adults and minors, due to the new forms of violence caused by the use of these technologies, such as «sexting» (sharing images with sexual or erotic content), «grooming» (sexual abuse of children) or cyberbullying, amongst others (Government delegation for domestic violence,

2013). Cyberbullying is one of the most negative effects associated with misuse of ICT in our society (Burgess-Proctor, Patchin & Hinduja, 2009; Microsoft, 2009; Ortega & al., 2008; Tejedor & Pulido, 2012). It can be defined as a form of intimidation, harassment and abuse by an individual or a group towards another, involving the use of technological media as the channel for this aggression (Ortega & al., 2008; Smith & al., 2008). In the same regard, other authors use the term to refer to any form of intimidation or hostility using ICT (Belsey, 2005) or any form of online social abuse (Willard, 2004). The perpetrator may send and share offensive, vulgar or threatening messages, spread rumours about the victim, violate their intimacy or socially exclude or impersonate their victims (Willard, 2005).

Currently, both international studies and those carried out in Spain show the existence of this type of abuse in adolescents (Del Rey, Casas & Ortega, 2012; Félix-Mateo, Soriano-Ferrer, Godoy-Mesas & Sancho-Vicente, 2010; Garaigordobil, 2011; Ortega & al., 2012), which mainly occurs via two channels: mobile phones and the Internet (Buelga, Cava & Musitu, 2010). Therefore, for example, researchers such as Price and Dalgleish (2010) place the involvement of adolescents in cyberbullying as being between 20% and 50%. In Spain, studies such as those by Buelga et al. (2010), Cava, Musitu, and Murgui (2007), Ortega et al. (2008), Calvete, Orue, Estévez, Villardón and Padilla (2010), Bringué and Sádaba (2009), Del Río, Sádaba and Bringué (2010) also show similar percentages of involvement. In this regard, a transnational study carried out in Europe on cyberbullying reported that 29% of adolescents said that they had been a victim of cyberbullying (Microsoft, 2009). This phenomenon began to be studied tentatively in young adults in other countries (Dilmac, 2009), but to our knowledge not in Spain.

One aspect that has received little attention even in studies carried out with samples of young adults in other countries is the analysis of cyberbullying in the sphere of romantic relationships. ICT are an important element in relationships between young adults in general and romantic relationships in particular, which makes them more susceptible to being controlled and abused by their partner (Burke, Wallen, Vail-Smith & Knox, 2011).

There are certain studies that evidence this. For example, Spitzberg (2002) highlighted that at least half of all young adults who had suffered cyberbullying identified their partner as the abuser. Alexy, Burgess, Baker and Smoyak (2005) showed that the most fre-

quent young abusers through the use of technology were romantic partners. In the review that was carried out, no studies were found that analyse cyberbullying in romantic relationships between young adults in Spain.

As such, in order to expand on the literature in this area, in this study we analysed the incidence of the phenomenon in romantic relationships in a sample of young university students, describing the levels of victimisation and cyberbullying through the use of mobile phones and the Internet. Although cyberbullying could be studied without distinguishing by which means it is carried out, we understand that mobile phones go beyond simply giving access to the Internet. As such, in line with previous studies, we chose to analyse involvement in this phenomenon both through the use of mobile phones and the Internet (Buelga & al., 2010).

Another aspect to bear in mind in the study of cyberbullying are gender differences, since the results in this regard are inconclusive. As such, while some studies do not find a statistical link between cyberbullying and gender (Finn, 2004), others do (Li, 2006), noting that males (compared to females) are usually those who commit more acts of cyberbullying and females (compared to males) are usually the main victims of this type of violence (Burgess-Proctor & al., 2009; Calvete & al., 2010; Estévez & al., 2010; Félix-Mateo & al., 2010; Finn & Banach, 2000).

Therefore, the second objective of this study is to analyse gender differences in cyberbullying that takes place in the context of romantic relationships, using a sample of young university students. On the basis of the abovementioned studies on victimisation and cyberbullying in adolescents, we expect to find that a higher percentage of university females than males report having been cybervictimised by their partners in the last year (Hypothesis 1) and that a greater percentage of males than females report having abused their partner through the use of technology in the last year (Hypothesis 2).

Lastly, one of the most researched aspects within

the phenomenon in adolescents regards factors related to involvement in cyberbullying (Sticca, Ruggieri, Alsaker & Perren, 2013). Some studies (Elipe, Ortega, Hunter & Del-Rey, 2012; Estévez & al., 2010) have indicated that cybervictimisation is related to involvement in cyberbullying as a perpetrator.

Additionally, studies on bullying in traditional contexts have shown the relationship between having been a victim of bullying and undertaking such actions oneself (Avilés & al., 2011; Rodkin & Berger, 2008;

These results may indicate the different way in which males and females react to cyberbullying that takes place in romantic relationships and offer interesting questions both for theoretical and applied research. For example, analysing whether in a situation of technological bullying in a romantic relationship males would tend to react to a greater extent than females, involving themselves in cyberbullying, while females would to a greater extent tend to ignore or not respond with this type of behaviour, or whether, by contrast, what this data may be reflecting is the different way in which males and females perceive cyberbullying.

Romera, Del-Rey & Ortega, 2011). Given the importance of this variable and the lack of studies on it amongst young people, the third objective of this study is to analyse the relationship between having been victimised by a partner via mobile phones or the Internet and the involvement in cyberbullying as a perpetrator via the same medium. In this regard, and using the previous literature on adolescents as a basis, we expect young adults who have been victimised by their partner by mobile phone to report higher levels of cyberbullying against their partner via this medium than those who were not victimised by their partner (Hypothesis 3). Likewise, young adults victimised over the Internet by their partner will report higher levels of cyberbullying against their partner via this medium than those who were not victimised over the Internet (Hypothesis 4).

2. Material and methods

2.1. Participants

The sample included 336 students in the first year of their Primary Education, Psychology and Journalism degrees at the University of Seville, comprising 180 females and 155 males, aged between 18 and 30 ($M=20.67$; $DT=4.26$), where sampling was applied for convenience. All declared that they were heterosexual and had participated voluntarily, without receiving any remuneration for doing so.

2.2. Instruments

We used the inductive-deductive method with a quantitative approach and data processing. As such, a questionnaire was employed, from which we obtained the following information:

- Socio-demographic data (age, sex, sexual orientation, year, degree).
- Frequency of victimisation and cyberbullying in romantic relationships through the use of mobile phones and the Internet in the last year. To collect this information, the following four scales were used:

Cyberbullying scales through the use of mobile phones and Internet. In order to measure cyberbullying towards a partner during the last year through the use of mobile phones and the Internet, we used the Peer victimisation scale, which was shown to have suitable psychometric properties (Buelga & al., 2010; Cava & al., 2007), adjusting the wording for romantic relationships. Both the measurements of cyberbullying against a partner via mobile phone and the Internet had a 4-point response scale with 1 being (never), 2 being (a few times), 3 being (quite a few times) and 4 being (many times). Examples of items in the first scale are: «I have insulted or ridiculed my partner with messages or calls by mobile phone», «I lied or spread false rumours about my partner by mobile phone». Examples of items in the scale of cyberbullying over the Internet: «I insulted or ridiculed my partner over the Internet», «I lied or spread false rumours about my partner over the Internet». The internal consistency for the two scales was satisfactory, with $\alpha=0.75$ for the scale of cyberbullying by mobile phone, and $\alpha=0.75$ for the scale of cyberbullying over the Internet.

Scales of victimisation through the use of mobile phones and the Internet. In order to measure cyberbullying experienced both by males and females by their partners in the last year through the use of mobile phones and the Internet, we employed the Peer victimisation scale, which was used and validated in a Spanish context (Buelga & al., 2010; Cava & al.,

2007) ($\alpha=0.76$ and $\alpha=0.84$, respectively), adjusting the wording for romantic relationships. These items had a 4-point response scale, with 1 being (never), 2 being (a few times), 3 being (quite a few times) and 4 being (many times). Examples of items that evaluate victimisation suffered by mobile phone in romantic relationships are: «my partner insulted or ridiculed me with messages or calls by mobile phone», «my partner lied or spread false rumours about me by mobile phone». Examples of those used to measure the victimisation suffered by a partner over the Internet are: «my partner insulted or ridiculed me over the Internet», «my partner lied or spread false rumours about me over the Internet». The internal consistency for the scale of victimisation by mobile phone was $\alpha=0.62$, while the internal consistency for the scale of Internet victimisation was $\alpha=0.70$.

2.3. Design

The research design was non-experimental; specifically, it had a correlational cross-sectional design.

2.4. Procedure

The participants responded to the questionnaire in their classes. They were guaranteed privacy and the anonymity of their responses. They firstly answered sociodemographic questions and they then completed the scales of victimisation and cyberbullying in romantic relationships through the use of mobile phones and the Internet. At the end, they were thanked for their participation and were provided with a summary of the main objectives of the study.

3. Analysis and results

The data was analysed using the SPSS (version 18) statistical software. In order to analyse levels of victimisation and cyberbullying in romantic relationships, that is, those who had received or carried out some of the acts described above in their romantic relationships in the last year, we carried out frequency analyses. We subsequently carried out a comparison of the means between the victimisation and cyberbullying scores by the partner through the use of new technologies, reported in accordance with gender. We then calculated the Pearson correlation coefficient in the variables of interest in this study (victimisation by mobile phone, Internet victimisation, cyberbullying through the use of mobile phones, cyberbullying over the Internet). Finally, we carried out a hierarchical regression analysis in order to find out the influence of victimisation and gender on involvement in cyberbullying against partners via both technologies.

3.1. Frequency of victimisation and cyberbullying in romantic relationships through the use of mobile phones and the Internet

Tables 1 and 2 display the levels of victimisation and cyberbullying reported by the sample. The results obtained highlight that in the last year, 57,2% of the young adults in the sample report having been victimised by their partners by mobile phone and 27,4% over the Internet. With regard to data on cyberbullying against their partner, the results show that 47,6% report that they used a mobile phone in order to abuse their partner, while 14% used the Internet.

3.2. Gender differences in victimisation and cyberbullying in romantic relationships through the use of mobile phones and the Internet

We found statistically significant differences according to gender, both in the victimisation suffered and in the carrying out of cyberbullying through the use of mobile phones and the Internet (table 3). The results show that males reported greater victimisation by their partners than females, both through the use of mobile phones and the Internet. With regard to differences in accordance with gender in cyberbullying against partners, the results show that males reported greater perpetration of cyberbullying towards their partners than females, both through the use of mobile phones and the Internet.

3.3. The relationship between victimisation and cyberbullying in romantic relationships through the use of mobile phones and the Internet

We observed a strong association between being

In order to analyse the influence of victimisation and gender on the involvement in cyberbullying against partners via both technologies, we carried out a hierarchical regression analysis for each type of cyberbullying (cyberbullying by mobile phone and cyberbullying over the Internet). Before the analyses and in line with the indications of Jaccard, Turisi and Wan (1990), all continuous variables were centred.

The first regression analysis was carried out with the aim of explaining cyberbullying, in the sample of university students, against their partner by mobile phone (table 4). In the first step, we introduced the variables Victimisation by Mobile Phone and Gender, and in the second step, the interaction between these variables. This analysis showed a principal effect of the variable Victimisation by Mobile Phone ($\beta=0,56$, $t=12,21$, $p<0,001$). That is, at higher levels of victimisation by mobile phone, levels of cyberbullying against partners by mobile phone were higher. However, this effect must be interpreted bearing in mind the second order interaction that occurred between the variables Victimisation by Mobile Phone and Gender ($\beta=0,24$, $t=3,46$, $p<0,001$) (figure 1).

Analysing this interaction, we discovered that in the case of individuals who had not been victimised by their partner via mobile telephone, differences were not found between the cyberbullying that males and females carried out by mobile phone against their partner, ($\beta=-0,15$, $t=-1,86$, $p=n.s.$). However, with regard to individuals who had been victimised by their partner via mobile phone, males in comparison to females, reported higher levels of cyberbullying against their partners by mobile phone, ($\beta=0,21$, $t=3,03$, $p<0,01$).

The second regression analysis was carried out on cyberbullying against partners over the Internet (table 5). In the first step, we introduced the variables Internet Victimisation and Gender, and in the second step, the interaction between these variables. This analysis

showed a main effect of the variable Internet victimisation, ($\beta=0,46$, $t=9,41$, $p<0,001$). That is, with higher levels of Internet victimisation, the levels of cyberbullying against partners over the Internet were higher. However, this main effect must be interpreted bearing in mind the second order interaction that occurred between the variables Victimisation by Internet and Gender ($\beta=0,38$, $t=6,02$, $p<0,001$) (figure 2).

Table 1. Frequency of victimisation by partners through the use of mobile phones and the Internet

	Never	A few times	Quite a few times	Many times	Total victimisation
Mobile; n=336	42,8%	54,8%	-	2,4%	57,2%
Internet; n=336	72,6%	24,4%	2,7%	0,3%	27,4%

involved in victimisation and cyberbullying in romantic relationships, both through the use of mobile phones ($r=.57$; $p<0,01$) and the Internet ($r=.47$; $p<0,01$).

Table 2. Frequency of Cyberbullying against partners through the use of mobile phones and the Internet

	Never	A few times	Quite a few times	Many times	Total aggression
Mobile; n=336	52,4%	46,1%	1,2%	0,3%	47,6%
Internet; n=336	86%	13,4%	0,6%	-	14%

Table 3. Mean and standard deviation within victimisation and bullying in romantic relationships of males and females through the use of mobile phones and the Internet

Course	Victimisation		F		T		Cyberbullying	
	Females	Males	F	T	Females	Males	F	T
Mobile n=336; M (DT)	1,16 (0,26)	1,29 (0,34)	14,84***	-3,83	1,09 (0,15)	1,19 (0,32)	25,16***	-3,65
Internet n = 336; M (DT)	1,14 (0,35)	1,24 (0,36)	7,02**	-2,65	1,06 (0,14)	1,14 (0,28)	16,57**	-3,00

***p<0,001; **p<0,01, M: Mean, SD: Standard Deviation.

As we can observe in figure 2, upon analysing the interaction, we discovered that in the case of individuals who had not been victims of cyberbullying over the Internet by their partners, there were no differences between levels of cyberbullying that males and females reported having directed against their partners

Table 4. Regression with Cyberbullying towards partners by mobile phone as dependent variable

Variable	ΔR^2 Adjust.	ΔF	Stand. Err.	Beta	T
Step 1	0,34	84,21***	0,2		
Victimisation mobile			0,03	0,56	12,21***
Gender			0,02	0,08	1,78
Step 2	0,02	11,94***	0,20		
Victimisation mobile X gender			0,07	0,24	3,46***

*** p<0,001

over the Internet, ($\beta = -0,08$, $t = -1,15$, $p = n.s.$). However, when participants had been victimised over the Internet by their partner, males reported higher levels of Internet cyberbullying against their partners than females ($\beta = 0,18$, $t = 2,20$, $p < 0,05$).

4. Discussion and conclusions

This study analyses victimisation and cyberbullying through the use of mobile phones and the Internet in romantic relationships, using a sample of young university students. Through this study, we have contributed to expanding the existing literature from three perspectives: firstly, the work is focussed on young adults, which complements existing studies which in Spain have focussed mainly on the adolescent population; secondly, it analyses cyberbullying that takes place in young adults who have a romantic relationship, extending the information existing in other studies focussed on peer relationships and in school contexts; lastly, it analyses the role of gender and of the relationship between having previously been victimised by a partner via these technologies and

the involvement in cyberbullying as a perpetrator.

With regard to levels of victimisation and cyberbullying, the results obtained show that 57,2% of participants say that they had been victimised by mobile phone and 27,4% over the Internet, while 47,6% state that they had carried out cyberbullying by mobile phone and 14% over the

Internet. These results support those of other international studies (Alexy & al., 2005; Burke & al., 2011) who highlight the presence of this type of behaviour towards partners in young university students through new technologies, and they extended the literature existing on cyberbullying by documenting this phenomenon in a sample of young Spanish university students.

With regard to gender differences, in the case of victimisation in relationships, males, in contrast to what was expected in Hypothesis 1, reported higher levels of victimisation by their partners than females, both by mobile phone and over the Internet. By contrast, in the case of cyberbullying, males reported higher levels of cyberbullying against their partner in the last year, both by mobile phone and over the Internet, therefore supporting Hypothesis 2 of this study. These latest results are along the same lines of those reported in recent studies carried out on an adolescent population (Buelga & al., 2010; Calvete & al. 2010; Elipe & al., 2012; Estévez & al., 2010; Féliz-Mateo & al., 2010; Finn & Banach, 2000) which highlight that males carry out more cyberbullying than females, with the existing

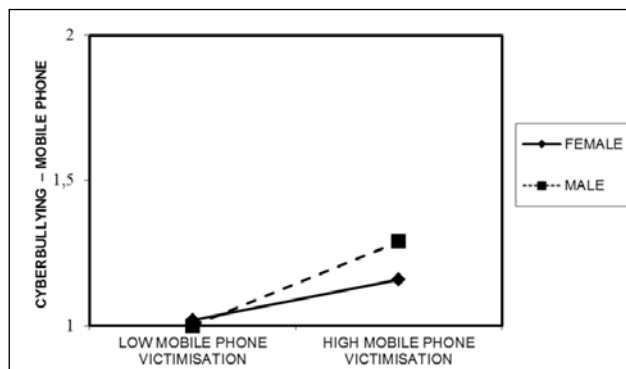


Figure 1. Relationship between victimisation by mobile phone and cyberbullying against partners in romantic relationships by mobile phone in accordance with the gender of the participants.

information being extended upon carrying out this study with an older population sample (young adults) and in a different relationship context (romantic relationships). However, these studies usually place adolescents as the main victims of cyberbullying by adolescents (Burguess-Proctor & al., 2009), while in our study, the males reported greater cybervictimisation, which is along the same lines as some more recent studies carried out on young adults in other countries (Burke & al., 2011).

In terms of the relationship between having been victimised by a partner through the use of mobile phones or the Internet and the involvement in cyberbullying as a perpetrator via the same medium, two main effects were observed that support Hypotheses 3 and 4 of this study, respectively. However, these effects must be interpreted considering the effects of interaction along with the gender of participants. As such, we found that compared with females, males who reported having been victimised by their partners by mobile phone were those who reported having carried out more cyberbullying against their partners by mobile phone. Likewise, cyberbullying against a partner through the Internet is influenced by Internet victimisation in interaction with the gender. Males, compared to females, who had been victimised by their partners over the Internet were those who reported having carried out more cyberbullying against their partners via this medium. The results of this study highlight victimisation suffered by the perpetrator as a relevant variable in the exercising of cyberbullying against their partner, that is, these findings highlight the figure of the victimised perpetrator. The results support studies that

suggested this both in the case of cyberbullying (Elife & al., 2012) and traditional bullying (Avilés & al., 2011; Rodkin & Berger, 2008; Romera & al., 2011; Sticca & al., 2013) and reaffirm the need to consider victimisation as an important variable in studies that analyse the involvement in cyberbullying, since there have been scant references to it in the literature.

These results may indicate the different way in which males and females react to cyberbullying that takes place in romantic relationships and offer interesting questions both for theoretical and applied research. For example, analysing whether in a situation of technological bullying in a romantic relationship males would tend to react to a greater extent than females, involving themselves in cyberbullying, while females would to a greater extent tend to ignore or not respond with this type of behaviour, or whether, by contrast, what this data may be reflecting is the different way in which males and females perceive cyberbullying. That is, are males overestimating their status as victims or are females underestimating it? In any case, responses to these questions will allow a greater understanding of the gender differences in the phenomenon. In this regard, in future research, it would be very useful to include evaluation instruments that allow qualitative information to be gathered, providing a greater explanation of the results obtained.

This study also has some limitations that should be borne in mind in future studies. It analysed cyberbullying in romantic relationships in a sample of young university students, and as such, future research may complement these results by analysing the phenomena of cyberbullying in young adults who are not studying at university. Likewise, other variables not analysed in this study could be taken into account such as the influence on cyberbullying against a partner of cyberbullying itself or traditional bullying suffered by young adults, that was inflicted by individuals other than their partner (for example friends, classmates or unknown individuals).

In short, the study carried out offers new con-

Table 5. Regression with Cyberbullying against partners over the Internet as a dependent variable

Variable	$\Delta R^2_{\text{adjust}}$	ΔF	Stand. err.	Beta	T
Step 1	0,23	50,00***	0,19		
Victimisation Internet			0,03	0,46	9,41***
Gender			0,02	0,09	1,93
Step 2	0,08	36,29***	0,18		
Victimisation Internet X Gender			0,05	0,38	6,02***

*** $p < .001$

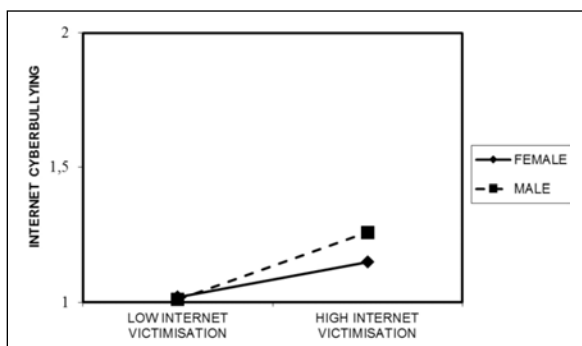


Figure 2. Relationship between Internet victimisation and cyberbullying against partners in romantic relationships over the Internet in accordance with the gender of participants.

tributions by analysing the phenomenon of cyberbullying in an older group (young adults), which is different to that normally studied in literature (adolescents), also using different relationship context (romantic relationships), and contributing data on these characteristics in a Spanish context. The results suggest a modernisation of the forms of bullying directed at partners, as a result of new technological changes that our society is experiencing. It also identifies factors that contribute to its occurrence, providing information that may be of interest for future research and interventions aimed at reducing its incidence.

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Influence of Placement on Explicit and Implicit Memory of College Students

Influencia del «placement» sobre la memoria explícita e implícita de estudiantes universitarios

-  Dr. Leslier Valenzuela-Fernández is Professor of the School of Economics and Business at the Universidad de Chile (Chile) (lvalenzuela@unegocios.cl).
-  Carolina Martínez-Troncoso is Professor of the School of Economics and Business at the Universidad Finis Terrae (Chile) (cmartinez@uft.cl).
-  Felipe Yáñez-Wieland Research is Assistant of the School of Economics and Business at the Universidad de Chile (Chile) (fyanezw@fen.uchile.cl).

ABSTRACT

The use of product placement as a marketing communication tool is based on the inclusion of products or brands in the scene where the action is. The use of this tool has benefits for both the producer of the movie, as well as for brands and / or products. There is currently no consensus in the academic world on how to measure the effectiveness of this communication tool. There is scarce scientific evidence in Latin America, and in Chile this format has been used in television programs, and only recently in movies. The objective of this research is to study the influence of placement in movies on explicit memory (unaided recall and brand awareness) and implicit memory (purchase intention) through the implementation of an experiment performed on a sample of 205 Chilean college students, according to the different types of placement in movies: brands as part of the background, used by a main character, and connected with the plot. The results indicate that the higher the degree of integration of the brand with the plot of the film, the higher the probability of stimulating the explicit memory of participants and thereby unaided recall and brand awareness, providing empirical evidence regarding the learning of consumer behavior through placement as a communication tool.

RESUMEN

El uso del «product placement» como una herramienta de comunicación en marketing, se basa en la inclusión de productos o marcas en el escenario donde se desarrolla la acción. La utilización de esta herramienta presenta beneficios tanto para el productor del largometraje, como también para las marcas y/o productos. Actualmente no existe en el mundo académico un consenso respecto a cómo medir la efectividad de esta herramienta de comunicación. En Latinoamérica existe una escasa evidencia científica, y en Chile, este formato ha sido utilizado en espacios televisivos, y recientemente se está incursionando en el cine. El objetivo de esta investigación es estudiar la influencia del «placement» en las películas sobre la memoria explícita (recuerdo espontáneo y reconocimiento de marca) y memoria implícita (intención de compra) a través de la aplicación de un experimento a una muestra de 205 estudiantes universitarios chilenos, según los distintos tipos de «placement» en las películas: marcas como parte del fondo, usadas por un personaje principal, y conectadas con la historia. Los resultados indican que cuanto mayor es el grado de integración de la marca con la trama de la película, mayor es la probabilidad de estimular la memoria explícita de los estudiantes y con esto el recuerdo y reconocimiento de una marca, aportando evidencia empírica en relación con el aprendizaje de conductas de consumo por medio del «placement» como herramienta de comunicación.

KEYWORDS | PALABRAS CLAVE

Placement, media influence, movies, higher education, unaided recall, awareness, experiment, brand.
Publicidad subliminal, influencia mediática, películas, educación superior, recuerdo espontáneo, reconocimiento, experimento, marca.

1. Introduction

Starting in the 1970s product placement became known as an alternative communications tool and its use quickly grew mainly due to the «audience fragmentation» phenomenon. This phenomenon arises as a consequence of the difficulty in effectively reaching the target market due to the ever increasing offer of advertising possibilities and the lack of interest shown by audiences (Karniouchina, Uslay & Erenburg, 2011; Miles, 2009; Eisend, 2009). Product, or brand, placement has been defined as «the paid inclusion of brand products or brand identifiers through audio and/or visual media, as part of the programming done by mass communication media» (Karrh, 1998). This concept implies integrated planning of a non-obstructive commercial message within media entertainment space, so that individuals do not perceive it as an explicit attempt to commercially influence them (Balasubramanian, 1994).

In this respect, the corresponding literature distinguishes different types of placement in movies, such as: verbal, visual or audiovisual, according to its importance within a scene (subtle or prominent) (Gupta & Lord, 1998), degree of integration with the plot, and its relationship with the main character(s) (Russell, 1998; d'Astous & Séguin, 1999). Starting with the landscape model, which exposes the information activation patterns in an individual's memory as part of the process of comprehension (Willes & Danielova, 2009; Van-den-Broek et al., 1996; Van-den-Broek, Yuhtsuen & Linderholm, 1999), visual «placement» has been categorized into three levels according to the degree of integration of the brand with the plot. In the first place, the brand may be presented as part of the background, shown in a scene but without being used. Secondly, it may be used by one of the main characters, but not in a manner relevant to the plot. And thirdly, it may be connected to the storyline, playing an integral part in the development of the movie (Yang & Roskos-Ewoldsen, 2007).

Placement in Chile has mainly been used in TV shows, TV series, and reality shows. In the last few years, this has been extended to movies and series (Salazar, 2012). This industry is still, however, in a developmental stage (Uribe & Campo, 2008). In fact, most of the studies have been applied to American audiences, with very little investigative evidence existing regarding Latin America (Khalbous & al., 2013).

Answering the question «how effective can this communications tool be?» is key when evaluating the use of placement. The academic world has not yet reached a consensus regarding what would be the

most appropriate way to measure the effects of placement. The most commonly used methods are memory measurements based on the kind of processing used by the audiences (recall, awareness, methods of choice and purchase intention, etc.) (Williams, Petrosky, Hernández & Page 2011; Bressoud, Lehu & Russell, 2010; Reijmersdal, Neijens & Smith, 2009; Duke & Carlson, 1993). The effects of placement have generally been analyzed through cognitive answers, for example, using memory and brand awareness tests (Pokrywczynski, 2005).

Tests that predict the behavioral response of individuals, such as purchase intention or brand selection methods, produce, however, different results and do not appear to be correlated with the cognitive measures (Law & Braun, 2000). In this sense, and from an educommunicational point of view, the existing literature has determined that the interaction of audiences with movies or television series could generate a «transfer effect» due to the fact that certain social consumer environments are shown in these media, and these could be adopted (Noguti & Russel, 2014). Therefore, the present research studies the influence of placement in movies on explicit memory (unaided recall and brand awareness), and on implicit memory (purchase intention), on a sample of Chilean college students, according to the different types of placement: 1) brands as part of the background; 2) brands used by the main character(s); 3) brands connected to the storyline.

2. Material and methods

2.1. Types of placement in movies

The types of placement in movies have been categorized in a wide range of methods (Kaur, 2014). Gupta and Lord (1998), Verhellen, Dens and De-Pelsmacker (2013) proposed a two dimensional focus to classify the incorporation of a brand within a movie. The first is related to the incorporation of the brand which can be: 1) visual, through a product, logo, or other brand identifier; 2) in audio format, through the mention of the brand; 3) as an audiovisual combination. These authors state that visual placement is used more often, whereas the audiovisual form is the most expensive and, possibly, the most complex to integrate. The second dimension is related to the level of prominence, or degree in which the placement works as a central focus point, categorized as «prominently» when it is presented in a highly visible manner, or as «subtly» when the product or brand identifier is presented away from the central focus point.

Similarly, Russel (1998) classified the types of pla-

cement in three dimensions. The visual dimension or «screen placement», implying the appearance of the brand on screen, which can be presented in different degrees according to the number of appearances, the recording style of the product or brand, etc. The audio dimension or «script placement», implying a verbal mention of the brand within the dialogue and may vary depending on the frequency that the brand is mentioned, as well as the emphasis and tone of voice used. And the third dimension, a connection to the storyline or «plot placement», which refers to the high or low level of intensity that the product is integrated into the central plot and storyline, and may be presented either visually or in an audio manner.

Authors d'Astous and Séguin (1999) catalogued three types of television product placement: 1) «implied placement», in which a brand is presented on a show without being formally mentioned, playing a passive or contextual role where the benefits or attributes of the product are not showcased; 2) «explicitly integrated placement», in which the brand or product plays an active role on a show, having its attributes and benefits demonstrated and showcased formally; 3) «non-integrated explicit placement», where the brand is formally referred to but is not integrated into the contents of the program.

Based on the landscape model, Yang and Roskos-Ewoldsen (2007) categorized visual placement into three different levels according to the degree of integration of the brand with the plot. The brand may be shown in a scene with the main character(s) presented as part of the background, but without being used; the brand may be used by a main character but not in a fashion relevant to the storyline; or the brand can be connected to the story playing an integral part in the outcome of the movie. The main discovery of these authors is related to the fact that brand placement connected to the storyline has a higher probability of being explicitly remembered in the future.

2.2. Placement effectiveness

DeLorme and Reid (1999) propose that placement effectiveness may depend on a number of factors such as: the perception of consistency between the brand and the context of the scene in the film, previous con-

sumer experiences with the brand, empathy towards the character(s), level of spectator involvement with the plot of the movie, the traditional advertisement consciousness that the brand has developed in the past, and individual differences such as age, interests, aspirations, etc. There is still, however, a discussion as to which are the most convenient methods to measure placement effectiveness with audiences.

Research has shown that individuals use their explicit memory to recover information related to an ad or exposure to a past event, implying a deliberate or purposeful effort to try to access the previous information (Shapiro & Krishnan, 2001; Jusufovic-Karisik, 2014). Law and Braun (2000) conclude that two cog-

he use of placement in movies, and more specifically the brand used by a main character, would stimulate implicit memory when the product already exists in the market because this would reinforce the individual's behavioral answers such as purchase intention or effective purchasing, working as a learning consumer stimulus; in other words, educommunication. This could eventually end up being detrimental if we apply these findings to restricted consumer products, such as alcohol.

nitive processes, brand recall and awareness, affect the same kind of memory (explicit), and that the impact of product placement in movies could be measured using memory or unaided recall tests (Wiles & Danielova, 2009). Shapiro and Krishnan (2001), on the other hand, explain explicit memory as an automatic or unconscious recovery process that is generally measured by requesting that the individual complete or finish phrases after having been exposed to a message, or through brand selection or purchase intention behavioral activities without referring to the episode to which the individual had been exposed to previously. These processes that affect the subconscious memory of individuals play an important role by influencing behavior, for example, in consumption (Bressoud, Lehu & Russell, 2010; Krishnan & Trappey, 1999;

Goode, 2007; Padmanabhan & Jena, 2013; Srivastava, 2014).

Regarding types of placement, it has been found that brands that are highly integrated with the plot are more often remembered and recognized (Lehu & Bressoud, 2009; Russell, 2002), as well as placement that involves a major character (d'Astous, Séguin & Chartier, 2000; Redker, Gibson & Zimmerman, 2013). Hypotheses 1 and 2 are formulated for the purpose of investigating the degree in which each type of placement influences unaided recall and brand awareness.

- H1: The rate of unaided recall in participants exposed to placement in movies is greater for brand placement connected to the storyline, followed by brand placement used by a main character, and lastly brand placement as part of the background.

- H2: The rate of brand awareness in participants exposed to placement in movies is greater for brand placement connected to the storyline, followed by brand placement used by a main character, and lastly brand placement as part of the background.

In spite of the fact that there is less evidence related to implicit memory, different authors have confirmed a possible influence in audiences using assisted memory recovery activities (Chung & Szymanski, 1997; Auty & Lewis, 2004; Morton & Friedman, 2002; Cholinski, 2012). Regarding the types of placement, however, the evidence is unclear. In any event, for the purpose of corroborating the general effect of placement in the implicit purchase intention activity after the experiment in the control group, a third hypothesis for study presents itself.

- H3: Exposure of participants to placement in film positively and significantly influences the subsequent purchase intention of brands.

Finally, for the purpose of identifying the existence of a relationship between the effects of each type of placement on purchase intention and the landscape model, the following research question is posed.

- RQ1: Does the purchase intention activity produce different results according to the type of placement to which the participants are exposed?

2.3. Method

In order to corroborate H1, H2, H3, and RQ1, a sample of 205 male and female students from different

colleges in Santiago, Chile were selected through a non-probability sampling (convenience sampling) (44% male, and 56% female), between 19 and 26 years of age, through the months of January and March of 2013. The distribution of the sample is detailed in the following table 1.

Additionally, approximately 80% of the sample mentioned that they go to the movies between one and two times a month, and 72% stated that they saw, on average, one to two movies a week.

The experiment was performed in a laboratory setting. Each respondent observed an edited video that exhibited extracts from different movies that contained two brands and only one of the three visual placement types.

3. Results

3.1. Explicit memory

So as to be able to analyze whether or not the placement types predict and are related to the unaided recall variables and brand awareness, Binary Logistic

Placement Type	Sample	Gender	
		Male	Female
Group 1: Brand as part of the background	50	24 (48%)	26 (52%)
Group 2: Brand used by a main character	50	18 (36%)	32 (64%)
Group 3: Brand connected to the storyline	50	29 (58%)	21 (42%)
Control Group	55	20 (36%)	35 (64%)
Total	205	91 (44%)	114 (56%)

Regression (BLR), procedure was applied. In this case, the dependent and dichotomical variable «brand recall» was defined, said variable adopting the value «1» when the participant remembered at least one brand, and the value «0» when this did not occur. Subsequently, so as to analyze the existence of significant statistical differences among the three experimental groups, the ANOVA analysis was used.

3.1.1. Unaided recall exercise

The BLR analysis for the dependent variable «brand recall» indicated the presence of a significant model as well as the existence of a significant statistical relationship with the «placement type variable» ($p=0.000$). Subsequently, the ANOVA analysis for the recall exercise resulted in a statistically significant F (2, 147) of 39,169 ($p=0.000$); therefore, there are significant differences between the performances of the three experimental groups. To identify whether or not the differences were significant in all of the group

combinations, post hoc tests were conducted. Due to the fact that the variances homogeneity test indicated an insignificant Levene statistic ($p=0.058$), the equality of population variances hypothesis and the main statistics are accepted for this condition (Tukey, LSD, Bonferroni, etc.), producing significant statistical differences ($p<0.05$) for all of the combinations among the three experimental groups. As can be seen in table 2 and figure 1, the recall rate for the group exposed to the brand connected with the storyline was 68%, which indicates the percentage of brands that are correctly recalled by the participants. This percentage is greater than the results shown by the group exposed to the brand used by a main character (30%). Both of these groups obtain higher percentages than the group exposed to the brand as part of the background (15%). Therefore, hypothesis 1 which indicates the degree in which unaided recall is influenced by each of the placement types is supported.

3.1.2. Awareness exercise

The BLR analysis for the dependent variable «awareness» indicated the presence of a significant model and the existence of a significant statistical relationship with the «placement type» variable ($p=0.000$). The ANOVA analysis resulted in an F (2, 147) of 46,597 ($p=0.000$), therefore showing the existence of significant differences between the awareness rate averages for the three experimental groups.

A significant Levene statistic ($p=0,000$) was obtained following the steps for the unaided recall exercise.

Therefore, the Tamhane, Dunnett and Games-Howell statistics are used, resulting in significant statistical differences ($p<0.05$) between the behaviors of the brand connected with the storyline and the two other groups. No significant differences ($p > 0.05$) were found, however, between the brand used by a main character and the brand as part of the background. For brand placement connected with the storyline the rate of recognition is 96%, indicating an

Table 2. Results of Brand Recall and Awareness Exercises

Variable	Performance according to type of placement			Hypothesis Results		
Percentage of Brand Recall	Brand found as part of the background (A=0,15)	<*	Brand used by a character (A=0,30)	<*	Brand connected to the storyline (A=0,68)	H1 is supported
Percentage of Awareness	Brand found as part of the background (A=0,44)		Brand used by a character (A=0,58)	<*	Brand connected to the storyline (A=0,96)	H2 is partially supported

* The difference in averages between the groups is significant, at a $p<0,05$ level.
 A=Average between the percentages of memory and awareness for each type of placement.
 Source: Prepared based on SPSS.

elevated percentage of brands correctly recognized by this group. For the brand used by a main character, the rate is less with a recognition percentage of 58%. The brand used as part of the background has an even lower recognition percentage at 44% (table 2). Because of the fact that the statistical difference between the brand placement used by a main character and the brand as part of the background cannot be corroborated with the aforementioned tests, hypothesis 2 which indicates the degree in which awareness is influenced by each type of placement is partially supported.

3.2. Implicit memory

3.2.1. Purchase intention exercise

For the purchase intention exercise, the BLR procedure for analyzing whether or not the existence of placement in film is related to, and can predict, purchase intention behavior for brands after exposure to the stimulus, was used. The «purchase intention» dependent variable was defined for this. This variable could have a value of «1» when the participant chose at least one of the brands that appeared in the film extracts shown, and a value of «0» if not. The independent, or explicative, variable corresponded to the group that was assigned to each surveyed participant (experimental group or control group). Subsequently, the ANOVA test was used as a factor so as to compare the answers

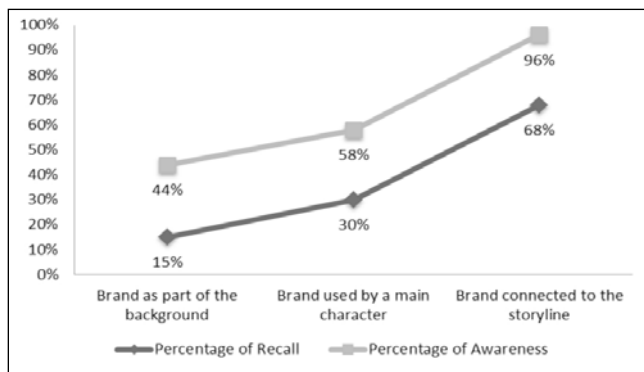


Figure 1. Relationship between the types of placement and percentages of recall and awareness.

between the experimental groups and the control group (Pope, 2002).

Analysis of the BLR for the «purchase intention» dependent variable indicated the presence of a significant model and the existence of a statistically significant relationship according to the group to which the participants were assigned ($p=0,03$), and according to the types of placement ($p=0,000$). In this sense, it is worth noting that the group that was exposed to placement in movies has a greater influence in purchase intention when compared to the control group. The ANOVA test performed among the participants of the experimental group and the control group so as to analyze the placement effect on purchase intention (Hypothesis 3), resulted in a significant $F(1, 313)$ statistic of 10,108 ($p=0,002$). The percentage of purchase intention in the experimental group was 36%, as seen in table 3 and figure 2, higher than the results obtained in the control group (24%). In other words, the percentage of brands that appear in movies that are chosen by the participants was 12% higher than the percentage of these same brands chosen by the control group which had not been previously exposed to the placement. Hypothesis 3, which refers to the influence on the purchase intention of the participants prior to the placement exposure in the films, is therefore supported.

With reference to the existence of differences between the three experimental groups (RQ1), the «purchase intention rate of variation» variable was generated. The ANOVA analysis resulted in a significant $F(2, 147)$ of 4,244 ($p=0,016$), implying the existence of differences between average variations in purchase intentions of the three groups (Table 3). When observing the multiple comparisons tests the only significant relationship occurs between the brand used by a main character (22% variation in the intention), and the brand as part of the background (5% variation). No significant results for the brand connected to the storyline (8% variation) and the rest of the groups were found. Therefore, it is worth noting that, regarding research question RQ1, brand placement used by a main character has a greater impact in the variation in purchase intention when compared to the brand as part of the background. However, no significant relationships of the brand connected to the storyline are found.

4. Discussion and conclusions

This research explored the influence of placement in movies on explicit memory (unaided recall and brand awareness), as well as implicit memory (purchase intention), on a sample of college students, regarding the different types of placements in film: 1) brands as part of the background; 2) brands used by a main character; 3) brands connected to the storyline through a landscape model, that explains the levels of activation of the information within memory in the comprehension processes.

The results obtained indicated that the use of brand placement connected with the storyline produ-

Variable	Performance according to type of placement		Hypothesis result and research question	
Percentage of Purchase Intention	Control Group (A=0.24)	<*	Experimental Group (A=0.36)	H3 is supported
Percentage of Variation in the Purchase Intention	Brand as part of the background (A=0.05)	<*	Brand used by a character (A=0.22)	RQ1: Higher results for a brand used by a main character

* The difference between the averages of the groups is significant at a $p<0.05$ level.
 A= Average of purchase intentions and variations in purchase intentions rates.
 Source: Prepared based on SPSS.

ces better results with regards to explicit memory, consistent with previous empirical evidence. The brand used by a main character, acting as a facilitator or support element of a scene, follows with lower results; this results in an intermediate level of explicit memory activation. Lastly, the brand used as part of the background which incorporates information that is not necessary for understanding the plot, therefore representing the lowest level of explicit memory activation. In this sense, use of placement in film, specifically when the brand is connected with the storyline, would imply a higher probability of stimulating explicit memory and, with this, recall and recognition.

The most relevant find of this research is related to

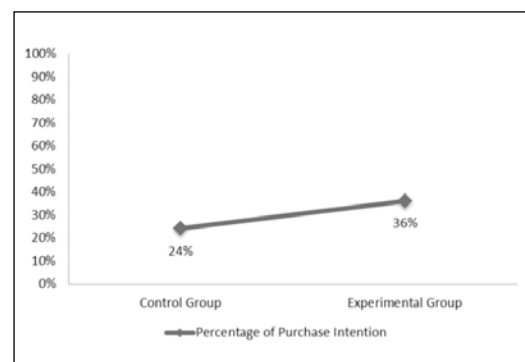


Figure 2. Purchase intentions results for the experimental and control groups.

the effect that placement apparently produces in the implicit memory of individuals, which is measured in this study through a purchase intention test. Regarding the types of placement, only a higher significant influence of the brand used by a main character is identified, compared to brand placement as part of the background. It has been mentioned that subtle placements could have a greater influence in implicit exercises, as explained by Ho, Ling and Young, 2011 in their placement study for video games; however, the results of the present study were the opposite. In this sense, no relationship with the comprehension of information model proposed by the landscape model is found, consistent with the evidence that supports that implicit memory would not be influenced by the way that the information is processed in the mind. A possible explanation could be that when the brand is used by a character the sense of familiarity increased, which could work as heuristic at the moment of brand selection, causing the so called «transference effect» due to the learning of certain consumer social environments.

In this way, the use of placement in movies, and more specifically the brand used by a main character, would stimulate implicit memory when the product already exists in the market because this would reinforce the individual's behavioral answers such as purchase intention or effective purchasing, working as a learning consumer stimulus; in other words, educommunication. This could eventually end up being detrimental if we apply these findings to restricted consumer products, such as alcohol (Noguti & Russel, 2014). In these cases, the individual could automatically, or unconsciously, recover the stimuli to which they had been exposed to during placement and thus have their conduct influenced.

The limitations that this research presents are in terms of the sample design used. Because the sample is not a probability sampling, the results cannot be generalized to the rest of the Chilean college student population. Regarding the methodology used, the immediate effects on the participants are measured through exercises that are provided immediately after exposure to the placement in the movies. An analysis of the effects of placement after a few weeks of having concluded the exposure to the stimuli would be interesting. The number of brands evaluated, or the category of products used, could be construed as limitations as well. Comparisons between products with or without an ethical load, with a high or low level of emotional attachment, etc., could be included.

Challenges for future investigations would include, for example, the incorporation of a greater number

of variables for the understanding of implicit memory and the higher influence found when the brand is used by a main character, time of exposure to the brands, previous consumer experiences, brand familiarity, empathy towards the characters, or individual variables. Due to the fact that the use of placement is increasing more and more each day throughout the world, another future challenge could be the expansion of the study towards other effective measures of placement. Finally, and considering that most of the studies done in this area are performed within laboratory environments, another suggestion presents itself regarding the collection of information from the sample: field research; for example, at movie theater exits, this could improve the external validity of the experiment.

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Categorization, Item Selection and Implementation of an Online Digital Literacy Test as Media Literacy Indicator

Categorización, selección de ítems y aplicación del test de alfabetización digital on-line como indicador de la competencia mediática

-  Dr. Jon Dornateche-Ruiz is Associate Lecturer at the Faculty of Law, Social Sciences and Communications at the María Zambrano, Campus in Segovia of the University of Valladolid (Spain) (jon@hmca.uva.es).
-  Alejandro Buitrago-Alonso is Trainee Researcher at the Faculty of Law, Social Sciences and Communications at the María Zambrano, Campus in Segovia of the University of Valladolid (Spain) (alexibuitrago.alonso@gmail.com).
-  Dr. Luisa Moreno-Cardenal is Associate Lecturer at the Faculty of Law, Social Sciences and Communications at the María Zambrano in Segovia of the University of Valladolid (Spain) (luisamorenocardenal@gmail.com).

ABSTRACT

This paper aims to measure a population's level of knowledge and active use of certain digital tools that play a primary role in developing their media literacy. To achieve it, an Online Digital Literacy test was designed to measure the knowledge and active usage of 45 different online software packages. This tool works as a reliable indicator to identify a population's media literacy development in terms of its linguistic and technological dimensions. More than 1,500 subjects of different gender, age and level of studies were tested in different cities within the autonomous community of Castilla and León in Spain, to measure their competence using these tools. The resulting data has enabled the identification of the level differences between age groups and gender and to formulate proposals in respect of digital literacy to enhance the public's competence in terms of media education. The general results indicate that people's Online Digital Literacy level is lower than ideal and that there is a level divide in relation to gender and age and that the average user has a social and recreational profile as a consumer of pre-existing content on the Internet rather than as manager, instigator or creator of his or her own content. This paper's conclusions therefore raise awareness of these deficiencies and encourage academic institutions to design specific digital literacy educational programmes to help citizens become media empowered.

RESUMEN

La presente investigación nace con el objetivo de medir el grado de dominio por parte de la población de una serie de herramientas digitales que juegan un papel clave en el desarrollo de la competencia mediática. Con ese fin, se ha elaborado una categorización que intenta abarcar todas las funcionalidades que la Web 2.0 brinda al usuario. Posteriormente, se ha delimitado cada una de ellas a través de tres ítems digitales concretos de uso extendido en la sociedad mediática. La selección realizada conforma un test de alfabetización digital on-line (test ADO) que mide el grado de conocimiento y uso activo de dichas herramientas, y que, por tanto, compone un indicador significativo de la competencia mediática en sus dimensiones lingüística y tecnológica. El test ha sido administrado a una muestra de más de 1.500 sujetos de diferente edad y nivel de estudios con el fin de obtener datos que ayuden a establecer objetivos en el panorama de la alfabetización digital y contribuyan hacia el empoderamiento ciudadano en materia de educación mediática. Los resultados y conclusiones generales indican que el nivel de alfabetización digital on-line del ciudadano medio no es el deseado, que existe una brecha digital generacional y de género, y que el perfil medio del usuario de Internet es más social, recreativo y consumidor de contenidos existentes, que proactivo, gestor y creador de contenidos propios.

KEYWORDS | PALABRAS CLAVE

Media education, educommunication, media literacy, digital literacy, languages, technology, empowerment, user profile. Educación mediática, educomunicación, competencia mediática, competencia digital, lenguajes, tecnología, empoderamiento, perfil de usuario.

1. Digital literacy as linguistic and technological dimensions of media competence

Following many years of debate around terminology it now appears unquestionable that media education should encompass a series of literacies that go beyond the simple acquisition of the long-desired digital competence; but competence in the areas opened up by the digital era still remains, to some extent, one of the fundamental pillars on which educommunication rests in the XXI century. We are surrounded by a plethora of «umbrella concepts» characterised by the diversity of their perspectives and a multitude of definitions (Koltay, 2011). As a result, in this article it has been decided to refer to «education» as the process, «literacy» as the result and «competence» as the set of skills that must be developed to achieve the result. Furthermore, the label «digital» refers to any aspect that relates specifically to the digital environment and «media» refers to the wider field of educommunication. However, as Gutiérrez & Tyner (2012: 37) suggest, «if we concern ourselves more with identifying the differences between «media education» and «digital competence» than attempting to reconcile them we will only dilute our efforts and may even generate greater conflict». To some extent this was the policy adopted by UNESCO in 2011 in an attempt to reconcile traditionally conflicting viewpoints when they opted to use the term «media and information literacy» (MIL).

When placing this current study in context it is impossible not to refer to Ferrés & Piscitelli (2012: 75-82) and their assertion that media competence has six core features: language, technology, production and dissemination processes, reception and interaction processes, ideology and values and the aesthetic dimension.

Although, to some extent, it inhabits every one of these dimensions, digital literacy relates directly to two of them in particular, the linguistic and the technological dimensions; linguistic in terms of everything related to codes, means and languages that comprise the digital information at our disposal and technology in terms of the ability to manipulate the tools (software or hardware) which give us access to this information. According to Dornaletche (2013) we can talk of «off-screen literacy» and «on-screen literacy». At the same time, whatever appears «on screen» can be subdivided between what happens online and offline. Everything relating to the offline use of media is constantly reducing as the tendency is towards a permanent online digital experience. It is therefore these digital tools that enable us to engage with different forms of a «partici-

pation culture» such as membership of user communities (Facebook), the generation of new forms of creative expression (mash ups), the development of knowledge through collaboration (Wikipedia) or the diffusion of and access to new information streams (blogging and podcasting) (Jenkins, 2009).

It is important to clarify that this study did not intend to concentrate solely on this online experience, on that part of digital literacy that resides «on screen» and at the same time «on the net». In this article this will be referred to as «online digital literacy», not from a desire to add yet another label to a technological feature that often creates confusion but rather to provide the focus for this study and construct a framework for the array of digital tools mentioned throughout the paper.

Despite its concentration on a particular element of digital literacy, this study tries to avoid the pitfall of reducing the concept of media education to the development of digital competence in its «most technological and instrumental dimension» (Gutiérrez & Tyner, 2012: 38). Instead it aims to explore in depth one fundamental aspect which has a significant effect on two of its dimensions (language and technology) without ignoring the very real importance of the other four dimensions. To this extent the present paper strongly supports the «need for interdisciplinarity in educommunication» (Gozálvez & Contreras, 2014: 13). The authors believe that studies such as the current one, focused on user behaviour around new and constantly evolving digital tools, should be compatible with studies concerned with empowering users based on a more ethical, shared and integral concept of media education. This approach entails more than the development of a series of practical skills or a call for additional creativity (Buckingham, 2010) and emphasises the need to acquire «mental habits, knowledge, skills and competencies required to be successful in the XXI century» (Hobbs 2010: 51). It is acknowledged that some tools included within this study, such as social networks, «do not always guarantee a conscious and enriching use of communication systems and media to promote intelligent exchanges» (García-Matilla, 2010: 167) and we therefore believe that the study of the knowledge and active use of these digital items should not conflict with the «desire for permanent construction and reconstruction of critical thinking» (García-Matilla, 2010: 168) which the educommunication tradition has always followed.

Finally, based on the current state of research into the field of media education, it would be wrong to omit mention of the increasing contributions coming

from the field of neuroscience, which indicate how vital it is that «the ability to exploit the instruments is accompanied by an ability to deal with the mind, both one's own and other peoples» (Ferrés, 2014: 239).

2. Opening the door to users with new profiles

An initial investigation of the issues confirmed how terms such as Google, Facebook, Whatsapp, Instagram, etc., have changed our lives, not only in terms of digital-media but also with regard to classic reading-writing literacy, as hardly a day passes without us reading or using some of the names of the digital products included within this article. «We can now Google» things and we have abbreviations to express ourselves more easily, such as «LOL» (laugh out loud), or «OMG» (Oh my God!). New technologies have also delivered new words such as iPhone, iPad or Droid (De-Abreu, 2010: 1). In the case of Wikipedia it represents «a living book which becomes more intelligent and comprehensive every day, thanks to the informally coordinated actions of millions of human beings across the planet» (Johnson, 2013: 222). No one talks these days about «message Servers», «instant messaging applications» or «social networks», but only about Gmail, Whatsapp and Facebook. It is therefore essential to create a system of categorisation for this array of constantly evolving digital tools to establish a list of items covering these brand names and specific software products to enable identification of their current usage among the public. «The Internet provides a range of digital tools and information distribution networks which enable people to join together in new forms of collective activity. Communities now exist for the creation and sharing of knowledge (Wikipedia), culture (YouTube, Flickr, the blogosphere), tools (free and open code software), markets (e-Bay, Craigslist), education (Open Educational Resources), journalism (citizens journalism) and political organisations (meetups, netroots activism, smart mobs)» (Rheingold, 2008: 25). Furthermore, but without wishing to focus too greatly on the experiential ground, this paper pro-

poses a way in which this categorisation and list of items can develop in the future to measure digital literacy in new ways without being subject to categories or items fixed in time.

The dimensions of media literacy mentioned above (Ferrés & Piscitelli, 2012: 75-82) are not only there to establish a simple classification of indicators but each of them develops its own content through two areas of participation: the area of «analysis» and the area of «expression». The area of analysis relates

The results of this survey suggest that educational institutions and bodies should design specific programmes to address the deficiencies in Online Digital Literacy that have been uncovered. This proposal is based on some of the disturbing data captured by the study, such as the confirmation that: (1) the average subject surveyed did not meet the anticipated level of knowledge and competence to achieve Online Digital Literacy, (2) even having a university education did not guarantee achieving the proposed average level, (3) the average Internet user has a passive profile and (4) females are less empowered than males in this area.

to those people that «receive messages and interact with them», whilst the area of expression concerns those that actually «create messages», taking into account that for many years «the creation of content has become easier than ever and a single technology can be used to both send and receive information» (Livingstone, 2004: 8). This reflects the traditional division between users that are just receivers and those that, faced with the opportunities available today, go one step further and could be called «emirecs» (Cloutier, 1973), «prosumers» (Toffler, 1980), «interlocutors» or indeed given some other appropriate label. However, based on the results obtained from the ADO test, it was considered important to analyse further this customary differentiation between media users to ask if these days we can talk about new types of profiles, beyond those of consumers and prosumers, or whether, as a result of the developing processes of

interaction with messages, we can establish any new profiles either within the «area of analysis» or the «area of interaction».

If digital literacy conforms to a central axis of what we call media education or, in the words of UNESCO, media and information literacy, then significant importance should be given to research that explores the assortment of new digital tools that erupt into the media panorama on a daily basis and which change in an instant our most rooted communication habits and formats.

Educational institutions should therefore consider ways to reduce the digital divide between the generations, increase the empowerment of females at a technological level from a young age and strengthen the range of expressive, creative and constructive content on the Internet through providing courses for the whole population.

3. Objectives, hypotheses and methodology

An instrument was designed for this study with the aim of measuring people's knowledge and their active use of a range of online digital literacy items. The items related to a set of programmes concerned with searching, creating and disseminating digital messages through the Internet. The results of this Online Digital Literacy test (ODL test) were used to develop specific educational proposals with the aim of empowering those sections of the population that need it most to control the digital tools they are least competent with.

The ODL test comprised three modules. The first included the socio-demographic variables; age, gender and highest qualification level, together with the question «Have you ever used the Internet?». The second module contained 45 items relating to the use and knowledge of specific digital tools. Finally, the third module comprised two questions: one about their main reasons for using the Internet (preferred online activities) and the other about the ways they learned how to use the Internet.

Five discussion groups were created to determine the 45 items that would go into the second and third modules of the ODL test. Each discussion group comprised eight students from each of the different year groups on the Advertising and Public Relations Degree

courses of the University of Valladolid (Spain) at the María Zambrano Campus in Segovia. The decision to involve students in the groups was based a priori on the fact that they represent one of the segments of society that is most active on the Internet and, consequently, have a higher level of competence in using online digital literacy items. The objective for each group was to determine a range of basic activities for an Internet user with average knowledge of the Internet. The five groups identified 15 categories of activities: browsers (access to Internet), operating systems

(a basic tool enabling access to Internet), search engines (for locating information), E-mail (messaging tool), telecommunications (calls and messaging), mobile devices (devices for accessing the Internet), social networks (information sharing, meeting people, promoting events), video (watching, editing and sharing videos online), photos (viewing, editing and sharing images online), music (listening to and sharing music), servers (storing and

sharing information), web/blog creation (producing and managing content), downloads (downloading files), online fiction (watching films or TV series for free), and shopping (buying and selling). The third module contained open questions and the responses were codified according to the predominant responses received. The main uses of the Internet were determined as: communicating, keeping up to date with information, accessing entertainment and for learning. In terms of learning how to use Internet the responses were: being self-taught, taking a course or being shown by friends or family. The primary activities undertaken on the Internet were considered to be: social networking, communication, chat, forums, E-mail, work, videogames, specialised information, downloads, watching and listening online, shopping and pornography.

Next, three items or tools were identified for each category in the second module: 1) Search engines were represented by Google, Bing and Altavista; 2) Browsers by Explorer, Chrome and Firefox; 3) Telecommunications by Skype, Viber and Whatsapp; 4) Video by YouTube, Vimeo and Dailymotion; 5) Photos by Flickr, Picassa and Instagram; 6) Servers by Megaupload, Dropbox and Hotfile; 7) Downloads by Taringa, JDownloader and uTorrent; 8) E-mail by

Gmail, Hotmail and Yahoo; 9) Creation of web/blogs by Blogger, Wordpress and Wix; 10) Shopping by Ebay, Paypal and Amazon; 11) Music by Spotify, iTunes and Soundcloud; 12) Social networks by Facebook, Twitter and Tuenti; 13) Operating systems by Mac, Windows and Linux; 14) Mobile devices by e-book, iPad and Samsung Galaxy and finally 15) On-line Fiction by Cinetube, Peliculasyonkis and Divx-online. The order of the items on the questionnaire was random to prevent any patterns in the responses.

The respondents were asked whether or not they knew of each item and if they actively used it. The responses were categorised using a Likert type scale with three values: 0 if they did not know of it; 1 if they knew of it and what it was used for but did not use it themselves; and 2 if they knew of it and used it themselves. This scale was used to categorise the responses in the simplest way possible so they could be fully exploited. The highest score that any item in each category could score was 6, so, based on the 15 categories, the ODL test had a maximum score of 90 points. The minimum value any item could achieve was 0 (no competence); 1 (low level competence); 2 (low to average competence); 3 (average competence); 4 (average to high competence); 5 (high level competence); and 6 (highest competence). Although it may be a useful guide this ODL test was not intended to produce an absolute value for digital literacy; it aims only to offer a specific and useful indicator of it and, by extension, of media competence in the linguistic and technological dimensions. Having an overarching view of the extent to which key tools are used can help us determine user profiles. Nevertheless, the phrase «ODL level» is used in this paper to refer to the general score of the subjects in the test and to enable the socio-demographic variables to be cross-referenced with the main uses and the way people learned to use the Internet. From 0 to 18 points was classed as a low ODL level, 19 to 36 as low to average, 37 to 54 as average, 55 to 72 as average to high and 73 to 90 as a high ODL level.

Based on the work in the discussion groups five key hypotheses were formulated: 1) the highest scores would be in the categories of messaging, searching and information sharing, using e-mail, Operating systems, Browsers, Social networks and Telecommunications as these represent the tools that have been available to the population for the longest period; 2) the lowest scoring categories would be those relating to managing, storing, and creating content using Servers, Downloads, and Web/blog spaces as they are the ones which a priori require higher levels of knowledge

and proactivity on the part of the user; 3) the ODL level would be inversely proportional to the age range of the respondents and there would be significant statistically significant differences between them; 4) the gender variable would not be significant in the ODL level; 5) the year of study of the respondents would be a factor that affected the ODL level.

The survey respondents conformed to a representative sample of the residents of the autonomous community of Castilla and León (Spain) (N=1506), distributed between 4 age ranges (15-29 years N=166 / 30-44 years N=499 / 45-64 years N=459 / 65-99 years N=382), in quotas established in accordance with the population in the various provincial capitals (Ávila N=120, Zamora N=120, Segovia N=120, Burgos N=205, Soria N=120, Palencia N=120, León N=154, Salamanca N=178, Valladolid N=368) and also proportional to gender. The questionnaires were delivered face to face and randomly on the streets of the provincial capitals by members of the previously established «Communication competence in the digital context in Castilla and León» research team (REF: VA026A10-1), during the 2010-11 academic year. Cronbach's Alpha coefficient ($\alpha=0.961$) was applied to assess the reliability of the test. Also, to measure the statistically significant variances between variables, both the average comparison and the ANOVA one-way analysis of variance tests were applied. Statistical significance is assumed when $P \leq 0.05$.

4. Results

The overall result of the ODL test for the population was 25 points; average to low. The only age range that scored 50% was 15-29 years with 45 points (an average ODL). They were followed by the 30-44 years range with 41 points (an average ODL level), the 45-64 years range with almost a 100% decrease at 23 points (an average to low ODL level) and finally the 65-90 years range with 2 points out of 90 (a low ODL level). Significant variations in the levels were found between each quota ($P=0.001$).

If the results for each category are examined in more detail it can be seen that the three items that scored most highly for each age range were E-mail, Browsers and Social Networks, which to some extent supports our initial hypothesis. However, the Telecommunications category (Skype, Whatsapp, Viber) was at the lower end, a long way from being the highest scoring. In last place, as predicted, came the category of Creation of web/blog sites, Servers and Downloads, although it was not expected that Photos

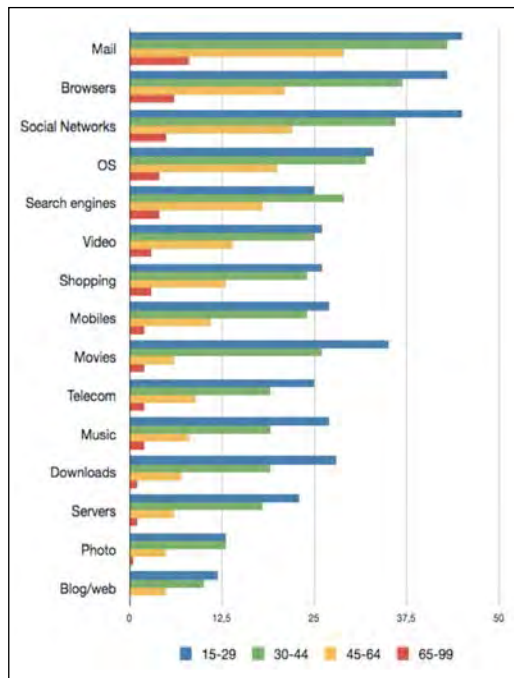


Figure 1. Categories of knowledge and use by age range.

and Music would also score so low. As can be seen from Figure 1 the only category in which the second age range scored more highly than the first was in that of Search engines. In contrast, the first age range scored significantly higher than any other age range in the use of Social Networks, Downloads, Servers and accessing Fiction online.

The cross-referencing of data from the categories of use and knowledge with the gender variable showed significant differences in the scores of males (N=745) and females (N=761) within the overall scores of the population, as per Figure 2. If further cross-referenced against the age variable, contrary to what might be expected, further significant differences were found in the two initial age ranges (15-29; $P=0.001$; 30-44; $P=0.001$). However, for the third and fourth age ranges the responses by gender were more homogeneous (45-64 $P=0.321$; 65-99 $P=0.081$). Much greater differences were found in the categories of Mobile devices, Downloads and Servers.

The level of studies completed by the respondents was found to be a variable that affected online digital literacy. Those with no or only primary studies completed (N=392) got the lowest ODL score. They were followed by those with secondary education or equivalent professional training (N=470). Finally, those respondents with a university degree (N=643) had the highest digital literacy. The most revealing result, though, was that having a university degree did

not guarantee an average ODL level, as the graduates scored no higher than 34 points out of 90, as can be seen in figure 3.

With regard to the main purpose for respondents' use of the Internet the data showed that 31% used the Internet primarily to access information, 18% for entertainment, 16% to access training or education, whilst 36% responded that they used it for communicating. Cross-referencing the main use of the Internet with the age variable showed that age significantly affected the primary use ($P=0.045$). As seen in Figure 4, the first age range (N=165) were those that used the Internet most for games (30%) and communication (38%). The second age range (N=484) were those that most used it to access training and education (21%). In the third age range (N=338) there were significant increases in use for accessing information/news (37%) and communication (35%) at the expense of entertainment (13%). The same happened in the final age range (N=81) as in the third age range but in a more dramatic way. The primary use for training/education fell to 4% and for entertainment to 8%. There was no significant variation between male respondents (N=554) and female respondents (N=514) in terms of the primary use they made of the Internet but there were differences in the way they learnt how to use the Internet ($P=0.001$). Males tended to be more self-taught (77%), and females more likely to take a course or be taught by family members or friends (55%). Likewise,

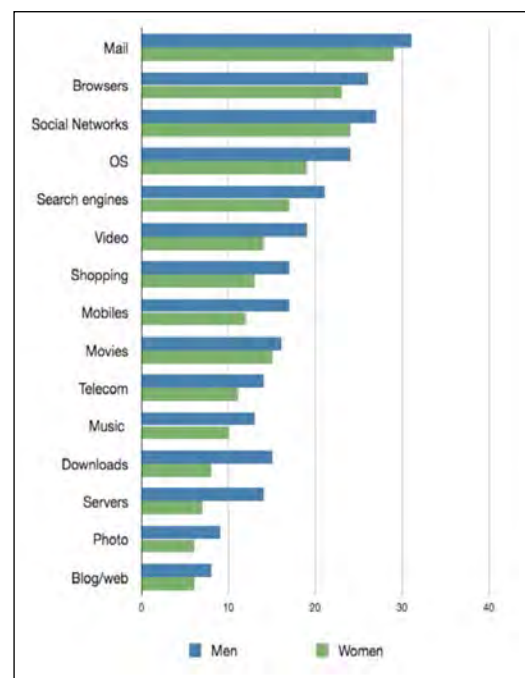


Figure 2. Categories of knowledge and use by gender.

significant variances can be seen between the age range and the way they learnt to use the Internet ($P=0.001$). Not only did 80% of respondents between 15 and 29 years of age consider themselves to be self-taught, they scarcely contemplated the notion of learning from a member of their family (1%).

When analysing the primary activity on the Internet of the study population it can be seen that there were significant differences between the age ranges of the study subjects ($P=0.042$). The first age range (15-29) was found to spend more time on social networks (34.5%) and less on E-mail (5.5%). A total of 32.8% of activity related to searching for information and 12% to watching/listening online and playing videogames. Working/studying (4.8%), Shopping (4.8%)

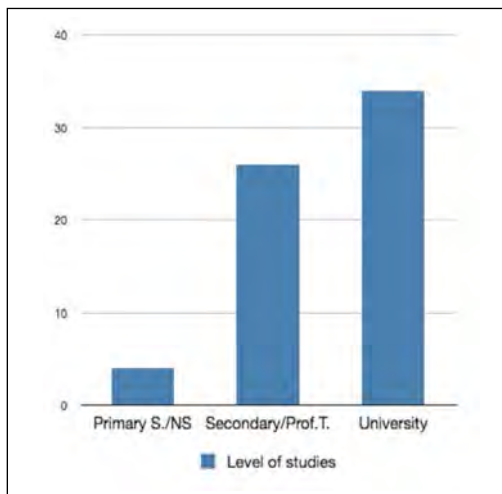


Figure 3. Level of ODL by level of completed studies.

and Downloads (5.2%) appeared to be secondary uses. For the second age range (30-44) E-mail (19.2%) was a higher priority than Social media (11.4%). Respondents in this age range dedicated the highest proportion of their time to searching for specialised information (27.9%) and accessing the communication media (16.1%). Strangely, they spent less on shopping on the Internet (2.6%) despite being the group with the greatest purchasing power. A clear increase in the use of E-mail (27.5%) at the expense of Social networking (1.5%) was found in the third age range (45-64). Together with the second age range this was also the group that used the Internet the most for seeking specialised information (30.5%) and for work (12.7%). Among respondents in the final age range (65-99) the range of activities decreased to just five. Their main interests were in accessing communication media (39.5%), searching for specialised information (19.7%) and using E-mail (34.2%). Although not statistically sig-

nificant, several subjects mentioned video-conferencing as a primary use of the Internet (5.3%).

5. Discussion

Although it might seem unsurprising that the results of the study identified a digital gap between the generations they also indicated clear weaknesses in digital

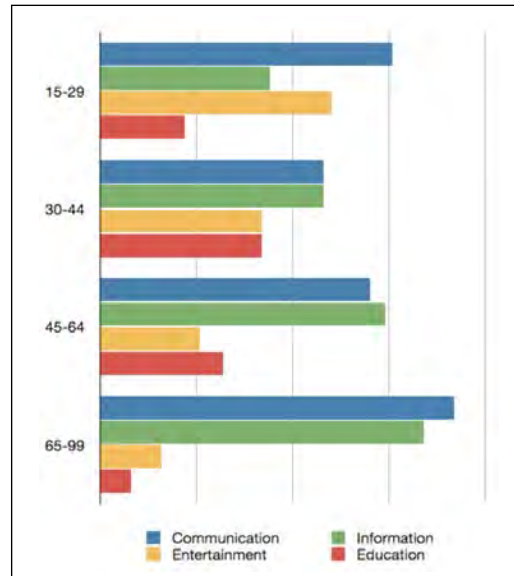


Figure 4. Primary use of the Internet by age range.

competence even among members of the earliest age ranges. This is worrying as it suggests a scenario in which young people are not fully exploiting the opportunities for personal growth and learning that the Internet offers and that opting for a self-taught approach, as suggested by the results, is not working well enough. Neither is having a higher level of education any guarantee of achieving an average level of Online Digital Literacy.

Of no less concern is the fact that the category of creation of own content using blogs was relegated to last place. Confirmation of the second hypothesis means that only a very small percentage of the population understands and actively uses the content management tools on the Internet. In other words, within the study population practically no content generators were found.

In terms of understanding the profile of the average Internet user within Castilla and León the data suggest they have a passive profile, focused on interacting, communicating, searching and downloading. The youngest use the Internet mainly to communicate with other users. Their main focus are the social networks; there they share their experiences and state of mind,

recommend things to their community and follow the recommendations of others. It could be said they have a «social and recreational profile» (socializer). Subjects within the second age range focused more on searching for specific information, on their own training/education and on keeping informed and were not interested in social networks or particular websites or special interest forums and only resorted to downloading when they needed to resolve a particular issue (searcher/downloader).

Although these two groups' profiles are proactive and they both understand and use new technologies a lot they are certainly not empowered in the areas of expression and creation. In this sense, among the study subjects surveyed, none displayed the type of profile of an individual that regularly generates and shares information. Those people with a more creative profile (uploader) tend to have accounts with Instagram or Vine where they share their artistic photos and with Vimeo or YouTube to share their videos. An uploader will have their own blog, forum, website or portfolio where they exhibit their work. An uploader creates content that may initiate a trend or become a «trending topic» and constantly updates their knowledge of and competence with the technology. An uploader has a high ODL level and also shares the characteristics of the other profiles (downloading, searching and interacting). Individuals with this profile are equally empowered as consumers of information and therefore in creating and expressing it as well. In contrast, the average user identified within this survey is far from being an uploader, someone who is empowered from both an expressive and technological point of view.

The average user identified from the survey in Castilla and León not only lacked creativity but, in line with other recent similar studies (Literat, 2014), significant differences were found in the level of ODL between males and females. These differences in the ODL levels between the genders occurred mainly in the two earliest age ranges, which is of concern as it indicates gender stereotypes which need to be addressed. There were no significant differences in the knowledge and use of particular categories however. No tools were used predominantly by males or by females. The results were more general, as in every category males scored higher than females to a statistically significant degree.

6. Conclusions

The results of this survey suggest that educational institutions and bodies should design specific programmes to address the deficiencies in Online Digital

Literacy that have been uncovered. This proposal is based on some of the disturbing data captured by the study, such as the confirmation that: (1) the average subject surveyed did not meet the anticipated level of knowledge and competence to achieve Online Digital Literacy, (2) even having a university education did not guarantee achieving the proposed average level, (3) the average Internet user has a passive profile and (4) females are less empowered than males in this area. Educational institutions should therefore consider ways to reduce the digital divide between the generations, increase the empowerment of females at a technological level from a young age and strengthen the range of expressive, creative and constructive content on the Internet through providing courses for the whole population.

This survey provided further evidence (Aguaded et al., 2011; Ferrés & al., 2011) of a lack of media literacy among the general population, in this case in relation to a lack of competence in the use of particular digital tools which are increasingly common and widespread and without which it is becoming ever more difficult to operate in the hypermedia context that surrounds us. An up-to-date and constantly-developing proficiency with these tools will never equate to acquiring full digital literacy but it will significantly support the empowerment of the population and the development of the competences that result in media literacy.

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Notes

1 Members of the research team «Communication competence in the digital context in Castilla and León»: Agustín García-Matilla, Eva Navarro-Martínez, Marta Pacheco-Rueda, Pilar San-Pablo-Moreno, Coral Morera-Hernández, Jon Domaletche-Ruiz, Luisa Moreno-Cardenal, Manuel Canga-Sosa, Tecla González-Hortigüela y Alejandro Buitrago-Alonso.

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Teaching Media Literacy in Colleges of Education and Communication

La docencia sobre alfabetización mediática en las facultades de Educación y Comunicación

-  Dr. Laura López is Associate Professor in the Department of Communication at the University of Malaga (Spain) (lauralopezr@uma.es).
-  Dr. María-Cinta Aguaded is School Counsellor and Associate Lecturer in the Department of Education at the University of Huelva (Spain) (mariacinta.aguaded@dedu.uhu.es).

ABSTRACT

This work is part of an R&D project involving thirteen Spanish universities in which needs and wants in the field of media education in higher education are studied in the areas of Communication (Communication Studies, Journalism and Advertising) and Education (Teaching, Pedagogy, Psychology and Social Education). The objective of this study focuses on analysing the college textbooks directly related to Media Education most used in Education and Communication. The report has been developed based on six educational competence dimensions: language, technology, interaction processes, production and distribution processes, ideology and values and aesthetics. Using each of these parameters the scope of the analysis and the scope of the expression were taken into account, based on guidelines set by Ferrés and Piscitelli in their well-known proposal of indicators for defining new media competence and which is structured around two areas of work: the production of own messages and interaction with others. The results were obtained by applying a quantitative methodology through a content analysis of semantic fields. The main conclusions point to a greater presence of the «Ideology and Values» dimension, and almost non-existent representation of the «Aesthetics» indicator.

RESUMEN

El presente trabajo forma parte de un proyecto I+D integrado por trece universidades españolas en el que se estudian las necesidades y carencias en materia de educación mediática en el ámbito de la enseñanza superior, tanto en las áreas de Comunicación (Comunicación Audiovisual, Periodismo y Publicidad) como de Educación (Magisterio, Pedagogía, Psicopedagogía y Educación Social). Esta investigación centra su objeto de estudio en el análisis de los manuales universitarios más utilizados en Educación y Comunicación, en asignaturas directamente relacionadas con la educación mediática. Este informe se ha desarrollado en base a seis dimensiones competenciales mediáticas: lenguajes, tecnología, procesos de interacción, procesos de producción y difusión, ideología y valores y estética. De cada uno de estos parámetros se ha tenido en cuenta el ámbito del análisis y de la expresión, partiendo de las pautas señaladas por Ferrés y Piscitelli en su conocida propuesta articulada de indicadores para definir la nueva competencia mediática, que se ha estructurado en torno a dos ámbitos de trabajo: el de la producción de mensajes propios y el de la interacción con otros ajenos. Los resultados han sido obtenidos mediante la aplicación de una metodología cuantitativa, a través de un análisis de contenido por campos semánticos. Las principales conclusiones extraídas apuntan hacia una mayor presencia de la dimensión Ideología y Valores, y una casi inexistente representación de la dimensión Estética.

KEYWORDS | PALABRAS CLAVE

Media literacy, media competence, critical thinking, emotion, aesthetics, languages.
Educación mediática, competencia mediática, actitud crítica, emoción, estética, lenguajes.

1. Introduction and current position

The discussion within academia about university student training has now become persistent as a result of dramatic shifts in society over recent decades marked by the arrival of mass information through multiple channels. The need has therefore become apparent to consider as part of the university curriculum subjects covering media competence and bibliographic resources for teaching. Even though research on media competence has been produced over these years it still remains a poorly explored area (Aguaded, 2012: 8). Some research has addressed the levels of compulsory education (Santibáñez & Masanet, 2012) and the university students (Marta, Grandío & Gabelas, 2014). Since the late eighties, international researchers such as Buckingham (2007) have embraced the challenges the education system should undertake in terms of educommunication. Others such as Piscitelli (2009), Maffessoli (2009), Martinelli et al (2011), Bordignon and collaborators (2010) and Fernández-Planells and Figueras (2012) approach media literacy from the perspective of training university lecturers and good formal teaching practice in Latin America.

This research therefore responds to an unmet need within higher education teaching and is driven by the urgency of detecting what training in media literacy is being given and what improvements could be established to achieve a comprehensive empowerment of citizens when they consume the media. The purpose of this work is therefore to contribute by publicizing the dimensions of the concept of media education being studied and worked on in the classroom.

In 2011, an analysis led by Ferrés, García-Matilla and Aguaded (2011) set out the population's shortcomings in media literacy. Spanish media society did not pass the test, necessitating a look at potential solutions. Some of these solutions are addressed in this research; what role does compulsory and university education play in this regard? Are the professionals who have been commissioned with leading the educating of new generations in media literacy adequately prepared and trained? (Sandoval & Aguaded, 2012; Maffessoli, 2009). Media education should be included at all educational levels, from infants to primary to secondary. University should then progress with this education (Osuna, Marta & Aparici, 2013).

In the field of higher education, on which the results of this research are centred, there are no tools that have validated literacy processes within the university community or the motivation and training of lecturers or references to media education in the most used literature during the teaching process.

What, therefore, is media competence? First of all we will take a more in-depth look at this concept by approaching its origins and analysing how it has evolved and been introduced into other areas of expertise.

The term was coined in association with the working world but it was then integrated into academia. According to Ferrés (2007: 100) «it is a combination of expertise, capacities and thinking considered appropriate for a certain context». From the Media Studies Unit at Pompeu Fabra University under sponsorship from the Catalan Audiovisual Council a document was drawn up using contributions by 14 researchers in Spain and 50 from Latin America to define the basic skills and key competences for lifelong learning. In order to review parameters from which media education should be taught, the levels need to be governed by two criteria: the first involves the personal and the second the operational. According to the experts, for a person to be competent in audiovisual communication he/she must be able to convert emotion into reflection and reflection into emotion. He/she must also be able to perform a critical analysis of the audiovisual products being consumed as well as producing audiovisual messages that are comprehensible and communicatively effective.

In the research sector, scientific and empirical results in the academic field provide uniform data regarding the state of media proficiency of citizens. These highlight the need for intervention in educational politics in order to attain literacy. These results gathered in Spain have been corroborated internationally in other ongoing investigations, indicating failings in media education and calling into question very recent concepts such as digital natives - the products of early exposure to media and the circumstance of living in a highly technological age. There is an evident need to encourage this literacy in media competence. Likewise, to undertake research into the issue it is fundamental to measure the media level, evaluating elements that demonstrate its importance, pinpointing and detailing the concept for a better understanding of what we are measuring and assigning a clear definition about what is understood by media competence, the elements that comprise it and the linchpins that provide its foundation.

Standardizing it by highlighting its directly related aspects is the basis for undertaking a deeper analysis: it then becomes important to describe synthetically, specifically and clearly the dimensions that constitute media competence in line with (Ferrés & Piscitelli (2012) who have explored its dimensions and indicators in more depth.

A summary of the dimensions of media competence is given below:

1) Languages: knowledge of the codes, the ability to use them and to analyse written and audiovisual messages from the perspective of sense and meaning, of narrative structures and categories and genres.

2) Technology: knowledge and the capacity to employ the tools that make written and media communication possible in order to understand how messages are produced. Understanding of the role ICT plays in society.

3) Interaction processes: ability to assess, select, review and self-evaluate the media diet itself. Ability to assess critically cognitive, rational, emotional and contextual elements that are involved in its receipt.

4) Production and diffusion processes: knowledge of the functions and tasks of production agents, production and diffusion phases and regulating codes. Ability to draw up, select, share and disseminate media messages.

5) Ideology and values: capacity for a comprehensive and critical interpretation, critical analysis and selective thinking in terms of media messages and how they represent reality.

6) Aesthetics: capacity to analyse and evaluate audiovisual messages through a formal and thematic innovative perspective and education in the awareness of aesthetics.

These indicators are structured around areas of analysis and expression where the media citizen is contemplated as a literate prosumer, in as far as he/she is able to produce messages and to interact with others from outside.

We will take the dimensions described by Ferrés in his article «Competence in media studies: dimensions and indicators» published in *Comunicar* 29 as a starting point for analysing college textbooks for degrees such as Education and Communication and the most used or recommended monographs in their bibliographies. More recently, in 2012, the same author offered a more detailed and updated work on this subject jointly with the lecturer Piscitelli from the University of Buenos Aires and that was published in *Comunicar* 38. The investigative objective of this article thereby seeks to continue the work undertaken

since 2010 in academia regarding media education offered to university students.

Furthermore, we consider the educommunication training and learning proposals put forward in Spain to be paramount. According to Marta & Grandío (2013: 127), «media literacy is a permanent learning undertaking (life-long learning), which should be formalized through greater presence in the curricula of all educational levels and also non-formal educational environments for adults».

2. Material and methods

In an initial phase of the investigation, a quantitative analysis was carried out on the selection of basic

In the field of higher education, on which the results of this research are centred, there are no tools that have validated literacy processes within the university community or the motivation and training of lecturers or references to media education in the most used literature during the teaching process.

bibliographic references in the textbooks of subjects directly related to media education offered in the Colleges of Education and Communication in Spain during the academic year 2011/12. Directly is understood as any material whose academic content included between four to six dimensions.

The results were obtained using an SPSS software database for processing statistics and by carrying out a univariant and bivariant descriptive analysis. Frequency tables were used for the univariant analysis and contingency tables for the bivariant. The most notable variables related to the bibliographic resources include the following: 353 references to books and book chapters, 54 research journals linked to the areas of communication, education, didactics, pedagogy, educational technology, etc. and 34 specialized websites.

In a second phase of the research, and after selecting the ten most consistent bibliographic references, an analysis was made of their content by semantic fields applied to the contents pages of the works referenced. Here, the total appearances of words or sets

of words linked to some of the six dimensions that make up the concept of media competence were quantified, with the addition of a seventh generic indicator that groups together the magnitudes that mention media competence generally and that is difficult to incorporate in any of the six previously mentioned.

Lastly, in order to give the investigation a qualitative capacity, the technique of in-depth interview was employed on 30 Spanish teachers who teach subjects directly related to media literacy in the Colleges of Education (20 selected in total) and Communication (10 interviewed in total), in order to analyse planning and learning expectations regarding the training they offer to students in ME. For this article some of the responses related to the dimensions proposed by Ferrés and Piscitelli have been extracted.

3. Analysis and results

Despite the fact that the database for this research contained a large number of variables, the results obtained from the statistical analysis places ten monographs into the ranking of most used bibliographic resources, as detailed in table 1.

Eight of the ten bibliographic contributions are monographs published in the last thirteen years. More specifically, the most recent works are those by Ferrés (2008) and De-Pablos (2009), inferring an updating of the material comprising textbooks in subjects directly related to ME, bearing in mind that data collection was carried out during the academic year 2011/12.

Meanwhile, the less recently edited works that figure in this ranking belong to works by Ferrés (1998) and Aguaded (1999). Nevertheless, despite the fact that they were edited in the 90s, these two manuals are undoubtedly the first reference works that demonstrate the need for a deeper social investigation into the importance of communicating this audiovisual communication medium, its impact and its audiences, particularly on children and teenagers. As textbooks, both works offer keys to educating about television, training the viewer and putting forward didactic pro-

posals for use of the medium in schools.

A notable aspect in this ranking is the appearance of three monographs by the lecturer Ferrés: «Televisión y Educación» (1998), «Educar en una cultura del espectáculo» (2000) and «La educación como industria del deseo» (2008). His work on show culture is in fact one of the most highly referenced in textbooks along with that by Cabero, «Tecnología Educativa: utilización didáctica del medio vídeo» (2007).

According to the authorship variable, eight of the ten works in the bibliographic collection are written by highly renowned Spanish researchers in the academic field of educommunication, while the others are by the lecturer in Education at the University of Loughborough (England), Buckingham, of equally high repute and with extensive experience in the area we are studying.

The subject blocks that the content of these monographs cumulate are, broadly speaking, linked to the study, description and analysis of media education associated with audiovisuals, to the use of technology

Table 1. Ranking of the 10 most used bibliographic resources in subjects related to media education in university studies of Education and Communication in Spain

«Educar en una cultura del espectáculo» (Ferrés, 2000).
«Una televisión para la educación» (García-Matilla, 2003).
«Crecer en la era de los medios electrónicos» (Buckingham, 2002).
«Educación en medios» (Buckingham, 2005).
«Tecnología educativa: la formación del profesorado en la era de Internet» (De-Pablos, 2009).
«Tecnología educativa: utilización didáctica del medio vídeo» (Cabero, 2007).
«Televisión y Educación» (Ferrés, 1998).
«Convivir con la televisión» (Aguaded, 1999).
«La educación como industria del deseo» (Ferrés, 2008).
«Tecnologías de la Información y comunicación para la formación de docentes» (Cebrián-de-la-Serna, 2005).

as an educational complement, to the training of teachers and education in electronic media. This research goes into further detail measuring the presence of the six dimensions that make up the concept of media competence in each of the manuals.

The semantic study carried out on the aforementioned monographs focused on an analysis of the contents. An assessment was made of which terminology used was likely to be classified in the dimensions chart constituting Media Education. In total, the corpus analysed a total of 346 chapter contents. Table 2 shows the total entries obtained in each of the indicators:

An initial assessment indicates that all the dimensions are present in the ten bibliographic resources

Table 2. Classification of the semantic references applied to the 6 dimensions on media education

Dimensions	Languages	Technology	Interaction processes	Production and diffusion processes	Ideology and values	Aesthetics	Generic
Entries	84	303	182	97	291	31	26

analysed. According to the total calculation, two sections from the 346 chapters that make up the corpus analysed are repeated the most: the first, comprehension of the social function of technologies (Technology Indicator) and the second, the ability to detect ideology and values, whether explicit or latent, even in unnoticed communication and the adopting of a critical interpretation (Ideology and Values Indicator).

These results show that most bibliographic resources are concurrent in attributing significant importance to the social function that communication and information technologies exert when teaching students. Likewise, content that addresses the capacity to detect stereotypes and messages that go against human values and the environment are also awarded significance. According to the chart of magnitudes applicable to media education, these sections correspond to the Technology and Ideology and Values dimensions. It must therefore be deduced that greater weight is given to analysis than to expression, although this does not mean they are not included in the textbooks as students are encouraged to develop the capacity to handle multimedia and multimodal tools. Of the works analysed, those by De-Pablos (2009), Cabero (2007) and Ferrés (1998) discuss these sections in most detail. The rest refer to them but to a lesser degree.

A second block resulting from the database assigns a notable position to the Interaction Processes dimension, particularly sections related to the capacity to comprehend and manage own emotions in terms of preferences and for cognitive purposes and the capacity to interact with people and groups in increasingly more varied identity and intercultural environments. This content is more present in the works by Ferrés (2000), Buckingham (2002; 2005), De-Pablos (2009) and Cabero (2007).

A third block assigns an average presence in

the manuals to the following dimensions: capacity to evaluate sources and capacity to manage own emotions in screen interaction (Ideology and Values and Interaction Processes), knowledge of production systems and ability to share and disseminate information (Production and Diffusion Processes) and lastly active interpretation when interacting with screens to build a richer society (Interaction Processes). In this last section the works by Aguaded (1999) and Ferrés (1998; 2000) are the most notable.

Data from the Languages dimension scored lower in the works analysed. Manuals by Ferrés (2000) and Buckingham (2002) attribute the greatest importance to the training of students in analysing and assessing narrative structures and gender and format conventions, to education in the establishment of intertext relationships -intertextuality-, codes and media and to interpreting and assessing the representative symbols and their expressive function.

It is interesting to reflect on the Languages dimension at this point. Despite the fact that the quantitative analysis showed it has limited presence in Media Education texts, some of the in-depth interviews held with lecturers and managers who participate in curricula planning in Communication and Education colleges demonstrated that this dimension should be considered intrinsic and a priority as it provides the foundation for deeper examination in the rest of the indicators.

Lastly, results of a more marginal presence in the

Table 3. List of the 5 dimensions most referred to in the monographs on media education

ME Dimension	Area (Analysis/ expression)	Indicator description	Entries referenced in the contents pages
Technology	Analysis	Comprehension of the social function of technologies.	195
Ideology and Values	Analysis	Ability to detect ideology and values, whether explicit or latent, even in unnoticed communication and adopting a critical interpretation of them.	105
Ideology and Values	Analysis	Capacity to detect stereotypes and messages that go against human values and the environment.	88
Technology	Expression	Capacity to employ multimedia and multimodal tools.	73
Interaction processes	Analysis	Capacity for comprehension and management of own emotions in terms of preferences and for cognitive purposes.	62

quantitative analysis correspond mainly to the Aesthetics dimension. Of special interest in this analytical block are sections that, despite being extremely important for Media Education, are barely present in the ten bibliographic resources. We refer here to student capacity for responsible reflection on their own online/offline identity and that of others, ethics when downloading products from the web or the ability to manage the concept of authorship to use resources such as «creative commons».

Of the ten bibliographic resources analysed, the works that offer greater uniform coverage of all the dimensions are those by Buckingham, «Education in media» (2005), and Ferrés, «Televisión y educación» (1998).

By way of classification, the following information is important for each of the magnitudes:

- The Languages dimension is most present in the bibliography by Ferrés (2000).
- The Technology dimension, in Ferrés (1998), Cabero (2007) and De-Pablos (2009).
- The Interaction Processes dimension, in Ferrés (2000).
- The Production and Diffusion Processes dimension, in Buckingham (2002).
- The Ideology and Values dimension, in Cabero (2007) and Ferrés (1998).
- And lastly, the Aesthetics dimension, albeit tentatively, is most prominent in work by Buckingham (2005).

4. Discussion and conclusions

From the results gathered in this research certain inferences can be made that call into question the quality of media literacy offered in university classrooms.

Although it is apparent from studying the textbooks that all the dimensions comprising the concept of media education are present, greater attention is paid to the Technology and Ideology and Values indicators while detracting from others such as Aesthetics. This dimension is somewhat cast aside, barely considered and even appears unfamiliar when being implanted in teaching guides.

This discussion section emphasizes the importance of some of the responses provided by teachers of subjects directly related to media education, in particular, their opinion about what two dimensions are given the most weight in their respective teaching activities in the classroom:

1) «The Ideology and Values dimension is, I think, fundamental. Technology is a basic competence, which is needed more and more» (Interviewee 2).

2) «I think Ideology and Values is crucial, especially for critical thinking. Once we have critically interpreted, we have learnt to read the media in a varying discerning manner. The second is languages» (Interviewee 3).

3) «I consider Technology extremely important as we need to stay very up-to-date with the new media emerging every day. The production process also concerns me quite a lot as nowadays it is hard to find products customized for teachers in the market» (Interviewee 4).

4) «Personally what most interests me in the classroom are the first and the last: Languages and Ideology and Values. That is, understanding the language and how we can encourage the competences of active, participative critical interpretation of messages» (Interviewee 6).

5) «I would highlight Technology, for example, and Languages» (Interviewee 8).

6) «Without a doubt Ideology and Values and then I would put Diffusion Processes on the same level» (Interviewee 10).

7) «I try to work on The two dimensions I have selected, receipt and production, through dialogue. All the dimensions are important, but those concerned with creating and direct production, as well as technology, always end up as pending issues and that will hopefully be worked on in other subjects in the future» (Interviewee 19).

8) «I work on processes of receipt and interaction and ideology and values by analysing the media from a psychological perspective (the child as spectator, the values the media convey...» (Interviewee 22).

9) «I think production is important as they need to be helped in doing, and the other one, ideology, because they have to be trained and not everything is acceptable» (Interviewee 30).

There is widespread agreement concerning the idea that the Ideology and Values dimension is one of the most important when teaching media education. Even though most of the teachers interviewed found it difficult to extract two dimensions from the six proposed many gave priority to the need to prosecute messages, detect ideologies and values, expose stereotypes and perform an active and participative interpretation.

On the other hand, there is no common denominator in terms of the indicator to which they devote the least time in their teaching. For either technology, languages, aesthetics, interaction processes and even diffusion processes, responses were marked randomly in the interviews analysed.

One common trait many cite, however, when

considering that not all the dimensions are dealt with in their respective subjects is lack of time.

The testimony from Interviewee 8 is interesting with regards to the aesthetics dimension: «what draws my attention is the aesthetics dimension, as I wasn't aware of it, and I think this could be introduced or inserted as a set or a sub-dimension in design areas or production» (Interviewee 8).

Associated with this indicator, there is significant and varied research in recent years that examines in-depth neuroscience. In media education curriculum this branch focuses on the interaction between rationality and emotiveness, in other words, between thoughts and feelings, on the need to bring out the unconscious as the most significant part of emotional activity (Ferrés & al., 2013).

The aim is to empower the citizen so that he/she becomes aware of his/her emotions deriving from images and be able to construct personal critical reflection, converting this capacity for analysis, this pleasure in aesthetics into a new source of satisfaction.

One of the main reasons why there is an apparent lack of teaching in the aesthetics competence is due to prioritizing reason over emotions, relegating the latter to a less academic and more personal aspect. Thus, according to the study by Ferrés, Masanet and Marta (2013) there is a mere 20% of scientific articles on communication that include a reference to the emotive semantic field while these terms are also employed with little depth and with minimum references.

«There is a tendency to complain about the supposed exorbitant fascination young people feel for screens and the apparent disproportionate influence they exert over them and, in return, the lack of interest they demonstrate in learning. Yet nobody alerts them to the fact that by excluding emotions from their teaching approaches as an object of study, they are hindering young people's understanding of the mental mechanisms that are activated in interaction experiences with screens, and that, by sidelining emotions in their teaching praxis as a motivational stimulus, they are in fact contributing to reinforcing the impotence of reason» (Ferrés, Masanet & Marta, 141-142). In this regard, there are examples that further examine this interesting issue through the in-depth interviews carried out in the study: «Do you consider the subject of emotions and the unconscious in media experien-

ces? If so, which perspective do you work on?»:

Without seeking to offer representative or transferable data, some of the responses were affirmative:

1) «The cultivating of emotional intelligence, emotional thinking, the relationship of students with the world through knowing how to understand others' emotions and their own, is held in increasingly higher regard, increasingly more prestige and in greater consideration when educating our students» (Interviewee 6).

2) «Also, emotions are very present, for example when we analyse cinematographic genres, horror or comedy strategies... from discussion of cases and also through re-montages, such as a Mary Poppins horror

The aim is to empower the citizen so that he/she becomes aware of his/her emotions deriving from images and be able to construct personal critical reflection, converting this capacity for analysis, this pleasure in aesthetics into a new source of satisfaction.

film, how discourse is reconstructed with original material...» (Interviewee 8).

3) «I think the study of receipt includes, by definition, aspects related to pleasure and emotions, an aspect that is the very essence of the relationship young people have with cultural resources» (Interviewee 19).

Others are more negative:

4) «Not consciously, no, but when discussing in each of the working processes there is a direct relationship with this area, I think» (Interviewee 20).

5) «Actually no. What you are suggesting is interesting but it is not something that's in the programme. It's not considered. Also there isn't time for everything but it is interesting» (Interviewee 27).

Emotions are aspects the interviewees took very much into account in the receipt of media messages: the ability to be sensitive to messages in order to be able to receive them better.

Incorporating other dimensions of media education and their link to competences acquired by the Spanish citizen (Ferrés, Aguaded & García-Matilla, 2011; Masanet, Contreras & Ferrés, 2013) it is interesting to note that the fifth dimension Ideology and

Values is one of the most highly referenced in the semantic study. A concordance is therefore inferred between the academic guidelines, the teacher's interest and the subject matter of the most used textbooks in ME.

There is a general conviction among experts that one of the fundamental components of media literacy is the critical sense (Pérez-Tornero & Sanagustín, 2011; Buckingham, 2007). Again, according to Ferrés, Masanet and Marta, «in 93.51% of the articles in *Comunicar* and in 85.05% of conference papers there are terms linked to the semantic field of critique» (2013: 139). There is no doubt that teacher training should be considered one of the challenges to be undertaken to ensure that citizens, and in particular children, adolescents and young people who are still in the teaching-learning process, receive correct literacy training in media from schools.

Proposals to improve this shortcoming must mandatorily include state institutions, which should first be given a picture of what is taught in classrooms nowadays as well as a real vision of media literacy recorded by citizens in recent works and as highlighted in this article.

Through an awareness of the failings and risks brought about by media illiteracy it falls to the teaching community to demand teacher training proposals and the inclusion of teaching material that they work on in the classroom in ME, rather than relegating them to transversality, which is what has been occurring in recent years in primary and secondary schooling.

Lastly, although this publication's perception focuses on the area of teaching, it is important to recognize that this immense responsibility should be extended to other social agents or institutions (Pérez-Tornero, 2009). The overriding debate about media literacy establishes that the family, the communication media themselves, schools and governments are competent in the task of empowering citizens. In short, children in the digital age must remain informed and trained in how to use it and teachers and the family should remain alert to this sensitive population. Thus, as they grow up they acquire the need to be competent and responsible and at university level this acquisition can be seen to come from below, from primary and secondary education backed consistently by families and the home environment.

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