Las posibilidades educativas de la curación de contenidos: una revisión de literatura

Educational possibilities of content curation: A literature review

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Palabras clave
Alfabetización digital, alfabetización informacional, curación de contenidos, educación superior

RESUMEN

El objetivo de este trabajo es analizar la implementación de experiencias de curación de contenidos en la práctica educativa, partiendo de la premisa de que esta actividad no se reduce a la gestión de información, sino que incide en el aprendizaje y la capacidad de los individuos para desenvolverse de manera óptima en el ámbito de los medios digitales modernos. La metodología utilizada es la revisión sistemática de literatura. Mediante una búsqueda acotada al período 2011-2016, se localizaron 19 estudios empíricos, en los que se identificaron objetivos, herramientas tecnológicas y principales resultados obtenidos. Se valoró el nivel de análisis de tres aspectos: el aprendizaje colaborativo, la gestión de información y la formación para los medios digitales, identificándose este último como el menos atendido. La discusión conceptual se integra con las evidencias de las experiencias revisadas a manera de marco referencial de las posibilidades educativas de la curación de contenidos. La revisión pone de manifiesto el gran potencial educativo de la curación de contenidos, lo que alienta a seguir explorándola desde diferentes miradas y contextos.

Keywords
Digital literacy, information literacy, content curation, higher education

ABSTRACT

The objective of this work is to analyze the implementation of content curation experiences in educational practice. The point of departure is the premise that this activity is not reduced to the information management, but that it affects the capacity of individuals to perform optimally in the environment of modern digital media. The methodology applied is the systematic literature review. Through a search limited to the period 2011-2016, 19 empirical studies were found. The objectives, technological tools and main results of these studies were identified. The level of analysis of the following three aspects was evaluated: collaborative learning, information management and training for digital media. The latter was less relevant. The conceptual discussion was integrated with the evidence of the experiences reviewed as a reference framework of the educational possibilities of content curation. The review shows great educational potential of content curation and encourages continued exploration from different contexts.

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INTRODUCTION

The field of Internet has become linked gradually to the different spheres of people's lives. Through this network people interact socially, acquire products or services, access news, and learn. Thanks to the Internet, information is available to all and is accessible from any part of the world for the benefit of society as a whole. However, the superabundance of information received by those who are permanently connected may lead to a problem that Cornellá (2008) qualifies as *infotoxicity*. This problem arises when the amount of information received exceeds the individual's capacity to process it all, which generates anxiety and confusion. Reducing the *informational noise* is barely one of the skills the interconnected society requires.

Increasingly open practices to share information have multiplied the amount of online publications as well as diversified formats. Hence, we can find magazines, blogs, microblogs, videos or images with a form that is not necessarily an indicator of greater or lesser quality. Along these lines, another essential skill to optimize the use of networks is to be able to localize and recognize, among all that existing, the best and most relevant information, have quick access to it and privilege quality over quantity.

Taking into consideration that "*learning to learn* continues being for the student the best guarantee in pursuing his educational jouney in formal and informal structures" (Bindé, 2005, p. 80), competencies to learn collaboratively, to manage information and to be able to function optimally in digital means are essential. Content curation has been introduced gradually in education to promote the competencies aforementioned. The concept of content curation was drawn from the field of marketing and social media that proposes an optimal management of the Internet resources through a process that implies seeking, filtrating, analyzing, editing and diffusing information.

This paper aims at offering a panorama of the research on the topic of contents curation in the educational practice, and evaluating those contributions in relation with the potentialities devised by the experts in this activity as a strategy to learn collaboratively, the management of information and training to function optimally in modern digital means settings.

THE CONTENTS CURATION PROCESS

The concept of *content curation* is attributed to Bhargava (2009), who suggested that the demand from Internet users to have access to quality contents cannot be met by search engines given the exponential growth of the information contained on the Web. When making a request to a search engine, the latter returns hundreds or thousands of results that are materially impossible to review; human intervention is necessary to determine which result is the best or the most relevant. Hence, this task is

carried out by people whom Bhargava (2009) called contents curators whose task is to find, organize and share in an ongoing manner contents of interest on a specific topic. Their work is not to generate new contents but rather to sort through and give a sense to contents that have been created by others. This idea was developed initially in marketing and *social media* settings since marketers started this practice of retrieving publications considered interesting for the target public. This process has a golden rule which is to give credit to the author; hence, it is critically important to cite the original sources.

Reig (2010a) took up the concept of contents curator and developed a Spanish definition: "A *content curator*, a critical intermediary of knowledge, is someone who seeks, groups and shares in an ongoing manner (lets recall the *real-time web* we live in) what is more relevant (separate the chaff from the wheat) in his field of specialization" (§ 18). As of these concepts, the content curation has transcended the marketing setting and has permeated other concepts such a journalism and education.

According to Posada (2013), the content curation "is the interactive act of researching, finding, filtrating, organizing, grouping, integrating, editing and sharing the best and the most relevant content of a specific topic in a meaningful online digital collection that could be important for a group of people whose learning of a topic can be updated" (p.3). The term establishes a parallel with the activities of the art curator who applies his knowledge, experience and professional criteria to select, preserve, organize and exhibit artworks collections (Posada, 2013). A museum exhibition underlies stories told by the art curators through the organization of artworks and the narratives told through these objects. Likewise, the curator of digital contents, when generating a new product, groups together and re-interprets multimedia texts; i.e., from this standpoint, in contrast with Bhargava's (2009) concept, the content curator is also creative.

The process of curating contents is not unique; models have been proposed from different perspectives; for example, Bhargava (2011) proposes five modalities to curate contents: aggregation which implies collecting in one site only the most relevant aspects of a topic; distillation that consists in extracting the main idea of a content and share it; elevation, one of the most difficult forms as it generates tendencies with messages that are shared; mashup, a term used in the musical production and refers to the fusion of two pieces in one, i.e. it consists in generating a publication from other sources and the timeframe in which the information is gathered and organized based on time.

On the other hand, Leiva-Aguilera and Guallar (2013, 2014) suggest a curation process they call the 4S's of Content Curation that refers to the initials of the words: *search*, i.e. locate the contents in different sources of information; *select*, that implies filtering and organizing the most relevant

contents in line with the interest of the target public; *sense making*, that implies preparing the information in order to adapt its content, form and style; and *share*, which is to publish and diffuse the contents through different means.

From an educational standpoint, there are proposals such as Deschaine and Sharma's (2015) 5 Cs of digital curation that describes a five-phase process: *collection, i.e.* to preserve, revise, collect; *categorization, i.e. to* purchase, generalize, classify; *critiquing, i.e.* criticize, assess, discriminate; *conceptualization, i.e.*, to conceptualize, reorganize, re-signify; and *circulation, i.e.*, circulate, exhibit, render accessible. This proposal is addressed to teachers who wish to curate resources in order to work with their students.

On the other hand, Wolff and Mulholand (2013) proposed a digital curation learning cycle, shown in Figure 1, which consists of seven interactive phases: *research*, that defines the goals and tasks; *content selection and collection*, that filtrates the contents and keep the best; *interpretation of individual content*, i.e. write notes on the specific content and highlight the key ideas; *interpretation between contents*, i.e. write notes on the task and identify the most relevant relations between the contents and individual notes; *organization*, i.e. the contents are organized in a coherent manner based on an underlying story while considering the learning objectives; *narration*, i.e. the story or report presented to the audience through the selected media; *research/re-curation*, i.e. the audience participates in the process of construction of the narration through feedback. This leads the author to reflect and, if necessary, re-curate the contents to obtain a better product.

Figure 1. Digital Curation Learning Cycle.
Source: Wolff and Mulholland (2013).

One of the characteristics of the models aforementioned is that they are not subject to any specific technological tool. Actually, the task of curating contents can be carried out with one or several tools provided they suffice

to develop all the phases of the process. Antonio, Martin and Stagg (2012) propose classifying these tools according to the primary activity for which they were created. As shown in Figure 2, Scoop.it is considered a tool exclusively designed to curate contents, while others are situated in the categories of blogs or microblogs, social markers or sites to share images and videos. The tools contents curators use the most are: Storify, Paper.li, Scoop.it, Pinterest, Pearltrees, Feedly, Flipboard, Evernote and Symbaloo.

Figure 2. Contents Curation Tools.
Source: Antonio, Martin & Stagg (2012).

THE POTENTIAL OF CONTENTS CURATION IN EDUCATION

Weller (2011) has made an interesting remark on the changes education requires shifting from a situation of scarcity to one of abundance. A situation of scarcity is, for example, having few experts available on a specific topic, which can be solved by inviting one of them to a conference at the university, or, having these experts write a book in collaboration. Both are solutions based on the economy of scarcity. However, at present there is abundance; it is now possible to see conferences given by experts – inclusive in real time – from any part of the world through Internet. It is possible to interact directly with them in networks such as Twitter or ResearchGate and have access to a great variety of publications such as journals, blogs, videos or podcasts. The question posed by the author is to know if we have developed teaching-learning methods appropriate to attain the so-called pedagogy of abundance.

Abundance implies a free, abundant and varied content. In regard to abundance, sustained by social interaction, sharing is simple; connections are *light*, they can be sustained without the need of a one-to-one ongoing interaction; the organization is cheap and groups of shared interest can easy be formed. Moreover, since Internet is free and unpredictable, it possesses *a* generative capacity, i.e. it is an environment favorable to creation and innovation (Weller, 2011). These characteristics and others in

which the maturity of technologies and social systems come together, make up what Reig (2010b) calls an ecosystem similar to knowledge, where the information conditions and social participation are favorable "for knowledge to flow and reproduce, in order for it to become an increasingly abundant and essential element" (p.98).

According to Cabrero (2001), the network user must possess critical judgment, otherwise, having access to the Network without the capacity to assess and discriminate information may lead "to a cultural colonization and subservience to specific cultural clubs" (p.68). Moreover, it is desirable that said network user be creative, collaborative and shows ethical behavior. In reference to the use of information and communication technologies (ICTs) in general, Crovi (2008) points out: "The challenge is to achieve that ICTs users do not remain mere technology and content consumers but become creators and innovators by using their personal technological skills" (p.77).

Rheingold (2012) claims that the power of networks will become so only when it will allow new skills to unfold in said networks. These skills are not limited to knowing how a search engine or a social bookmarking manager functions, or create a blog, edit and publish a video or how social network platforms operate. It is also necessary to develop social skills on the network to know how to behave in an online community, how to generate and cultivate a personal learning network or how to share contents with third parties in an ethical manner.

The development of technical and social skills that allow the optimal use of Internet resources, must be assumed by higher education as a fundamental task, not only so the students may navigate in this new social and cultural configuration adequately but rather for them to become cofactors of the knowledge society. In this environment of collaboration and collective construction of learning, Reig (2010b) suggests that participation be brought to a higher level.

> We are evolving from the perspective of "I think, therefore I am" to the drifting of social constructivism, connectivism itself and the conception of Web 2.0, "I participate, therefore I am". I exist, I would add, as active "Prosumer", as producer of knowledge where I am the true lead actor. I participate and I am the origin and the recipient of information, of knowledge. I participate, therefore I am in a new conversation as globalized and as diverse as I wish (pp 102-103).

In view of this new learning scenario, Good (2015) sets out the key reasons for which the curation of contents is revolutionizing education and learning:

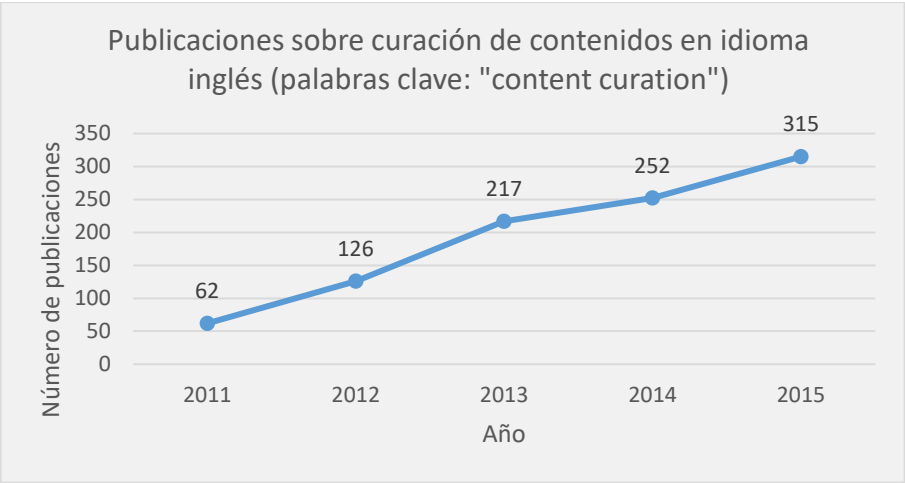
1. *Curation is the new learning banner*, hoisted by those, tired of the traditional approach based on memorization, to promote a new education centered on the students (§ 7).
2. *Curation is a new way to seek*, when one wishes to learn, one does not seek a name, a site or the image of someone (§ 9) [in this sense, the curation of contents generates better knowledge than search engine].

3. *Curation is the new Google [...]*, in fact, it is a new method to identify, create and sound out learning paths by gathering the best between the enormous amount of educational resources available on the Net (§ 10).
4. *Curation is the best way to identify*, facilitating finding new tools and resources on a specific topic (§ 12) [the person chooses among the alternatives and not the search engine].
5. Curation is the new approach in personalized textbook construction, that gather the best contents for any subject (§ 13).
6. *Curation helps generate reliable open educational resources (OERs) guidelines*, since it is the mean through which valuable OERs can be located, assessed, organized and diffused in benefit of many users (§ 14).
7. *Curation is the path the empowers collective intelligence at planetary level*, beyond the field of mere scientific research *[...]*, increasing the possibilities to learn, discover and extend the comprehension of the world that surrounds us (§ 15).
8. *Curation is the spark that frees human beings of the idea that all the information is and must be found through Google* (§ 16).
9. *Curation is the revitalized path for fortuitous findings*. By joining relevant elements of information or elements that share features and patterns on the topic being researched, the curator provides opportunities to explore and discover (§ 17).
10. *Curation redefines the truth as a relative factor*. It proclaims the gradual acceptance of a subjective, dynamic and interchangeable reality in opposition to the dogma of the only truth (§ 18). [The curator's subjectivity lies in him determining the value to be curated; however, there is no implicit ultimate truth.

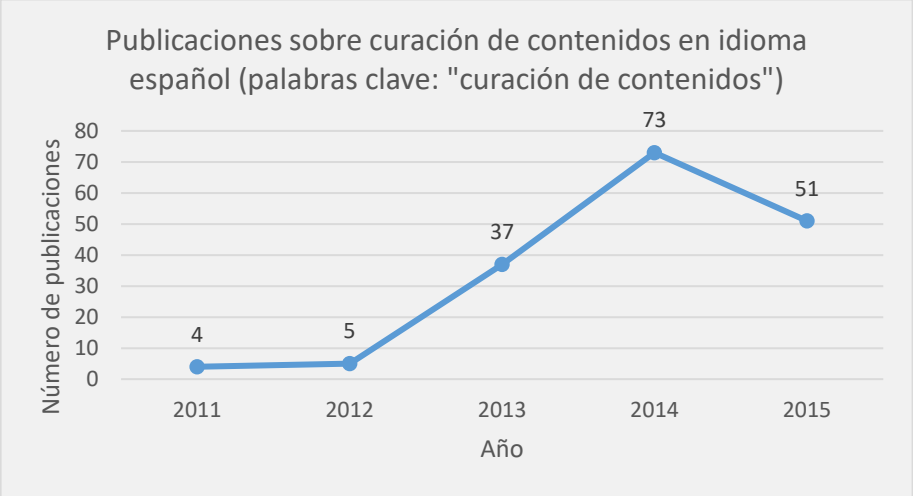
In line with this logic, the potential value of the curation of contents in education is immense. The main interest in this paper is to know how the curation of contents tackles education; to do so, we looked into literature.

METHODOLOGY

In order to have access to the literature related to the curation of contents, we did two searches through Google Academic. In the first search, we requested results in English exclusively entering *content curation* as key words; the second search was made exclusively in Spanish with the words "*curación de contenidos*". In both cases, we narrowed our search from 2011 to 2016, disregarding patents and quotes. We used Google Academic instead of a specialized database because we decided to make and exhaustive and open search. We obtained a total of 1,190 results for our search in English and 232 for Spanish. Graph 1 and Graph 2 show the tendency of the publications between 2011 and 2015 for English language and for Spanish in, that sequence.



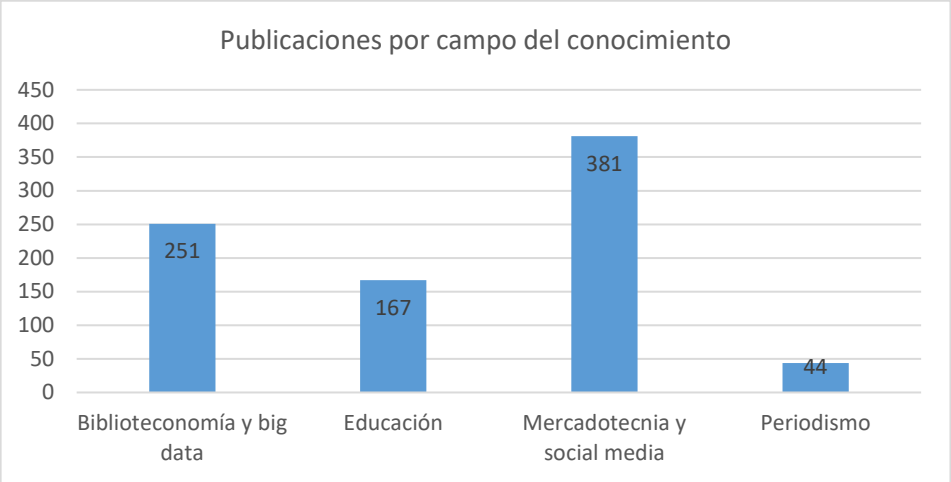
Graph 1. Postings on content curation in English between 2011 and 2015.
Source: Results obtained from Google Academic search engine for content curation on September 22, 2016.



Graph 2. Postings on *curación de contenidos* in Spanish between 2011 and 2015.
Source: Results obtained from Google Academic search engine for *curación de contenidos* on September 22, 2016.

The analysis of the documents found was made in three steps. First, we reviewed 1,442 results – the two languages jointly –; abstracts and key words available were found in the documents to determine the areas of knowledge of the postings. In this process we discarded books, slide presentations, curricular designs, course materials, among others. By eliminating also repeated entrances, 843 postings remained, distributed into four categories, as show in Graph 3, according to the field of main knowledge.

- Library Management and big data: from the library management, content curation is seen as a service activity to select, organize and make the information available to a community. This category also includes postings related to the concept of big data which refers to the management and organization of big databases or repositories in which the curation procedures, supported by a specialized technology such as the data mine, allows the sorting of useful information.
- Education: postings related directly with the teaching and learning processes at all levels and modalities.
- Marketing and social media: those referring to marketing strategies and network interactions, but also studies related to social media phenomena from the standpoint of sociology and psychology, among others.
- Journalism: postings in which content curation is applied to the field of journalism and information agencies.



Graph 3. Number of postings on "*curación de contenido*" per field of knowledge.

The following phase of the analysis focuses on the 167 postings linked to education. The objective was to identify the types of documents and locate empirical studies that report educational experiences applying content curation. In total, we located nine limited access articles in the Emerald, Wiley Online Library, IEEE Xplore and LearnTechLib databases for their in-depth analysis. As a result of this process, we identified five types of documents: 120 articles, 14 book chapters, 23 congress communications, eight master's theses and two doctorate theses. In 85 of these articles, the topic of content curation is marginal, i.e., it is mentioned but it is not addressed. In twelve articles, the topic is addressed but the study reported does not refer to content curation. On the other hand, ten of the documents deal with the development of tools or modules for technical educational platforms. Lastly, in forty-one postings, the main topic is content curation, however, these are not empirical studies; only nineteen are empirical

studies on experiences with content curation. This is where the last step of our research lies.

RESULTS

From the 19 empirical studies found, ten are articles and 9 congress communications. All the publications corresponded to the higher education level. In the following table, we summarize the information on the objectives, the tools used and the results reported in each case.

Table. Empirical studies on content curation found in the literature

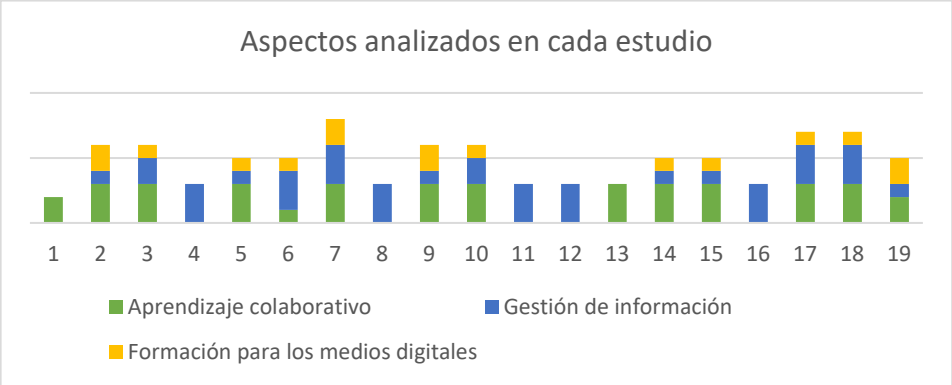
Study	Objectives	Tools	Main Results
1. Ackerman (2014)	Create lesson plans that will include challenges and a multimedia material container in one of the content curation platform chosen by the student	Scoop.it, Symbaloo, Edmodo, Powtoon, Pixton, Quia, Twitter and others	Identify opportunities to improve the experience: give more examples, use caption to select contents, improve motivation and work in teams
2. Albion (2014)	Encourage students to access resources to support learning and establish professional learning, beyond the course	Scoop.it, Pinterest, Facebook, Weebly, Wix	Students' insight on the positivity of the tasks. Students are benefited by feedback. We haven't observed any daily habit of curating contents yet. Adjustments are required to form more solid networks
3. Antonio and Tuffley (2014)	Explore the potential of Scoop.it, the content curation tool	Scoop.it	Scoop.it is an efficient platform to interchange information and share resources and ideas. Its potential as socializing tool is less evident.
4. Antonio and Tuffley (2015)	Cultivate the development of information competence	Scoop.it	The students' insight was positive in regard to the development of critical thinking, capacity to evaluate, synthesize, analyze in-depth contents and quote their sources. They showed more confidence in using Internet contents.
5. Haley-Mize (2014)	Evaluate a participative learning experience that includes a practice of content curation	Storify	The strategy was considered an efficient disruptive method since the student constructed his knowledge through a self-directed creative process
6. Harwood (2014)	Support the learning of the English language with academic purposes	SymbalooEDU	The use of the software was beneficial for learning and for information competence; however, we acknowledged a need for a stronger structure from the instructors

7. Hergueta Covacho (2014)	Encourage students to learn how to manage their personal learning and be interacting producers	Scoop.it	Skills were developed for the selection, analysis and comprehension of contents, the classification of concepts, the exploration of cyberspace and critical thinking and reflection
8. Marín, Moreno and Negre (2012)	Improve information management in higher education	Scoop.it	The experience was valued positively in regard to the collaborative work and digital information management.
9. McFall (2013)	Foster active learning and encourage a sense of community among new students	Twitter and Paper.li	The experiences were positive and the value to link personal experiences with current events and the topic addressed in class was acknowledged
10. Negre y Marín (2014)	Combine pedagogical and technological elements to promote learning and collaboration	Scoop.it	The collaborative work and the information management based on content curation was effective and was valued and the students and the teachers.
11. Negre, Marín & Pérez (2013)	Design and evaluate strategies to manage information	Mendeley	The experienced was valued positively and the teachers' information competence shows progress
12. Negre, Marín & Pérez (2014)	Develop information competence	Mendeley	The didactic strategy implemented was efficient for the development of information competence
13. Ostashewski, Brennan and Martin (2014)	Provide a roadmap to guide the students in participating actively *in b-learning* course	Blackboard	The content curation activities supported the preparation of the students for class discussion and fostered critical analysis
14. Pérez, González and Morales (2013)	Create a personalized social and interactive learning environment based on content curation	Scliped	The boards were well accepted by the students given their easy use and access to the best resources on the world physiology
15. Romero (2016)	Know if content curation is the adequate didactic strategy to be used in a university setting	Google (alerts), Pinterest, Twitter, Scoop.it, Facebook, Feddly and others	The students and the teachers valued positively content curation as a general didactic strategy to acquire digital competencies
16. Verhaart (2012)	Test a teaching-learning environment based on Wiki technology for content curation	WikiMe	It was concluded that the WikiMe platform meets the learning requirements and is adequate for curating contents

17. Vivas, Andrés y Gómez (2016)	Value the potential of content curation as a didactic strategy in an engineering course	Moodle	A learning practice community was formed. The tools contributed to the development of two areas of the digital competence: communication and content creation
18. Whyte (2014)	Test if techno-pedagogical skills are achieved and if collaborative learning practices are adopted	Scoop.it, Twitter, Skype, Facebook, Google Sites	We observed progress in techno-pedagogical competencies, collaboration and attitudes before the use of ICTs by the professors being trained
19. Wilkes & Hodson (2013)	Inquire if students, through content curation, can identify dominant tendencies or discourses of social networks	Twitter, Reddit, Digg, Technorati	The experience showed that the students developed the skills to distinguish tendencies and their origin as well as recognize the types of contents preferred by a specific sector of the community

Source: Developed by the author.

In each one of the 19 studies, we evaluated the level of analysis of three aspects that we assume may benefit from the incorporation of the content curation, that is: collaborative learning, information management and training in digital means. To do so, we took into consideration the application or non-application of specific instruments for the evaluation, the standpoints from which the analysis was conducted and the importance granted to each aspect when reporting the results of the study. Then we assigned labels: absent, superficial, medium and deep, and we numbered them in the following sequence: 0, 1, 2 and 3. These values are shown in Graph 4 and represent the interest of the three topics considered in each study respectively. From a global point of view, collaborative learning and the management of digital information have been addressed with the same level of depth, while the training in digital means has been less considered in this research. The approximate ratio is 42, 41 and 17% respectively. Next, we present some specific observations for each topic.



Graph 4. The depth of the topic analysis for each study.

Collaborative Learning

Given the nature of the content curation, learning fostered by the didactic experiences based on this activity are of the collaborative type. Therefore, we can identify collaborative learning in personal networks made up of teachers and students (Albion, 2014; Antonio & Tuffley, 2014; Hergueta, 2014), that give evidence of the benefits of feedback, more specifically when this interaction includes experts. This collaborative environment "allows students and the community as a whole to converse, share knowledge and help each other mutually to achieve a better comprehension of the topic discussed through comments, and share information and resources" (Antonio & Tuffley, 2014, p. 186). According to (Negre, Marín and Pérez, 2014; Ostashewski, Brennan & Martin, 2014; Verhaart, 2012), limiting the experience aforementioned to the members of a group that study the same subject, share a context and have a similar level of knowledge, is acceptable as the first approach of content curation, since its implies putting aside diversity, an important element of collaborative learning.

According to the logic of the pedagogy of abundance, students should ideally be encouraged to get close to experts in the real world, raise their concerns and question their responses. Another important point is that the possibilities of integration of content curation to another type of learning experiences are extensive; for example, Hergueta's (2014) study which purpose is to construct the curriculum of a subject with the participation of the professors and the students of the master's degree. In this case, we obtained global results for the three practices: content curation, creation of a reflexive digital narration and the elaboration of a content guideline. We used Scoop.it for the content curation and during the course we used a virtual classroom, chat, Facebook and Twitter. For the author, this combination of practices and use of media is "a first approach to the creation of an educo-communicative inter-methodological relational model for horizontal, decentralized and multidirectional education that can be implemented in the 21st century" (p. 35).

Online Information Management

It is clear that most studies on content curation focus on the topic of the management of digital information. The results reported are clearly positive (Antonio & Tuffley, 2015; Marín, Moreno and Negre, 2012; Negre, Marín and Pérez, 2013, 2014; Vivas and Gómez, 2016) which confirms that curating contents implies giving sense to data and develops the capacity to discern the quality and reliability of the information, sort it and grant it value through personal comments or develop new contents as well as share and interchange standpoints with other network users. The purpose of this practice is that it becomes usual and permanent, regardless of the tool used to perform it.

Marín *et al*. (2012) report that information management based on content curation with Scoop.it, was efficient and that students and professors evaluated it positively. This was the first of the three consecutive experiences that allowed configuring and improving a content curation model consisting of six phases: conceptualization that establishes the topic and objectives of content curation; creation and reception that configure the space of the curation and determine the search and sorting systems; valuation and selection that apply criteria of information discrimination; conversion, preservation and storage, that store data duly labeled to be subsequently accessed, used and re-used, which implies sharing the information through different media; and the transformation of a new product in which the curator adds a value to the information by developing new products. The tool used for Negre *et al*. (2013, 2014)'s studies was Mendeley Reference Manager which indicates that this activity does not necessarily need using a specialized tool for content curation.

Training for Digital Media

The last field of analysis was the training actions to develop the ability of the students to function adequately in digital media. Vivas and Gómez (2016) report that content curation contributed to the development of contents communication and creation, which implies to equip the students with some of the necessary skills to assume the role of prosumer as described by Reig (2010b). Therefore, by being able to identify the tendencies and interpret the phenomena in the setting of social networks through content curation, the students acquire a power of decision based in personal criteria (Wilkes & Hodson, 2013). On the other hand, McFall (2013) is interested in fostering a sense of community to content curation activities. This sense of community begins with the school group and later it transcends to other groups with similar interests in the virtual context. To function optimally in the setting of modern digital media entails participating in said media in a respectful and productive manner. The first step towards that figure of a citizen of critical judgment of the virtual setting is that the student changes his dynamics of copying and pasting to one of analysis and sharing, or, even better, to participate in the collective construction of knowledge. Establishing links and networks is important in any setting, whether in person or virtually, in such a way that the strategies to constitute personal learning networks must also be addressed in the training for digital media.

CONCLUSIONS

Notwithstanding the fact that the experiences documented in the 19 studies revised are valuable and the results reported are encouraging, we could consider them scarce; hence, it is evident that we are at an early stage of exploration of the potential of content curation in education, more specifically in Latin America, where only few publications have addressed the topic of content curation in the education setting (Blanco, 2014;

González and Bermeo, 2013) and there is a lack of documented implementation experiences.

The studies revised allowed us to see that the potential of content curation in education is real; however, it is necessary to continue exploring them from different perspectives. Generally speaking, there is a lack of studies that go beyond the students and professors' perception. Two challenges stand out among those posed in this field of research; the first is to develop instruments that allow contrasting the perceptions aforementioned, and the second, is to follow up on students to corroborate that they adopt the practices promoted in the course by incorporating them in their daily tasks so they may transcend the school environment. In Negre *et al*. (2014) study, 25% of the students said they would not continue using the Mendeley tool in the academic or the professional environments; 65% said they would make use of it only in the academic setting, i.e., for other subjects or their thesis. In this last case, the question refers to the specific tool and it is raised in terms of intent of use, but it would be interesting to inquire on the practice of content curation in subsequent courses and see if the students incorporate this practice into their daily life.

On the other hand, the training provided in order for the students to achieve functioning optimally in digital media through content curation has been scarcely studied. Notwithstanding, that it is a task that can be addressed through different strategies; content curation offers, in a natural way, the opportunity to promote skills to establish networks and personal learning environments to develop a personal and professional brand so the student becomes a citizen who participates, that has critical judgment, is creative and ethical in the virtual environment.

Considering that one of the main purposes of content curation is to help form permanent apprentices, students require feeling motivated to make this activity become a habit. Some authors suggest that students will feel more motivated if teachers are actively involved in the students' activities (Harwood, 2014; Romero, 2016). Students are motivated if they write comments on their publications or diffuse them on their personal social networks since they perceive that their work has an impact on others and their standpoint on things may also be relevant to others. Moreover, let us not forget that the professor and his way of functioning in digital media is a reference model for the students. Along these lines, we must consider that current education demands that professors work collaboratively which can be done through joint projects such as the development of repositories of curated contents. This collaboration could extend to the students and establish with them interchanges of ideas and reflections on the process of curation which, in the process, would benefit the quality of contents and the construction of learning. To have the students participate in this type of projects implies an additional motivation in order for the students to assume the task with responsibility and interest. Notwithstanding that the adoption of the curation of contents in the educational practice has not spread as rapidly as expected and that the

research is still in the making, the enormous training possibilities of content curation encourage us to continue doing research from different viewpoints involving different sources of information. Without a doubt, there is still a long way to go which, as for any important transformation in education, will not be without difficulties and limitations.

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