

Introduction

Shared Science and Knowledge. Open Access, Technology and Education

Ciencia y saber compartidos. Acceso abierto, tecnologías y educación

Guest-edited special issue:

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During the development of the Society of Knowledge, at the height of the digital era, scientific knowledge and the innovation processes constitute the foundation for the people's progress. The elimination of any barriers to knowledge access has become a world-wide priority. Thus, the attainment of shared and open-access knowledge, as well as the promotion of the joint, collaborative and interdisciplinary construction of diverse communities, has become the foundational basis of the open knowledge movement (García-Peñalvo, García-de-Figuerola, & Merlo-Vega, 2010).

The philosophy of the open movement is mainly focused on the possibilities that it offers for the democratization of knowledge. Thus, approaches are set in place to bolster the sharing of knowledge through the production of materials, inducement of open practices, dissemination to expand knowledge and mobilization to have an impact on training environments, organizations and networks. The open education movement (Ramírez-Montoya, 2015) enable the teachers to innovate their teaching and research practices, to create shared-construction experimental laboratories, collaborative academic networks, multidisciplinary projects that transcend contexts and research with the sense of generating open knowledge. This movement is re-enforced by technological developments that offer new possibilities to educational processes that provide an added value to the academic community, institutions, organisms, associations and the public in general.

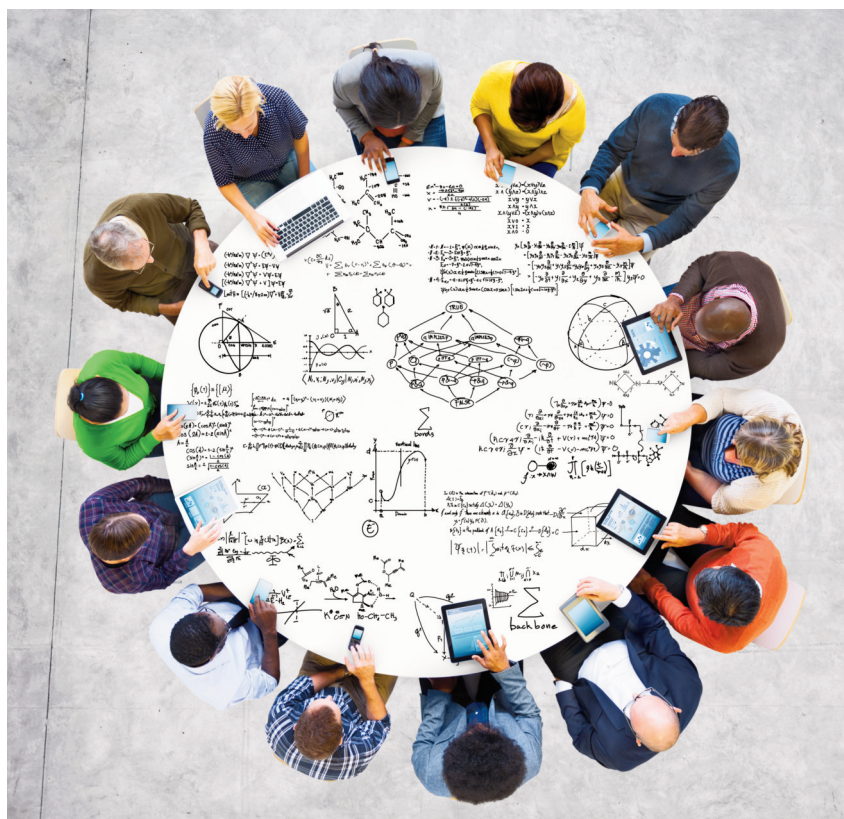
This monograph from the Comunicar Journal is entitled «Science and shared knowledge. Open access, technologies and education», and has as an objective to present studies, research and experiences that evidence the current state of how knowledge is being constructed, through the practices of open knowledge, underpinned (or not) by technology. From these practices, the most interesting ones are those that have a direct influence on academia in a broad sense, with focus on research (science), to innovation and open education. Within these three spheres, the focus will be placed on the most-emergent practices, as examples of what is currently the state of the art of the open knowledge movement.

The model of open education practices in the last five or six years is, without a doubt, the phenomenon of the massive open online courses (MOOC). The MOOCs are considered by many as authentic disruptive proposals in online learning, that enable the democratization of learning processes (García-Aretio, 2017), with the unfinished business of integrating, in a generalized manner, innovative didactic practices such as gamification (Borrás-Gené, Martínez-Nuñez, & Fidalgo-Blanco, 2016), the challenges (Observatory of Education Innovation at the Monterrey Institute of Technology and Higher Education, 2015), or learning mediated through the use of technologies such as virtual laboratories, remote laboratories, biometrics, augmented reality, among others.

Of course, the MOOCs are not the only models of open education. If the MOOC have brought the debate to

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the practices, the OER (Open Educational Resources), previously, had placed the focus on the re-utilization of the educational content in any educational process, independent of the modality (in-person, «eLearning», «b-Learning»), the device for access («mLearning», «e-Learning»), or the formal nature of the learning (formal, non-formal, informal). Likewise, the open practices (Sarango-Lapo, Mena, & Ramírez-Montoya, 2015) foment activities that are linked to the creation of networks, shared projects, open creation or research communities that free up knowledge, not only of the databases, but the production created through open science as well.



Open science is underpinned by both an editorial ecosystem and technological ecosystem. The editorial ecosystem brings with it what is named the golden road of open access, with journals and other types of open-access publications, after the payment (or not) of publication fees, and journals that have a hybrid format, meaning that they are not fully open-access, but allow the publishing of open-access articles after payment of a fee. The hybrid model has many detractors, as it could signify a publication barrier for authors and institutions that are not able to pay the fees imposed. However, on the other hand, it has become a way to break the subscription to scientific journals model, thereby promoting the necessary migration towards Open Access in a large scale (Schimmer, 2016), which is the objective of the Open Access 2020 initiative (<https://oa2020.org>). The technological ecosystem is the basis of the denominated green route to open access, which is comprised by all the components and services that allow for the diffusion of some version of the article («pre-print», «post-print», published version), as well as its complementary elements («datasets», videos, presentations, etc.). The main component of this technological ecosystem is the institutional repository (García-Holgado & García-Peñalvo, 2017), which facilitates the integral management of the life cycle of the open access scientific knowledge. An institutional repository (Ferrerías-Fernández & Merlo-Vega, 2015) is a database that is composed by a group of services that are destined for capturing, storing, organizing, preserving and redistributing of academic documentation in digital format, complying with high-quality criteria and offering adequate options for the dissemination of the content through internationally-known collectors. Besides the service of dissemination of the published articles, the institutional repositories offer a valid channel for the diffusion of the so-called grey scientific literature, especially doctoral theses (Ferrerías-Fernández, 2016).

In the open innovation section, in a more exhaustive manner, if at all possible, the collaboration characteristics for achieving the co-creation of knowledge, are highlighted. Crowd-science, citizen science or networked science are variants that have in common the participation of a wide group of people in open projects, with their results available without any types of restrictions (Franzoni & Sauermann, 2014). Within this context, it is worthwhile to specifically mention citizen laboratories (Gey, Meyer, & Thieme, 2013; Ricaurte & Brussa, 2017), as open spaces where people can be integrated into workgroups with the aim of solving challenges or problems, arriving at the development of prototypes.

In this context, the present monograph intends to open a space for reflection and debate within which the following (not closed) set of issues are raised:

The open education movement enables teachers to innovate their teaching and research practices: How does the open education movement bolster the practices of teaching-learning and research? What competencies should be developed? What challenges must be faced by movement for constructing shared knowledge?

The innovative strategies have gained a foothold not only in education, but in the areas of business, social and cultural learning. They have become a medium for the development of competencies and for motivating students. However, their inclusion in the MOOCs, as well as the measurement of the effectiveness, are still under development: How can we ensure that they generate social construction of knowledge? How can the impact on motivation be measured more rigorously? What mediating aspects, including the teacher's role are considered in a massive course?

The third mission of the university includes, besides the transfer of knowledge, social action. Many higher education institutions are seeking innovation spaces within which the co-creation of knowledge is its main «leitmotiv», as is the case of citizen laboratories: How is the interdisciplinary work coordinated for the collaborative construction of knowledge? How is knowledge being developed in citizen laboratories of innovation? Are expected results being obtained in terms of co-creation of knowledge and open innovation in open social laboratories initiatives?

The technological infrastructure utilized for the implementation of open-access repositories should be linked to scientometrics standards, and should incorporate the user's experience, as well as the smart management of the information that will allow for relying on indicators and metrics: How could cutting-edge disruptive technologies that could drive the functionalities offered by the technological ecosystems geared towards the preservation, publication and dissemination of the scientific activity of the institutions, be determined? What is the model of management of knowledge that can strengthen the implementation of initiatives and practices of open access within the institutions?

The 5 articles that comprise this monographic section of number 54 of the journal *Comunicar Journal* seek to answer these and other issues.

In first place, Ramírez-Montoya and García-Peñalvo in their article «Co-creation and open innovation: Systematic review of the literature» explore the relationships between open science, innovation and co-creation through a systematic review of the literature. 168 open-access articles published between 2014 and 2017 were studied, all of which were indexed in Web of Science and Scopus, finding that challenges appeared in the possibilities of innovation, openness and research, with the context and the collaboration practiced being the more substantial elements for innovation and open science.

Suárez-Perdomo, Byrne, and Rodrigo, in their article «Evaluation of the ethical quality and the content of online resources for parents», analyze the quality, both ethical and of the content, of the open online resources oriented towards the parents. The ethics criteria utilized are based on those of health on the Web, while the content criteria are based on the principles of positive parenting and the efficiency of the learning materials used. The most significant results highlighted show how the high-quality websites, as compared to those that were lower in quality, valued the equality of gender, the positive parental role, modeled a variety of parental practices, educational content with multimedia formats and provided experiences, academic and technical information. On the other hand, privacy, financial information and justifiability were characteristic of clusters of high and medium quality. The study illustrates some of the challenges of open knowledge, and defines areas of priority for quality improvement for web designers and for the professional workers who want to help those parents who want to develop skills for seeking trustworthy sources.

In the third article, «Participative design of citizen science experiments», Senabre, Ferran-Ferrer, and Perelló describe and analyze co-creation in the collaborative design of a citizen science project. Three groups of high

school students designed, with the support from a group of scientists, three experiments on human behavior and the social capital in public and urban spaces. The experience delves into how citizen science can achieve co-creation, beyond the mere collecting of data found in most of the social science research studies.

Soler-Adillon, Pavlovic and Freixa, in their article «Wikipedia at the University: changes in the perception of value with the creation of content», present a project in which the students are asked to edit or create Wikipedia posts to verify if the experience changes their evaluation of this open access resource. This experience is developed within a Spanish university, Pompeu Fabra University, and a Serbian university, the University of Niš. The results of the study show a significant change in the participant's perception as for the reliability and usefulness of Wikipedia, as well as the probability of finding false information within this resource. In contrast, a significant variation was not found on the study participant's opinion on the social prestige of Wikipedia.

In the last article of this monograph, entitled «Ecologies of ubiquitous learning for the critical-thinking cybercitizenry», Díez-Gutiérrez and Díaz-Nafría try to detect and analyze the ubiquitous learning that is acquired in expanded learning environments oriented towards the permanent training of teachers. Expanded environments are understood to be spaces that foment the creation of learning networks and communities thanks to the support of digital media that allow for the creation of ubiquitous learning ecologies, which can dilute the formal frontiers of the curriculum. More specifically, the study is focused on the so-called "soft" skills that are obtained for effectively managing oneself at work or in everyday life. The results obtained by these authors indicated that the skills related to the ability of autonomous work, the use of transforming media and resources, the enhancement of social cooperation, the resolution of cognitive and social challenges, the enhancement of civil compromise and functional learning, that creates expanded learning, can be converted in an instrument for the empowering of the people, the collectives and social movements.

These five articles of the monograph are contributions to the knowledge of open science, the editors are thankful to the authors and the academic and scientific community who submitted their contributions. Likewise, they are thankful for the institutional support provided to the editors (Tecnológico de Monterrey, University of Salamanca and Athabasca University), as well as the Comunicar Journal for the introduction of this subject, which is inspired towards the democratization of knowledge, co-creation, the generation of new shared, multidisciplinary and collaborative knowledge, which contributes to technology, education and the society that concern us all.

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