





The Wiki Learning Project: Wikipedia as an Open Learning Environment

El proyecto Wiki Learning: Wikipedia como entorno de aprendizaje abierto

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ABSTRACT

Traditional educational models limit learning possibilities to formal and closed environments. However, mobile technologies and digital platforms are changing this paradigm, expanding learning opportunities. Based on the principles of peer knowledge production, we argue that Wikipedia can be used as an open learning environment that serves several purposes: a) it allows the acquisition of basic skills; b) it contributes to collective intelligence; c) it shortens the global knowledge gap; and, d) it enables the creation of global learning networks. The aim of this study is to introduce the process, strategies, and results of the implementation of the Wiki Learning project at a Mexican university, as an open learning model for the use of Wikipedia as a learning tool. This project included a variety of activities, from article production to workshops by and for students and teachers; 115 students and 57 teachers were surveyed to identify their perception about Wikipedia, its use and potential as educational tool. The results showed that, although the majority are Wikipedia users, there is still a lack of knowledge about its functioning, structure and communities, and a negative perception of the Wikipedia. This poses a great challenge to overcome this stigma and recover the value of collective knowledge production, the purpose of the encyclopedia and its place as a relevant product of collective intelligence.

RESUMEN

Los enfoques predominantes en el sistema educativo tradicional circunscriben las posibilidades de aprendizaje a entornos formales y cerrados. Sin embargo, las tecnologías móviles y plataformas digitales están transformando este paradigma, expandiendo las posibilidades de aprendizaje. A partir de esta condición y en el marco de la producción del conocimiento entre pares, sostenemos que Wikipedia puede ser utilizada como un entorno de aprendizaje abierto que cumple varios propósitos: a) permite adquirir competencias básicas; b) contribuye a la inteligencia colectiva; c) acorta la brecha global de conocimiento; y, d) facilita la construcción de redes globales de aprendizaje. Este estudio de caso tiene como objetivo presentar el proceso, estrategias y resultados del proyecto Wiki Learning, como modelo de aprendizaje abierto a través del uso de Wikipedia en una universidad mexicana. El proyecto abarcó desde la producción de artículos hasta talleres para el desarrollo de capacidades de profesores y estudiantes. Se realizaron encuestas a 57 docentes y 115 alumnos para identificar la percepción acerca de Wikipedia, su uso y posibilidades como herramienta educativa. Los resultados demostraron que a pesar de que todos son usuarios de Wikipedia, existe un desconocimiento general sobre su funcionamiento, estructura y comunidades, además de cierta desconfianza. Se presenta un desafío para romper el estigma y recuperar el valor de la gestión compartida del conocimiento, el propósito de la enciclopedia y su lugar como producto de la inteligencia colectiva.

KEYWORDS | PALABRAS CLAVE

Internet, knowledge, Information, skill, university, students, teachers.

Internet, conocimiento, información, competencia, universidad, estudiantes, profesores.

1. Introduction and state of the art

We live in an age where the mechanisms for producing, circulating and consuming knowledge are being reconfigured, and this poses profound implications for learning. Castells (1996) states that we find ourselves within a new information paradigm which displaces the previous one based on energy production. Like never before in history, “with access to open educational resources and free or inexpensive communication platforms, groups of people can learn together outside as well as inside formal institutions” (Rheingold & al., 2013). The possibilities in so far as to the amount of access to information and the possibilities for interaction and participation offered through digital technologies go beyond the constraining limitations of mass media and traditional pedagogy (Buckingham, 2010). Under these circumstances, we need to rethink the goals and meaning of learning in formal educational environments in a way that institutions can respond adequately to social demands and global changes.

We face a complex challenge; on one hand, the transformation of the learning processes as a result of the accelerated technological development; on the other, the deficiencies of the formal educative system. Because of these, it is essential to insist in the necessary development of basic cognitive skills, but also, assign a prominent place for other competencies relating to the management of information, creativity and problem solving. Furthermore, students should develop ethical and civic competences during their academic formation so they can positively affect their communities.

Wikipedia is the largest resource of knowledge created through crowdsourcing and the seventh most visited site in the world (Alexa, 2016). We argue that Wikipedia can be understood as an open learning environment for the development of a diverse set of skills. In this text we will go over the theoretical categories related to peer knowledge production, learning in the digital age and Wikipedia. Later we will present the process, strategies and results of our pedagogical proposal to put these principles into action in the case of the project Wiki Learning. Finally, based on these results, we will argue how complex it is to change the current perception on Wikipedia into an environment associated to the paradigm of open and distributed knowledge.

1.1. Peer knowledge production

The debate on knowledge is framed in contexts of permanent tension: on one hand, the establishment of cognitive capitalism (Moulier-Boutang, 2011) is characterized by the concentration and privatisation of

information and knowledge; on the other, as a result of this process of accumulation, the disparity in the production of information and knowledge on a global level generates new forms of control, inequality and exclusion (Ostrom & Hess, 2007; Graham & Zook, 2013, Graham, Hogan Straumann, & Medhat, 2014). Contrary to these, it emerges the understanding of knowledge as a commons, or shared good, which must be conceived, defended and construed (Ostrom & Hess, 2007). Finally, the current state of the development of socio-technical structures and the growing complexity of the digital and communications ecosystem either recreates or attempts to transgress the routes of production, dissemination and consumption of the dominant knowledge. These scenarios provide a frame of reference to approach the problem of knowledge production either as a commodity or as a commons, and account for the way in which these tensions materialize through the merger of structures of knowledge production, both socio-technical and communicative.

If we assume that knowledge production possesses social, cooperative and historic components (Fuchs, 2008: 161) and that responds to the logic of cognitive capitalism, it is necessary that we use this as a starting point to locate our pedagogical and educative practice. Because of this fact, we would like to call attention on the need to develop frames of reference that situate the development of competences in a wider socio-technical level, which includes reflecting on the process of peer production (Benkler, 2013; Benker, Shaw, & Hill, 2015) and the place of knowledge production in the educative process.

1.2. Learning in the digital age

According to United Nations 2030 Agenda (2015), learning cannot be constrained to age, place, time or a particular situation; and it is necessary to guarantee the conditions so every person may “acquire the knowledge and skills needed to exploit opportunities and to participate fully in society”. To think on learning as a permanent process that covers formal, non-formal and informal learning, without restrictions of time and space, is essential to “reformulate the purpose of current educative systems at all levels and give cause to a generation of alternative contexts and strategies that allow individuals to potentiate their capabilities to the fullest” (Ricaurte, 2013: 7).

The technological development and the generation of a digital ecosystem have potentiated the construction of open environments that added to collective knowledge production and peer learning (Rheingold

& al., 2014); they allow that the learning processes transcend the classroom walls. Open learning environments (Hannafin, Land, & Oliver, 1999; Mott & Wiley, 2013), through supporting student-centered learning and the possibilities offered by technology, allow broadening the perspectives on education, on the abilities students can develop and the relevance of creativity, collaboration and problem-solving. We maintain that incorporating open learning in digital environments to the principles of formal educative institutions constitutes an opportunity for the students to develop attitudes, competences and values associated with a digital culture that is participative, collaborative and borderless.

1.3. Wikipedia

Several authors have evaluated the educative experience of Wikipedia as a learning tool, and they highlight both the development of the competences as the nature of the platform as a space for the production of collective knowledge. Staub and Hodel (2016) state that Wikipedia is an important and successful learning tool and recommend its use within educative environments as writing articles and managing content are founded on the principles of producing open and decentralized knowledge. These activities reinforce consulting and citing abilities in students, who also learn to work in a collaborative environment (Alonso-de-Magdaleno y García, 2013). What is more, the concept of wiki (a platform where everyone can contribute) questions the traditional notion of the construction of formal academic knowledge (hierarchical, authorial, individual), and defends the vision of knowledge as the result of interaction and cooperation. In this respect the model of knowledge productions promoted by Wikipedia can be thought of as an epistemology and methodology of peer production and open learning that aims to generate collective intelligence (Levy, 2004) through collaborative and creative infrastructures that support the development of multiple competences.

1.4. Competences in the digital age

There is abundant literature focused on measuring digital competences both for university students as well as for university academics. Pérez-Rodríguez & Del-

gado-Ponce (2012) present an analysis of six studies (Área, 2008; Celot & Pérez-Tornero, 2009; Churches, 2009; Di-Croce, 2009; Ferrés, 2007; and Marquès, 2009) dealing with the issue of digital and audiovisual literacies; and they establish a series of indicators that define media competence. López & Aguaded (2015) analyze the needs and deficiencies in media education in Spanish universities. Gewerc, Montero, Pernas and Alonso (2011) found that digital compe-

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tences are usually ignored, while specific competences, belonging to one area of knowledge, are prioritized. Therefore, they point out the need of new pedagogic patterns that adjust to current technological changes.

Marcelo, Yot and Mayor (2015) study the level and learning activities in which teachers use technologies. Hepp, Prats and Holgado (2015: 38) reflect on the importance of the development of digital competences as part of the training of teachers. Fernández-Cruz and Fernández-Díaz (2012) state that teacher's competences determine the competences students might be able to develop.

It is possible to identify diverse points of view to define which competences should be prioritized both in the training of teachers as well as in the education of students. In many cases, institutional policies constrain the development of competences to the use of applications and tools, but are not associated to theoretical or pedagogical models that justify their use. Therefore, we argue that the development of digital competences should be holistic and must be associated with a set of principles related to the production of knowledge and cooperation in the digital age.

We consider Wikipedia to be an environment that allows the development of a wider scope of competences. Through Wikipedia students can:

- Incorporate technology and digital media as meaningful learning tools.
- Develop the abilities of critical thinking, information management, research, and content curating.
- Develop linguistic competences in their own language and in others through translation.
- Produce and disseminate knowledge about their culture.

To incorporate an innovative experience in learning processes implies a challenge for the institution as well as for the teachers and the students. It is essential to have institutional support for the teacher training, the availability of the appropriate spaces, resources, as well as curricula flexibility for the incorporation of activities that are not measured through traditional parameters. From the teachers, it requires an additional effort: the development of certain technological competences and to be convinced of the importance of transforming their pedagogic experience through new paradigms.

- Develop a culture of respect to copyright and partake in promoting a free culture, through the production of contents and resources under Creative Commons licensing.

- Engage in the philosophy of open knowledge and open learning.

- Receive external feedback, erasing the physical and formal constraints of the classroom and becoming part of a global community.

2. Materials and method

Wiki Learning is a project that proposes the use of Wikipedia as an open, collaborative and global learning environment. It is part of a model of innovative education promoted by a private Mexican university. The project emerges from a change in paradigm on the production of knowledge that materializes in

Wikipedia. The strategic design is not centered only in the encyclopedia, but in diverse features of the wiki world: Wikimedia Foundation, Wikimedia's Education Program, GLAM (Galleries, Libraries, Archives and Museums), Wiki Initiative, Wikimedia Commons (a repository of images and other resources), Wikipedia in Spanish, Wikipedia in English, and the events of the Wikimedia Foundation (like Wikimania). The study presented in this article, part of an on-going project, analyses the results of the work carried out during the 2014-2015's academic year. Its impact appears on

different levels that go from article writing to the development of abilities in teachers and students. Here we present a descriptive approach supported on surveys whose goal was to explore the perception, the use and the experience when using Wikipedia. First, 57 surveys were carried out to explore the previous pedagogic experience in teachers during two Wikipedia workshops imparted during the summer of 2014. The workshops were part of a training program with curricular value. And second, 115 students were surveyed during an edit-a-thon (a marathon of editing), organized by the institution and that lasted for three days, in March 2015.

The questionnaire was designed to identify the notion that both teachers and students have about the encyclopedia, the experience of using it and editing it, the politics of use in the

classes, its incorporation in the educative practice as a tool, and their expectations in relation to the possibilities of its use in the future. Seven items composed the questionnaire, divided in qualitative questions (those concerning the users' perception) and quantitative (usage). An additional item was included in the students' survey to evaluate their learning after the edit-a-thon.

2.1. Process and strategy for impacting the different areas of Wikipedia

a) Wikimedia Foundation, Wikipedia's Educative Program and GLAM. Wikimedia Foundation has two great programs to get institutions involved: Wikipedia's Educative Program and the GLAM initiative. Numerous institutions and organizations that have a global

reach, such as the British Museum, the City of Sidney, Germany's Federal Archives, The Smithsonian System, and Harvard University among others participate in these programs. The programs offer the best opportunities for the students to gain access to people and national and international institutions; for favoring the generation of content for Wikipedia; and for the community to recognize and adopt it as a valuable learning experience.

b) Teacher training and Wikipedists in Residence (WER). For increasing the activities in Wikipedia and get more people involved it is necessary to form a team of qualified individuals.

c) Production of audiovisual resources (images and audio) for Wikimedia Commons. Although writing and editing texts is the main activity, donating photographs and other resources to Wikimedia Commons repository is essential. Only those resources freed through Wikimedia Commons can appear in Wikipedia, since it is a way to guarantee that they possess the proper licenses for their reuse and free circulation. In Wikimedia Commons each image has its own page, with a description, links to the donator (in this case the institution) and metadata. These pages are categorized, and are easily located with search engines.

d) Production of Content for Wikipedia in Spanish, English and other languages.

e) The creation of an institutional program. To have a presence and receive formal support from Wikipedia, the projects need to be recognized institutionally; this means that they are part of a specific group designed to collaborate with Wikipedia. It is important that the participation is structured as a permanent program so it can have a larger impact and reach. An institutional program is characterized by its development of a culture of production of distributed open content, so the group of teachers can have a deep understanding of how Wikipedia's technology and community work. It is not easy to contribute properly to Wikipedia as, to be successful, students and teachers need mentors to guide them in this task. Wikimedia Foundation has developed a system of ambassadors, volunteers who work as mentors to the teachers and the students.

It is also important that the teachers who receive the training from Wikipedia belong to different departments so that the students may take more advantages of the existing opportunities. To support this process, the institution must have at least one teacher who is an expert on Wikipedia, known as a "Wikipedian on Residence" (WER). WERs must be in contact with other teachers and other campus instances to develop

programs and make the universities presence visible in the communities of editors.

f) Student Wikipedian. The concept of Wikipedian in Residence can also be applied to students. There are many museums, archives and other institutions that can benefit from collaborations with Wikipedia but do not know how to do it. The project contemplates training Wikipedians with experience that can continue to learn through collaborating with these institutions. These student Wikipedian "experts" are a great support to the expansion of program.

g) Production of content to be used later in Wikipedia. One restriction Wikipedia imposes on the content is that it does not allow the use of primary sources, that is, original information that has not been previously published in trustworthy sources (books, articles, magazines, newspapers). Many subjects that should be part of Wikipedia have not yet been covered because of the lack of sources. One way in which the universities can solve this problem is by creating an institutional publication based on primary sources: interviews, research, news articles about people or topics, and then use them to write articles for the encyclopedia. With the project Wiki Biography students can carry out interviews and research projects under the guidance of their teachers. Then they can publish the articles in Wiki Biography (with attribution) through free licensing and then adapt the text for Wikipedia with links to the original text.

h) Representation in Wikipedia Communities. Wikipedia has its own community of editors in each language, and these communities possess different idiosyncrasies. If more academics understand how Wikipedia in Spanish works, there are more possibilities for supporting, correcting and judging the articles written by the students. Furthermore, this community of editors helps with the creation of groups to guide the teachers that work on projects in Wikipedia in Spanish. It is important to think about incorporating students and teachers that speak other languages and to sign agreements with other institutions to produce articles in more languages.

i) Attendance to international Wikipedia events. Wikimedia Foundation and other organizations support several events related to the dissemination of Wikipedia and the wiki world. The most important one is Wikimania, which takes place every year. It is necessary that the Wikipedists attend these events to get to know the community and create international networks that allow them to make known the work of their institution with Wikipedia.

We think that this model of incorporating Wiki-

pedia as a learning tool contributes to increase the participation of a larger number of people as editors for the encyclopedia. Thus, the institution can achieve an important place in the production of knowledge in different disciplines of the culture of the country in Spanish, in English, and, when possible, in other languages.

The project generated synergies between different areas of the organization; institutional contents were donated; training workshops were imparted; students were integrated into the project as part of their social service; and activities were designed so they could be incorporated by teachers into their regular classes.

3. Analysis and results

The surveys were used as an instrument to identify participants' background and their perception of the experience with the encyclopedia through the Wiki Learning project. The results allowed us to establish a starting point and to adjust the model based on the areas that required more attention and competence development.

The results from the perception and Wikipedia use survey (Ricaurte & Carli, 2016) show that for a great percentage of the surveyed students (42.6%) Wikipedia is a source of information. For another group (12.1%), Wikipedia has a negative image, and they considered it an unreliable source.

Most of the students (87%) have not edited a Wikipedia article, mainly because they do not know how to do it. A percentage (4.4%) of those who have done it felt that editing was easy, while a minority thought it was difficult (3.5%). In the case of the teachers, an equal percentage (3.5%) found it to be either easy or confusing. Although 66.7% of them said that they used Wikipedia, most of the participants in the survey (80%) have not used it as a learning tool. Regarding the teacher policy on letting students consult Wikipedia, 27% agree in allowing them to use it as a

Activities	Results
Donations to Wiki Commons	601 photographs (summer 2014); 3838 photographs (August-December 2014); 7 graphics, 27 animations and 3 videos.
Day of the Dead Photography contest, Wiki 2014 Style	36 participants, 594 photographs
Presentations at national and international conferences	A representation of Wiki Learning in Wikimedia's Annual Conference and exhibit in London. Participation in the group Education Collaborative (leading programs in education using Wikipedia and sibling projects), with meetings and participation in Wikimedia Education Program in Prague (March 2014), and Edinburgh (November 2014). Participation in the Professional Events 2014 at Monterrey's International Book Fair. Participation in the VII and VIII Research Innovation and Educative Management Congress and in the First International Congress for Innovative Education, in Mexico.
Training	9 workshops on Wikipedia as a learning platform in open digital environments. 8 training workshops for students. Workshops for librarians on Basic Editing for Wikipedia.
Social service	12 social service students (summer 2014) 132 Wikipedia articles in Spanish.
Wikipedia in the Classroom	5 teachers, 145 students and 9 classes participated.
Redacting of the Articles created, edited and translations	Creation or improvement of 132 Wikipedia articles in Spanish (summer 2014). 185 articles added to Wikipedia in Spanish, one to Wikipedia in English, 28 articles in Wikipedia in Spanish revised as part of a basic course in composition (August-September 2014).
Edit-a-thon	For three days in March 2015, in Mexico City's metropolitan area an edit-a-thon was carried out with the collaboration of Festival Cervantino and CONACULTA.
Wikimania 2015	A documentary Video about Wiki Learning Project. A paper on Wikipedia and the production of knowledge between peers. A presentation of the project's results on a panel on worldwide educative program.
Creation of the biographies of the distinguished guests	Cristóbal Cobo, Gilles Lipovetsky, Michael Kleiman, Enrique Metinides, Paul Seligson, Sergio González Rodríguez, among others.

reference. There is a positive response to the expectation of Wikipedia use, since 24.3% would like to learn how to use it, while 17.3% would like to use it in the classroom to support their classes or their area of expertise. Only 5.2% does not want to do anything with Wikipedia. For 9.5% Wikipedia represents collaborative knowledge, and 3.4% hopes they can participate in the collaborative content.

While all the students know about Wikipedia, a small percentage of the teachers (3.5%) does not. The difference between teachers and students who have edited content is less than a percental point. Only 10.5% of the teachers mentioned having a policy that allows the use of Wikipedia, in contrast with 27% of the students. In its majority, neither the teachers nor the students use Wikipedia as a learning tool.

In general, we were able to see that there are positive expectations in respect to the possibilities of using Wikipedia. Both students (66.6%) and teachers

(69.9%) show interest in learning to use it as an educative tool or participate in some way producing knowledge through Wikipedia.

The additional question included in the student questionnaire is on what they learned through their use of Wikipedia. Most of them indicated that they learned about Wikipedia and the use of the platform (22.6%). The second most frequent answer was about the open and collective character of knowledge production, and the notion of the open and participative character of the encyclopedia (11.3%). Another group (10.4%) mentioned the development of linguistic competences –orthography, composition, translation–. The rest of the answers had to do with critical thinking and the search for valuable sources of information. Less significant are the values concerning the learning of text editing, teamwork, the knowledge about the topics developed in the articles and the resignification of the encyclopedia as a reliable source of information.

4. Discussion and conclusions

Based on the survey results, it is possible to see that there are not big differences between the responses given by teachers and by students. In both cases, there is still lack of awareness about how Wikipedia works, especially as a learning tool. This demonstrates that Wikipedia could be included as a tool for the development of digital competences in the field of education, but educators are taking advantage of its potential. One of the motives for this lack of engagement is the general lack of teachers and students trust, as the questionnaires revealed (21% and 12.1% respectively, do not consider Wikipedia to be a reliable source.

If we go back to the argument made by Fernández-Cruz and Fernández-Díaz (2016) and consider that the teacher competences determine the competences in the students, we should give a greater role to the development of digital competences when training teachers. In the models of competences we documented there was not specific attention paid to the production of knowledge between peers as a specific competence. Although collaboration is highlighted as a fundamental element, collective construction of

knowledge in open digital contexts is not emphasized as a specific learning goal. None of the teachers surveyed had the intention or had considered using Wikipedia to generate collaborative content. Teachers should explore new approaches that allow them to take advantage of the pedagogic possibilities of the digital space; design activities, use tools that make possible the generation of collective knowledge and integrally develop abilities. We maintain that Wikipedia contributes to fulfilling this purpose and that the Wiki Learning project was a way of bringing the encyclopedia and its possibilities closer to the university community.

Some of the transformations that the institutions require to become places that promote the development of the competences for the 21st century include flexibility in their programs and in their learning spaces; intercultural competence; critical thinking; linguistic competence; processes of co-production of knowledge in digital contexts; and creativity.

Based on the questions asked to the students about their learning after their experience of using Wikipedia, it is possible to see that the pedagogic work with the encyclopedia can potentiate the acquisition of competences for their personal and professional life in a place outside the physical limits of the classroom; it can favour the inclusion of technology in their learning process, the production of collective knowledge, critical thinking, information management and content curation, and the improvement of their linguistic and intercultural abilities. Furthermore, it can facilitate being acquainted with the values of free culture and open learning, and the enriching of students' learning

Table 2. Competences developed through the use of Wikipedia (from the students perspective)

	Students	f	%
What do you think you learned from working with Wikipedia	Use of Wikipedia/Platform	26	22.6
	Participating in the collaborative creation of knowledge/Everyone can edit	13	11.3
	Orthography/composition	12	10.4
	Translating	8	6.9
	Sources of information	5	4.3
	Text editing	4	3.4
	Learning about the topic of the article	4	3.4
	Learning to code	3	2.6
	Teamwork	2	1.7
	Unreliable source	2	1.7
	Nothing	1	0.8
	Other	16	13.9
	Didn't answer	23	20

experience through peer-to-peer learning. However, it is necessary to design a pedagogic proposal that allows the effective acquisition of multiple competences.

This change in the paradigm is neither immediate nor simple. In the case of the Wiki Learning project, even though training workshops for more than 100 teachers were imparted, few teachers worked formally through the semester to develop projects with Wikipedia. Although there was a good disposition on behalf of the teachers, almost none had any previous work experience with the Wikipedia (only 19.2% had used it as a learning tool). This meant a larger challenge for the first training given in this project, because we had to begin with the notion that most of them were not acquainted, namely the educative possibilities of the platform. In order to get a professional commitment with Wikipedia after receiving their first training it was necessary a significant effort that required personalized monitoring, more training and technological support. Therefore, it is necessary to develop a better institutional strategy that allows more teachers to join so that the obstacles can be reduced and motivate the participation of the teachers. In spite of these issues, the project achieved considerable results thanks to the participation of students, which was linked to the grades in a unit or as participation in their social service.

To incorporate an innovative experience in learning processes implies a challenge for the institution as well as for the teachers and the students. It is essential to have institutional support for the teacher training, the availability of the appropriate spaces, resources, as well as curricula flexibility for the incorporation of activities that are not measured through traditional parameters. From the teachers, it requires an additional effort: the development of certain technological competences and to be convinced of the importance of transforming their pedagogic experience through new paradigms. From the students, it requires the development of a digital culture that gives special relevance to collective knowledge production, authentic collaborative competences and networks of learning on a global scale. Therefore, it is necessary to generate synergies that facilitate embedding Wikipedia as part of the academic and digital culture of the community.

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