

Wikipedia as OER: the “Learning with Wikipedia” project

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(submitted: 03/07/2020; accepted: 18/12/2020; published: 21/12/2020)

Abstract

Wikipedia is the world’s most widely used collaborative encyclopedia, contributed to by a community of users who read, write and edit the content of the articles, embracing the principles of Open Knowledge. The paper presents the results of the “Learning with Wikipedia” project which involved 1200 students and 30 faculty members at the University of Padova in creating and expanding encyclopedia articles on various subject-specific topics. Teaching activities were developed which considered Wikipedia not so much as a container for Open Educational Resources, but as a true learning environment, well organized with precise rules that can stimulate instructors to adopt Open Educational Practices. Students attended workshops where they were introduced to the project’s aims, the competences expected of them, and the procedures for contributing to the encyclopedia. One of the most significant points that emerged during the project was the importance of stimulating the full set of digital competences (for example finding and evaluating information). Gaining these competences is essential for the activities’ success and for participating, now and in the future in an extended community based on OER. That’s why we investigated students’ and instructors’ perceptions regarding a set of digital competences gained by working with Wikipedia. The project was also able to make students and instructors understand that writing encyclopedia articles is not a mere academic exercise, but is a Service Learning activity that benefits the entire community, and that Wikipedia should be considered as a participatory social process and not just as a means of learning subject-specific content.

KEYWORDS: Wikipedia, OER, OEP, University

DOI

<https://doi.org/10.20368/1971-8829/1135322>

CITE AS

Petrucco, C., & Ferranti, C. (2020). Wikipedia as OER: the “Learning with Wikipedia” project. *Journal of e-Learning and Knowledge Society*, 16(4), 38-45.

<https://doi.org/10.20368/1971-8829/1135322>

1. Introduction: Wikipedia: an encyclopedia or an open movement?

Wikipedia is the world’s most widely used collaborative online encyclopedia: the English version contains over 6 million articles, and the total number of articles in all language editions exceeds 50 million. Wikipedia is based on a community of users who write and correct the articles, adhering to the principles of Open Knowledge (García Peñalvo, Figuerola & Merlo, 2010; Pomerantz & Peek, 2016). Wikipedia does not impose limitations, and anyone can contribute to drafting articles in accordance with their skills and expertise in specific topics, and the community itself will then correct, discuss or rewrite each contribution.

Wikipedia has spawned a large number of other projects supported by the Wikimedia Foundation and local associations in countries around the world. The users who identify with these communities and share the values of free culture make up the Wikimedia movement. Many of the movement’s projects involve collaboration between the community and cultural institutions, and are called “GLAM-wiki”, dove G.L.A.M. stands for “Galleries, Libraries, Archives and Museums”. This collaboration is important, because the projects’ cultural content is made publically available according to the paradigms of Open Access (Tennant, 2016) and Open Content (Iiyoshi & Kumar, 2010) under free licenses such as Creative Commons that permit content to be adapted and reused. Wikipedia thus contributes to the visibility and distribution of freely licensed cultural content. Increasingly, institutions and organizations host “Wikimedians in Residence”, or WIRs, to help them share content complying with the encyclopedia’s guidelines by training personnel, and, in the case of schools and universities, tutoring students and working together with faculty in targeted teaching projects.

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2 Wikipedia and the university: an interesting challenge

2.1 Academia’s changing perception of Wikipedia

The encyclopedia has always been extensively used by students, who see it as a fast, flexible and easy to use resources that provides clear, straightforward information in all subject areas (Blikstad-Balas, 2016), especially when they need background information about a topic they are not yet familiar with (Head & Eisenberg, 2010). Initially, many educators viewed Wikipedia use with suspicion, maintaining that it is an incentive to plagiarism (Premat, 2020) and a less than reliable source (Garrison, 2018), not least because of the difficulty in finding out who wrote the articles, which may be entirely anonymous. Educators’ opinion of Wikipedia is an important factor, as it appears to have a significant influence on their colleagues (Konieczny, 2016) and on students (Lim, 2013), and hence on how they use it as a teaching aid and in private life.

In general, the objections to using Wikipedia do not hinge only on the articles’ perceived quality, or in other words on their reliability, but also concern the more specific dimensions of Comprehensiveness—or breadth of coverage and level of detail—Readability, or complexity of style and lexical density, and Currency, or the degree to which articles reflect up-to-date information about their topics (Yaari, Baruchson-Arbib & Bar-Ilan, 2011).

In recent years, however, many educators’ attitude towards Wikipedia has changed (Minguillón et al., 2018), particularly as regards two important factors: there is a growing realization that even though the online encyclopedia is not a primary source, it has very strict rules for citing sources and verifying their reliability, and that the articles’ anonymity does not substantially affect the quality of their content (Fallis, 2008), and indeed may be an opportunity to rethink the links between the concepts of credibility, trust and authority in the broader context of collaborative knowledge building (Sahut & Tricot, 2017). The world of academic and scientific research also seems to be increasing its use of Wikipedia: a recent study found that word-usage patterns appearing in Wikipedia articles show up in many papers published in scientific journals dealing with the same topic, a sign that the papers’ authors had read the articles (Thompson & Hanley, 2018).

2.2 Wikipedia in university teaching

Wikipedia is now widely used in teaching: the Wikipedia page on the topic numbers over 300 projects instituted by universities around the world since 2003 (Wikipedia: School and university projects, 2020). Interestingly, university teaching projects with Wikipedia invariably involve active collaboration between teachers and students. According to a review of

the literature on the topic (Mesgari et al., 2015), activities can be classified in six areas:

1. *Consulting* educational material.
2. *Writing* new articles or expanding existing ones.
3. *Reviewing* sources.
4. *Translating* Wikipedia articles written in different languages.
5. *Exercising critical thinking* by interacting on the discussion page of an encyclopedia article.
6. *Uploading free-use files* (audio, images, video) on the Wikimedia Commons online repository.

In the first case, the teaching approach uses Wikipedia articles to supplement traditional materials such as textbooks and the like, and as a starting point for further investigation using the primary sources cited in the articles (Selwyn & Gorard, 2016).

The most common activity is undoubtedly that of collaboratively editing encyclopedia articles (Wannemacher, 2010; Soler-Adillon, Pavlovic, & Freixa, 2018), which is chosen as an alternative and highly motivating approach to learning content and at same time developing the digital and communication skills needed to make complex concepts accessible and understandable to the general public (Leuthold & Gilli, 2019).

A closely related topic is that of reviewing the sources of encyclopedia articles, which enables students to go into further depth and check the quality of the literature on the subject concerned (Sormunen & Lehtiö, 2011; Dawe & Robinson, 2017).

Translating articles from one Wikipedia language edition to another is an interesting teaching activity, not just because it builds linguistic skills, but also because it helps develop reflexive and critical abilities such as those involved in translating articles dealing with terms or concepts that are difficult to convey in other cultures.

Exercising critical thinking is very much in the nature of Wikipedia editing, and is encouraged in a special discussion area associated with each article: the so-called talk pages provide a forum for exchanging views with other users in order to improve and elaborate on content. When there are disagreements or divergent interpretations of the content of an article, the Wikipedian community urges users not to engage in an “edit war”, i.e., stubbornly continuing to override deletions or additions for the same content, but to use the talk page to discuss the question and reach a consensus concerning the content.

The last activity is that of uploading material on Wikimedia Commons: an online repository database of multimedia files (video, photos, animations, audio or images dealing with science, the arts and history) released under a free license available to Wikipedia and all Wikimedia Foundation projects (Gutiérrez-Madroñal, 2014).

2.1 Wikipedia as a new form of open, participatory assessment

An undoubtedly important part of university (and school) teaching is the student assessment process. Any Wikipedia-based activity where articles are edited necessarily involves co-participatory review by the community of readers and contributors. This makes Wikipedia a potentially revolutionary educational environment, and one which is ideal for trying alternative forms of evaluation drawing on authentic and open assessment practices (Nascimbeni et al., 2018; Petrucco, 2019; Johinke, 2020). A number of studies have confirmed that the feedback from the community of Wikipedia readers and editors as a whole results in levels of quality that come quite close to those provided by expert raters (Cope et al., 2013). There are thus two forms of assessment:

- one by the instructor in the university’s formal educational context, and
- one in the informal/non-formal context to which the various external actors belong.

Here, we use the term informal context to mean the simple users or experts, while the non-formal context refers to identifiable individuals belonging to institutions such as museums, agencies and associations. The forms of evaluation that can potentially be employed are thus formative and summative assessment in the formal context, and participatory, open and formative assessment in the informal context (Fig. 1). While “authentic tasks” usually simulate how a student’s knowledge is assessed in a real-world context, in a Wikipedia activity, the context is real.

On the basis of these considerations regarding alternatives to traditional assessment, our university is promoting the “Learning with Wikipedia” project which will involve subject-specific teaching and learning processes open to the Wikipedian community Over and above its teaching aims, “Learning with Wikipedia” is thus an innovative educational research project.

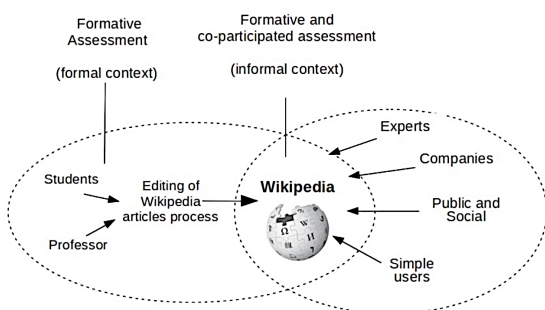


Figure 1 - Open and co-participatory assessment in a Wikipedia activity between students/instructors/users.

3. Open Education and the “Learning with Wikipedia” project.

The project is a response to the need to promote Open Education, which has been on the European and UNESCO policy agenda for a number of years (UNESCO, 2015). This framework offers multiple ways of teaching and learning, and of building and sharing knowledge. It also suggests access routes to formal and non-formal education (Dos Santo, Punie & Munoz, 2016). The concept of Open Education includes the use, provision and publication of OER, open resources that can be accessed and adapted by students and instructors (Havemann, 2016). As regards the effectiveness of this teaching strategy, many scholars have found a positive correlation between the use of OER and students’ academic performance (Fisher et. al, 2015; Grewe & Davis. 2017; Hilton, 2019).

3.1 Wikipedia as a learning and OER publishing environment

Collaborative writing on Wikipedia as part of a university course requires that students express and give shape to subject-specific knowledge. At the same time, it engages them in active learning processes. Editing an encyclopedia article also gives students an opportunity for open access publishing, and thus for making the content they create available to other students and all encyclopedia users. In addition, it enables students to explore and work with subject-specific content that will help them pass their examinations.

Wikipedia thus serves as a true learning environment. As a result of collaboration between students and supervision by the instructors, the students’ articles are reasonably reliable Open Educational Resources: open in the sense of being available for self-learning or for classroom activities, and also in the sense of open-ended, so that they can potentially be revised or expanded by other contributors in the future. They are also open in the sense of being subject to other forms of assessment in addition to that provided by the instructor, the evaluations by the Wikipedia tutors and the community of readers and contributors. As we have seen, not only do the “talk pages” offer very detailed feedback that encourages metacognitive processes of critical thinking that often serve as the drivers of deeper learning, but feedback and continual revision and improvement are also typical characteristics of OER.

This is thus formative assessment, consisting of feedback and constructive criticism centering on the following competences:

- Specific digital competences needed to use the wiki platform, and for searching, selecting and evaluating sources,
- Competences in organizing and framing the article as required by Wikipedia rules, and

- Competences in scientific writing and critical thinking.

It should be emphasized that these competences are in line with the European Framework for the Digital Competence of Educators (Redecker, 2017) which identifies areas for improvement in educators’ digital competences, and with DigComp 2.1: The Digital Competence Framework for Citizens (Carretero, Vuorikari & Punie, 2017), which has become a model for the competences to be developed in educational systems at all levels, and thus also at universities.

These are processes for improving digital competences that involve educators and students alike. One of the potential outcomes of this activity is that students in the future will become active and independent contributors to Wikipedia. In view of their experience, this will make it possible to improve the quality of the articles and support the OER philosophy even after they complete their university program.

3.2 Project description

The “Learning with Wikipedia” project’s essential aims are as follows:

- Make Wikipedia part of individual single university courses to determine the effectiveness of learning subject-specific content with alternative forms of assessment and encouraging Open Educational Practices (Jacobson, 2019).
- Create knowledge and make it readily accessible to everyone in the spirit of Open Content and Open Educational Resources, providing opportunities for interchanges between academic and non-academic settings.
- Stimulate specific digital competences, especially those involved in Information Literacy (Jemielniak & Aibar, 2016).

The project started in 2017 but the finalized program was adopted only last year. Overall, it involved 30 faculty members and 1200 students who wrote 210 Wikipedia articles. The courses involved represented a wide range of subject areas: Economy, History, Art history, English language, Spanish language, Italian literature, Pharmacy, Mineralogy, Veterinary sciences, Astrobiology, Engineering, Chemistry, Educational sciences, Scientific communication, Botany and Philosophy.

The project is divided into the following stages:

1. Involving instructors and training them in the Wikipedia “philosophy” and rules.
2. Designing the specific activity for each course.
3. Starting and reviewing workshops conducted by a Wikimedian in Residence, both in person – particularly during the COVID-19 emergency – and online.
4. Direct online support on the “sandboxes” (student test pages) to check compliance with Wikipedia

rules and the quality of each article written for the project.

Teaching design was based on a number of specific learning outcomes that were already part of each course syllabus. This ensured that the project was flexible, as it could be adapted in the field in collaboration with instructors and students. In planning each activity, the instructor was assisted by a learning designer, who organized group design sessions to help the instructor bring the type of activity into sharper focus. In this stage, instructors were thus able to plan one or more of the following activities:

- Select a high quality article addressing a mature discipline on the English Wikipedia and translate it into Italian, as an introductory activity for the entire course.
- Elaborate on content that had already been presented in the course, associating it with a search for sources.
- Propose an activity that calls for critical thinking in comparing the validity and quality of content and sources.
- Write biographical entries or articles dealing with narrative literature using the Wikipedia templates.
- Write articles requiring that multimedia resources (original images released under Creative Commons licenses) be uploaded to provide iconic information (pictures of horse breeds, drawings of molecules, monuments, etc.).
- Write articles that call for reconstructing the history of a phenomenon.
- Write new articles in the English Wikipedia (for courses using English as vehicular language).
- Reconstruct a scientific controversy.

Students attended workshops where they were introduced to the project’s aims, the competences expected of them, and the procedures for contributing to the encyclopedia. Near the end of the activities, all participants worked together as a group for the final review of the articles. Ongoing assistance in writing the articles took place online, as did overall project monitoring.

This design approach enables the instructor to propose a teaching and learning process based explicitly on the Open Content philosophy and sharing knowledge through the development of transversal skills (teamwork, digital competences, social and communication skills, etc.). One of the most significant points that emerged during the project was the importance of stimulating the full set of digital competences: gaining these competences is essential for the activities’ success and for participating, now and in the future, in an extended community based on OER.

We refer in particular to information literacy (i.e., developing skills in finding, selecting and evaluating information), digital citizenship actions, applying guidelines for online etiquette (netiquette or wikiquote),

creating and developing digital content, becoming familiar with copyright issues and the use of Creative Commons licenses, protecting personal data and self-assessment of e-skill needs (Dawe & Robinson, 2017).

4. Perceptions of Wikipedia and the development of digital competences in the OER creation process: results and discussion

4.1 Method, context and research questions

To investigate perceptions of Wikipedia and the role of digital competences, questionnaires were administered to instructors (N=30) and students (N=1200, with response rate of 74%, corresponding to 888) before and after the project. The percentage of females was 70% and that of males 30%, with the following frequency of use of Wikipedia at the beginning of the activity: 55,6% at least once a week; 23,3% at least once a month, 14,4% at least once a day, 6,1% several times a day, 0,6% never.

Questionnaires were developed on the basis of the following research questions:

1. How do teachers and students perceive Wikipedia?
2. What digital competences do teachers and students believe have been improved by creating a Wikipedia article in the project?

The entry questionnaire administered to students consisted of 37 items, while that administered upon exiting consisted of 39 items. Questions were divided into the following sections: socio-demographic data, use of Wikipedia, beliefs about Wikipedia, role of digital competences in creating OER, and open assessment. Teachers were asked to answer 25 items, many of which were open-ended questions in order to give them freer rein to reflect on the teaching experience, which was quite new for them as well as for the students. Some of the findings from these questionnaires that are particularly relevant to the topics addressed in this paper will be presented below. One especially significant aspect is the opinion of Wikipedia held by university students and teachers. Investigating this aspect enables us to understand the extent to which an OER culture can be instilled by using and creating encyclopedia content. Other important aspects include students' and teachers' beliefs regarding the role of digital competences in the proposed activity, and hence in producing OER.

4.2 Results

As regards the opinion of Wikipedia, comparing responses by instructors and students (on a scale of 1=not at all good to 5=very good) shows that the two groups' opinions are almost diametrically opposed: on average, teachers seem to have a poor opinion of Wikipedia (around 54% assigned scores of either 1 or 2), while students on average have a good opinion, with

around 52% scoring the encyclopedia at either 4 or 5, as shown in Figure 2. This data shows how important it was to involve teachers in planning, implementing and assessing the project in order to prevent any negative biases from influencing their experience. The teachers who joined in the project were active, motivated and informed partners in the OER production processes and in the open education practices involved in working with Wikipedia. In the literature, academic teachers generally express caution about judging Wikipedia to be sufficiently reliable for use in keeping up to date or doing research (Aibar et al., 2015). In our case, by contrast, a full 63% of the faculty members involved in the project reported that they use Wikipedia to keep up to date, and 25% use it for their scientific research. These are significant figures, and probably also depend on the high degree of open-mindedness that these teachers demonstrated by choosing to participate in the project of their own accord.

Opinion of Wikipedia: teachers/students comparison

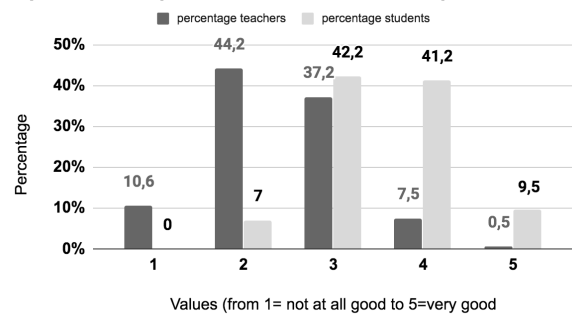


Figure 2 - Opinion of Wikipedia: instructors and students compared (Percentage distribution - Instructors N=30, Students N=888).

Students also expressed their views about what specific skills can be improved by publishing Open Content/OER with Wikipedia. Results and trends from the entry and exit questionnaires are shown in Table 1.

The table is the result of different answers concerning eight competences elaborated from DigComp 2.1 (Carretero, Vuorikari & Punie, 2017, p. 11) and emerged from the following question: “Do you think that an educational activity with Wikipedia is a way to improve your digital skills? Please indicate which ones (more answers are possible)”. The positive trends enable us to assume that the students perceived that these specific digital skills improved beyond initial expectations. In this connection, the students reported that the aspects that had been stimulated most during the project were “Browsing, and searching for data, information and digital content”, “Learning the rules of netiquette (wikiquette)” and “Learning to create and manipulate digital content”. It should be noted that these aspects are also important in producing OER.

The negative trends draw attention to shortcomings in the proposed teaching activities in relation to certain

specific skills. For example, “Evaluating data, information and digital content” and “Learning to protect personal data and privacy” were not sufficiently stimulated, or at least not to the extent that students had expected prior to the activity. The question of privacy, in fact, was not the main focus in designing the project and setting its goals, whereas the ability to evaluate content was regarded as essential.

Digital skills	Entry	Exit	Trend
Learning Wikipedia’s rules	16.7 %	27.3 %	+10.6
Browsing, and searching for data, information and digital content	54.8 %	63.6 %	+8.8
Learning to create and manipulate digital content	48,4 %	56,8%	+8.4
Learning about copyright rules and digital licensing	52.4 %	52.3%	=
Self-assessing e-skill needs	23 %	22.7 %	=
Exercising digital citizenship	34.9 %	33.0 %	-1.9
Evaluating data, information and digital content	76.2 %	65.9 %	-10.3
Learning to protect personal data and privacy	17. %	6.8 %	-10.7

Table 1 - *Digital skills and activities on Wikipedia*: Data from entry and exit questionnaires administered to students.

This divergence from expectations was analyzed with attention, particularly in view of the fact that the instructors’ answers were markedly different in tenor. By contrast with the students, the instructors felt that the project was particularly successful at stimulating such specific aspects of digital skills as “Browsing, and searching for data, information and digital content” (87.5%), “Evaluating data, information and digital content” (100%) and “Learning about copyright rules and digital licensing” (75%). In addition, instructors believe that the project was successful in stimulating skills in scientific writing and manipulating digital content, as well as the culture of collaborative writing, which is essential for shared production of OER.

4.3 Discussion

The comparison between teachers and students is limited due to the different numbers of the two samples, anyway we can conjecture that the notable difference in instructors’ and students’ perceptions regarding the evaluation of sources and content was due to the fact that although evaluation was considered to be a priority skill, its importance was only implicit: in most cases many

bibliographic sources used in writing the articles were suggested by the instructors (especially in the scientific subject areas) and then searched by the students on their own. Consequently, the students did not perceive a clear improvement in their evaluation skills at the end of the project. Greater attention will thus be given to developing digital skills, considering them not only in terms of technical ability but also as key competences for creating OER and participating in OEP.

Analysis of the open-ended questions indicates that collaboration between instructors and students in writing Wikipedia articles had a clear impact on several aspects of subject-specific learning, but above all on Open Education culture. An intrinsic characteristic of the OER produced as Wikipedia articles is that they involve a process of improvement by the community and are artifacts that can be reused in subsequent years as part of university teaching. At the same time, the fact that they are published under free licenses ensures that they are open to users outside the university. In our case, the project itself is “open”, as it is available on a dedicated Wikipedia page and demonstrates that the encounter between academic educational practices and the world of Wikipedia can promote OEP.

5. Conclusions

The first results of the experimental project that brought Wikipedia to our university have shown that designing teaching programs whose sole aim is to create OER necessarily involves addressing the broader issue of open educational practices (OEP) (Koseoglu & Bozkurt, 2018). In this sense, Open Educational Resources must be seen as the dynamic product of a process defined by Open Educational Practices. The technologies selected for creating OER can facilitate these processes, and Wikipedia-based activities are ideal for this purpose precisely because the encyclopedia is not only a container for open resources, but a true learning environment, well organized with precise rules that can stimulate the adoption of Open Educational Practices.

On the basis of our experience, implementing these practices in university teaching calls for careful planning and constant monitoring in order to overcome technical difficulties and effectively manage learning strategies for subject-specific content and digital competences. A primary concern is to provide adequate support and training, as there is a high risk of breaking Wikipedia’s rules when writing articles, thus causing a conflict with the community of Wikipedians which, if unresolved, can lead to the article’s deletion, bringing all of the effort that students and instructors have put into the project to nought. Second, it is necessary to define students’ and instructors’ educational needs for specific digital competences, particularly those involved in searching, selecting and evaluating information. For example, in redesigning the approaches our project will take in the

coming years, it will be recommended that instructors try giving students a freer hand in finding and choosing sources.

Lastly but not least importantly, a sense must be instilled in participants that writing a Wikipedia article – an Open Educational Resource – involves an open, spontaneous and collaborative process (Xu & Li, 2015): this means that both the student and the instructor must share the “open” philosophy, seeing their work with Wikipedia as a service to the community, not unlike the Service Learning approach, and interpret it as a social process and not simply as a question of learning subject-specific content.

Author contributions

Although this paper is the outcome of both co-authors’ joint reflections and analysis, Corrado Petrucco wrote sections 1, 2 and 5, while Cinzia Ferranti wrote sections 3 and 4.

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