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- Frameworks for digital literacy and digital competence analysis
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# INTERNATIONAL JOURNAL OF DIGITAL LITERACY AND DIGITAL COMPETENCE

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# Wikipedia as Training Resource for Developing Digital Competences

Corrado Petrucco, University of Padua, Italy

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## ABSTRACT

*It seems improbable that Wikipedia could be considered a valid resource for educational institutions like schools and universities because of the risk of incurring mistakes, inaccuracies, and plagiarism. The bad reputation of the free encyclopedia is false, Wikipedia is reliable and can be used in the curriculum as a new approach for social and collaborative construction of knowledge. It can enter fully into educational contexts, which will represent an opportunity to reflect on the verification of information, the ethical use of technology, and the role of democratic participation of people that use social software. In fact, the creation and maintenance of the articles of Wikipedia as classroom activities offer higher processes of cognitive development and on-line relationships, allowing the development of essential digital competences for life-long learning, like Information Literacy, Participation Literacy, and Ethical Literacy.*

*Keywords:* Digital Competences, Ethical Literacy, Information Literacy, Participation Literacy, School, University, Wikipedia

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## INTRODUCTION

Today social software and instruments of Web 2.0, allow the sharing and construction of knowledge by using a complex network of social interaction. A particular example of constructive collaboration is the Wikipedia project, the “Free Encyclopedia” that gives anyone the possibility to contribute to the writing of articles. From a typical point of view of social software and Web 2.0, it doesn’t represent an innovation, looking as practically all the applications of this type which are open to editing, comments and mash up by the users. From the epistemological point

of view, instead, it represents a real and true breaking point (Fallis, 2008).

Indeed, Wikipedia has caused a crisis within the concept of authoring and the “principle of authority”, concepts on which the traditional encyclopedia has always been based on, since the eighteenth century’s famous *Encyclopédie ou Dictionnaire Raisoné des Sciences, des Arts et des Métiers* of Diderot and Alembert. In Wikipedia, in fact, contributions are spontaneous, anonymous and/or are the result of modifications by many people: their identity and competence with regards to the subject, remaining unknown.

When we consult a traditional encyclopedia, it goes without saying, that we rely

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implicitly on the authors and the processes of updating and editing the articles. Wikipedia doesn't have a true editing process. It doesn't possess a classification system which attempts to give a significance to the world (Eco, 1990). It doesn't highlight and prioritize certain opinions rather than others; it is based mainly on the concept of emergent semantics. No one can establish priority on its worthiness, in being an encyclopedic article or not, and how in depth it could be developed.

## IS WIKIPEDIA A RELIABLE RESOURCE FOR SCHOOLS?

From the introduction, it seems improbable that Wikipedia could be considered a valid resource for Educational institutions like schools and Universities. Indeed, they need to guarantee, within their teaching and learning processes, the access to a body of organized knowledge. Knowledge that is reliable and relevant, and respects the principles of accuracy, completeness, and that of being updated and comprehensive (Fox, 1994). This therefore explains the wariness that teachers expressed initially, with regard to Wikipedia. Wariness aggravated from the fact, that the students used it as a resource for their homework, copying and pasting their text, without verifying the contents, and thereby running the risk of incurring mistakes and inaccuracies. An example of this is the History Department of the Middlebury College, which banned students from citing Wikipedia (Cohen, 2007).

Nevertheless, contrary to what may be seen as unreliable in its contents, further studies illustrate the real problem of Wikipedia (Giles, 2005; Magnus, 2006; Bragues, 2007). The problem doesn't lie in the inaccuracy and comprehensiveness of its articles, but rather in the completeness of its entries. In certain areas of knowledge it seems to be more profound (Mathematics, Physics, Medicine and science in general) than in others, where it's feasible there is a "stub". This is a rough draft of a few

lines, which no-one has developed yet, and in which there aren't quotations of the source yet.

In fact in Wikipedia reliability/verification of an argument dealt with, is related to the concept of a secondary source. In its own rights it is itself a secondary source, which must anyway quote in each of its articles the primary influential source, in which it refers to. From this point of view, the necessity to validate the source is however not only a problem of Wikipedia, but of all the resources found on the Internet.

Wikipedia has also a bad reputation because of "vandalism". That is to say the cancelling and modifying not relevant to the entries. Actually, these problems are in most cases solved in a short time span. A more subtle and interesting problem, on the contrary, is that of the continual changing of entries. This occurs with regard to a non-neutral point of view, (NNPOV) from political and social groups, opposing contributors which are the cause of heated arguments or "edit wars". In this case, the administrators invite the participants to choose the compromised route. In extreme cases the entries become blocked waiting for reconciliation.

However, Wikipedia doesn't give a guarantee of absolute neutrality, like all other resources, no resource – digital or paper can. The reason being that every encyclopedic entry is however an artifact generated from a specific culture, and group of people within that culture, which have potentially different visions of the world. These are attempts at imposing structures of knowledge-power, as defined by Foucault, or of interpretations of reality. The discussions that are created are within "sensitive" cultural entries of Wikipedia, they are not therefore a problem. They are rather an interesting sign, which has the honor of allowing to emerge and highlight "bias", otherwise hidden. The same community of editors of the encyclopedia represents the guarantee to treat every theme with a greater objectiveness and tolerance as possible.

On the basis of these considerations, we can then answer the question with a "yes", Wikipedia certainly can be a reliable source for schools. Its educational importance is however

in a dimension which exceeds the simple use of a traditional encyclopedia. It moves it to other levels of social and collaborative construction of knowledge, on meta-cognitive reflection and on Information Literacy.

## WIKIPEDIA AS A CONSTRUCTIVE AND COLLABORATIVE LEARNING ACTIVITY

Schools and other educational institutions, in this sense, could take the responsibility of an important role in the Wikipedia project and vice versa. Wikipedia, in turn, could provide an important support to the didactic and educational processes. The schools experience with *free encyclopedia* is now numerous all around the world. They have supplied a starting point at an institutional level for its direct introduction in the didactic practice. A recent school reform proposal in an English Primary School, for example, highlights the importance of having the necessary competence to judge the accuracy and reliability of the source of information, quoted the case of Wikipedia (Rose, 2009; Becta, 2009).

Generally, the most frequent experiences in the schools and Universities, want that the students, with the help of their teachers of a specific subject, modify some entries of the encyclopedia. They go into more depth and verify its reliability, or else they create new entries. This research process, based on scientific method, permits to individualize objective and reasonably reliable sources to quote. These are all activities that favour learning connected to constructive collaboration and dialogic knowledge (Bereiter & Scardamalia, 2005). At the end of the research process, there is a creation of shared artifacts on the web that can be perceived as a useful service to others.

One of the most interesting experiences in this sense was the Department of Wildlife Ecology of the University of Florida. Here, the students were requested to evaluate the contents of some entries about ecology and natural science, and to edit the articles while

working together to improve it (Callis et al., 2009). The outcome was very positive, although the interaction with other editors of Wikipedia wasn't always without friction. The students appreciated the exercise, and they perceived it as a formative and educational experience, with a superior value to that of a simple report or written exercise.

A similar experience occurred, in The Faculty of Educational Science of the University of Padua, with the students in 2009 Course on Educational Technology. A part of the assignment consisted of a group activity that aimed at critically editing some entries on "e-learning" and "tutoring on line" in Italian language. Also, here the "dialogic interaction" with the community of Wikipedians wasn't always easy and in some cases appeased notably initial enthusiasm. In the end, however, the students' efforts, that implied depth study and accurate methods of research, were rewarded by the final entries published. It also gave them greater satisfaction, in comparison with traditional written assignment. Many other existing experiences can be found quoted in Wikipedia under the apposite entry "Schools and University Projects" (Wikipedia, 2010).

These practices of interacting with on line encyclopedias modify the old model of reference use from encyclopedic source. They transform them in a participating and dialogic-based approach to knowledge (Jonassen, 2000). It is interesting to note that, in this way, the objectives of the subject taught are pursued on an educational and social level. It puts the school in contact with the community of authors, and editors of Wikipedia, that comes from an informal world and from contexts which places an emphasis on the use of knowledge.

In this sense, an action research undertaken by the author research group at the Department of Education of the University of Padua, in collaboration with IPRASE - Provincial Institute of Educational Research of Trento - Northern Italy, attempts to investigate learning processes in informal and non-formal environment examining Wikipedia entries about subjects relevant to local community. The research analyze their

possible integration within the formal school curriculum, using active learning environments: students and teachers seek to collaborate to create digital artifacts, highly contextualized in the real world, and making them useful to the whole community. For example one was developed by two secondary school teachers from the Institute Comprehensive Bassa Val di Sole, who edited with their children in classes, the article “Museum of Solandra” in the Italian Wikipedia ([http://it.wikipedia.org/wiki/Museo\\_civilt%C3%A0\\_solandra](http://it.wikipedia.org/wiki/Museo_civilt%C3%A0_solandra)). Another project was carried out by pupils of lower secondary school level including the Institute of Cles along with two of their teachers. By taking the overall aim of constructing a historical memory of the country, the working group implemented the Wikipedia entry on Cles (<http://it.wikipedia.org/wiki/Cles>). They ventured into the photo collection trips constructed on the ground, interviews with elders to gather personal knowledge about the country, research in books and other documents and finally the publication of selected photos and news on Wikipedia. Indeed, the publication of the articles was the latest step in work that lasted months and included the training of students on search strategies, editing and evaluating Wikipedia entries.

It is important to say that every Wikipedia article is a *shared digital artifact*, and the methods of revision and updating are codified in rules. These rules must be respected if one doesn't want to run the risk of being excluded from the community. Therefore, a sense of membership or belonging is created, by a collective process of knowledge construction. A community project and decentralized cognitive places (entries in Wikipedia) are created where each participant finds his/her “work niche” and competence (Geser 2007). However, it is necessary to highlight that there exists an important distinction between the practical community that spontaneously collaborates, and those “forced”, which result in academic or University learning. This could bring with it significant differences in attitude and motivation (Wannemacher, 2009).

The advantages of an educational activity which involves editions from Wikipedia can be summarized in the following six points:

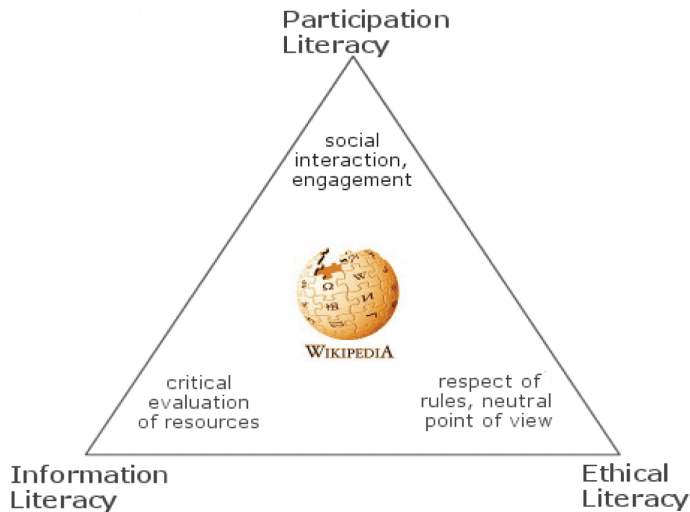
- You are more motivated in your study especially if you can see your contribution posted online. (i.e., “global audience”)
- You promote the use of the language by adopting it
- You improve dialogue-based skills, negotiation skills (Wannemacher, 2009) and collaborative skills
- You acquire technical skills by using search engines
- You develop critical behavior with regard to evaluating information sources, and finally
- You learn to respect rules and ethical principles as regards information management.

Moreover, a significant percentage of students continue to edit the entries in the encyclopaedia also after the assigned exercise from the teacher has been completed. Consequently they become long term contributors, participating actively in the community and contributing to words improving and extending the scope of Wikipedia.

## THE DIGITAL COMPETENCES WITH WIKIPEDIA

On the basis of these experiences, it is important to try to understand if the ability acquired during the practical use of Wikipedia can then evolve through a process of active transfer, in a series of organic and complementary abilities encountered in everyday life and work. This is referred to, for example, in the “Recommendation of the European Parliament and the Council (2008) on the establishment of the European Qualifications Framework for lifelong Learning. In the context of the European Recommendation, “skills” means the ability to apply knowledge and use know how to complete tasks and solve problems. Skills are described as cognitive (involving the use of logical, intuitive

Figure 1. The main digital competences using Wikipedia in educational settings



and creative thinking) or practical (involving manual dexterity and the use of methods and materials, tools and instruments). On the other hand, “competence” is described in terms of responsibility and autonomy and means the proven ability to use knowledge, skills and personal, social and / or methodical abilities, in work or study situations and in the professional and personal development.

From this point of view, Digital Competences should be part of the skills required for digital citizenship (e-citizenship) and for the world of work, which now tends to exclude those who can't use social software to continuously update their professional profile. There are three dimensions referred to and they depict particular kinds of Literacy: Participation Literacy, Information Literacy and Ethical Literacy (Figure 1).

Today every aspect of learning, teaching and working in the job place, requires the gathering, processing and communication of information. While in the past there was a reliance only on the textual medium, now the most important source is the networked information.

**Information Literacy** includes technological and methodological skills which allow the person to be able to know how to find information, to efficiently filter it, so as not to be subjected to information overload and above all to evaluate it adequately (Eisemberg, 2008). Therefore, this literacy includes also the development of meta-cognitive and critical skill. The teacher must become a point of referral: he helps the students to decide if the resources retrieved online are valuable and reliable, stimulating the use of appropriate methods of research (Garvoille & Buckner, 2009). The attention given to the source should support the development of critical thinking, which is how to think critically, evaluating and verifying continuously paper resources or online resources. Evaluating the authority, and the objectiveness of the source of information, signifies to determine not only that the author of a certain document is present on the net, but also that the opinions expressed are validated by concrete facts.

**Participation Literacy** (Giger, 2006), regards the relational aspects of the participants using social software; people can exploit the knowledge of others and share information in online communities of practice. You are participation literate if you work actively to invite everyone into a discussion and consider everyone's discourse valuable. It is also a crucial competence when it allows developing the ability to dialogue, to argue one's own ideas. To be participation literate signifies not only to know how to share one's knowledge with others, but also how to manage appropriately one's privacy and virtual identity.

**Ethical Literacy**, examines the competence to respect people and the rules defined by a community, to which one belongs, (i.e., mutual respect) (O'Sullivan, 2009) and the privacy of others. The exchange of knowledge takes place in the moment in which there exists respect and trust among people. If this is missing, it is highly improbable that people can have useful and significant experiences on-line. Also, the honest use of information to contrast for example problems like "Plagiarism" is a part of this literacy.

## CONCLUSION

Wikipedia can fully enter in educational contexts representing a stimulating occasion to reflect on the verification of information, ethical use of technology and the role of democratic participation of people which use social software. The prohibition of quoting Wikipedia, in schools and Universities tasks and assignments doesn't encourage the development of the student, and doesn't represent an answer to the problem of finding, evaluating, sharing and critically discussing the information which can be retrieved on the Web. In intentional, collaborative and dialogue-based learning situations the students are occupied in actively confronting with the source of the problem. This process is certainly more educational than focusing on what is an

acceptable resource rather than a banned one. This could also offer the opportunity to activate higher processes of cognitive development and relations. The student could experience in a context of real life situation, abilities which more than ever seem to be required of the adult in the digital society. Wikipedia could then become an efficient instrument for the acquisition, and development of reflection, participation and ethical competences, in the vision of lifelong learning.

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