Emerald Insight

The Electronic Library

Wikipedia at university: what faculty think and do about it
Eduard Aibar Josep Lladós-Masllorens Antoni Meseguer-Artola Julià Minguillón Maura Lerga

Article information:

Users who downloaded this article also downloaded:

For Authors

If you would like to write for this, or any other Emerald publication, then please use our Emerald
for Authors service information about how to choose which publication to write for and submission
guidelines are available for all. Please visit www.emeraldinsight.com/authors for more information.

About Emerald www.emeraldinsight.com

Emerald is a global publisher linking research and practice to the benefit of society. The company
manages a portfolio of more than 290 journals and over 2,350 books and book series volumes, as
well as providing an extensive range of online products and additional customer resources and
services.

Emerald is both COUNTER 4 and TRANSFER compliant. The organization is a partner of the
Committee on Publication Ethics (COPE) and also works with Portico and the LOCKSS initiative for
digital archive preservation.

*Related content and download information correct at time of download.

Wikipedia at university: what faculty think and do about it

Eduard Aibar
Department of Arts and Humanities, Universitat Oberta de Catalunya, Barcelona, Spain

Josep Lladós-Masllorens
Internet Interdisciplinary Institute, Universitat Oberta de Catalunya, Barcelona, Spain

Antoni Meseguer-Artola
Department of Economics and Business, Universitat Oberta de Catalunya, Barcelona, Spain

Julià Minguillón
Department of Computer Science, Multimedia and Telecommunication, Universitat Oberta de Catalunya, Barcelona, Spain, and

Maura Lerga
Internet Interdisciplinary Institute, Universitat Oberta de Catalunya, Barcelona, Spain

Abstract

Purpose – The purpose of this paper is to investigate university faculty perceptions and practices of using Wikipedia as a teaching resource.

Design/methodology/approach – This study is based on a large survey to all faculty members in two large public universities. A total of 913 valid responses were collected through an online questionnaire with 9 control variables and 41 Likert-scaled questions.

Findings – The results do not support an overwhelming sceptical attitude among faculty towards Wikipedia. The overall quality of Wikipedia articles is highly valued and most faculty are regular users, just as students are. Though most faculty show a positive view on the teaching usefulness of Wikipedia, few of them actually use it for teaching purposes. A certain conflict has been detected between standard academic procedures of knowledge building and the open collaborative model on which Wikipedia rests. In the end, two important factors play a role in shaping faculty views: their colleagues' perceived opinions and practices, and academic disciplines.

Research limitations/implications – The survey has only been conducted in two universities. More institutions are needed to broaden the scope.

Originality/value – The authors have gathered a greater number of answers than those collected in previous studies. The questionnaire is also very extensive. The survey has been addressed to all faculty members at one online university and at one standard brick-and-mortar university.

Keywords Encyclopaedias, Higher education, Academic staff, Open educational resources, Peer production

Paper type Research paper

1. Introduction

A key impact that the Internet has had on university education is the vast availability of open educational resources – course materials, study guides, collections of exercises and so forth – accessible via the network and free for everyone. This phenomenon began in 2001 with the creation of the initiative OpenCourseWare at the Massachusetts Institute of Technology (MIT) and has evolved into the so-called Open Educational Resources movement. MIT's initiative spurred many universities elsewhere to start similar projects and thus contributed to the international movement of open educational resources. The emergence of Web 2.0 has also opened up a wide range of new possibilities that may end up decisively influencing learning processes, both inside and outside of formal academic institutions. Among other impacts, Web 2.0 initiatives have blurred the traditional boundary between producers and consumers of information and knowledge.

Wikipedia represents the junction where the two trends mentioned above converge. From one perspective, it can be depicted as a gigantic open repository of knowledge and information with great potential for use in learning processes at all levels of education (Saorín Pérez *et al.*, 2011; Konieczny, 2014), and from another, it has become a prime example of the collective construction of knowledge, through a virtual platform that facilitates collaboration on an unprecedented scale. In fact, Wikipedia can be taken as a canonical example of what Benkler (2006) has called *mass-online commons-based peer production* (or, in the short form, *peer production*): a particular mode of producing information and knowledge goods that has its origins in free software projects.

Peer production can be characterized as a form of voluntary cooperation aimed at building a common resource through the intensive use of networking platforms and tools. In contrast to traditional institutions, peer production initiatives usually work by means of non-hierarchical and highly decentralized organizations. They are also based on a particular understanding of copyright as a right for distribution (Weber, 2004), not as a right to exclude. Entry barriers to participation are usually low and formal accreditations are mostly irrelevant. Authority and influence in peer production projects come mainly from the quality of individuals' past contributions, as judged by their peers.

The great success of some peer production projects – GNU/Linux or Wikipedia – has led to the application of this model in other realms of human activity, including hardware building and design. A number of recent initiatives are trying to import, sometimes explicitly, peer production mechanisms to the sphere of science: from citizen-science projects, to the movements for open research and open access (Nielsen, 2011). Similarities between science and peer production are clear: both fields rely heavily on the open publication of results, on peer review as an essential mechanism for quality control, and have been described as meritocratic cultures. Yet there are also important differences between them; among others, authorship in peer production is somehow diluted as a result of massive collaboration and anonymous contributions, and peer review is mostly done post-publication in an open, not blind, way.

To explore the compatibility and possible tensions between science and peer production, we have translated the problem into a more manageable research issue: analysing the way an important part of science, university faculty members perceive and use for teaching purposes is a particular instance of peer production, namely, Wikipedia.

1.1 Wikipedia in higher education

Wikipedia is currently the most important website for general consultation and is contributing positively to learning processes, both inside and outside academia. In fact, as the Internet is now the general public's most important source for information on science and technology issues (Brossard and Scheufele, 2013) and as most search engines place Wikipedia entries in their top results, it is likely that the free encyclopaedia has also become the most important channel for the public's understanding of science.

In the university context, it is one of the most used resources by students who use it regularly as a reference tool to carry out different assignments and tasks (Brox, 2012; Knight and Pryke, 2012). This is not only due to the quality of many of Wikipedia's articles, but also to the easy access to its content, the hypertext structure that facilitates navigation and the abundance of references and sources, according to Alonso and García (2013) and Lim (2009). Based on a representative online survey among 4,400 students from German universities (with a return rate of 40 per cent), Wannemacher and Schulenburg (2010) found that 80 per cent of students use Wikipedia on a regular basis and 60 per cent use it frequently or very frequently.

Despite students' broad and intensive use of Wikipedia, the attitude of university faculty does not seem so positive. There is widespread opinion that academics perceive Wikipedia with some scepticism. It is known that many academics believe, for example, it is illegitimate to cite Wikipedia as a source, because their articles do not have clear and identifiable authorship, and so it is difficult to verify their content (Jaschick, 2007). Others do not like their students to use it and even try to ban it in their courses. Unfortunately, empirical studies on faculty perceptions and uses of Wikipedia in learning environments are few and limited in scope.

Based on a survey of 14 university instructors, An and Williams (2010) identified both educational benefits and major barriers of using Web 2.0 tools. Some benefits mentioned are: fostering of interaction; communication and collaboration among students; improvement in writing and technological skills; the ease of use and flexibility; and a new role for teachers as facilitators of learning rather than distributors of knowledge. The major barriers are a perceived unease with openness among students, the lack of institutional technical support for faculty and the time needed to learn and manage new tools.

Dooley (2010) noted that the negative attitude of faculty members towards Wikipedia is usually based on a perception of inaccuracy of its content and also on its potential for discouraging students from using other, more reliable, sources of information. Her survey of 105 faculty respondents showed that only 7 per cent used Wikipedia frequently for teaching or research tasks. In a similar vein, Chen (2010) identified credibility as university faculty's main concern about Wikipedia and highlighted academic disciplines as a key factor in explaining attitudes towards Wikipedia. This study also showed that age correlates with having a more negative view and that faculty who frequently use other online resources are more sceptical of Wikipedia.

In a qualitative study based on five interviews, Bayliss (2013) proposed two main causes of the cautionary and cynical attitude towards Wikipedia. First, a lack of knowledge and a poor understanding of Wikipedia's editing processes and policies by academics, and second, a negative attitude towards collaborative knowledge production occurring outside of academia. Along the same lines, Knight and Pryke (2012), following

a survey of 133 faculty members, stated that the main reason for academics to distrust Wikipedia is its obvious departure from conventional models of scholarship. They mention the lack of accreditation for contributors, the possibility of anonymous editing, the absence of formal pre-publication peer review and the blurred authorship of entries. Most faculty members tend to favour a low-stakes use by students (like the initial scoping of an issue) over higher-stakes (such as citing facts or as a serious source of knowledge and references).

Other possible explanations of negative attitudes towards Wikipedia have to do with its particular way of producing and assessing knowledge content, something that is closely linked to the peer production model it represents. Beyond specific accuracy and credibility concerns, a more fundamental conflict on epistemological and power grounds is detected by several authors (Black, 2008; Chen, 2010; Eijkman, 2010). Based on a survey with 99 respondents, Eijkman (2010) showed that a majority of academics display "a blend of relatively cautious acceptance and/or gentle discouragement" towards Wikipedia. Surprisingly, the study finds a slight negative correlation between knowledge of Wikipedia and favourable views of it, and that so-called soft-science academics – allegedly more prone to a social constructivist view of knowledge – show a more negative attitude than their hard-science fellows. However, his main point is that, for faculty members, Wikipedia has become a symbol of opposition to the traditional power–knowledge arrangements in academia.

2. Research aims and design
This project was undertaken to systematically analyse, using a comprehensive empirical study, the perception and attitudes of university faculty from different scholarly areas towards Wikipedia. The study aims to investigate relationships between these perceptions and several faculty characteristics to establish the extent to which the sceptical attitudes are related to:

- personal or generational factors; or
- an implicit conflict between the standard scientific or academic epistemological stands and the specific peer-to-peer culture of Wikipedia (as a paradigmatic example of content production in a collaborative open network).

The focus of attention is on faculty members. In particular, if they perceive Wikipedia as useful for teaching, if they actually use it for teaching purposes and what they think about students using it. Other related issues addressed are what faculty members think about Wikipedia's editing system, how they assess Wikipedia's overall quality and whether they think Wikipedia is compatible with academic standards.

Faculty member attitudes towards open collaboration and other Web 2.0 tools are also explored to help identify possible incentives that would be appropriate for fostering the teaching uses of Wikipedia. Finally, associations between actual teaching use of Wikipedia and a number of perception and usage variables, and personal and professional characteristics of faculty members are explored.

As the central part of this study, we conducted an online survey of all faculty members of the Universitat Oberta de Catalunya (UOC) and the Universitat Pompeu Fabra (UPF). UOC, launched in 1994, is a purely virtual public university providing higher and continuous education to more than 60,000 students by means of a hierarchical structure composed of approximately 250 full-time professors and almost

2,000 part-time associate professors. Some of these associate professors also teach in other brick-and-mortar universities, but all of them are considered as faculty members. UPF was launched in 1990 and it is the most recent public university created in Catalonia. It has around 12,000 students and there are 1,511 faculty members.

As shown in Table I, we had 913 valid responses from a universe of 3,639 individuals. To our knowledge, this is the largest number of responses ever gathered from university faculty members about Wikipedia. For a confidence level of 95 per cent and the assumption of maximum uncertainty ($p = q = 0.5$), the margin of error is 2.81 per cent.

The questionnaire was organized in two parts. The first part collected data on gender, age, area of expertise, PhD degree, years of experience in university teaching and academic position. The second part, with 41 questions, was aimed at gathering information about perceptions, practices and other aspects that could affect the teaching use of Wikipedia in higher education. These questions had to be answered via a five-point Likert scale. Depending on the nature of the questions, this scale referred to the level of agreement or disagreement with a statement (1 = "Strongly disagree" and 5 = "Strongly agree") or to the frequency of certain actions (1 = "Never" and 5 = "Very often").

To design the final version of the questionnaire, an exploratory qualitative study was carried out involving 12 interviews of faculty members – selecting two from each of the six main schools at UOC. Comments and suggestions collected through this procedure helped to improve the survey until it reached its final form. These interviews were conducted between 12 and 16 October 2012. The online survey was launched on 19 November and remained open until 3 December 2012 for UOC faculty and from 29 April until 16 May 2013 for UPF faculty.

A descriptive statistical analysis was used to provide basic information about the main characteristics of the sample. Correlation analysis was also used to demonstrate the existence of associations between some variables that identify faculty perceptions and uses. In particular, we have chosen the polychoric correlation as a measure of interdependence between two different variables. To investigate the influence of personal variables on the decision to use Wikipedia for teaching, an analysis of variance (ANOVA) for testing the statistical significance of differences in the mean value among different categories of individuals was used.

Study universe	Faculty members of the Open University of Catalonia (UOC) and the Universitat Pompeu Fabra (UPF)
Study universe size	3,639
Method	Online survey sent to all faculty members, with no quota groups
Sample size	913
Sampling error	±2.81% for overall data in the case of maximum uncertainty ($p = q = 0.5$). Confidence level 95%
Resulting sample	Not weighted
Date of launching	19 November 2012 (UOC) and 29 April 2013 (UPF)
Data collection	From 19 November to 3 December 2012 (UOC) and from 29 April 2013 to 16 May 2013 (UPF)

Table I.
Technical information on the questionnaire

3. Results

The most important results of the descriptive analysis – grouped by the theoretical constructs used in the study – as well as some associations between variables that seem particularly relevant are presented below.

3.1 Wikipedia as a teaching tool

Three questions in the survey were designed to measure the *perceived usefulness* of Wikipedia as a teaching tool. The majority of respondents (46.8 per cent) agree[1] that Wikipedia is useful for teaching, while only 18.8 per cent disagree ($N = 908$). When asked for particular benefits, the answers are a bit less positive: 35.9 per cent agree it fosters new skills for students, while 27.7 per cent disagree, and 36.0 per cent think it improves students' learning, while 26.4 per cent do not think so ($N = 902$).

There is a sharp contrast between the perception of teaching utility – rather positive – and the actual *teaching practices* of faculty members, which is, as expected, very low. A vast majority of faculty has never or seldom used Wikipedia for teaching assignments (75.7 per cent). Only about 9.0 per cent say they use it frequently or very frequently for that purpose ($N = 896$). Wikipedia is used a little bit more as an information source for developing teaching materials: the percentage of faculty who never or seldom use it is about 66.9 per cent, while frequent users rise to 11.9 per cent ($N = 899$) (Figure 1).

3.2 Recommending and citing Wikipedia

As previous literature has shown that some faculty explicitly discourage the use of Wikipedia among students and also that some even ban citing it in essays and assignments, we have included in our survey some questions about both issues – recommendation and citing. When asked about their willingness to recommend that students consult Wikipedia, almost half of the respondents (46.5 per cent) never or seldom do, while about 27.2 per cent do it frequently or very frequently ($N = 904$). They are even less eager to recommend Wikipedia to their own colleagues – only 23.5 per cent recommend it frequently ($N = 890$). Nevertheless, most of the respondents (46.0 per cent) do not see any problem in students using Wikipedia; however, 23.1 per cent do not feel comfortable about it ($N = 898$).

This last result contradicts the common idea that most faculty are completely against students consulting Wikipedia or that many of them eventually ask them not to use it.
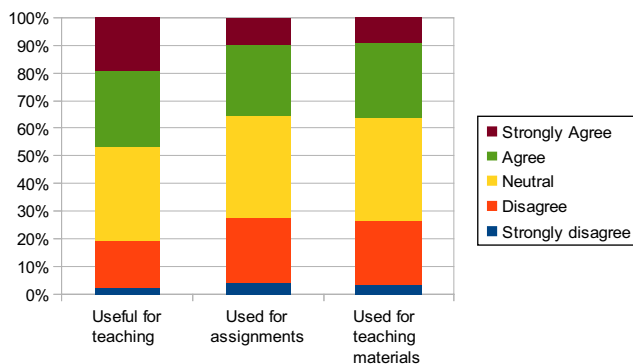

Figure 1.
Wikipedia use in teaching

Although 23.1 per cent do not like students to do so, only 13.7 per cent completely disagree with them using it.

Nevertheless, when asked about citing Wikipedia in their academic output, faculty show a clear negative position. The biggest percentages are for those that never do it (44.9 per cent) and those who seldom do it (24.5 per cent). Only a handful do it very frequently (4.1 per cent) or frequently (8.7 per cent). It is worth noting that when phrasing the question, we did not specifically ask about research papers, but about academic texts in general – which includes teaching materials and less formal pieces of work too ($N = 905$).

3.3 Ease of use and editing system

We have also explored the perceived ease of use of Wikipedia. As expected, a vast majority of faculty members think Wikipedia is easy or very easy to use (87.3 per cent) and most of them also think it is rather straightforward to find the information they are seeking ($N = 909$). But while this passive use for consulting shows no usability problem, active use involving editing – providing new or modifying existing content – is perceived rather differently. About 14.0 per cent disagree that editing Wikipedia is easy, while 42.5 per cent agree ($N = 816$). Because, as we will see later, few of them actually contribute to Wikipedia and we may assume the number of faculty who have ever tried to edit it is not much higher, we have to view these figures with care.

There was also a question about the editing and reviewing system in Wikipedia. Here 31.8 per cent of the respondents say they trust the system, while a slightly lower percentage, 26.8 per cent, declare that they do not ($N = 884$). The greatest number is for those who are undecided (41.4 per cent). It is worth noting that the 6.1 per cent who strongly disagree (about trusting the system) outnumber the 5.3 per cent who strongly agree. However, as the percentage of respondents who choose the midpoint answer is substantial, we can hypothesize that most faculty do not actually know Wikipedia's specific editing system very well or the way the peer-review process works. This could explain their lack of a clear opinion and is also consistent both with the results of the qualitative interviews in our exploratory study and with the low percentage of faculty members editing, and thus contributing to, the content in Wikipedia.

3.4 Quality assessment

As previous literature demonstrated that most faculty show serious concerns about Wikipedia's credibility, accuracy and reliability, four questions in the survey were designed to measure how the quality of Wikipedia is perceived by academics. Three of the questions specifically addressed the quality assessment of articles by asking for their opinion on the overall encyclopaedia. Regarding article reliability: 38.4 per cent of respondents agree that information contained in Wikipedia articles is reliable, 20.6 per cent do not agree and 41.0 per cent are of an opinion somewhere between the two; thus, the answers are leaning towards a fairly positive view ($N = 906$). Information deployed in the articles was updated, and the answers were substantially more positive: 48.4 per cent think it is updated, only 13.8 per cent think it is not and 37.8 per cent choose the midpoint ($N = 903$). Also, there was a question asking about how comprehensive the articles are: this was the feature most negatively assessed and the only one where affirmative answers were outnumbered by negative ones. Specifically, 27.3 per cent

agree or strongly agree that articles are comprehensive, 29.4 per cent disagree or strongly disagree and the remainder (43.3 per cent) were neutral ($N = 898$) (Figure 2).

These results altogether do not at all support the idea – highlighted by previous studies and commonly believed – that university faculty are really concerned about quality standards in Wikipedia and often take a sceptical or even plainly negative attitude. Most faculty members actually think that the overall quality of Wikipedia articles is relatively respectable. When quality assessment is decomposed in more specific factors, these results are very apparent. Though articles, in general, are deemed a bit more uncomprehensive, they are clearly considered reliable and updated. A strong negative perception of quality is only held by a minority.

3.5 Active and passive use

Another set of questions in the survey was devoted to exploring the previous user experience with Wikipedia. We wanted to explore both active (editing and contributing) and passive (mainly searching and browsing) uses of Wikipedia.

Passive use was split into three questions, consulting Wikipedia:

(1) for topics related to their own field of expertise;

(2) for other academic fields; and

(3) for personal matters.

Here a decreasing pattern is found that diminishes from personal matters (the most consulted area) to their own field of expertise (the least consulted). In personal matters, more than 62.6 per cent of respondents declare they visit Wikipedia frequently or very frequently, while less than a mere 18.1 per cent say they never or seldom visit it ($N = 900$). A majority of faculty (55.3 per cent) also use Wikipedia to search for information about other academic matters not in their field of expertise, whereas 20.1 per cent never or rarely do it ($N = 902$). When asked about consulting Wikipedia for issues related to their own academic discipline, only 38.1 per cent do it frequently or very frequently, while a slightly lower percentage, 37.1 per cent, say they never or seldom do ($N = 900$).

These data on the frequency of visits to Wikipedia are certainly striking. On the one hand, they clearly show that most faculty are regular users of the encyclopaedia and thus deny, or at least call into question, the mostly negative or plainly sceptical attitude commonly attributed to them. On the other hand, the figures on the frequency of
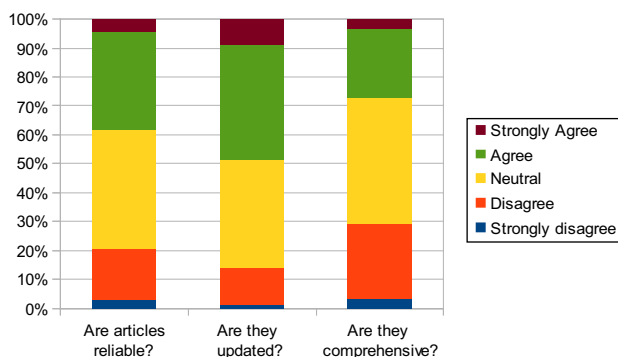
Figure 2.
Quality assessment

consultation are virtually the same as those provided by the largest studies undertaken on university students. Wannemacher and Schulenburg (2010), in their large survey, reported that 60 per cent of the students use Wikipedia frequently or very frequently. There seems to be no difference between faculty and students in their respective use of the free encyclopaedia.

The data also confirm our initial expectation that faculty mainly use Wikipedia for consulting matters not strictly belonging to their field of expertise – where they are more acquainted with the basic facts and concepts usually provided by encyclopaedic entries and also have other more specific sources of information (academic and scientific literature, mainly). They use Wikipedia, in their professional activities, primarily for quick introductory and basic information in areas beyond their own disciplines.

Active use (contributing to Wikipedia) is scarce, as expected. In fact, from all frequency questions in the survey, it shows the biggest rate of "never" answers: 64.5 per cent. Taken together, the "never" and "seldom" answers amount to 84.1 per cent, while only 5.8 per cent of respondents say they frequently contribute to Wikipedia ($N = 899$). Very frequent editors amount to just 1.7 per cent, a figure that closely resembles the one found for students in the above-mentioned survey (1 per cent) (Figure 3).

3.6 The social image of Wikipedia within academia
An important set of questions addressed the issue of the social image of Wikipedia within academic culture. First, a clear majority, 53.2 per cent, of faculty members think the use of Wikipedia is not well-considered by their colleagues, while only 13.8 per cent think it is ($N = 891$). Faculty perception of their colleagues' actual use of Wikipedia, to contrast it with the previous item, was also examined. Though most respondents ($N = 856$) do not take a clear side (40.0 per cent choosing the midpoint), those who think colleagues do not use it much (34.0 per cent) significantly outnumber those who think they do (26.0 per cent) (Figure 4).

This is indeed in sharp contrast with our own data on actual use: though few faculty members think their colleagues are really using Wikipedia, we notice that most of them do. It is clear that the majority perception that Wikipedia is not well-considered by their colleagues prevents many academics from publicly acknowledging its use and, even less, to recommend it. As we mentioned before, only a few actually recommend Wikipedia to their students (27.2 per cent) and fewer (23.1 per cent) recommend it to their own colleagues.
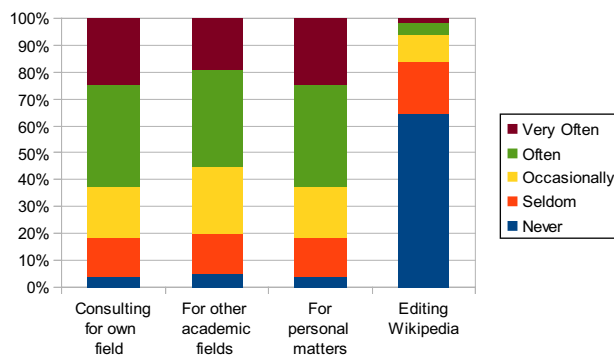

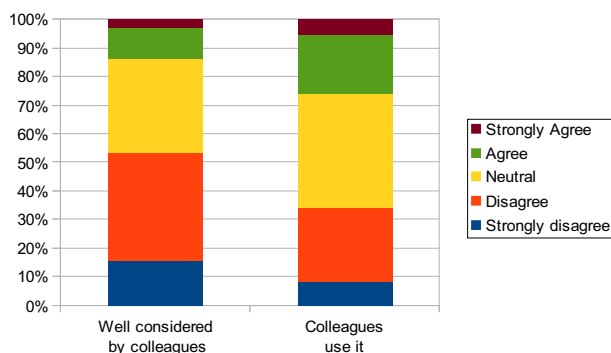
Figure 3.
Passive and active use

Wikipedia at
university

677

Figure 4.
Image within
academia

3.7 Sharing, collaboration and Web 2.0 tools

Also included are three more questions in the survey regarding "sharing and collaborative attitude". First, faculty were asked to rate the importance of openly sharing academic content on the Web ($N = 902$). A vast majority agree this is important (84.8 per cent), while only a few think it is not (3.4 per cent). When asked if they thought it is also important to publish research results in other media and not only in academic journals ($N = 901$), a similar, though a bit smaller, clear majority also gave positive answers (77.5 per cent). The third question concerned how important they consider it to be for students to become familiar with collaborative environments on the Internet. From these three items, this was the one that got the greatest agreement: 86.6 per cent agree or strongly agree this is important ($N = 902$).

When asked if the open sharing of teaching resources is welcome in academic culture, though answers are still apparently positive, the difference with the negative position is not so sharp: 45.4 per cent agree and 24.1 per cent do not ($N = 893$). Again, it seems that the use of Wikipedia is seen as less socially acceptable within academic culture, when compared to other open educational resources.

Three further questions were included to evaluate the degree of use of Web 2.0 tools. First, contributing to blogs ($N = 902$) was asked about. Only 19.4 per cent of faculty declare they contribute frequently to blogs and a broad majority never do it (37.7 per cent) or seldom do it (24.2 per cent). A similar negative answer was obtained when asked about publishing academic content in open environments: 28.6 per cent never do it and 22.1 per cent only seldom do it, while 8.7 per cent do it very frequently and 17.0 per cent frequently ($N = 899$). The third question inquired about active participation in social networks. Here, the percentage of non-users and low users was significantly smaller (18.4 per cent and 24.6 per cent, respectively), while frequent users were slightly higher (33.3 per cent) than in previous items ($N = 907$).

3.8 Institutional context and possible incentives

The next section of the survey was devoted to the topic of institutional support and possible incentives to use open environments in teaching and, specifically, Wikipedia as a teaching tool. Institutional support does not seem to be a real concern, as more than 62.4 per cent of faculty think their own university promotes the use of such open environments. Only 14.7 per cent do not agree with the statement ($N = 886$). The next question looked at the extent to which their university considers the use of those

environments as a teaching merit. Answers on this issue were clearly less positive (agreement was declared by 38.6 per cent and disagreement by 29.2 per cent), though they still outnumber the negative view ($N = 860$).

Possible incentives were also explored by asking the extent to which four specific factors would help them to design educational activities using Wikipedia. The four factors were:

(1) having a catalogue of best practices;
(2) having colleagues explaining their own experiences;
(3) receiving specific training; and
(4) getting more institutional recognition.

The factor that got the best assessment was "having a catalogue presenting best practices", where 63.8 per cent agree or strongly agree with the statement ($N = 878$). The second best assessment was for "getting greater institutional recognition", with 52.0 per cent showing their agreement ($N = 871$). Experience explanations by colleagues was third with a very similar distribution of answers – agreement by 51.3 per cent ($N = 878$) – and the least valued was specific training, although a majority of faculty (49.9 per cent) still declared their agreement ($N = 876$).

3.9 Factors associated with using Wikipedia as a teaching tool
As mentioned in the Methods section, the possible associations between variables in the study were explored. In particular, correlation tests to check associations between the teaching uses of Wikipedia were developed – the latent variable encompassing consulting Wikipedia to develop teaching materials and planning assignments involving Wikipedia – and a number of other variables:

- quality perception – encompassing reliability, updating and comprehensiveness of articles;
- perception by colleagues;
- use by colleagues;
- improving student's learning;
- editing Wikipedia;
- consulting Wikipedia for personal matters; and
- feeling comfortable about students using it for their tasks.

The correlations between quality perception and the rest of the variables were also checked.

First of all, the teaching use of Wikipedia is associated with its perceived quality, though the correlation is only moderate ($r = 0.40$, $N = 874$, $p < 0.001$[2]) and certainly lower than we expected (Table II). As quality concerns among faculty have been repeatedly highlighted by previous literature, it was thought that the small percentage of faculty who actually use Wikipedia as a teaching tool were also going to make a more positive assessment of its overall quality. They do, but not to a great extent – quality perception does not seem to be so influential and other factors might be more relevant.

The strongest correlation for teaching uses is, nevertheless, the active use of Wikipedia, i.e. making editions or contributions ($r = 0.59$, $N = 887$). Passive use (consulting) is only weakly associated ($r = 0.30$, $N = 886$).

Another not so predictable relationship has been found between teaching uses and both colleagues' perception and their behaviour of use. Those faculty who use Wikipedia in teaching have a more positive view of their colleagues' opinion of Wikipedia ($r = 0.41$, $N = 872$) and also think they use it more frequently ($r = 0.41$, $N = 838$). Noticeably, a moderate correlation is also detected between the assessment of quality and the perception of colleagues' opinion ($r = 0.42$, $N = 874$) and use ($r = 0.37$, $N = 840$). Those who attribute higher quality to Wikipedia also think their colleagues share a positive view and make regular use of it.

This association, together with the findings presented earlier, supports the idea that academic colleagues are a strong role model for faculty members. Not only does their eventual decision to use Wikipedia as a teaching tool seem to be substantially related to their perception of what colleagues do and think, but also their perception of Wikipedia's overall quality is also linked to their opinion about what colleagues believe.

Finally, other expected associations have also been found with the teaching use of Wikipedia – though correlations are moderate. First, with the opinion that using Wikipedia improves student's learning processes ($r = 0.47$, $N = 882$). Second, with seeing no problem when students use it as a source of information ($r = 0.51$, $N = 878$).

3.10 Teaching use of Wikipedia and faculty features

The study also investigated the extent to which certain faculty personal and professional characteristics are associated with the latent variable measuring teaching uses of Wikipedia. This has been done by estimating an ANOVA for testing statistical significance of differences in the mean value among some categories of individuals. In particular, the following categories were explored: gender, academic discipline, years of teaching experience and age. Significant differences were found among our respondents ($N = 869$) in the case of gender ($F = 17.50$, $p < 0.001$) and academic discipline ($F = 7.53$, $p < 0.01$).

The list of academic disciplines provided in the survey was designed taking into account the main schools of both universities in the survey. That said, the analysis shows that faculty members belonging to STEM fields (in this case, natural sciences and engineering disciplines) are the ones with a highest score in teaching practices involving Wikipedia (mean 4.379, $N = 206$); for other disciplines (in this study, mainly humanities, social sciences and law), the mean value was 3.804 ($N = 685$). This is consistent with

Factors	r	n	p
Quality perception	0.40	874	0.000
Perception by colleagues	0.41	872	0.000
Use by colleagues	0.41	838	0.000
Improving students' learning	0.47	882	0.000
Editing Wikipedia	0.59	887	0.000
Consulting Wikipedia for personal matters	0.30	886	0.000
Feeling comfortable about students using it for their tasks	0.51	878	0.000

Table II.
Correlations between teaching use of Wikipedia and other associated factors

former studies – particularly Eijkman (2010) – that have found a more sceptical or negative view on Wikipedia among so-called soft-sciences faculty than among their hard-sciences colleagues.

As expected, gender differences were also found, e.g. men being more prone to develop teaching uses of Wikipedia – and it should be noted that a vast majority of Wikipedia editors are known to be male (Antin *et al.*, 2011). Nevertheless, as the population of women in engineering and natural sciences is low (16.7 per cent in our sample, while 42.5 per cent in non-STEM fields), when corrected by the discipline, the gender divide becomes negligible as far as teaching uses of Wikipedia are considered.

Finally, as the influence of age and teaching experience was not found to be significant, we can state that faculty's decision to use Wikipedia in learning processes does not follow the usual pattern of other Web 2.0 tools where young people tend to be more frequent users.

4. Discussion
There are a number of general conclusions to be drawn from the analysis presented above. First of all, as expected, few faculty members use Wikipedia for teaching purposes. From those respondents who actually do use it, most restrict themselves to passive use; that is, basically consulting Wikipedia for elaborating teaching materials. An even smaller minority use it as a platform for developing students' assignments that may involve editing, improving or contributing content. It was determined, however, that most faculty show a positive view on the teaching usefulness of Wikipedia, so there is a sharp contrast between their a priori cognitive disposition and their eventual engagement in actual teaching practices.

Contrary to widespread opinion, the results of our survey do not support an overwhelming negative or sceptical attitude among university faculty towards Wikipedia. On the one hand, not only do most of them see it as a useful teaching resource, but few feel uncomfortable about students using it as a source of information. On the other hand, and most surprisingly, data on quality assessment and on use practices plainly contradict the commonly accepted negative standpoint.

The overall quality of Wikipedia articles is rather positively valued. From the three questions asking about quality issues, reliability and updating got a striking majority of positive answers, and only article comprehensiveness received a slightly negative evaluation. The common assumption that most faculty members perceive Wikipedia as an inaccurate and unreliable source of information is not supported by the survey results. Therefore, a negative assessment of quality cannot be taken as the main reason to explain low teaching use rates.

When considering their level of use of Wikipedia both for professional and personal matters, but without focusing specifically on teaching activities, faculty members show a similar behaviour to that reported from empirical studies on university students. Most of them are regular users of Wikipedia. In fact, control data show that a relatively high percentage of them (13.5 per cent) are even registered users of Wikipedia – far beyond the average rate of registered users for the general population of Catalonia: 0.4 per cent. All in all, our survey depicts faculty members as frequent users of Wikipedia as far as passive use – consulting or browsing – is concerned.

The results indicated signs of a certain conflict between standard academic procedures of knowledge building and the open collaborative model of peer production

on which Wikipedia rests. This is consistent with some of the previous literature discussed and it is supported by different findings from the survey. First, the overall assessment of the quality of Wikipedia content by faculty is much higher than their appreciation of the editing and reviewing system of Wikipedia, which is regarded with distrust. Respondents are more concerned about how articles are built and published than about the quality. As only very few faculty are actually involved in contributing to Wikipedia – either in improving existing content or in providing new content – this distrust in editing mechanisms is probably not built on accurate knowledge. In fact, in the interviews conducted before launching the survey, several wrong assumptions were found regarding the workings of Wikipedia, particularly on the editing procedures and on the mechanisms for quality control.

Second, private instances of use – whether professional or personal – are not matched by public uses – those uses that required some sort of publicly stated commitment. Most faculty are definitely not prone to accept students quoting or citing Wikipedia in their assignments, nor do they see it as legitimate to cite or make references to Wikipedia in their own research or teaching. While frequently using it in the private sphere, most faculty think Wikipedia is not well-regarded by their colleagues as a respectable source of information. Although they find it useful and rich, they do not tend to recommend its use to students and even less to their colleagues. They are frequent users of Wikipedia, but prefer not to talk about it. In general, this deep dependence on colleagues' opinion and behaviour, together with the preference for private uses of Wikipedia – those not involving public acknowledgement – create a negative feedback loop. As colleagues do not talk much about it, most faculty tend to think their colleagues do not use it because they find it inappropriate or unreliable and that prevents them from publicly exposing their own positive opinion and intensive use.

Colleagues seem to act as strong role models for most faculty members on this issue, whereas the institutional context – their own university policies and culture – seems less important. Even quality assessment of Wikipedia content seems to be dependent on their perception of colleagues' position about it. Consistent with that, belonging to a specific area of expertise seems to be more decisive than formal institutional affiliation. As in some of the past literature, the study finds that faculty from the hard sciences show a more positive assessment and use of Wikipedia than their soft-sciences colleagues. The general clash between scientific culture and peer production hypothesized is eventually modulated by the particular subcultures of more specific scientific disciplines. As former studies on science culture have demonstrated (Knorr-Cetina, 1992), there are enormous disparities – in methods, practices and epistemological styles – between different sciences.

A final remark can be made on the benefits of actively using Wikipedia in higher education. Though previous studies have successfully highlighted the positive educational improvement of different students' abilities, such as motivation, collaboration, critical reviewing, writing and referencing skills (An and Williams, 2010; Saorín Pérez *et al.*, 2011; Konieczny, 2014), much less has been said on the urgency for scientists and scholars to pay attention to Wikipedia as a new and powerful channel for the public communication of science. The widespread social use of Wikipedia as a source for scientific information – including sensitive information on medical and health issues – for the general public, should also encourage a more active and systematic

engagement of professional scientists and scholars in improving this free encyclopaedia's content in science-related matters.

Notes

1. When we just mention agreement or disagreement, we consider values 4 and 5 for "agree" and values 1 and 2 for "disagree". The remaining percentage corresponds to the middle option (value 3).

2. We omit p value for the rest of correlations, as it is always $p < 0.001$.

References

Alonso, M.I. and García, J. (2013), "Colaboración activa en Wikipedia como método de aprendizaje", *Revista Iberoamericana de Educación a Distancia*, Vol. 16 No. 1, pp. 13-26.

An, Y. and Williams, K. (2010), "Teaching with Web 2.0 technologies: benefits, barriers and lessons learned", *International Journal of Instructional Technology & Distance Learning*, Vol. 7 No. 3, pp. 41-58.

Antin, J., Yee, R., Cheshire, C. and Nov, O. (2011), "Gender differences in Wikipedia editing", *Proceedings of the 7th International Symposium on Wikis and Open Collaboration, Mountain View, CA, ACM, New York, NY*, pp. 11-14.

Bayliss, G. (2013), "Exploring the cautionary attitude toward Wikipedia in higher education: implications for higher education institutions", *New Review of Academic Librarianship*, Vol. 19 No. 1, pp. 36-57.

Benkler, Y. (2006), *The Wealth of Networks: How Social Production Transforms Markets and Freedom*, Yale University Press, New Haven, CT.

Black, E.W. (2008), "Wikipedia and academic peer-review – Wikipedia as a recognized medium for scholarly publication?", *Online Information Review*, Vol. 32 No. 1, pp. 73-88.

Brossard, D. and Scheufele, D.A. (2013), "Science, new media, and the public", *Science*, Vol. 339 No. 6115, pp. 40-41.

Brox, H. (2012), "The elephant in the room: a place for Wikipedia in higher education?", *Nordlit*, No. 30, pp. 143-155.

Chen, H. (2010), "The perspectives of higher education faculty on Wikipedia", *The Electronic Library*, Vol. 28 No. 3, pp. 361-373.

Chen, S. (2010), "Wikipedia: a republic of science democratized", *Albany Law Journal of Science and Technology*, Vol. 20 No. 2, pp. 249-326.

Dooley, P. (2010), "Wikipedia and the two-faced professoriate", *Wikisym'10 Proceedings of the 16th International Symposium on Wikis and Open Collaboration in Gdansk, Poland 2007*", *Article No*. 24, *ACM, New York, NY*, available at: http://dl.acm.org/citation.cfm?id= 1832803 (accessed 13 December 2013).

Eijkman, H. (2010), "Academics and Wikipedia: reframing Web 2.0+ as a disruptor of traditional academic power-knowledge arrangements", *Campus-Wide Information Systems*, Vol. 27 No. 3, pp. 173-185.

Jaschick, S. (2007), "A stand against Wikipedia", *Inside Higher Education*, No. 26, available at: www.insidehighered.com/news/2007/01/26/wiki (accessed 13 December 2013).

Knight, C. and Pryke, S. (2012), "Wikipedia and the university, a case study", *Teaching in Higher Education*, Vol. 17 No. 6, pp. 649-659.

Knorr-Cetina, K. (1992), "The couch, the cathedral, and the laboratory: on the relationship between experiment and laboratory in science", in Pickering, A. (Ed.), *Science as Practice and Culture*, The University of Chicago Press, Chicago, IL, pp. 113-138.

Konieczny, P. (2014), "Rethinking Wikipedia for the classroom", *Contexts*, Vol. 13 No. 1, pp. 80-83.

Lim, S. (2009), "How and why do college students use Wikipedia?", *Journal of the American Society for Information Science and Technology*, Vol. 60 No. 11, pp. 2189-2222.

Nielsen, M. (2011), *Reinventing Discovery: The New Era of Networked Science*, Princeton University Press, Princeton, NJ.

Saorín Pérez, T., de Haro, M.V. and Pastor Sánchez, J.A. (2011), "Posibilidades de Wikipedia en la docencia universitaria: elaboración colaborativa de conocimiento", *Ibersid*, Vol. 5, pp. 89-97.

Wannemacher, K. and Schulenburg, F. (2010), "Wikipedia in academic studies: corrupting or improving the quality of teaching and learning?", in Ebner, M. and Schiefner, M. (Eds), *Looking Toward the Future of Technology-Enhanced Education: Ubiquitous Learning and the Digital Native*, Information Science Reference, Hershey, PA, pp. 295-311.

Weber, S. (2004), *The Success of Open Source*, Harvard University Press, Cambridge, MA.

Corresponding author
Eduard Aibar can be contacted at: eaibar@uoc.edu

This article has been cited by:

1. Amalia Mas-Bleda, Mike Thelwall. 2016. Can alternative indicators overcome language biases in citation counts? A comparison of Spanish and UK research. *Scientometrics* . [CrossRef]
2. Dariusz Jemielniak, Eduard Aibar. 2016. Bridging the gap between wikipedia and academia. *Journal of the Association for Information Science and Technology* **67**:7, 1773-1776. [CrossRef]
3. Kayvan Kousha, Mike Thelwall. 2016. Are wikipedia citations important evidence of the impact of scholarly articles and books?. *Journal of the Association for Information Science and Technology* . [CrossRef]