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Piotr Konieczny

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Teaching with Wikipedia in a 21st century classroom: perceptions of Wikipedia and its educational benefits

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Piotr Konieczny
Hanyang University, Dept of Inf. Sociology Room 210
55 Hanyangdaehak-ro, Sangnok-gu* Ansan, Gyeonggi-do 426-791
82 10 4056 5659
piotr.konieczny@gmail.com

This paper explores the current perception of Wikipedia in academia, focusing on both the reasons for its unpopularity among some, and the reasons for its growing acceptance among others. First, the reasons that Wikipedia is still struggling to gain acceptance among many academics and higher education professionals are identified. These include common misconceptions about Wikipedia, doubts about its quality; uneasiness with the challenge it poses to the traditional peer review system; and a lack of career-enhancing motivations related to using Wikipedia. Second, the benefits of teaching with Wikipedia for educators, students and the wider society, as discussed in the current teaching literature, are explored. Finally, the paper presents an argument for using Wikipedia in a variety of ways to help students develop critical and academic writing skills.

Keywords: digital literacies , wikis, Wikipedia, service learning, writing

1 Introduction

There are winds of change blowing through the ivory towers of academia and education, winds that whisper, ever more loudly, the word that still makes many educators frown: Wikipedia. Yet this should not be so, as Wikipedia is not our foe, but rather, an ally a new and, perhaps, somewhat uncouth ally, but an ally nonetheless, and one that I will argue educators should embrace more wholeheartedly – for the good of our students and the wider society.

Throughout most of the developed world, within a little more than a decade, Wikipedia has become one of the most often consulted reference works, used by nearly all students, as well as most academics and educators (for general background on Wikipedia and interaction with it on the part of experts see Jemielniak 2014). Despite this, there is relatively little understanding in those circles of what Wikipedia is, and what should be done with it.

This paper focuses on two aspects of the educational use of Wikipedia within the higher education setting . In the first part, I will present the emerging findings on the reasons why Wikipedia is only slowly and grudgingly gaining acceptance among many academics and educators. This is based primarily on the corpus of seven works, Bayliss (2013), Brunet (2013), Chen (2010), Eijkman (2010), Knight and Pryke (2012), Meseguer et al. (2015)¹ and Xiao and Askin (2014), which comprise the entirety of the corpus of scholarly work on this topic, as of early 2015 (see Table 1 for a comparison of their methodology and findings). I begin by presenting the history of the attitudes of academics and educators towards Wikipedia, which are usually framed as generally shifting from a more negative view in the 2000s to a more positive view in the last few years, although I find that more research is necessary to establish with certainty that this was, indeed, the case. Next, the reasons that Wikipedia is still struggling to gain widespread acceptance among many academics and higher education professionals are identified. These include common misconceptions about Wikipedia, doubts about its quality; uneasiness with the challenge it poses to the traditional peer review system; and the lack of career-enhancing motivations related to using Wikipedia.

1 Meseguer et al. (2015) study incorporates and builds on an earlier work of its contributors, Eduard (2014) and Lladós et al. (2013), using the same dataset and arriving at more refined conclusions. For that reason those works are not reviewed or cited separately.

In the second part, I will outline the benefits of teaching with Wikipedia for educators, students and the wider society; this part of the article is based on a much larger body of works, as several dozens of papers have been published on various aspects of having students contribute to the site. In their comprehensive (up to October 2012) systematic review of scholarly research on Wikipedia, Okoli et al. (2012) identified two relevant bodies of literature: 41 works on “student readership” (which focus on measuring changes in students’ information literacy through assignments involving critically reading and using information from Wikipedia articles) and 17 works focusing on “student contribution” (which describes a wide variety of Wikipedia assignments, such as: creating a new article, translating, copy editing, reviewing or adding references to an existing article , and so on). (Their overview seems more comprehensive than that of Fessakis and Zoumpatianou (2012), which, while covering exactly the same period – up to October 2012 – lists only a total of 30 works concerning the educational uses of Wikipedia). In addition to the works discussed by Okoli et al. (2012) and Fessakis and Zoumpatianou (2012), the body of literature discussed in this paper has been supplemented with related works listed in the general Google Scholar database, as well as those reviewed by the specialized Wikimedia Research Newsletter index (<https://meta.wikimedia.org/wiki/Research:Newsletter>). Applying Okoli et al.’s (2012) grouping, I have identified a further 16 published papers that fit within the “student readership” group, and another 16 in the “student contribution” group that were published in the period from October 2012 up to March 2015.

Based on my analysis of that second group of works, I conclude that using Wikipedia in our teaching (primarily conceptualized as employing assignments that require students to post their written work to the site, and engage in critical, reflective thinking about that process) has a number of benefits. We can increase students' motivation (they appreciate sharing their work with the wider world, rather than a waste paper basket) , teach them digital literacy, collaboration and critical thinking skills, and enable them to engage in socially responsible activity (as student contributions enhance what is, in essence, a non-profit, universally-accessible reference work), as conceptualized in the service learning paradigm. This endorsement, nonetheless, should be tempered with the caveat that existing literature is unanimously focused on the positive aspects of the Wikipedia assignment, with no studies addressing the question as to what happens if it fails (an avenue for future research to pursue).

2 Conflicting attitudes to Wikipedia within academia

In one of the first published studies focusing on the perception of Wikipedia in academia (Eijkman 2010), the author observed that the debate about Wikipedia relied on anecdotal evidence concerning the critical attitude of academics towards its use. Indeed, most, if not nearly all of the works reviewed here seem to take for granted that Wikipedia is not popular in academia, a tendency epitomized by Dooley's (2010) opening sentence: "Ask any university faculty member whether her/his students use Wikipedia, and there's a good chance you'll hear complaints [...].", or Knight and Pryke's (2012) rhetorical question, "why then are academics so wary about the use of Wikipedia within universities?". Such opinions are commonly backed up by references to one or two newspaper articles focusing on criticism of Wikipedia by academics (a trend visible in, among others, Bayliss 2013, Brunet 2013, Chen 2010, Dooley 2010, Knight and Pryke 2012 and Meseguer et al. 2015). Such media references certainly contribute to our understanding of the public's view of Wikipedia, including its perception within academia and educational institutions (Brunet 2013). However, Eijkman (2010) suggests that the media, at least in the early 2000s, were prone to focusing on sensational critique, rather than presenting a more balanced opinion. Reporting on this three years later, however, Brunet (2013) suggested that the view of Wikipedia among scholars and educators, as well as in the media, is becoming more positive. Unfortunately, no dedicated scholarly study of longitudinal change in attitudes towards Wikipedia, either in press coverage or among academics and educators, has been published so far, which makes generalizations about a change in attitudes towards that platform somewhat problematic (and indicates a

promising avenue for future research).

With regard to works focusing on attitudes to Wikipedia in academia (Bayliss 2013, Brunet 2013, Chen 2010, Eijkman 2010) there is a consensus that around the mid-2000s a number of articles in mainstream and educational press (through not in any peer reviewed outlets) focused on the negative image of Wikipedia among educators, with influential educational periodicals such as InsideHigherEd publishing articles with titles such as “A stand against Wikipedia.” (Davidson 2007, Jaschik 2007, Nate 2007). Chen (2010) further noted that “Members of the academic community express mixed opinions at several blog sites”. Eijkman (2010) found that that a fifth of the respondents in his survey refused to allow their students to use Wikipedia, similar to Knight and Pryke (2012) who found it to be true for 58% of their sample. According to one media report, as many as 70% of educators still banned their students from using Wikipedia as of 2012, though the number has decreased from over 80% reported in 2008 (Olanoff 2012). As recently as two years ago, Purcell et al. (2013) observed that “in focus groups with teachers and students prior to the survey, Wikipedia was often noted as a tool teachers discourage or bar students from using because of concerns about the reliability of its content.”

Unfortunately, we do not have a clear picture of what practices, exactly, are being discouraged or banned, as reported studies and news stories often use a generic phrase (ex. “a ban on use of Wikipedia”), without specifying whether this refers to educators telling students, for example, “do not visit the site, ever” or “a reference work like an encyclopedia is a good starting point of research, but should not appear in your paper's references” (a crucial difference, to say the least).

At the same time there are signs that the time of Wikipedia being treated as a pariah among educators is drawing to a close. Almost 90% of American educators use Wikipedia in some fashion (Purcell et al. 2013), and similar numbers have been reported elsewhere; for example Knight and Pryke (2012) find that it is used for various purposes by three quarters of faculty and students in their UK sample. Instead of stories about students told not to use Wikipedia, we see reports on how professors are promoting the “teaching with Wikipedia” approach, roughly defined as assigning students assignments involving one or more of the following tasks: analyze how Wikipedia works, assess its reliability, learn when to use it and when to go beyond it, contribute to the site through written assignments that are published on it, and engage in critical, reflective analysis of those processes (Pollard 2008; Wilson 2008, Cummings and Barton 2008, Cummings 2009a; Chapman 2010; Wright 2012). Knight and Pryke (2012) reported that 70% of instructors in their sample used Wikipedia for background teaching information, while an “enlightened minority of academics have [directly] attempted to assimilate it into their teaching”. A number of professional publications, from journal articles to entire books, have transformed the idea of Wikipedia as a teaching tool from a preposterous idea to an acclaimed innovation (Rozenzweig 2006; Cummings 2009b; Reilly 2011; Konieczny 2012). It is not uncommon to see panels, workshops, and even entire tracks dedicated to the educational use of wikis in general and Wikipedia in particular; they can be found not only at dedicated conferences such as Wikimania and WikiSym, but also at major conferences like the American Sociological Association Annual Meeting.

Most visibly, in the past few years, professional academic organizations have actively begun to endorse teaching with Wikipedia, beginning in 2009 with the Society for Neuroscience (SfN), the American Psychological Society (APS) and followed by the American Sociological Association (ASA), with presidents of all of these organizations having expressed support for such an approach on a number of occasions (Carew 2009; Banaji 2010; Wright 2011; Wright 2012). In 2010, InsideHigherEd, who just three years ago ran an article about the bans on Wikipedia usage in educational establishments, reported on the Wikimedia Foundation's (the NGO which is responsible for maintaining Wikipedia) growing ties with academia, noting that "in recent years, academics seem to have gotten used to Wikipedia being around... and much of the discussion has shifted to how it can be applied constructively." (Kolowich 2010). By mid 2011, those organizations launched online initiatives encouraging their members to assign students to edit Wikipedia. In 2013, a similar project was launched by the National Communication Association (NCA). That year, the International Society for Computational Biology began offering monetary prizes for trainees and students who contribute to Wikipedia articles in their field (Bateman et al. 2013), while the University of California, San Francisco, attracted media attention over the new course it was offering, which will give credit to fourth-year medical students for editing Wikipedia articles about medicine (Bunin 2013). In early 2015, a Wikipedia Initiative has been announced by the Midwest

Political Science Association and the National Women's Studies Association.²

3 Peer reviewed studies on perceptions of Wikipedia within academia

Despite a possible shift in attitudes, recent studies suggest that many academics and education professionals are still highly skeptical of Wikipedia. Bayliss (2013), Brunet (2013), Chen (2010), Eijkman (2010), Knight and Pryke (2012), Meseguer et al. (2015) and Xiao and Askin (2014) present a number of reasons why Wikipedia keeps facing a rather cautionary attitude from the academic and educational establishments (see Table 1).

Table 1. Works on perceptions of Wikipedia within academia. Sample, methodology and key findings.

2 For the Wikipedia Initiatives of various professional academic associations mentioned here, see https://en.wikipedia.org/wiki/Wikipedia:WikiProject_Neuroscience/SfN2009_Welcome, http://www.asanet.org/about/wiki_Initiative.cfm, <https://www.psychologicalscience.org/index.php/members/aps-wikipedia-initiative>, <http://www.natcom.org/wikipedia/>, <http://www.mpsanet.org/Membership/WikipediaInitiative/tabid/948/Default.aspx> and <http://www.nwsa.org/wikiedu> .

Work	Sample and methodology	Key findings
Chen (2010)	201 respondents (response rate not available) subjects were international, worldwide faculty members recruited from academic listservs; (approximately half from the social sciences field, and approximately 80% from US/Canada); sampling type not specified	1) more familiarity with Internet and Web 2.0 tools leads to more familiarity and positive views of Wikipedia 2) most participants were concerned about Wikipedia's credibility 3) academic discipline is a major factor, in terms of faculty attitudes toward Wikipedia regarding teaching and research
Eijkman (2010)	a convenience sample-based survey of faculty from predominantly Australian universities across various disciplines; 99 respondents out of the 137 surveyed	1) social science educators are more skeptical of Wikipedia 2) approximately half of the educators discourage the use of Wikipedia among the students 3) knowledge of Wikipedia is negatively correlated with views on it 4) "implicit if not explicit awareness among academics that Wikipedia... [is] a disruptor of conventional academic power-knowledge arrangements"
Knight and Pryke. (2012)	133 respondents from a survey of academics at Liverpool Hope University (response rate was 31%)	1) Wikipedia's model of knowledge creation (collaborative, no traditional peer review, anti-elitist, non-proprietary, anonymous) is at odds with the academic traditions 2) 74% of surveyed academics use Wikipedia 3) 58% tell their students not to use it
Bayliss	sample size: 5 (unknown number)	1) a lack of understanding of Wikipedia

(2013)	<p>declined to be interviewed)</p> <p>subjects were selected based on experience with online collaborative, educational tools</p> <p>semi-structured interviews with “members of academic teaching staff” at an unidentified UK Business School)</p>	<p>(ex. that it is non-profit, or that it has internal, collaborative collective intelligence peer-review system)</p> <p>2) a negative attitude toward collaborative knowledge produced outside academia</p>
Brunet (2013)	<p>sample: 5 (unknown number declined to be interviewed)</p> <p>unknown subject selection criteria</p> <p>interviews with faculty members at University of Windsor (Canada) from various disciplines</p>	<p>1) a general lack of understanding of how Wikipedia works</p> <p>2) a negative attitude toward collaborative knowledge produced outside academia</p> <p>3) lack of institutional support, and perceived widespread suspicion as to whether contributing to Wikipedia would be well received by one’s peers</p>
Xiao and Askin (2014)	<p>120 respondents to a survey advertised on listservs and to specific universities (response rate not clear)</p> <p>survey was announced to “leading” universities and large research listservs</p>	<p>1) engagement with Wikipedia leads to improvement of one’s views of the site</p> <p>2) the researchers’ academic environment and institutional support has an impact on their opinions about Wikipedia</p>
Meseguer et al. (2015)	<p>no sampling: survey was sent to all of the 2,128 faculty (800 respondents) members from the Open University of Catalonia, Spain, of various disciplines.</p>	<p>1) positive views of Wikipedia are influenced by one’s colleagues perception of it and one’s own perception of Wikipedia’s quality</p> <p>2) a strong positive perception of Wikipedia’s quality among faculty members</p> <p>3) institutional support for Wikipedia</p>

		and other open collaborative tools can significantly improve attitudes towards Wikipedia
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While the anecdotal, mass media reports from the 2000s suggested that many academics were primarily concerned about the quality of Wikipedia, a claim repeated in a number of studies (Brunet 2013, Dooley 2010, Eijkman 2010, Knight and Pryke 2012), recent quantitative data suggests this is no longer accurate (to what degree it was in the past is a matter for further research, particularly given that said anecdotal claims were never based on any quantifiable data). In fact, Dooley (2010) and Meseguer et al. (2015) noted that most of the faculty they surveyed had positive views of Wikipedia's quality, though Knight and Pryke 2012 research concluded otherwise (poor operationalization of terms like quality, credibility or reliability, used in those studies, being a possible factor to blame). Existing research on Wikipedia's quality is pretty unanimous in showing that the Wikipedia crowdsourcing model of knowledge production can produce content of similar quality to expert output, and in much greater quantity. This is not to say that Wikipedia is free of errors – it is certainly not; though neither is expert-produced content. However, Wikipedia has no more errors or controversies that can be found in traditional encyclopedias such as Britannica (Messnera and DiStasob 2013, Reavley et al. 2011). Time and again, Wikipedia's quality and reliability has been shown either on par with or actually outperforming that of traditional encyclopedias, with the notable exception of readability, as the quality of the prose in Wikipedia articles is usually found to be inferior compared to that in more professionally edited outlets (Reavley et al. 2011). For more information on Wikipedia's reliability and quality I refer interested readers to two recent reviews of relevant literature on that very topic, compiled by Joo and Normatov (2013),

and Mesgari et al. (2014).

If concerns over quality are not a major factor, how can the widespread notion of Wikipedia being unpopular in academia be explained? A major reason for the continued criticism of Wikipedia, emerging as a common theme in cited research, is the lack of understanding of a number of fundamental aspects of the project. Xiao and Askin (2014) noted in their study of factors leading academics to contribute to Wikipedia that “previous experience with Wikipedia seems to lead to more positive responses”. Meseguer et al. (2015) concluded that one's perception of Wikipedia's usefulness and quality is significantly and positively correlated to whether one will consider using it as a teaching resource. Correspondingly, poor knowledge about Wikipedia in particular, and about open access and collaborative knowledge creation models in general, are negatively correlated with views on Wikipedia. Yet only one of five of Brunet's (2013) interviewees “seemed to know or have studied in some way how the Wikipedia worked”; similarly only half of Xiao and Askin's survey respondents (2014) knew that Wikipedia entries undergo some form of review process, and most of them still “did not know or could not give specifics...” of that process or were “vague or incorrect”.

One of the reasons why Wikipedia is often misunderstood is that the public generally lack the knowledge that it is, in fact, a *non-profit* organization. Two out of five of Bayliss's (2013) interviewees expressed concerns about "politics and motivation behind [Wikipedia's dominant position on the Internet]", incorrectly believing that "this is a commercial business; it wants to make money" and "they are obviously doing it from a business perspective". Though her sample was small, her findings correspond with the results of Glott, Schmidt and Ghosh's (2010) survey of Wikipedia readers, which found that about 20% did not realize the project was non-commercial. This can be explained by the fact that we are used to most of our services being provided by commercial companies – Google, Facebook, Youtube, Twitter, etc. In the Top 100 Most Popular Websites, as reported by Alexa Internet Statistics, Wikipedia is the only non-profit. As a result, a significant number of educators and academics may operate under a mistaken assumption that Wikipedia is a commercial project. As Bayliss (2013) observes, they are therefore distrustful of Wikipedia's dominant position as the provider of information on the Internet, cynically suspecting it of attempting to somehow “sell” a product, “corrupt” the students and “undermine” the educational system in pursuit of monetary gains. Contrary to such views, Wikipedia is not selling anything; in fact it is a product of a social movement whose mission is the delivery of free (both as in free speech – *libre* – and as in free beer – *gratis*) encyclopedic knowledge to everyone (Konieczny 2009).

Another major reason why academics and educators are suspicious of Wikipedia lies in our unfortunate if understandable negative attitude toward knowledge produced outside academia. Wikipedia is written primarily by anonymous volunteers, many of whom are amateurs, not experts. Wikipedia content is not subject to a traditional peer review, and this makes us instinctively cringe and declare it “unreliable”. Chen (2010) points to lack of credibility as academic faculty’s primary concern about Wikipedia. Brunet (2010) and Bayliss (2013) both find a negative attitude among educators and academics toward collaborative knowledge produced outside academia. Eijkman (2010) explicitly states that the primary reason for academia's distrust of Wikipedia is a “philosophical tension”: the threat it offers to the traditional model of the production of knowledge. Wikipedia democratizes it, disrupting the power-knowledge arrangements which in the past gave power to the academics through the peer-review and academic press systems. Knight and Pryke (2012) similarly note that Wikipedia's unpopularity is likely related to its model of knowledge creation (collaborative, no traditional peer review, anti-elitist, non-proprietary, anonymous) being at odds with the academic traditions. Xiao and Askin (2014) noted that only about a fifth of researchers in their sample felt comfortable with having their contributions reviewed by Wikipedia users, with majority citing concerns over reviewers’ backgrounds (biased, non-experts, etc.). Yet perhaps the Wikipedia mode of knowledge production is not so new after all; Loveland and Reagle (2013) argue that it fits within a paradigm of stigmergic accumulation (revising and improving prior versions of a text) that has been an aspect of encyclopedic and to a lesser extent even academic knowledge

production for centuries. All that Wikipedia does is that it democratizes that process through online crowdsourcing, taking it to the next level of efficiency.

Meseguer et al. (2015) draw attention to the perception of one's professional colleagues' opinion about Wikipedia's perceived quality, suggesting a causal link between colleagues' views and one's own perception of Wikipedia quality. The authors conclude that the strong peer culture within academia makes the importance of role models very significant. Further, they observe that “a growing number of academics think it is very useful and desirable to publish research results or even intermediate data in open repositories”, an attitude that also correlates positively with positive views of Wikipedia, and conclude that as instructors and academics become inevitably more familiar with open repositories and Wikipedia, their support for those tools will keep increasing. Signs of generational change were also suggested by Zlatos (2014), who in a study of digital literacy among librarians found a negative correlation between a librarian's age and views on Wikipedia.

The above, nonetheless, does not explain why the participation of academics in writing or editing articles for Wikipedia, either as teachers and contributors, is so low. One of the answers likely lies in the classic free rider dilemma. The majority of Internet users gladly consume Wikipedia, but far fewer contribute to it. The majority of content on the site has been created by a small group of the most active volunteers; the classic 80/20 rule holds well on Wikipedia: 80% of its content is created by 20% of its most active editors (Voss 2005). Educators and researchers have a number of related excuses. Describing the prevalent feelings at his institution, Brunet (2013) noted that contribution to Wikipedia "was [seen as] a noble idea but due to the current traditions of the academy and economic cut backs, [...] neither feasible nor desirable". He quoted a participant who claimed that contributing to Wikipedia was a form of "academic suicide", and cited a number of more mundane concerns such as: "lack of time, lack of academic credit, and overall lack of resources to do work not directly related to their professional responsibilities." We have data to collect, papers to write, students to teach, tenure assessment to prepare for... and even if we were to agree that contributing to Wikipedia is as valuable, we are simply not rewarded sufficiently for it. Xiao and Askin (2014) similarly noted the lack of institutional support as a factor holding back academics' involvement with the project, and observed that in the few cases where researchers' contributions to Wikipedia were recognized by their department, their involvement with the project was likely to increase

In summary, most academics and educators seem to use Wikipedia, though they are not very familiar with how the site really operates (Bayliss 2013, Brunet 2010, Xiao and Askin 2014), and that lack of familiarity can lead to mistaken assumptions, distrust and cynicism. Rather than concerns over quality, more common are concerns over credibility, related to the challenge that open collaborative tools pose to the traditional model of hierarchical knowledge creation in academia (Chen 2010, Brunet 2010, Eijkman 2010). At the same time, Bayliss (2013), Eijkman (2010) and Xiao and Askin (2014) observed that for the (likely growing) minority who are more familiar with Wikipedia, their attitudes become more positive, and the distrust due to mistaken assumptions of low quality or hidden interests disappears. With many scholars influenced by their colleagues' opinions (Meseguer et al. 2015), and given a slow but steadily growing number of endorsements of Wikipedia in the world of academia, and similar incremental increases in the institutional support for engagement with that project (Brunet 2013, Xiao and Askin 2014, Meseguer et al. 2015), it seems reasonable to agree that with time, attitudes to Wikipedia within the education sector will improve.

4 Teaching students digital literacy skills

It is a simple fact of life that Wikipedia is widely used. Despite many instructors still telling the students not to rely on it, the same instructors use it themselves (mostly as a reference work, but some even as a cited source) to a significant extent (Lim 2009; Chen 2010; Dooley 2010; Head and Eisenberg 2010; Menchen-Trevino and Hargittai 2011, Knight and Pryke 2012, Meseguer et al. 2015). Besides, teachers disapproval of Wikipedia use simply does not affect students' likelihood of using it (Chung 2012). They are not an exceptional demographic; Wikipedia is heavily used by most Internet users, and its reach is steadily increasing (Zickuhr and Rainie 2011).

Given Wikipedia's reliability, its widespread use is not something to be concerned about. Rather, the worrisome issue is the general lack of understanding on the part of the students, the general public, and even educators and academics of the basic elements of Wikipedia, such as the fact that it is non-profit, freely licensed, or written by volunteers. This is further compounded by the fact that judging the reliability of a Wikipedia article requires somewhat different skills from judging whether a printed source is reliable (Menchen-Trevino and Hargittai 2011; Zickuhr and Rainie 2011; Bayliss 2013). The problem is not limited to Wikipedia: many have problems evaluating online sources in general (Hammett 1999). Most students lack expertise even with Google, let alone with Wikipedia (Badke 2009:122-124). This makes them vulnerable to scams (there are entire organizations out there which will gladly sell Wikipedia content to unaware buyers, as described in Anderson (2010)), prevents them from knowing how to properly mark or correct errors, or results in attempts to add content to Wikipedia that is promotional, biased, or a copyright violation, to name just some of the most common problems. Recognizing the scope of the problem, Lim (2009:2200) noted: "educators and librarians need to provide better guidelines for using Wikipedia, rather than prohibiting Wikipedia use altogether", a sentiment echoed by Reilly (2011), Bayliss (2013), Todorinova (2015) and others.

Teaching the students how to use more sophisticated sources, and increasing their digital literacy, is a recommended component of a 21st century course (Evans 2006; Pollard 2008; Badke 2009:128; Smallbone and Witney 2008). Knowing when to use Wikipedia and when to go beyond it is a crucial aspect of modern digital literacy we need to teach in today's classroom, just like in the past we needed to teach the students about why and how to use academic articles or books. The need to teach them about these sources of knowledge has not disappeared, but the context has changed. Where once the students had to learn how to navigate the library shelves, and later, Google and its like, today, they often look at Wikipedia articles. And herein lies a new challenge: Lim (2013) notes that students often have some vague grasp of when a Wikipedia article is reliable, but they usually limit themselves to a quantitative analysis: if an article has many references, they are satisfied, never bothering to analyze their quality. Todorinova (2015) shows that most students cannot distinguish between good and bad references, and a substantial number think that the quality of references can be discerned from things like reference numbering, not realizing that references are usually ordered alphabetically or (in Wikipedia) in the same order in which they appear in the text.

Through the process of engaging with Wikipedia and analyzing the articles and their reference sections, as well as contributing to them, students can learn that not all references are equal. Miller (2014), in a study of a group of students, found a measurable improvement in their research skills. Similarly, Freire and Li (2014) compared students who submitted a traditional writing assignment versus those carrying out a wiki one, and in the case of the latter, noticed significant improvements in students' ability to find and include references, as well as in their writing quality in general.

It is worth noting here that Wikipedia assignments do require students to release their content under a free license (as per Wikipedia's terms of use). As recommended by Konieczny (2012), we should secure their permission for this (a note in a syllabus may be sufficient). Curiously, the concerns over assigning students an assignment that requires them to license their copyright seem to be mostly ignored in existing literature, an oversight that ought to be addressed by future research on the use of Wikipedia in the classroom. On the bright side, rather than seeing the issue of copyright as cumbersome or technical, it may be worthwhile to consider turning this topic into a short discussion about copyright, and introducing students to Wikipedia's sister sites, such as Wikimedia Commons, one of the world's largest collection of freely licenced media. Knowledge of such sites, and copyright in general, is emerging as a new aspect of digital literacy in the modern era (Yankova et al. 2013).

Many, if not most universities, still offer no classes dedicated to improving students digital literacy, and the few that do offer those classes are either not obligatory, not comprehensive enough, or both (Zlatos 2014). Incorporating Wikipedia assignments into a course offers a convenient way of addressing this failing, while retaining focus on our core topics.

5 Increasing students motivation: editing with Wikipedia is fun

Contributing to Wikipedia, seeing their work used, commented upon and improved by others, can show students that they have the power to make a positive impact on the wider world. An incredible amount of creativity and labor is wasted around the world when students' papers are discarded after being graded. Submitting their work to Wikipedia allows their work to bring benefit to – and be improved upon – by the entire world. Although initially some students may be apprehensive about their work being in the public domain, most come to appreciate this aspect of their work (Davies, Pantzopoulos and Gray 2011). This echoes past research that has repeatedly shown that students are more motivated to participate in activities they see as having a visible impact on the real world (Weiger 1998; Hollis 2002).

Another benefit of familiarizing the students with the wiki platform is the fact that it is increasingly used by various organizations. Students often express concerns that the skills they take from academia have little practical application in the modern job market (Hoop 2012). The skill in editing wikis (Wikipedia employs MediaWiki software, the most widespread wiki software worldwide), described as a “a required job skill [of the near future]” (Blessinger and Wankel 2012:181), is likely a valuable addition to their resume.

The Wikipedia writing assignment also answers a related concern often raised by students: that there is not enough connection between the theory they are learning about and 'real life' (Hoop 2012). No matter how theoretical a topic, the Wikipedia assignment involves interaction with the real world, and shows the students that there is an audience – consisting of both the Wikipedia editors and readers – waiting for the topics they are learning about to be properly described on Wikipedia.

Upon learning that the Wikipedia assignment teaches them skills that are useful in the workplace, allows them to contribute something useful to the website they and their peers use on a regular basis, and earns them the recognition of the Wikipedia community, the students are much more likely to reevaluate the task of the writing assignment, changing it from a 'must-do assignment' to something 'fun'. Indeed, millions of Wikipedia volunteers list that very reason – fun – as their primary motivation for contributing to Wikipedia (Nov 2007). While no assignment will motivate every single student, Wikipedia assignments have been reported as motivating students by a number of educators (Banaji 2010; Chen and Reber 2011; Wright 2012; Szymczak 2013). That said, as predicted by Eisen (2012), I have also observed that the students see the Wikipedia assignment as rather challenging.

I daresay that convincing a student that researching and writing papers is 'fun' and 'useful' is always a worthwhile achievement, and the assignment itself is likely to increase their lifelong interest in the learning and academia; Wikipedia is a very helpful tool for achieving just that.

6 Pedagogical benefits of contributing to Wikipedia

Fessakis and Zoumpatianou (2012) provide a useful literature review of expected learning outcomes in the context of educational assignments on Wikipedia. In addition to the development of digital and informational literacies, increased motivation and familiarity with the wiki software discussed previously, they list the following learning outcomes: concept exploration and understanding, learning of research methodology, developing scientific communication skills, learning critical thinking, developing collaboration skills, and improving language skills.

In terms of pedagogical theory, Wikipedia's exercises can be seen as an example of service learning. This approach has been described by Hollis: a subtype of community work that is structured and has academic attainment as its primary goal (Hollis 2002). Weigert (1998) describes six elements of service learning, all of which show much synergy with the Wikipedia assignments:

- 1) students contribute to the wider society – yes, Wikipedia is used by a major and growing portion of the general populace;
- 2) their contributions meet a need and have visible results – yes, they create or improve encyclopedic articles that are going to be read by dozens if not thousands each day;
- 3) the need is recognized by the community – yes, Wikipedia invites new contributors, and clearly welcomes students and educators who want to contribute to the site (through dedicated pages and programs I will introduce later);

- 4) the students' contributions are connected to the course objectives – yes, students acquire skills in objective, neutral, encyclopedic writing on academic topics, as well as skills related to digital literacy;
- 5) the students' contributions allow reflections upon themselves – yes, this is easily achieved through related assignments such as class discussions and reflexive writing assignments about students' editing experiences;
- 6) their contributions can be easily assessed and the community can contribute to the assessments – yes, this is very easy to achieve on Wikipedia, as the wikis provide us with detailed “track changes”-style information on what and when each individual student contributed, and it is available to all readers.

This point about reflexive contributions is worth considering in detail. A problem common in many types of writing-intensive courses is that the students will not create their own arguments, and thus fail to develop analytical skills, (Massengill 2011). This can indeed be a problem for a Wikipedia assignment, which on the most basic level can be seen as just summarizing existing knowledge. A limitation of encyclopaedic writing that is practiced on Wikipedia is that it is not geared to generating new knowledge, but instead it is a form of a literature review that is meant to synthesize , knowledge from existing sources. To develop the higher-level thinking that is essential for critical thinking, therefore, we need to go beyond just writing an article on Wikipedia. Accordingly, an important goal of a writing activity should be “asking students to make their *own* arguments [which] is a critical moment of interaction between the writing process and higher-level thinking (Massengill 2011:2-3).”

Thus, students should discuss in class or write essays about their experience of participating in the Wikipedia community, about how their article complements or goes beyond the textbook, about their thoughts on the collaborative knowledge creating process, and other topics that can be seen as related to the particular subject studied. For just one example, the concept of free license can familiarize the students with concepts related to digital rights such as free culture, copyright monopolies, and shared/remix culture. A good place for students to practice such reflexive writing is – yet again – Wikipedia itself, where each article is accompanied by a discussion page (tab). Reilly (2011) provides a useful discussion of benefits the students can acquire through sharing their thoughts in that public space, noting that doing so is a valuable teaching experience about the practical agency of content creators, and about the credentials of Wikipedia knowledge, and also that it helps students to develop reflexivity with regard to their own writings. Pollard (2008) also stresses the significance of participating in the Wikipedia discussion space, noting that it gives students a space to discuss the construction of the entry and speak out in defending any edits.

Discussing why it is permissible to copy or remix freely licensed media is also helpful in discussing concepts relating to plagiarism, which I find is never a topic than can be exhausted completely . A potential side advantage of using a Wikipedia assignment, if approached properly, might be a reduction of plagiarism in written assignments, as suggested by Cubric (2007), Konieczny (2012) and Sormunen et al. (2012:311). This can be achieved through student education (Wikipedia has a large numbers of helpful guides and manuals on avoiding plagiarism), and by drawing students' attention to the fact that the Wikipedia community also has a large number of volunteers who specialize in identifying plagiarized content, and who employ dedicated software to catch copy-and-paste jobs. Further, its public nature may also give students second thoughts about committing unethical actions that will be visible for the entire world, for eternity. As the existing literature primarily suggests that Wikipedia assignments may reduce plagiarism, rather than provides data confirming this indeed happens, the potential of the Wikipedia assignment to reduce plagiarism is a promising topic for research.

This process of collaborative writing on Wikipedia and participating in the discussions with other editors sports all the advantages of collaborative learning as discussed by McDuff (2012), namely, it energizes the students, moving them from passivity into actually using the newly found knowledge, both inside and outside the classroom. This can be witnessed in particular in their interactions with the Wikipedia community, when they often have to use this knowledge to present and justify their edits. This is also observed by Su and Beaumont (2010), who note that wikis embody social-constructivist principles, allowing for much more efficient feedback, better involvement of students in the knowledge creation process, and, in essence, are “exactly the environment needed to promote peer and self-assessment.”

As recommended by Massengill (2011), the students could also be asked to take the scholarly, encyclopedic piece they wrote and apply it to something they observed in their own life, or in media they are familiar with. There is a synergy here with improving their skills in evaluating resources, something that is an easy-to-incorporate element in many a writing assignment (Badke 2009:125). Here the Wikipedia assignment offers much potential. Whereas Massengill uses this exercise to great benefit in an activity with three scholarly pieces, the Wikipedia activity results in each student finding a much larger number of sources (Rosta and Kraut 2013). They will often have to evaluate many sources already present in the article, and then search for better ones, properly covering their assigned topic. They will thus be engaging with a significant body of scholarly literature; often involving dozens of books and academic articles, as well as a number of other sources (such as news reports).

Yet another potential benefit has been proposed by Roberts (2008:15). He notes that certain forms of teaching suffer from an over-reliance on traditional scholarly sources, which can inadvertently reinforce dualistic thinking and a “dependence on an authority who has right answers.” The Wikipedia exercise is great in that it allows those concerned to avoid this, introducing students to an environment in which expert authority is more likely to be questioned, and where reliable knowledge can be created through a collaborative practice that is lacking in more traditional assignments, yet increasingly common in the wider society (Bayliss 2013). On a related note, it has been noted that students often feel they have nothing new to add to the scholarly conversation (Gaipa 2004). By contributing to Wikipedia, and synthesizing numerous scholarly sources, rephrasing them in their own words and producing content aimed at a reader with no greater understanding than the students themselves, students can be shown that they too can create a valuable resource and participate in educating the world.

A worthwhile idea comes from the adaptation of the “writing before students” activity suggested by Edwards (2002). If the teachers contribute to one or more Wikipedia articles, and keep on doing this throughout the course, those experiences can be used to increase the efficiency of any “teaching with Wikipedia” activity. The students are likely to feel a closer bond with the lecturers who help them by illustrating the Wikipedia exercises with the stories of their own experiences on the site. Baytiyeh and Pfaffman (2010) similarly note that Wikipedia offers an opportunity for instructors to reduce the distance between themselves, the students and the wider society, and note that it brings students into a virtual environment that values motivations such as altruism and the desire to learn.

Assigning students to write Wikipedia articles also follows the recommendations for writing-intensive classes—in particular, requiring students to write drafts and revisions of each essay, engaging in close mentoring work with students in discussing their writing, and conducting class workshops in which students take turns reading each others’ works-in-process (Bidwell 1995; Grauerholz 1999; Roberts 2008).

In a tie-in to innovative assignments from the field of visual sociology, students often produce sociological media, such as photographs, an activity encouraged for the sociological curriculum by Eisen (2012). Those media can serve a two-fold role: besides educating students about a social problem they illustrate, they can be used to enrich Wikipedia articles about those very social problems. In fact, any class that uses tools of visual sociology produced by the students themselves can be easily enhanced with a Wikipedia assignment in that fashion – even if there is no room in the class for a Wikipedia writing assignment. Uploading the media to Wikipedia, finding a relevant Wikipedia article or articles and improving them with student-produced media is an easy enough modification, providing many of the benefits discussed here (increasing student motivation and familiarity with wikis, and enhancing knowledge available to the general public).

7 Writing for Wikipedia benefits the general population

Science is about sharing the fruits of our research with the wider world – but these days, that world is likely getting its information from Wikipedia (Zickuhr and Rainie 2011). We have an opportunity to turn it into a boon: perhaps the most important aspect of teaching with Wikipedia is the benefits that can and already are being reaped by the general public. One of the major motives behind APS' and ASA's launching of their Wikipedia Initiatives is the hope that, in line with the service learning paradigm, the increased involvement of psychologists, sociologists and their students with the global, open access and non-profit encyclopedia will lead to the drastic improvement of social science content available to the general public. And it is not just the general public who will benefit; as Bunin (2013) noted, one of the rationales for assigning students to improve Wikipedia's article on medicine, presented by the interviewed course instructor, is that “[Wikipedia] is second to Google as the most frequently used source by junior physicians”. In a wider context, already in 2006 Rosenzweig discussed the reasons why we and our students should contribute to Wikipedia, drawing our attention to Merton's concepts of the communism of the scientific ethos, and communal sharing.

There are grounds to expect that we can, with a little effort, substantially improve the public understanding of science through the teaching with Wikipedia approach. Rosta and Kraut (2013) recently reported on a project launched by the Association for Psychological Science, which had over a year's head start on the ASA's project. Having analyzed the efforts of 640 undergraduate and graduate students who edited Wikipedia articles on scientific topics in 36 university courses, they found that the "students substantially improved the scientific content of over 800 articles, at a level of quality indistinguishable from content written by PhD experts."

I will end this overview of the "teaching with Wikipedia" approach with a word of caution. The published works on "teaching with Wikipedia" seem, with minor caveats, highly supportive of this new proposed method. What seems to be missing from the studies is a more refined discussion concerning where such assignments do not work. Likely, this is a result of publication/confirmation biases: educators who find Wikipedia helpful are much more likely to publish reports of their successes, whereas those who find it unhelpful usually do not report on their failed experiments. This is a shame, as learning more about what does not work would be very valuable in further refining this teaching tool; hopefully this observation will encourage a more critical discussion of this topic in future studies.

8 Conclusion

Slowly, but steadily, the attitude of academics and educators to Wikipedia is changing. Still, too many of us labor under mistaken assumptions, such as that the site, lacking traditional peer review, provides inferior, unreliable information. We are uneasy about the site's new, collaborative model of knowledge construction, which is not reliant on experts, despite the fact that we have plenty of peer reviewed studies assuring us of its quality. We are also too often concerned with "coming out", admitting to our students and even more, colleagues, that the site is a valuable resource we also consult (we do so, too). As long as such attitudes persist, we are denying ourselves access to one of the most revolutionary tools for educating the general public, and our students, about the topics we have spent years, if not decades, teaching about.

At this point I am reasonably confident that the “teaching with Wikipedia” approach offers an efficient way of replacing many of the traditional (“write-grade-shred-forget”) writing assignments with a student-motivating contribution to a popular, public and non-profit project in the best traditions of the “service learning” and public science paradigms. The Wikipedia writing assignment encourages not only students but also the instructor to be engaged in a continuing process of improving teaching and learning, while answering the call to contribute to the largest free reference work ever created. We may not be able to educate every single individual, but working with Wikipedia we can ensure they have a high quality resource available to them for free, – and increase our students’ motivation to produce writing assignments at the same time.

The educational benefits of the Wikipedia assignment are best realized when it is combined with a reflexive segment, in which students can discuss their progress and experiences, often together with a number of “passing by” Wikipedia editors. It can enrich most courses that feature a writing assignment by allowing one to incorporate lessons on reliability and credibility of information, develop students critical thinking about Wikipedia, the primary reference work of the modern age, and provide students with practical skills regarding the editing of wikis – all increasingly useful skill sets for the 21st century new, digital literacies.

Of course, all roses have thorns. The Wikipedia assignment is not an assignment to end all assignments. Like all good things, it should be used in moderation, and to enrich our courses, not to become a goal in itself (as laudable as the principle of contributing to the world's largest and free reference work is). Students - and the world - can benefit from our engagement with the site, but they should also consider that just like encyclopedias of the past it is only the beginning of a proper research process, a new gateway portal (but nothing more) into the world of knowledge discovery.

In the end, several things are needed. We need to admit to ourselves that the site is widely used (by ourselves, not the least) and provides information on a par, if not exceeding, those of other reference works. We need to realize that the Wikipedia assignment has the potential to enrich our educational toolbox, not only in terms of our assignment offerings, but also as a way to educate the world about things we care about. We need to encourage institutional support for contributions to Wikipedia by researchers and students, through popularizing "Wikipedia initiatives", and recognizing participation in them through awards, career evaluations, and simple peer acceptance. And finally, we certainly need more research on how this assignment works, what happens when it fails, and how to make it even better.

On that final note, I'd like to summarize a number of promising avenues for further research outlined in this article. There are certain assumptions whose veracity is currently taken for granted that it would be useful to investigate and confirm, such as whether it is indeed true that the majority of academics used to have a negative perception of Wikipedia in the early 2000s, or whether this is a myth perpetuated by several journalists looking for attention-grabbing headlines. If, as seems likely, the academics and educators' attitude to Wikipedia is shifting, the nature of this shift is not well known. Further, whether one's academic discipline impacts one's attitude to Wikipedia (as suggested by Chen 2010, and Eijkman, 2010, Knight and Pryke, 2012 and Xiao and Askin 2014) is poorly understood; so are the implications of other factors, such as demographics (ex. age, nationality or gender, the latter not be discounted, given the major gender gap among Wikipedia contributors - Eckert and Steiner, 2013). Second, the existing literature is too narrowly focused on the "what works" approach; we need information about when the "teaching with Wikipedia" assignment fails, so that we can refine it based on constructive feedback. There are also a number of aspects of this topic that have not been properly researched (ex. plagiarism or the understanding of copyright). Finally, future studies would benefit from proper operationalization, facilitating comparisons of the topics discussed. Hopefully, this piece will increase the likelihood that research addressing the above topics will appear sooner, rather than later – and that more educators and researchers will engage, constructively, with the Wikipedia project.

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