

# Wikipedia and e-collaboration research: Opportunities and challenges

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## Abstract

*Wikipedia's precursor started in the year 2000 as a traditional online encyclopedia with content controlled by a small group of experts. In 2013 Wikipedia's current user-controlled incarnation was such a successful enterprise that an asteroid was named after it. We briefly discuss key opportunities and challenges in e-collaboration research on Wikipedia. The opportunities refer to studies on the impact of Wikipedia on individuals and organizations, as well as on the spontaneous formation of online communities. The main challenges discussed refer to the consensus-building nature of content creation in Wikipedia, making practical applications of findings somewhat limited, as well as data compilation difficulties.*

**KEYWORDS:** Wikipedia; wiki; e-collaboration; collaborative writing; structural equation modeling; WarpPLS

## Introduction

One can think of Wikipedia as a collection of “wikis”, of which the most abundant are articles on topics of general public interest. Wikis are user-readable data repositories (e.g., articles) that can be collaboratively created, modified and deleted by a group of individuals. The first wiki software, WikiWikiWeb, was developed by Ward Cunningham (see Figure 1).

**Figure 1: Ward Cunningham (left) and Jimmy Wales**



Wikipedia started as a traditional online encyclopedia called Nupedia, with content controlled by a small group of experts (Giles, 2011). Nupedia was founded in early 2000 by Jimmy Wales (see Figure 1) and Larry Sanger, and was not initially very successful. Its user-controlled incarnation, Wikipedia, was established in early 2001. In 2013 it was such a successful enterprise that an asteroid was named after it; the asteroid “274301 Wikipedia” (Workman, 2013).

E-collaboration is defined as “collaboration using electronic technologies among different individuals to accomplish a common task” (Kock, 2005, p. i). In Wikipedia, editors collaboratively write articles, or wikis, using a markup language (often referred to as “wiki markup”, see figures 2a and 2b) that bears some similarities to the HyperText Markup Language (HTML; the standard markup language used to create Web pages). The main common task accomplished by Wikipedia editors is to create and maintain Wikipedia articles. Generally speaking, anyone can be an editor in Wikipedia.

**Figure 2a: Text for Wikipedia article as seen by regular readers**

The word “portmanteau” was first used in this context by [Lewis Carroll](#) in the book *Through the Looking-Glass* (1871),<sup>[14]</sup> in which [Humpty Dumpty](#) explains to Alice the coinage of the unusual words in *Jabberwocky*,<sup>[15]</sup> where “slithy” means “lithe and slimy” and “mimsy” is “flimsy and miserable.”

**Figure 2b: Script for Wikipedia article as seen by editors**

The word "portmanteau" was first used in this context by [[Lewis Carroll]] in the book "[[Through the Looking-Glass]]" (1871),<ref name="oed">{{ cite encyclopedia |year=2010 |title =portmanteau, "n." |encyclopedia=Oxford English Dictionary, third edition |publisher=Oxford University Press |location=Oxford |url=http://www.oed.com/view/Entry/148217 |accessdate=23 February 2011 }}</ref> in which [[Humpty Dumpty]] explains to Alice the coinage of the unusual words in "[[Jabberwocky]]",<ref name="multiple">Fromkin, V., Rodman, R., and Hyams, N. (2007) An Introduction to Language, Eighth Edition. Boston: Thomson Wadsworth. ISBN 1-4130-1773-8.</ref> where "slithy" means "lithe and slimy" and "mimsy" is "flimsy and miserable."

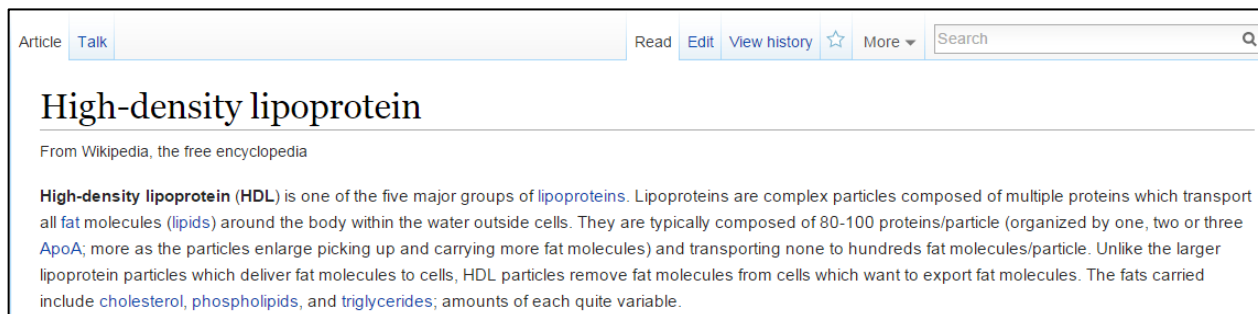
In this article we briefly discuss key opportunities and challenges in e-collaboration research on Wikipedia. The opportunities refer to studies on the impact of Wikipedia on individuals and organizations, as well as on the spontaneous formation of online communities. The main challenges discussed refer to the consensus-building nature of content creation in Wikipedia, making practical applications of findings somewhat limited, as well as data compilation difficulties.

## Wikipedia and e-collaboration research: Opportunities

**Impact of Wikipedia on individuals.** One research opportunity that seems to have been largely unexplored refers to the impact of Wikipedia on individuals. A great deal of the content that ends up in Wikipedia articles is contributed by expert researchers, who bring in knowledge in their areas of specialization. This is due to Wikipedia's "verifiability" policy (Wikipedia, 2015a), which encourages citation of published research.

The resulting widespread availability of expert knowledge on a number of subjects can have effects on individuals that are clearly worth exploring. For example, it would be interesting to explore the relationship between an individual's reading of Wikipedia articles on health issues (see Figure 3) and the individual's overall health.

**Figure 3: Wikipedia article covering an important health topic**



The image shows a screenshot of a Wikipedia article titled "High-density lipoprotein". At the top, there are navigation tabs for "Article" and "Talk", and a utility bar with "Read", "Edit", "View history", a star icon, and a "More" dropdown menu. A search box is located on the right. The main heading is "High-density lipoprotein", followed by the text "From Wikipedia, the free encyclopedia". The article text begins with "High-density lipoprotein (HDL) is one of the five major groups of lipoproteins. Lipoproteins are complex particles composed of multiple proteins which transport all fat molecules (lipids) around the body within the water outside cells. They are typically composed of 80-100 proteins/particle (organized by one, two or three ApoA; more as the particles enlarge picking up and carrying more fat molecules) and transporting none to hundreds fat molecules/particle. Unlike the larger lipoprotein particles which deliver fat molecules to cells, HDL particles remove fat molecules from cells which want to export fat molecules. The fats carried include cholesterol, phospholipids, and triglycerides; amounts of each quite variable."

One would assume that more access to specialized knowledge on health issues would help individuals make better decisions about their health, in consultation with their doctors, but it is reasonable to assume that many doctors would feel uncomfortable about their clients possibly challenging their (i.e., the doctors') knowledge. The possibility of a negative effect makes this a

research topic that is particularly worth exploring in view of the fact that counterintuitive findings can be uncovered.

Another research opportunity that refers to the impact of Wikipedia on individuals comes from a different angle. What is the effect of the creation of a Wikipedia article about an individual on the individual's career and life in general?

Some believe that Wikipedia can be successfully used to build a "personal brand" (Kalonatchi, 2013). However, Wikipedia's rules on article deletion involve written debates that are normally conducted publicly. Once an article is created, say, for an individual of debatable notability, a deletion discussion usually ensues. Such a discussion involves editors and includes votes, such as "Keep" and "Delete", and the rationale for them (see Figure 4).

**Figure 4: Entries of a deletion discussion related to a Wikipedia article about an individual**

- **Delete** Acting college administrators are not automatically Wikipedia notable. there would have to be significant coverage in reliable media. In this case, there is not.[E.M.Gregory \(talk\)](#) 21:16, 12 August 2015 (UTC)
- **Delete** This is a very new article, and it seems a shame to jump on it immediately with an AfD, but I clicked on the searches offered by [Stanleytux](#) as "substantial evidence" and found only three Google entries for each. It's not that US-related sources dominated the first pages, but that there were *only* three sources total. If the creator of the page can find local sources that perhaps we don't find in Google and add them to the page, then I'm happy to change my Ivote. If there is more work to be done on this, the creator can ask for it to be userified, and can continue to work on it without fear of deletion. [LaMona \(talk\)](#) 21:44, 12 August 2015 (UTC)

The rationales given for "Delete" votes may be quite embarrassing for the person who is the subject of the article being considered for deletion (Wikipedia, 2015b), and even detrimental to the person's career. For example, in the case of a young researcher who is being considered for tenure at a university (Wikipedia, 2015c), such a public debate on Wikipedia may end up negatively influencing the perceptions of the members of the university committees evaluating the tenure application.

**Impact of Wikipedia on organizations.** Another area comprising research opportunities refers to the impact of Wikipedia on organizations. A representative research question would be the following: What is the effect of the creation of a Wikipedia article about a small organization on the performance of the organization, particularly in terms of revenues? One would expect that revenues would go up, but in many cases the article creation may backfire – a negative deletion discussion or even negative content could have the opposite effect.

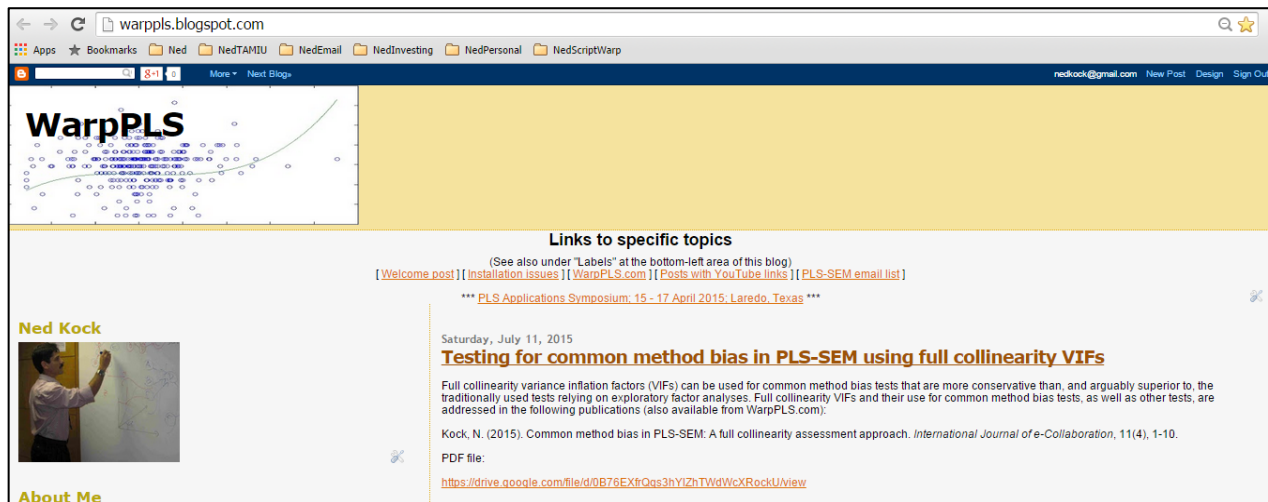
**Spontaneous formation of online communities.** Finally, Wikipedia can be seen as an instance of spontaneous formation of online community, building on a relatively simple technological infrastructure. Wikipedia can be seen as a social experiment whereby an online "world" has emerged and morphed into a mechanism to improve society.

A better understanding of this social experiment can help us not only understand how similar online communities may spontaneously form in the future, but also provide insights into our human nature. Are Wikipedia editors naturally altruistic, and if yes, is this a reflection of human nature in general? Or are the editors' contributions motivated by self-interest, with the goal of increasing their social capital within Wikipedia, or by increasing citations to their own research?

## Wikipedia and e-collaboration research: Challenges

**Consensus-building nature of content creation in Wikipedia.** Web 2.0 tools enable the creation and growth of Web sites with user-generated content. In Web sites created by many Web 2.0 tools, such as blogs, one or a few users control the content. Wikipedia is very different in this respect, as content is created as part of a consensus-building process.

Figure 5: Example of blog



One of the consequences of this consensus-building process underlying content creation is that Wikipedia articles cannot be easily used for promotional purposes. Normally promotional use of media of any kind involves the manipulation of a message by one or a few individuals to influence many. By “manipulation” we do not necessarily mean providing false information, but to design the message to achieve its goals – e.g., by emphasizing useful features of a software tool, in posts on a blog about the tool.

Attempts at self-promotion and promotion of others on Wikipedia can, and often do, backfire. This poses a challenge to e-collaboration research building on Wikipedia, in terms of its implications for practitioners. If one cannot control Wikipedia content, how can a researcher provide advice to, say, marketing professionals, based on research suggesting that the creation of a Wikipedia article about a small business organization increases that organization’s sales? Practical applications of findings from research on Wikipedia are likely to be somewhat limited due to the lack of control inherent in user-generated online content.

**Data compilation difficulties.** While there are many tools available to analyze Wikipedia content, the largely textual nature of such content poses another challenge for researchers – data compilation. For example, a key variable that would likely be of interest to e-collaboration researchers is the quality of a Wikipedia article. There is a consensus-based scheme whereby quality ratings are assigned to articles, but many articles are not rated.

So if an e-collaboration researcher wants to conduct a study on the association of a possible predictor variable (e.g., number of words of an article) and the quality of an article, the researcher will have to either restrict the analyses to rated articles or generate ratings’ scores for a broader set of articles.

The latter option can be implemented with the help of raters who would score articles based on a rubric, where the rubric would have to be developed by the researcher. The different sets of scores generated by the raters could then be aggregated into a latent variable, where each set of scores produced by a rater would be one of the indicators of the latent variable (Kock, 2010).

This type of data could be analyzed with structural equation modeling software such as WarpPLS, which is widely used in e-collaboration research (Kock, 2010; 2011; 2013) and implements composite-based as well as factor-based structural equation modeling algorithms (Kock, 2015a; 2015b).

## Discussion and conclusion

We briefly discussed above key opportunities and challenges in e-collaboration research on Wikipedia. The opportunities discussed refer to studies on the impact of Wikipedia on individuals and organizations, and the spontaneous formation of online communities. The main challenges identified and discussed refer to the consensus-building nature of content creation in Wikipedia, as well as data compilation difficulties.

The extensive Web site formed by the immense and growing number of Wikipedia articles in various languages is arguably one of the most successful sites ever created, both in terms of online visits and actual value provided to users. Wikipedia is also an online community, essentially governed by volunteer editors. It is not, however, an extensively studied online community – there is much room for improvement in this respect. It is our hope that this article will stimulate future e-collaboration research on Wikipedia.

## Acknowledgments

Various publicly available definitions, descriptions, and multimedia materials related to wikis and Wikipedia have been used as a basis for this article. Particularly useful sources were the following Web sites: Likesuccess.com, WarpPLS.com, Wikipedia.org, and Wired.co.uk.

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