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# Wikipedagogy: Enhancing student motivation and collaboration in an economics class with Wikipedia

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## ABSTRACT

Wikipedia is not only a source of knowledge and a medium for communicating research but also opens new avenues for teaching in academia. In this article, the authors provide theoretical considerations and practical guidance for setting up a postgraduate economics course where students disseminate research on income inequality in Europe to a greater audience on Wikipedia. Publishing in the well-known and widely-used online encyclopedia has been shown to have a lasting impact on student motivation. Moreover, the authors assess the benefits of reciprocal feedback options and collaborative editing, and also the costs that accompany Wikipedia.

## KEYWORDS

Collaboration; inequality; motivation; teaching; Wikipedia

## JEL CODES

A23; D31; D63

In recent years, public interest in economic inequality has been rapidly rising following the secular trend of increasing inequalities in the United States and Europe (Piketty and Saez 2014). An indicator of the growing urge for knowledge about inequality is the number of online searches. Google Trends shows that Web searches for “income inequality” have increased, particularly after the Great Recession at the end of the early 2000s. Google points to corresponding Wikipedia articles for many search items; however, the largest online encyclopedia provides only one entry on general “economic inequality” and no specific article on “income inequality.” Moreover, Wikipedia features almost no information on income inequality in individual countries. We present guidelines for bridging the demand for knowledge and the lack of available information in a postgraduate economics class where students collaborate to enrich Wikipedia with articles on income inequality.

While inequality has found its way into many economics curricula, there is only sparse literature on teaching single aspects of inequality (Hanlon 2013; Schnetzer 2018; Barnes, Easton, and Hanig 2019). In addition, most of this literature does not account for technological advances in teaching that have changed economic pedagogy substantially in recent decades (Hoyt and McGoldrick 2019). Online media such as wikis, blogs, and podcasts have become particularly popular teaching tools in order to increase student motivation by the dissemination of course outputs rather than traditional writing assignments (Jemielniak and Aibar 2016). These insights have also boosted the popularity of Wikipedia in the classroom. In its early stages, Wikipedia was regarded as an enemy of academia and criticized for poor quality management (Chandler and Gregory 2010). The wind has changed direction, and a rising number of scholars have even started using the controversial resource in teaching. Moy et al. (2010) report that students are generally very excited to participate in Wikipedia projects and are motivated by the visibility of their efforts. In the same vein, Lundin (2008) argues that teaching with wikis in general improves collaboration among students due to unique features such as easy editability and detailed page histories.

The aversion to recurring traditional curricula and the lack of easily accessible information on income inequality encouraged us to design a postgraduate course where students contribute scientific research

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on income inequality to Wikipedia. The lecture is called “Economics of Distribution” and is part of the elective classes within the master’s program in economics at the Vienna University of Economics and Business. The students are supposed to choose three out of ten fields of specialization, resulting in a particular intrinsic motivation for the topics covered. The average enrollment is between 30 and 35 students. We present an outline of this course and provide a number of reasons why professors and students alike benefit from this way of teaching. We particularly suggest various guidelines that enhance motivation and collaboration among students, which showed positive effects on their learning outcomes.

This tutorial qualifies for imitation and is easily adaptable for other economic questions. The primary aim is to guide students step by step through an experienced-based research project and successfully mobilize students’ self-motivation by pointing to a potential publication on Wikipedia. Our emphasis on income inequality thus serves as an illustration, and instructors are encouraged to implement other topics. A factor for success, however, is to precisely study the Wikipedia guidelines in advance and to consider the high workload for students and instructors alike to achieve high-quality Wikipedia articles.

## Wikipedia in teaching

Wikipedia, by its self-definition, is a multilingual online encyclopedia that features free content in 285 languages and currently comprises more than 52 million articles. This makes Wikipedia one of the most popular Web sites in terms of Internet traffic and engagement. One reason for Wikipedia’s popularity might be that its reliability compares favorably to the reliability of traditional encyclopedias, as empirical studies show (Fallis 2008). Wikipedia has changed everyday life and also affects real-world economic outcomes (Hinnosaar et al. 2021).

The success story of Wikipedia has attracted scholars from all disciplines to use this channel for the communication of science with the general public. The entry barriers are low, and contributing to Wikipedia requires only following some simple guidelines, which are available at <https://w.wiki/jCa>. Vice versa, the online encyclopedia is also a popular resource for researchers and thus has the potential to shape science (Thompson and Hanley 2018). Still, there is disagreement whether Wikipedia’s coverage of science is a balanced and high-quality representation of academic literature (Kousha and Thelwall 2017; Teplitskiy, Lu, and Duede 2017). There is also a note of caution by Wikipedia editors with respect to the academic use of its contents at [https://w.wiki/\\$k5](https://w.wiki/$k5). As the perception of Wikipedia’s quality among the academic community has improved in recent years (Meseguer-Artola et al. 2016), there is a rising number of institutional initiatives encouraging scholars to contribute to Wikipedia and bridge the gap to academia (Jemielniak and Aibar 2016). Students are very familiar with Wikipedia and regularly use the online encyclopedia for academic purposes, even though they have reservations with respect to the quality of the information (Lim 2009; Head and Eisenberg 2010; Knight and Pryke 2012).

Wikipedia’s popularity has been growing among academics, and it has also been incorporated into teaching (Konieczny 2012). The use of Wikipedia as a collaborative teaching tool bears various advantages but also comes with some costs. Compared to a teaching environment in the classroom with clear-cut expectations by the instructor, a rigid timeframe for the course assignments, and face-to-face feedback, working with Wikipedia entails considerable uncertainties due to the unpredictable workload for students and instructors alike and the exposure of the output to a broad, anonymous audience. There is a risk of unexpected events, like recurring revisions by the community, delays due to careful but long review processes, or even rejection by administrators, which can also be frustrating for both students and instructors. It is essential to consider these risks when preparing such a course and to think of potential alternatives with less exposure and even more technical options, like a university-based repository for graduate work that may enhance collaboration and comply with other important learning goals.

Notwithstanding the challenges and downsides, Wikipedia also bears advantages that support its application in teaching. Reciprocal feedback is not limited to instructors but to a greater community of experts and laypeople, which might be a valuable experience for students with regard to future academic careers where research is usually being reviewed by a larger scientific community. It also makes the lecturer’s life easier as tasks, such as feedback and evaluation, are spread onto more shoulders, and plagiarism is quickly detected. It is duly noted, however, that grading is not based on the feedback from an

anonymous community but on the assessment of student performance by the instructor. Writing Wikipedia articles also adds to the skill set of students because it requires reviewing academic sources, synthesizing knowledge, using proper references, and writing clearly (Jemielniak and Aibar 2016; Freire and Li 2016; Chandler and Gregory 2010). Since most graduate curricula do not include training for future scientists on how to communicate advanced concepts to a general audience successfully, this is an important lesson when working with Wikipedia (Moy et al. 2010).

Besides all theoretical reasons, there was a major practical motivation for working with Wikipedia in our course. There has been only a single article in German Wikipedia focusing on national income inequality, namely, Germany. This implied a large gap between the rising general interest in distributional issues and the availability of easily accessible information on the Internet. The initial aspiration for the syllabus was to narrow this gap by generating Wikipedia content on income inequality in a number of European countries.

## Setting the stage

As a first step, we defined the learning goals of the course. These are, on the one hand, content-related objectives, such as understanding pivotal concepts, grasping major trends in inequality, and recognizing the properties, virtues, and blind spots of the most common inequality indicators. Students should thus gain basic knowledge of the theoretical and empirical foundations of inequality research. We additionally pursued more general objectives like fostering motivation and collaboration among students. This article focuses on the latter.

By exposing students to particular elements of a scientific workflow, we aimed to generate a learning environment that supports the acquisition of skills, namely

1. structured teamwork and dynamic project management;
2. mutual assessment and constructive feedback;
3. transparency, reproducibility, and documentation of individual process steps; and
4. preparation and publication of results for a general audience.

These dimensions can be applied easily to any other course, irrespective of the specific topics and content of the curriculum. In the following, we present a combination of different tools and assessment methods that enabled us to achieve these goals.

## *Working on a common goal: Sharing knowledge via Wikipedia*

The cornerstone of the course was to produce content in a fashion and quality that warrants publication and dissemination via Wikipedia to an interested public audience. The foundation of these Wikipedia articles were student papers summing up the current state of research that could be processed into entries in the encyclopedia. We discussed this plan with the students at the beginning of the semester and stressed that learning a set of new tools as well as writing for multiple audiences creates an increased workload. However, working on content that is not only evaluated by the instructors but accessible to a broader group of readers and continues to be online after the course boosted student motivation, resulting in an exceptionally high degree of activity throughout the semester.

Additionally, we threw a spotlight on collaboration. In a modern professional environment, in academia as well as in private business, almost nobody works completely solitarily. Successful projects are carried out by teams of experts in different fields. Therefore, a key ingredient to success is efficient collaboration in groups of people with diverse backgrounds and prior knowledge. The students thus had to work together on a major joint project, which was defined as enriching Wikipedia with information on income inequality. They were not supposed to draft a number of unrelated articles but rather contribute to a bigger project that integrates individual pieces of the puzzle. Students were aware that while working on their own piece, the success of the whole project depended on everyone's dedication. They prepared descriptive statistics and initial drafts for the Wikipedia articles in small groups

of two or three participants, but the class as a whole was responsible for the quality of the outcome. This community spirit was further strengthened by developing a general outline of the articles with the whole class. We discussed and defined the structure, the selection of subtopics and indicators, as well as the style of figures and tables. This way, the wiki contributions would be similarly structured and as harmonized as possible.

### **Using media-supported assessment forms**

We introduced the students to the basic concepts and functionalities of version control systems and used them for the process of writing the scientific papers that were the groundwork for the Wikipedia articles. The software Git (and the online platform github.com) makes it possible to track every change in a file and undo it if necessary and also to comment and give feedback on different levels. Git was originally adopted in the world of software development but now enjoys great popularity in the scientific community. Teammates are informed about changes in the files via *commit messages*, and open tasks are documented and tracked via *issues*. Finally, critical or sensitive changes in the code are submitted to predefined users (in our case, the course instructors) for review before publishing via *pull requests*. Wikipedia uses a similar framework to manage the multiple historical versions and track changes in the articles. After having worked with Git while writing the scientific background papers, students had no difficulty transferring the logic of version control to the content management system of Wikipedia.

### **Reciprocal feedback**

In addition to the usual procedure of course instructors giving students a performance assessment, we encouraged motivation and collaboration by means of reciprocal feedback:

1. *From students to instructors.* Students were regularly asked about their assessment of the process steps they had taken. Their feedback was instantly included by the course instructors in their planning of future units.
2. *From students to fellow students.* While developing the research papers, tasks and open questions were documented in Git issues. The students often supported each other with comments and suggestions for solutions. Additionally, this form of feedback provided all groups with feedback on their articles and further orientation for revisions before going public.
3. *From experts and the Wikipedia community to students.* The instructors invited an administrator and senior contributor from the local Wikipedia community to share his experiences in class. The engagement of this expert proved to be an enormous enrichment for the course. In addition to his introductory presentation on the history and rules of Wikipedia, the expert gave the students initial feedback on the rough drafts of their articles during a writing workshop. The articles were submitted for publication on Wikipedia after two further feedback loops and revisions by students. At this point, the Wikipedia expert and other experienced authors from the Wikipedia community assessed the quality of articles, provided feedback to students, and finally decided on their publication.

### **The role of transferable skills**

In addition to promoting the acquisition of transferable skills like the handling of different tools for reproducible scientific analysis and skills in the area of dynamic process management, it was convenient to utilize the students' specific experiences and knowledge in the interest of achieving the goals of the course. At the beginning of the semester, students were invited to write a self-assessment and to disclose specific previous knowledge or relevant skills that could benefit the project. Examples are country expertise due to a long stay abroad in a particular country or good technical knowledge of one of the programs used. This information was compiled in order to assign participants to specific tasks according to their

skills, thus advancing the team as a unit that could accomplish more with fewer resources. Participating in a shared overall goal with one's individual strengths is an additional important aspect that contributed to the exceptional motivation of the students.

## **Course of action**

Having described the general principles, we now outline the specific building blocks of the teaching method that were applied in the classroom. It should be noted that the course counts as 9 credits in the European Credit Transfer and Accumulation System (ECTS), which corresponds to 4 hours of lessons per week. The extensive workload and the ambitious goals were possible only because the curriculum included high credits for this course. Otherwise, instructors would have had to lower their expectations significantly.

### ***Lay foundations through lectures by the instructors***

At the beginning of the course, the instructors presented essential subjects that would help the students to navigate the challenges ahead. It started with a general overview of the current debates in the scientific literature on income inequality. We discussed stylized facts of the development of inequality in industrialized countries and made the students aware of the significant cross-country heterogeneity that exists. This is particularly important because institutional peculiarities and historical developments play a crucial role when comparing new and old member states of the European Union.

The lecture comprised different income concepts and the manifold decisions an analyst has to make (definition of income, gross or net, at the household or the individual level, with or without governmental transfers, what about social transfers in kind?) when calculating a Gini coefficient for a given country. Another milestone was to instruct students how to work with complex sample surveys such as European Union Statistics on Income and Living Conditions (EU-SILC). This is the data source on which the institutions of the European Union base their monitoring of poverty and social inclusion. Consequently, it provides a range of indicators that are an indispensable ingredient of various policy assessment programs and has the potential to shape policy decisions in the member states. Eurostat is providing pre-compiled values of a broad set of indicators in their publicly available database, which can be used in Wikipedia articles. However, special tools are required to obtain results that are representative of the whole population and not only for the sample observations. Being able to handle such complex survey data is an important learning outcome in itself, but it also enables the students to experiment with the definitions of the indicators and check for the sensitivity of the results. This enforces the learning effect that indicators are social constructions. To get their interpretation right, it is often critical to delve deep into the details of data preparation and sample definitions.

### ***Involve students through brief presentations***

By giving short presentations, the students also contributed to the knowledge transfer in the introductory units. The presentations also served to loosen up and eliminate monotony in the course units. Groups of students were assigned a specific tool or piece of knowledge that would be of use later in the course. The topics ranged from adjusting the purchasing power of incomes with the statistical software R, to possible graphical representations of inequality measures, to the basics of the version control system Git.

Requirements made of the students consisted of a targeted focus through rigid time restrictions, the simple communication of a complex subject, the writing of a “cheat sheet” with the most important information for their colleagues, and the willingness to act as contact persons for other students.

### ***Lecture by a Wikipedia expert***

An important goal of the course was to make the generated content available to a broad public. As Wikipedia was the preferred platform for dissemination, the instructors invited a senior member of the



Wikipedia community and experienced contributor to share his experiences with the class. This expert presented an introduction to the most important rules of Wikipedia and was also available to students in a writing workshop at a later date.

### ***Research papers***

Reproducibility is a very important characteristic of scientific work. However, in reality, results are influenced by numerous small decisions that have to be made during the data preparation and analysis. Even in published articles, these choices often are not documented in enough necessary detail to facilitate an exact reproduction of the results (Maniadis and Tufano 2017). The students were made aware that this applies especially to empirical work based on microdata, where the selection of observations, handling of missing data, and preprocessing of the data usually do not receive the attention they deserve. Students experienced this themselves while conducting a small research project from beginning to end. Based on their prior knowledge, students had to choose a European Union member state and write a research paper that would be the foundation of the Wikipedia article. Research papers were drafted as a country study combining a literature review on the development of income inequality in that country, institutional specifics of the respective welfare state, and the reproduction of Eurostat's headline statistics on income inequality based on the students' own evaluations of EU-SILC data with the statistical software R.

### ***Share knowledge with short presentations of the research papers***

The preliminary results of the research papers were discussed in short presentations. Other students were able to learn from best practice examples but also discussed issues that were not solved satisfactorily. Generally, some students faced similar problems in their work related to different EU countries, which they could address together. These presentations and the following discussions were the first of several feedback loops and were especially well-suited to quick revisions.

### ***Individual feedback on the research papers by instructors***

Individual feedback on the research papers by the course instructors included a more detailed assessment. This also allowed for dealing with concrete questions and country-specific idiosyncrasies. Students were also able to obtain a more comprehensive assessment and assistance with programming work upon request.

### ***Collective brainstorming: Content and style guide for Wikipedia***

After writing the research papers, participants discussed which parts of the papers were suitable for dissemination on Wikipedia. As almost all students had at least some experience with Wikipedia as a reader, a top-down approach to the specification of the articles by the course leaders seemed less effective than joint brainstorming, which fostered broad participation by the students. This also ensured the harmonization of the individual country entries in the online encyclopedia.

### ***The first feedback loop for Wikipedia: Peers***

The final part of the course included a full-day writing workshop where all students participated in producing drafts for the Wikipedia articles in an informal atmosphere. During the workshop, we assigned each group of students as referees to another group; each group had to review another group's article and provide short written feedback. The aim of this process was to provide each group with timely initial feedback on their own Wikipedia article, which they could readily implement while finalizing their drafts. While this setting has proven to be very effective and is beneficial in generating a productive and collaborative learning environment, we acknowledge that not all curricula provide the necessary flexibility to hold such a blocked full-day lecture.

## ***The second feedback loop for Wikipedia: Instructors and Wikipedia community***

After the writing workshop, the students were given one week to complete a final draft for their contribution to Wikipedia. The course instructors provided detailed feedback and comments on these drafts. The focus of the feedback lay on the comprehensibility of the argument and the correct application of the concepts. After a further phase of incorporating these suggestions and comments, the final feedback was given by the visiting Wikipedia expert and the Wikipedia community before the contributions were published.

## **Results and discussion**

The main result of the course is 17 German-language Wikipedia articles on income distribution in European Union member states. An overview article of income inequality in the European Union is the nodal point that links to the 16 country reports on Austria, Belgium, Croatia, Denmark, France, Germany, Hungary, Ireland, Italy, the Netherlands, Poland, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. The overview article can be found at [https://w.wiki/\\$k4](https://w.wiki/$k4). As mentioned, all underlying income data are publicly available from Eurostat and easy to verify.

The structure of all country reports was harmonized for the readers' convenience and in order to provide guidance for the students. All articles comprise subsections on mean and median income, inequality measures (Gini index, top income share, income quintile share ratio S80/S20, poverty rate), gender pay gap, and regional inequality, as well as additional background information. An aim of the Wikipedia project was to present a harmonized set of indicators with country-specific information and even a similar design of figures for reasons of better comparability. Based on Eurostat data, students created various figures with the statistics software R to illustrate their articles.

In total, 57 postgraduate students participated in the course and collaborated on the project over two semesters. In the first semester, students set up the Wikipedia articles with basic information on inequality measures. The second semester was needed to revise the drafts from the previous semester and to add information on gender and regional inequality. One group of students complemented the dissemination on Wikipedia with an online dashboard presenting all data at a glance. This subproject also supported the course's objectives to enhance collaboration and motivation among students and make scientific research more accessible to a larger audience. The dashboard is available at <https://learn.wu.ac.at/shiny/ineq/>.

Did this course ultimately succeed in enhancing student motivation and collaboration? After the experience of two semesters teaching with Wikipedia, we can answer this question in the affirmative. From the beginning, students were more excited by the project than discouraged by the workload. The formulation of a joint major project led to immediate collaboration and mutual assistance among the students, which were facilitated by the technical tools we introduced. The prospect of contributing accessible knowledge to the largest online encyclopedia and being in the role of intermediaries between the scientific community and the general public was a major factor in student motivation. The positive atmosphere in the classroom was confirmed by several students who expressly declared that they appreciated this way of teaching and preferred it to traditional learning.

The feedback on the course and the project was positive throughout the work. Students and the instructors proudly shared the outcomes of the course on social media, and the resonance from the Wikipedia community was likewise very positive. Colleagues from international universities asked us to share the syllabus for their adoption. The course also won the award for innovative teaching in 2019 at the Vienna University of Economics and Business. The jury acknowledged the collaborative and reciprocal feedback by all protagonists and deemed the generation of content for different audiences as another positive aspect of the teaching design. This positive feedback is an indicator that this teaching design might be applicable in multiple ways to economics curricula around the globe.

Finally, we highlight three challenges and caveats that instructors should be aware of when adopting this teaching concept. First, we advise using the students' mother tongues when composing Wikipedia articles. Even though English Wikipedia is the most visited Web page in the Wikipedia universe, and there are still no entries on income inequality for individual European countries, the quality management of revising articles in a foreign language would have been too burdensome within the scope of a single course. Second,



students cannot publish their own calculations on Wikipedia. We only learned very late that Wikipedia does not publish original thoughts. All material must be attributable to a reliable, published source, which in our case was Eurostat. A combination of traditional written assignments and their dissemination on Wikipedia is not possible. Therefore, instructors should carefully study the article guidelines at <https://w.wiki/jCa> to avoid misconceptions. Third, instructors should be aware that students have little experience in translating scientific content into plain language. It was a major challenge for the students to write in simplified diction rather than academic phraseology. We suggested that students should ask their lay relatives or friends to proofread their articles regarding comprehensibility.

## Conclusion

We present considerations for using Wikipedia to enhance motivation and collaboration in the classroom. While there is abundant literature on the relationship between Wikipedia and academia, tutorials detailing how to integrate the online encyclopedia in economics courses are rare. We have tried to fill this gap by providing theoretical considerations and practical guidance on setting up a course where students disseminate research to a greater audience. A focus is put on the benefits of the reciprocal feedback options and collaborative editing inherent in Wikipedia. Moreover, we highlight the nexus between the visibility of efforts and student motivation, although there are some challenges and obstacles that can jeopardize the success of such an endeavor.

The tangible achievement of the presented course was to enrich Wikipedia with 17 comprehensive articles on income inequality in European Union member states. With help from a Wikipedia administrator and immediate feedback from the instructors, peers, and the Wikipedia community, students delivered high-quality articles that are now part of the largest online encyclopedia and available to everyone. There is much room left for articles about special fields of economics in multiple languages. For instance, the most obvious follow-up would be country reports on wealth inequality, which are still lacking on German Wikipedia. The data for such reports are provided by the European Central Bank and could easily be incorporated in an economics class on wealth inequality. Thus, Wikipedia does not impede instructors from imitating our course.

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## References

- Barnes, W., T. Easton, and R. L. Hanig. 2019. Student preconceptions and reality: A survey exercise to teach wealth inequality. *International Review of Economics Education* 30 (January): 100124. doi: [10.1016/j.iree.2018.02.001](https://doi.org/10.1016/j.iree.2018.02.001).
- Chandler, C. J., and A. S. Gregory. 2010. Sleeping with the enemy: Wikipedia in the college classroom. *The History Teacher* 43 (2): 247–57.
- Fallis, D. 2008. Toward an epistemology of Wikipedia. *Journal of the American Society for Information Science and Technology* 59 (10): 1662–74. doi: [10.1002/asi.20870](https://doi.org/10.1002/asi.20870).
- Freire, T., and J. Li. 2016. Using Wikipedia to enhance student learning: A case study in economics. *Education and Information Technologies* 21 (5): 1169–81. doi: [10.1007/s10639-014-9374-0](https://doi.org/10.1007/s10639-014-9374-0).
- Hanlon, M. 2013. Inequality and growth: Understanding the link through a simulation. *International Review of Economics Education* 13 (May): 44–49. doi: [10.1016/j.iree.2013.04.015](https://doi.org/10.1016/j.iree.2013.04.015).
- Head, A., and M. Eisenberg. 2010. How today's college students use Wikipedia for course-related research. *First Monday* 15 (3). doi: [10.5210/fm.v15i3.2830](https://doi.org/10.5210/fm.v15i3.2830).

- Hinnosaar, M., T. Hinnosaar, M. Kummer, and O. Slivko. 2021. Wikipedia matters. *Journal of Economics & Management Strategy* 2021:1–13. doi: [10.1111/jems.12421](https://doi.org/10.1111/jems.12421).
- Hoyt, G. M., and K. McGoldrick. 2019. 50 years of economic instruction in the *Journal of Economic Education*. *Journal of Economic Education* 50 (2): 168–95. doi: [10.1080/00220485.2019.1582388](https://doi.org/10.1080/00220485.2019.1582388).
- Jemielniak, D., and E. Aibar. 2016. Bridging the gap between Wikipedia and academia. *Journal of the American Society for Information Science and Technology* 67 (7): 1773–76.
- Knight, C., and S. Pryke. 2012. Wikipedia and the university, a case study. *Teaching in Higher Education* 17 (6): 649–59. doi: [10.1080/13562517.2012.666734](https://doi.org/10.1080/13562517.2012.666734).
- Konieczny, P. 2012. Wikis and Wikipedia as a teaching tool: Five years later. *First Monday* 17 (9). doi: [10.5210/fm.v0i0.3583](https://doi.org/10.5210/fm.v0i0.3583).
- Kousha, K., and M. Thelwall. 2017. Are Wikipedia citations important evidence of the impact of scholarly articles and books? *Journal of the Association for Information Science and Technology* 68 (3): 762–79. doi: [10.1002/asi.23694](https://doi.org/10.1002/asi.23694).
- Lim, S. 2009. How and why do college students use Wikipedia? *Journal of the American Society for Information Science and Technology* 60 (11): 2189–202. doi: [10.1002/asi.21142](https://doi.org/10.1002/asi.21142).
- Lundin, R. W. 2008. Teaching with Wikis: Toward a networked pedagogy. *Computers and Composition* 25 (4): 432–48. doi: [10.1016/j.compcom.2008.06.001](https://doi.org/10.1016/j.compcom.2008.06.001).
- Maniatis, Z., and F. Tufano. 2017. The research reproducibility crisis and economics of science. *The Economic Journal* 127 (605): F200–208. doi: [10.1111/ecoj.12526](https://doi.org/10.1111/ecoj.12526).
- Meseguer-Artola, A., E. Aibar, J. Lladós, J. Minguillón, and M. Lerga. 2016. Factors that influence the teaching use of Wikipedia in higher education. *Journal of the American Society for Information Science and Technology* 67 (5): 1224–32.
- Moy, C. L., J. R. Locke, B. P. Coppola, and A. J. McNeil. 2010. Improving science education and understanding through editing Wikipedia. *Journal of Chemical Education* 87 (11): 1159–62. doi: [10.1021/ed100367v](https://doi.org/10.1021/ed100367v).
- Piketty, T., and E. Saez. 2014. Inequality in the long run. *Science* 344 (6186): 838–43. doi: [10.1126/science.1251936](https://doi.org/10.1126/science.1251936).
- Schnetzler, M. 2018. Teaching wealth inequality in the Eurozone: An outline based on HFCS data. *International Journal of Pluralism and Economics Education* 9 (1/2): 168–91. doi: [10.1504/IJPEE.2018.10013525](https://doi.org/10.1504/IJPEE.2018.10013525).
- Teplitskiy, M., G. Lu, and E. Duede. 2017. Amplifying the impact of open access: Wikipedia and the diffusion of science. *Journal of the Association for Information Science and Technology* 68 (9): 2116–27. doi: [10.1002/asi.23687](https://doi.org/10.1002/asi.23687).
- Thompson, N., and D. Hanley. 2018. *Science is shaped by Wikipedia: Evidence from a randomized control trial*. Last revised August 16, 2019. MIT Sloan Research Paper No. 5238-17. Cambridge, MA: MIT, Computer Science and Artificial Intelligence Lab.