Wikipedia editing in chemistry classrooms: Resonance and gaps between educational needs and Wikipedia community practices

Ye Li, Chemistry Librarian, University of Michigan Library
Why Wikipedia Editing in Classroom?

- Active / Engaged learning
  - Subject knowledge
  - Information literacy skills
  - Critical thinking
  - Writing for general public
  - Peer review
  - Teamwork

- Contributing to public good with our educational resources

Truly understand when and how to use Wikipedia with a critical eye and how to contribute to it.
Typical workflow/components of a chemistry class with Wikipedia editing project

**Introduction** to Wikipedia (community dynamics and editing basics)

**Selecting a topic** relevant to class subject to edit in 2-3 student groups

**Outlining editing plans** for a new article or after reviewing the existing article

**Editing articles in Sandboxes**

**Internal peer review** of the Sandbox among groups and posting reviews on Talk page

**Revising articles** based on peers’ and instructors’ feedback

**Moving articles** to the formal Wikipedia entries along with the Talk page

(Interacting with broader Wikipedia community and continue revising articles)

See sample syllabus from Wikipedia: Training /For educators
Scalable components

- Copy editing
- Adding citation
- Adding images
- Adding small sections
- Adding several sections
- Developing stub articles to full articles
- Creating new articles
- Peer review and responding to peer review
- Interacting with Wikipedia community

Select one or more components depending on time and effort you’d like students to spend on the project.
Examples of student works

- Course example: Chem538 at University of Michigan
  - Sample syllabus and assignment at [http://deepblue.lib.umich.edu/handle/2027.42/94153](http://deepblue.lib.umich.edu/handle/2027.42/94153)

- Article example (Both articles nominated as Did You Know? articles, featured on Wikipedia homepage, and attracted over a thousand hits within a day.)

<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
<th>Talk page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synergistic Catalysis (New article)</td>
<td>N/A</td>
<td>Synergistic Catalysis (After Editing)</td>
</tr>
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</table>
Examples of student work

Before

After

Talk page with peer review and responses
Classroom learning v.s. community-based collaborative knowledge production

Wikipedia: Five pillars

From Wikipedia, the free encyclopedia

The fundamental principles of Wikipedia may be summarized in five "pillars":

- **Wikipedia is an encyclopedia**: It combines many features of general and specialized encyclopedias, almanacs, and gazetteers. Wikipedia is not a soapbox, an advertising platform, a vanity press, an experiment in anarchy or democracy, an indiscriminate collection of information, or a web directory. It is not a dictionary, a newspaper, or a collection of source documents, although some of its fellow Wikipedia projects are.

- **Wikipedia is written from a neutral point of view**: We strive for articles that document and explain the major points of view, giving due weight with respect to their prominence in an impartial tone. We avoid advocacy and we characterize information and issues rather than debate them. In some areas there may be just one well-recognized point of view; in others, we describe multiple points of view, presenting each accruing in context rather than as "the truth" or "the best view". All articles must strive for verifiable accuracy, citing reliable, auth sources, especially when the topic is controversial or is on living persons. Editors' personal experiences, interpretations opinions do not belong.

- **Wikipedia is free content that anyone can use, edit, and distribute**: Since all editors freely license their work to the public, no editor owns an article and any contributions can and will be mercilessly edited and redistributed. Respect copyright laws, and never plagiarize from sources. Borrowing non-free media is sometimes allowed as fair use, but strive to find free alternatives first.

- **Editors should treat each other with respect and civility**: Respect your fellow Wikipedians, even when you disagree. Apply Wikipedia etiquette, and don't engage in personal attacks. Seek consensus, avoid edit wars, and never disrupt Wikipedia to illustrate a point. Act in good faith, and assume good faith on the part of others. Be open and welcoming to newcomers. If a conflict arises, discuss it calmly on the nearest talk pages, follow resolution, and remember that there are 4,943,320 articles on the English Wikipedia to work on and discuss.

- **Wikipedia has no firm rules**: Wikipedia has policies and guidelines, but they are not carved in stone; their content and interpretation can evolve over time. Their principles and spirit matter more than their literal wording, and sometimes improving Wikipedia requires making an exception. Be bold but not reckless in updating articles, and do not agonize about making mistakes. Every past version of a page is saved, so any mistakes can easily be corrected.


Snap shot of one second. Unregistered edits only. See http://rcmap.hatnote.com/
Resonances from librarians’ perspective: Improving information literacy skills
Librarians’ perspective: Improve information literacy skills

✦ Students act as both consumers and creators of information meaningful for their learning subjects with general public as their targeted audience

✦ Learning outcomes from the editing process fit many threshold concepts of the latest Framework for Information Literacy for Higher Education filed by ACRL Board

http://www.ala.org/acrl/standards/ilframework
Authority is constructed and contextual

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<tr>
<th>Relevant Knowledge Practices and Dispositions</th>
<th>Outcomes from Wikipedia Editing Projects</th>
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<tbody>
<tr>
<td>Recognize that authoritative content may be packaged formally or informally and may include sources of all media types</td>
<td>✤ Understand how Wikipedia works as a new type of media</td>
</tr>
<tr>
<td>Develop awareness of the importance of assessing content with a skeptical stance and with a self-awareness of their own biases and worldview</td>
<td>✤ Recognize how everyone could modify Wikipedia thus being able to select what is to be trusted on Wikipedia</td>
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<tr>
<td></td>
<td>✤ Develop awareness of “neutral point of view” in the literature context as a standard of Wikipedia content standard</td>
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# Information creation as a process

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<td>Develop, in their own creation processes, an understanding that their choices impact the purposes for which the information product will be used and the message it conveys</td>
<td>✤ Create information for general public and use the encyclopedia writing style appropriate for a broad audience literature review only read by instructors)</td>
</tr>
<tr>
<td>Accept the ambiguity surrounding the potential value of information creation expressed in emerging formats or modes</td>
<td>✤ Identify neutral point of view on a topic through studying literature and use it to write Wikipedia articles but also recognize what’s neutral</td>
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Information has value

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<td>Articulate the purpose and distinguishing characteristics of copyright, fair use, open access, and the public domain</td>
<td>✤ Identify the copyright status of media files to be posted on Wikipedia and use them in appropriate manners monitored by the community</td>
</tr>
<tr>
<td>See themselves as contributors to the information marketplace rather than only consumers of it</td>
<td>✤ Differentiate plagiarism v.s. violating copyright</td>
</tr>
<tr>
<td></td>
<td>✤ Contribute to a resource they use on a daily basis</td>
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## Research as inquiry

**Relevant Knowledge Practices and Dispositions**

- Synthesize ideas gathered from multiple sources
- Appreciate that a question may appear to be simple but still disruptive and important to research

**Outcomes from Wikipedia Editing Projects**

- Consult primary, secondary, and tertiary resources and then report a cohesive story about the given topic (no original research or ideas)
- Choose a topic they have learned in class or have previous knowledge about and recognize the challenges articulating the topic to general public
Scholarship as conversation

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<td>Contribute to scholarly conversation at an appropriate level</td>
<td>✤ Contribute to the public knowledge base by “translating” expert opinions to stories general public can understand and find useful</td>
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<tr>
<td>Value user-generated content and evaluate contributions made by others</td>
<td>✤ Review peer editors’ contribution to Wikipedia and respect each others’ contributions</td>
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# Searching as strategic exploration

## Relevant Knowledge Practices and Dispositions

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<th>Utilize divergent and convergent thinking when searching</th>
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<td>Understand the first attempts at searching do not always produce adequate results</td>
<td>✤ Seek for information to illustrate big pictures but also highlight perspective most commonly accepted (neutral) style article</td>
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<tr>
<td>✤ Recognize that Wikipedia entries can be used as starting point for further research</td>
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**Searching as strategic exploration**

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**Relevant Knowledge Practices and Dispositions**

- Utilize divergent and convergent thinking when searching
- Understand the first attempts at searching do not always produce adequate results

**Outcomes from Wikipedia Editing Projects**

- Seek for information to illustrate big pictures but also highlight perspective most commonly accepted (neutral) style article
- Recognize that Wikipedia entries can be used as starting point for further research
Chemistry specific learning outcomes

- Broaden students’ view of chemistry concepts and issues from history and social impact perspective
- Recognize data is not copyrightable
  - Plot their own molecule structures or reaction schemes to post
  - With permission from original authors and appropriate citation, re-plot experimental data for review purpose and to post
- Master tools and standards are needed to handle and share chemical data
  - Filling ChemBox expose students to many data issues in chemistry such as chemical representation, data provenance, metadata etc.
Gaps:
Controlled learning environment v.s. open and diverse Wikipedian community
Semester-based cycle v.s. long-term commitment

- Limited time for assignments and instructions
- No guarantee to address feedbacks from other Wikipedians after the assignment ended
Protected environment to learn v.s. “into the wild”

- Grading needs v.s. bit-by-bit collaborative editing style
  - Students often need to draft their whole articles before posting it for grading purpose

- Students privacy concern v.s. complete open community
  - Students’ username and works may be connected to their real life identity (FERPA violation concerns)

- Stability and consistency needs v.s. impulsive and accidental contribution
Academic value v.s. Public good value

- Creditability v.s. semi-anonymity
- Right/wrong academically v.s. “neutral point of view” from diverse perspectives
When students’ work got deleted unreasonably...

- Case example: an Ecological and Evolutionary Medicine first-year seminar at U-M
  - Blog post from Professor Duffy after a student edits got deleted by another editor

- Related page
  - Superspreader before student editing
  - Superspreader after student editing
  - Superspreader after the student edits being deleted
  - Superspreader - current

- Talk page of Superspreader (Relevant discussion has been archived. Check History page of the Talk page.)
When students’ work got deleted unreasonably...

Using Wikipedia in the classroom: a cautionary tale (Updatedx2)

(Third and final update: If you read this post, please also read this follow up post, which includes summaries of ways to try to reduce the likelihood of running into the same problem.)

Last fall, one of my students contacted me to ask if she could do an “Honors Conversion” of the first-year seminar I was teaching on Ecological and Evolutionary Medicine. After learning what that meant (basically, just that the student has to do an extra assignment in order for the course to count towards the Honors Program), I decided that this could be a great opportunity to do a trial run of an idea I had considered in the past: having students edit Wikipedia as part of their coursework. The learning experience for my student and me was a pleasant surprise: I will use Wikipedia in the classroom again.

Using Wikipedia as an educational tool was the perfect way to improve student learning – students would have to know how Wikipedia was structured and how to add new information to it in a way that was not seen by another human. And it took place in the classroom, and it worked well.
Wikipedia pages on Chemistry topics could unexpectedly become “popular”

https://en.wikipedia.org/wiki/Nuclear_magnetic_resonance_spectroscopy

Ranked the second most popular page on English Wikipedia during the week of July 26 to August 1, 2015 (6,021,608 views)

http://www.wikipediatrends.com/Nuclear_magnetic_resonance_spectroscopy.html
What to do to avoid frustrations

- Inform the Wikipedia community
  - Course page on Wiki Education platform (http://dashboard.wikiedu.org/)
    - Articles to be edited
    - Instructions and trainings offered and completed by students
    - Education banner and editing plan on Talk page of the targeted articles

- Work closely with relevant WikiProjects
  - e.g. Wikipedia:WikiProject Chemistry

This article is/was the subject of an educational assignment in Fall 2013. Further details are available on the course page.
What to do to avoid frustrations

- With students:
  - Clarify encyclopedia writing style
  - Ask students respect other editor’s contribution
  - Alert students what could happen on the open platform
  - Emphasize avoiding plagiarism and copyright violation
  - Clarify internal peer review standards from Wikipedia community perspective
Acknowledgement

- Professor Anne McNeil, University of Michigan
- Wiki Edu Foundation
  - Jami Mathewson
  - Halaine Blumental
  - Ryan McGrady
- All Wikipedians who helped our students
- Professor Martin Walker, SUNY at Potsdam
Thank you!

- Contact me for questions or exploring collaborative projects about Wikipedia editing in Chemistry classrooms

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