Peer Review and Wiki Textbooks: The Good, the Bad, and the Unmeasurable

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Peer Review and Wiki Textbooks: The Good, the Bad, & the Unmeasurable

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Presentation will be uploaded to http://tinyurl.com/SoTL_Commons_wikitext
Outline

- Introduction: Why wiki textbooks?
- The administrative burden
- The process
- Results
- Reflection
- Textbooks of the future

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Introduction

- Wikis are one of the premier collaborative spaces on the Web.
  - Editing in place
  - No need to “disseminate” to others

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Why wiki textbooks?

Costs of textbooks ↑ even faster than med. care!

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The claim …

Textbooks cost $900 per year for the average student

Source: Student PIRGs, GAO

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Has your school encouraged you to reduce textbook costs?

A. Yes, in general terms
B. Yes, with a specific plan
C. No/not yet
The Instructor’s Dilemma

- No traditional textbook fits exactly
- It’s all or nothing
- Students complain about paying high prices
- They complain even more if only a few chapters are used in a high-priced book
- They complain even louder when sent hither and yon for materials
- Too many resources, too little time to decide what’s fair to use and what’s illegal....

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Why wiki textbooks?

- Important for students to “take ownership” of learning
  - Need to evaluate different points of view
  - Compatible with constructivism
- No scientific evaluation of textbook effectiveness
  - No comparative studies
  - Even buying textbook doesn’t help ...
  - Contrast that with wiki textbooks, where research exists

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Why wiki textbooks, cont.

- “Writing across the curriculum”
  - Students write for an audience of their peers
  - Feedback helps them improve
  - Other advantages of prompt-peer feedback
Online textbook usage

- Have you ever used an online textbook?
  A. Yes, an online version of a commercial text
  B. Yes, an open-access (but not wiki) text
  C. Yes, an open-access wiki textbook
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The administrative burden

- Students are allowed to choose what they work on
  - Electronic signup gives everyone an equal chance
- Multiple deadlines needed for each project
  - Choose topic, submit, review, resubmit, etc.
  - Students must be reminded
- Data must be presented in one place, & visible in graphical format
The Solution

- Use peer reviews for guidance.
  1. Have students review teams’ work using a rubric that includes numeric scores.
  2. Allow authors to comment on reviews, using a rubric.
  3. Allow third parties to do metareviews—reviews of reviews to assess the quality of those reviews.
  4. Have teammates review the contributions of each other to the project.
The Solution, cont.

- Make all of this evidence available to the instructor.
  - Scores, with a precomputed average.
  - Text of each review

- Allow instructor and/or TA to do their own reviews and
  - Average their score in with the student-assigned scores, or
  - Override the student-assigned scores.

- Either way, instructor has copious evidence on each project.
What kind of review do you use?

- Review by course staff (instructor, TA)
- Face-to-face peer review
- Blind peer review (on paper)
- Web-based peer review
- Teammate review

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Outline

- Introduction: Why wiki textbooks?
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- Results
- Reflection
- Textbooks of the future
The process

1. Sign up for a topic
2. Submit your work
3. Review others’ work
4. Give feedback on your reviews
5. Revise and repeat
6. Metareviews
7. Teammate reviews
Step 1. Signing up

- Every two weeks,
  - students sign up for chapters
- Depending on size of course
  - There are more or fewer topics
    - 2 to 10
  - More or fewer authors allowed to sign up for each topic
    - 2 or 3
- Students encouraged to work in pairs
Step 1 (cont.). Example signup sheet

Signup sheet for Wiki textbook A assignment

<table>
<thead>
<tr>
<th>Topic #</th>
<th>Topic name(s)</th>
<th>Max choosers</th>
<th>Available slots</th>
<th>Waitlist</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>Comparisons between supercomputers</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>☑</td>
</tr>
<tr>
<td>1b</td>
<td>Does Moore's Law still hold?</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>✗</td>
</tr>
<tr>
<td>1c</td>
<td>MISD architectures</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>☑</td>
</tr>
<tr>
<td>2a</td>
<td>SAS programming on distributed-memory machines.</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>☑</td>
</tr>
<tr>
<td>2b</td>
<td>Data parallelism in GPUs.</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>☑</td>
</tr>
<tr>
<td>1d</td>
<td>Chapter 1 update</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>☑</td>
</tr>
<tr>
<td>3a</td>
<td>Patterns of parallel programming</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>☑</td>
</tr>
<tr>
<td>3b</td>
<td>MapReduce</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>☑</td>
</tr>
<tr>
<td>4a</td>
<td>Automatic parallelism and its limitations</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>☑</td>
</tr>
</tbody>
</table>

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Step 2. Submit work

- Students log in and submit their work to Expertiza
  - Upload files
  - Upload links
Step 3. Peer review

- Submissions are peer-reviewed through our Expertiza system.
  - ≈ 5 reviewers give feedback to each team.
  - Teams improve work based on feedback
  - Reviewers suggest a grade.
    - Instructor/TAs review student recommendations, assign final grades.

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Step 3 (cont.). Choose a submission

Review for "Wiki textbook before"

Select a topic below to begin a new review:
- I don't care which topic I review.
- 1a: IDEs for Ruby
- 1b: Collections frameworks
- 1c: Closures vs. methods
- 1d: Closures in statically typed languages
- 1f: Comparing version-control systems from the programmer's standpoint
- 1g: Object-oriented languages and scripting
- 1h: Common attribute/member syntax
- 1i: Reimplementation of methods in descendant classes
- 2a: Currying
- 2b: Access control in o-o languages
- 2c: Mixins vs. interfaces
- 2d: Testing frameworks for Ruby
  - 1e: Block-structured vs. o-o languages
  - 2d: Extending objects
  - 2f: Rails 2 vs. Rails 3

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Step 3 (cont.). Students review submissions

- Individuals review team submissions.
  - For each question, they enter a score between 1 and 5.
  - They can also enter a text comment for each question.
Step 3 (cont.). Students review submissions

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Step 4. Authors view feedback

- The authoring team can then view this feedback, as shown below.
- Note that in addition to comments on each rubric question, there may be comments on the submission as a whole.
Step 4. Authors view feedback

---

Score for Wiki textbook before

<table>
<thead>
<tr>
<th>Contributor</th>
<th>Submitted work</th>
<th>Reviewing</th>
<th>Author Feedback</th>
<th>Teammate Review</th>
<th>Final Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balaji S Iyengar</td>
<td>82.86% (2a)</td>
<td>71% - 91%</td>
<td>97.50% (2)</td>
<td>95% - 100%</td>
<td>80.00% (2)</td>
</tr>
</tbody>
</table>

Average score: 85.71%

Question 1: Links
Score: 5 out of 5
Response:

Question 2: Organization
Score: 4 out of 5
Response: Could have been more elaborate

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Step 4 (cont.). Authors evaluate reviews

- The author can give feedback to reviewers.
  - This uses a rubric similar to the review rubric.
  - Helps insure careful reviews
Step 4 (cont.). Authors evaluate reviews

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Step 5. Revise and repeat

- There may be several rounds of review.
  - Allows for formative assessment.
Step 6. Metareviews

- Once the review period is over, 3rd parties are asked to evaluate the reviews.
  - These can be instructors or other students (not the reviewer or reviewee).

- The metareviewer is shown the review ...
Step 6 (cont.). Metareviews

- and can view the submission ...

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Step 6 (cont.). Metareviews

- Then the metareviewer can fill out a rubric form.
- Metareviews are based on their own rubrics.

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Step 7. Teammate reviews

- At the end of the project period, team members can select each of their team members ...
Step 7 (cont.). Teammate reviews

• ... and review them on several criteria.

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Viewing results

- Instructor’s grade report shows all scores given to teams.
- Instructor can expand the team to see its members, who has reviewed the team, and the scores they have given.
- Team members’ grades may differ, depending on their grades for reviewing and contribution to the teams.
### Summary report for OSS project

<table>
<thead>
<tr>
<th>Team</th>
<th>Submitted work</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>o661</td>
<td>75.67%</td>
<td>72% - 88%</td>
</tr>
<tr>
<td>o662</td>
<td>93.33%</td>
<td>83% - 100%</td>
</tr>
<tr>
<td>o663</td>
<td>100.00%</td>
<td>100% - 100%</td>
</tr>
<tr>
<td>o664</td>
<td>96.00%</td>
<td>92% - 100%</td>
</tr>
<tr>
<td>o665</td>
<td>97.33%</td>
<td>96% - 100%</td>
</tr>
<tr>
<td>o666</td>
<td>100.00%</td>
<td>100% - 100%</td>
</tr>
</tbody>
</table>

#### Contributor

<table>
<thead>
<tr>
<th>Contributor</th>
<th>Submitted work</th>
<th>Reviewing</th>
<th>Author Feedback</th>
<th>Final Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simpson, William</td>
<td>100.00% show reviews</td>
<td>100% - 100% email reviewers</td>
<td>100% - 100% email metareviewers</td>
<td>100.00% edit score</td>
</tr>
<tr>
<td>Winston, Mary Susan</td>
<td>100.00% show reviews</td>
<td>100% - 100% email reviewers</td>
<td>77.50% show metareviewers</td>
<td>55% - 100% email authors</td>
</tr>
</tbody>
</table>

### Gehringer, Peer review and wiki textbooks, efg@ncsu.edu
Interested?

- Please sign my signup sheet ...
- Feedback
  http://tinyurl.com/expertiza-form
Outline

- Introduction: Why wiki textbooks?
- The administrative burden
- The process
- Results
- Reflection
- Textbooks of the future
Lessons learned

- Students need guidance on organization
- Helpful, at the start, to direct students to useful sources.
Lessons learned

- Signup sheet is very useful
  - The only reliable way to manage topics in a large class.
  - Tells reviewer if author wrote on correct topic
- Students need e-mail reminders to stay on track
  - Otherwise, there are too many deadlines to remember
  - This may contribute to “too much rating for this course.”
### Survey results — contributions

<table>
<thead>
<tr>
<th>Question</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>I had trouble understanding what was expected of me in writing a textbook chapter.</td>
<td>2.63</td>
<td>2.05</td>
<td>2.20</td>
</tr>
<tr>
<td>I put a lot of effort into writing my articles for the wiki textbook.</td>
<td>4.13</td>
<td>4.07</td>
<td>4.23</td>
</tr>
<tr>
<td>The material I read in order to write my chapter gave me new insight into the topic I was writing on.</td>
<td>4.20</td>
<td>4.10</td>
<td>4.45</td>
</tr>
<tr>
<td>The textbook articles I wrote are credible entries for a graduate textbook.</td>
<td>3.80</td>
<td>3.78</td>
<td>4.11</td>
</tr>
<tr>
<td>I am proud of my contributions to the wiki textbook.</td>
<td>4.11</td>
<td>3.97</td>
<td>4.31</td>
</tr>
</tbody>
</table>
## Survey results — process

<table>
<thead>
<tr>
<th>Question</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Having students write a textbook supplement for a course like ECE/CSC 517 is a good idea.</td>
<td>3.80</td>
<td>3.71</td>
<td>4.11</td>
</tr>
<tr>
<td>I clearly understood what was expected of me in reviewing a textbook chapter.</td>
<td>3.73</td>
<td>4.04</td>
<td>4.21</td>
</tr>
<tr>
<td>The chapters I read that were authored by other students gave me new insight into the material they covered.</td>
<td>3.71</td>
<td>3.74</td>
<td>4.12</td>
</tr>
<tr>
<td>The reviews I received helped me to improve my work.</td>
<td>3.49</td>
<td>3.83</td>
<td>3.76</td>
</tr>
<tr>
<td>The scores assigned by the reviewers were fair.</td>
<td>3.30</td>
<td>3.44</td>
<td>3.76</td>
</tr>
</tbody>
</table>

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Survey results — software

<table>
<thead>
<tr>
<th>Question</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>There was too much rating required for this class.</td>
<td>3.75</td>
<td>3.88</td>
<td>3.72</td>
</tr>
<tr>
<td>I had trouble determining how to carry out the assigned activities in Expertiza.</td>
<td>3.04</td>
<td>2.66</td>
<td>2.49</td>
</tr>
</tbody>
</table>

- Only the first question above received an unfavorable average response.
  - We’ve cut down on the amount of review in that class.
Another view of results

... % agreeing (A, SA) with each statement

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Negatively phrased questions …

1. I had trouble understanding what was expected of me in writing a textbook chapter.

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Negatively phrased questions …

18. There was too much rating required for this class.
Negatively phrased questions …

19. I had trouble determining how to carry out the assigned activities in Expertiza.

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Excellent scores …

2. I put a lot of effort into writing my articles for the wiki textbook.
3. The material I read in order to write my chapter gave me new insight into the topic I was writing on.

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4. The textbook articles I wrote are credible entries for a graduate textbook.
Constant improvement …

7. I clearly understood what was expected of me in reviewing a textbook chapter.

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8. The chapters I read that were authored by other students gave me new insight into the material they covered.
Altogether, 9 of the 19 questions showed constant improvement.

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Why the improvement?

- Later cohorts mostly started with existing pages
  - Could *enhance* them, rather than *creating* them.
- Better rubric
  - More detailed criteria, but
  - Less textual feedback

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○ Introduction: Why wiki textbooks?
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○ Results
○ Reflection
○ Textbooks of the future

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What we didn’t measure

- Learning gains ...
  - Students are writing, reading on different topics

- Value added each semester
  - Do our improving results mean that students are learning more, or that they are working with better materials?

- Quality of text
  - Only students assess ...
Outline

- Introduction: Why wiki textbooks?
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- Textbooks of the future
Commercial textbooks: a broken model

- Publisher needs to recoup costs
  - Print books: “sticker prices”
  - Printing is a small part of the cost
  - Fewer students pay full price,
    - So cost needs to be recouped from fewer students
    - \( \rightarrow \) vicious circle
  - Cost needs to be recouped before secondary market develops
- Publishers would prefer to sell a “product” to all students at ¼ the “sticker price.”
Solutions to textbook crisis

- Different ways of paying
- Different ways of creating
- Avoiding textbooks altogether
Open content, open supplements

- Open-textbook movement
  - Embedded content
- Ancillary resources
  - Lecture slides
  - Testing engine
  - Videos
  - Worked-out examples
  - Test bank/homework problems
Textbooks of the future

- STEMWiki project

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Summary

- A wiki is an excellent medium for collaborative writing.
- With appropriate software support, a class can engage collaboratively in a large project.
- Students see the benefits of the approach.
- Some evidence that benefits build with repeated use.
- Opens the door to fully featured, less expensive textbooks.

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