Math 308 Wiki Project Discussion

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January 18, 2017
Project Summary

- MediaWiki
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- Course broken up into 52 topics (basis; linear dependence; matrix multiplication; etc.)
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- Students used MediaWiki markup and LaTeX to fill in pages
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- Students assigned to groups of 3-4; groups assigned to 3-4 topics
- Students used MediaWiki markup and LaTeX to fill in pages
- (Show: section J topic list; linear system example; matrix powers before/after/source code)
Project Goals

1. Encourage engagement
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2. Practice technical problem solving
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3. Deeply learn a new way of thinking
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4. Provide a community resource
Project Details

- Technology survey at start of quarter
Project Details

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  - (Show: summary statistics)
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- Group assignments posted first week
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- Groups filled in grade page by end of second week
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- Groups filled in grade page by end of second week
  - (Show: section J groups page; group JB grade page)
Project Details

- “Initial version” of each topic due 1 week after lecture introduction

Completion grade

- Draft comments emailed to group roughly 1 week later

- “Final version” of each topic due on the day of the final

Project: 25% of overall grade; initial version: 25%; final version: 75%; replaced midterm
Project Details

- “Initial version” of each topic due 1 week after lecture introduction (completion grade)
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Further highlights

- Nice examples of student work
  - (Show: section J “Big theorem” intuition section; section I row reduction; section I subspace caption; section I basis)
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- Low resolution in final scores
  - (Show: wiki project grade summary)
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- Section I grading options: 40 group, 9 individual
Further highlights

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- Low resolution in final scores
  - (Show: wiki project grade summary)
- Section I grading options: 40 group, 9 individual
- Section J grading options: 11 group, 35 individual
My workload

- Initial setup: Ovid Shared Web Hosting; MySQL installation; MediaWiki; SimpleMathJax plugin; instruction, topic, group pages

- Group assignments: a couple hours

- Initial version comments: roughly 15 hours overall, way too long

- Final version grading: section J's took 4 hours, 16 minutes total (section J final grading took 7 hours)
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- Student time commitment
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- Section-by-section assignments
The mixed

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- Page layout
Final survey: quantitative

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- Hours on wiki project: 10.83 average, 8.61 standard deviation
Final survey: quantitative

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- Hours on wiki project: 10.83 average, 8.61 standard deviation
- Hours studying for midterm: 11.6 hours average, 9.6 hours standard deviation
Final survey: free response

“What were the biggest issues you encountered during the Wiki project?” My summary.
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“What were the biggest issues you encountered during the Wiki project?” My summary.

- Editing pages, x14
- Wiki server connection issues, x8
- Group meetups, x4
- Not knowing when to stop writing, x3
- Due date issues, x3
- Sketchy grading rubric, x2
- Coming up with an example, x2
- Uneven group workload, x2
- Being mathematically precise
- Learning the topic
- Overemphasized your unimportant topic
- Took away second midterm
- One-size-fits-all template didn’t perfectly fit
Final survey: free response

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- Learning to edit a wiki/LaTeX/MediaWiki, x7
- Understood course content better, x3
- Engaged with classmates, x3
- Clear guidelines
- None, prefer quizzes
Final survey: actionable advice

“What actionable advice do you have for improving the Wiki project?” My summary.
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- Allow students to choose groups, x2
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- Allow students to choose groups, x2
- No projects due during dead week, x2
Final survey: actionable advice

“What actionable advice do you have for improving the Wiki project?” My summary.

- Fix server issues, x2
- Remove groups, x2
- Peer-review, x2
- Keep project, don’t make it replace exam, make it supplement the rest, x2
- Don’t make it graded
- Only allow individual grades
- Integrate the project with the rest of the course somehow
- Clarify initial instructions
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- Give small amount of lecture time for group meeting
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- Professor/group meetings

Replace with posters or PowerPoints

Expand LaTeX intro, e.g. discuss typesetting linear systems

Explain what info to duplicate from other topics and what not to

Assign homework problems to each topic
Final survey: actionable advice

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Goals reached?

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4. Provide a community resource
Local tweaks

- Set aside 20-30 minutes one early lecture for a little tutorial and for groups to meet each other
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- Use more reliable web server
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- Add quizzes/break up midterm into parts
Global changes

- Decrease focus on grades
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  - Use low-resolution or completion grades

- Decrease sense of ownership over pages
- Emphasize collaborative editing
- Add peer-review component
- Emphasize links to other pages
- Class-wide incentives
- Modify topics
- Enrichment: e.g. adjugate matrix; Cayley-Hamilton theorem; page rank/SVD
- Extended examples: e.g. diagonalizing a permutation matrix
- Computational explanations: e.g. a Gauss-Jordan algorithm in Matlab
- Make frequent small edits instead of a few large edits
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Discussion questions

“What is the place and usefulness of modern technology for teaching college-level math?”
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- Computers do virtually all linear algebra computations in practice, but they’re not currently used in Math 308. Should there be, for instance, a Matlab component to any introductory linear algebra course? Another language?
Discussion questions

“What is the place and usefulness of modern technology for teaching college-level math?”

- What value do we as lecturers add compared to having students watch existing well-regarded lectures, like those from Khan Academy?
Discussion questions

“What is the place and usefulness of modern technology for teaching college-level math?”

▶ What are the best qualities in automated homework systems? How do they improve on or worsen traditional grading systems?
Discussion questions

“What is the place and usefulness of modern technology for teaching college-level math?”

- What uses of technology genuinely improves lectures? (Ex: video demonstrations; using computer algebra systems to solve problems live; clickers)
Discussion questions

“What is the place and usefulness of modern technology for teaching college-level math?”

- Are there other areas of the information revolution which are not yet well-exploited in the classroom setting?
Thanks for your time!