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Comparing Approaches to Wiki Assessment

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Comparing Approaches to Wiki Assessment

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NCSU Faculty Center for Teaching and Learning
NCSU LITRE (Learning in a Technology-Rich Env.)
NCSU/Duke Center for Advanced Computing & Communications
Outline

- Teaching with Wikis
- Expertiza “Virtual Demo”
- Comparing Assessment Methods
Teaching with Wikis

- A wiki is, essentially, a Web site that can be edited by any user.
  - Users create their own pages.
  - Or, pages can be pre-created by the instructor and edited by students.
- Wikis have been used for many different purposes, including writing a textbook ...
Advantages of Wikis

- **Co-editing**: Homework done on wikis promotes collaboration between students.

- **Co-assembly**: Wikis lend themselves well to projects where different people contribute different parts.
How Wikis Are Used—Examples

○ Glossary of course-related terminology
Glossary of Course-Related Terms

Category: Turf

Articles in category "Turf"

There are 200 articles in this category.

A
- Aceonul
- Acid soil
- Acretal penetrants
- Activated sludge
- Active ingredient (AI)
- Aerate
- Aggregate
- Agricultural cultivator
- Air drainage
- Alkaline soil
- All weather track
- American Society for Testing and Materials (ASTM)
- Amino
- Annual grasses
- Apical buds
- Apomixis
- Application efficiency (EA)

C cont.
- Clay court
- Closed Impact Tester
- Coated fertilizer
- Conserve
- Combining
- Complete fertilizer
- Compost
- Concrete sand
- Conditioners
- Consumer Product Safety Commission (CPSC)
- Contact pesticide
- Continuous pressure main line
- Contour mowing
- Contour plan
- Controlled release fertilizer
- Controller charts
- Cool

F cont.
- Fast dry court
- Fertilization
- Fertility
- Fertilizer
- Fertilizer analysis
- Field contour
- Filled synthetic turf
- Fills
- Filter cloth
- Finale
- Finish grade
- Flail mower
- Flat sloped field
- Flocculate
- Flow-by
- Foliar burn
- Foliar feeding
- Foliar fertilizers
Glossary of Course-Related Terms, ex.

Activated sludge

1. A granular, porous, organic fertilizer material derived from sewage. Aeration, digestion, and drying processes kill all bacteria and weed seeds. Nitrogen is the most valuable component of this product.
How Wikis Are Used—Examples

- Glossary of course-related terminology
- Chemical engineering dynamics and controls textbook (Hohne)
Chem. Engineering Process Textbook

Welcome to the University of Michigan Chemical Engineering Process Dynamics and Controls Open Textbook. This electronic textbook is a student contributed open source text covering the materials used at Michigan in our senior level controls course.

Click here for the 2006 version of the text

Information about this course

Other texts that may also be of interest:
- ECOSSE HyperCourse on control theory from the university of Edinburgh, Scotland
- David MacKay's text on Information Theory, Inference, and Learning Algorithms. This text provides a solid foundation for probability theory.
- Videos lectures on linear algebra from MIT's open courseware. If you want to learn more about eigenvalues, eigenvectors, determinants, and SVD, here is a good place to go!

Authors and Editors
- 2006 Edition Authors
- ChemE 466: Class of 2007

Chemical Process Dynamics and Controls

Contents [First]
1. Modeling Basics
2. Sensors and Actuators
3. Piping and Instrumentation Diagrams
4. Logical Modeling
5. Modeling Case Studies
6. Chemical Process Controls
7. 1 PID control

Gehringer, Comparing Approaches to Wiki Assessment
http://research.csc.ncsu.edu/efg/teaching/presentations/SoTL_2009.ppt
How Wikis Are Used—Examples

- Glossary of course-related terminology
- Chemical engineering process textbook (Hohne)
- Ethics in Computing Web site
CSC 379: Week 5, Group 4

Paperless Electronic Voting

Examine the ethical issues regarding paperless electronic voting (e.g., voting machines with no voter-approved persistent paper record of the electronic ballots cast). Include a brief overview of what paperless electronic voting is and instances where it has been used. Draw from a variety of internet resources to explain its advantages and disadvantages (including obstacles to adoption of equipment that maintain a paper record). Is there an ethical responsibility to create and maintain a persistent paper record of votes, if so, whose?

The discussion questions listed at the bottom of the weekly assignments page should be answered through the content you provide on this wiki page.

- What is Paperless Electronic Voting
- Ethical Issues
- Sarasota County election of Republican Vern Buchanan?

Ethical Issues
How Can You Use Wikis in Your Courses?

- Share ideas with your neighbors
Pitfalls of Wikis

- Others can “deface” wiki pages.
- Some technology-averse students have trouble learning to use wikis.
- Under FERPA, students need to give consent for their required work to be posted publicly.
- Some students are uncomfortable with public writing.
- Wikis use their own markup language, which is not as flexible as HTML.
How to Assess Wiki Contributions?

- **Instructor/TA assessment**
  - There is a lot to assess.
  - Students write on different topics
  - “History” feature shows who has done what
  - Assessment based on rubric

- **Student assessment**
  - Students write up short commentaries
    - on their contributions
    - on their collaborations
  - Students suggest grades; instructor approves

- Wikis are new, so not everyone assesses ...
Peer Assessment

- Students can be assigned to review others’ work.
- A peer-review system presents them with links to wiki pages by other authors.
- They score these authors based on a rubric.
- The authors don’t have to be writing on the same topics.
Peer Assessment—Advantages

- Adds a new dimension to collaboration.
- Electronic peer review of wiki contributions
  - gets students working together to improve others’ learning experiences,
  - helps them learn, by performing tasks that are similar to real-world responsibilities,
  - gives them experience in writing their ideas up for an audience of their peers,
  - allows each cohort to “stand on the shoulders” of students in earlier classes.
Outline

- Teaching with Wikis
- Expertiza “Virtual Demo”
- Comparing Assessment Methods
Our Approach

- **Selection:** Students select from a set of topics for a wiki assignment.
- **Submission:** They write their wiki page(s).
- **Review:** Their submission is peer-reviewed by other students.
- **Resubmission, re-review:** They have a chance to revise their submission.
- **Partner contributions:** Students rate the contributions of their partners.
- **Grading:** Instructor considers the reviews, revisions, and partner evals in assigning grades.
To review the submissions you are assigned, you should go to http://expertiza.ncsu.edu, where you will see a screen that looks like this.
When you log in, you will see a list of assignments to which you have access.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Course</th>
<th>Topic</th>
<th>Current Stage</th>
<th>Stage Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 4 wiki</td>
<td>—</td>
<td>—</td>
<td>rereview</td>
<td>Mon Nov 05 23:00:00 -0500 2007</td>
</tr>
<tr>
<td>Research project</td>
<td>—</td>
<td>—</td>
<td>Complete</td>
<td>Complete</td>
</tr>
<tr>
<td>Week 2 wiki</td>
<td>—</td>
<td>—</td>
<td>Complete</td>
<td>Complete</td>
</tr>
<tr>
<td>Week 1 wiki</td>
<td>—</td>
<td>—</td>
<td>Complete</td>
<td>Complete</td>
</tr>
</tbody>
</table>

To begin, first click on an assignment from the list above.
Submit or Review

- Your work (Submit and view feedback)
- Others’ work (Give feedback to others on their work)
- View scores

Next: Click the activity you wish to perform on the assignment titled: Innovate demo

Select “Others’ work” from the menu.
A list of reviews will appear. Now select one of the reviews you have been assigned.
At the top, you will see wiki pages listed. Typically, these will be various versions of your authors’ submissions. Click on the top one to see the most recent version.
Now, fill out the rubric. Select a value for each question, but also type helpful comments into the text box below each question. This will help your reviewees to improve their work.
At the bottom of the page is a blank for an “Additional Comment”. You can use it to make more comments, or write a general review of the work.
Expertiza
Reusable learning objects through peer review

Welcome to Expertiza
The Expertiza project is a system for using peer review to create reusable learning objects. Students do different assignments; then peer review selects the best work in each category, and assembles it to create a single unit.

Login
Name
s2

Password
******

Forgotten your password?

After others have reviewed your work, you may wish to log in again to view your scores.
Submit or Review

- Your work (Submit and view feedback)
- Others' work (Give feedback to others on their work)
- View scores

Next: Click the activity you wish to perform on the assignment titled: Innovate demo

And click on “View scores”.
Scores

Review 1:

<table>
<thead>
<tr>
<th>Question</th>
<th>Score</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>This paper covers a topic appropriate to engineering education.</td>
<td>5</td>
<td>Very timely.</td>
</tr>
<tr>
<td>This paper appears to be technically sound.</td>
<td>3</td>
<td>It is a little sloppy in places</td>
</tr>
<tr>
<td>This paper is well organized.</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>I believe this paper is worthy of presentation at the conference.</td>
<td>5</td>
<td>The audience would learn a lot from the author’s experience.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>17</td>
<td><strong>(85%)</strong></td>
</tr>
</tbody>
</table>

Review 2:

<table>
<thead>
<tr>
<th>Question</th>
<th>Score</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>This paper covers a topic appropriate to engineering education.</td>
<td>3</td>
<td>It was more timely about three years ago.</td>
</tr>
<tr>
<td>This paper appears to be technically sound.</td>
<td>5</td>
<td>I see no problems.</td>
</tr>
<tr>
<td>This paper is well organized.</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>I believe this paper is worthy of presentation at the conference.</td>
<td>3</td>
<td>I think many of the audience have already seen similar developments.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15</td>
<td><strong>(75%)</strong></td>
</tr>
</tbody>
</table>

Grade
- Average = 16 (80%)
- Final Grade=80

You will see scores and comments by your reviewers, along with the average score and a calculated grade.
Outline

- Teaching with Wikis
- Expertiza “Virtual Demo”
- Comparing Assessment Methods
The Experiment

- We studied ten NCSU classes that used wikis in 2007-08.
  - CSC 216, Programming Concepts—Java
  - CSC/ECE 506, Architecture of Parallel Computers
  - CSC/ECE 517, Object-Oriented Languages & Systems
  - COM 598W, Gaming and Social Networks
  - ECI 306, Middle Years Reading
  - ECI 521, Teaching Literature for Young Adults
  - ECI 525, Contemp. Approaches in Teaching Social Studies
  - HI 216, Latin America since 1826.
  - HI 453/553, U.S. and Latin America.
  - TOX 415, Environmental Toxicology & Chemistry

- We compared students’ reactions to wiki assignments and assessment.
The Assignments

- **COM 598W**: Find and post links related to class topic
- **CSC 216**: Design an active-learning exercise.
- **CSC 506**: Research a topic related to course.
- **ECI 306**: Post class notes, comments on articles, keep vocabulary list, debrief after presentation
- **ECI 525**: Background for project using 19th-c. letters
- **HI 216**: Research a topic on LA history or culture
- **TOX 415**: Debate--
  - Worldwide ban on DDT
  - Safety of CCA-treated wood
Assessment Methodologies

- COM 598W: Class discussion
- CSC 216, CSC 506: Peer review
- ECI 306: Instructor assessment
- ECI 525: Instructor assessment
- HI 216: Instructor assessment, based partially on oral report
- TOX 415: Outside team of experts
Results: Critical thinking

“The experience of using a wiki helped me to think critically about the subject matter of this assignment.”

What factors do you think might have influenced the results?
Results: Critical thinking

“The experience of using a wiki helped me to think critically about the subject matter of this assignment.”

<table>
<thead>
<tr>
<th>Course</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM 598W</td>
<td>2.25</td>
</tr>
<tr>
<td>CSC 216</td>
<td>2.40</td>
</tr>
<tr>
<td>CSC 506</td>
<td>1.94</td>
</tr>
<tr>
<td>ECI 306</td>
<td>3.22</td>
</tr>
<tr>
<td>ECI 525</td>
<td>1.75</td>
</tr>
<tr>
<td>HI 216</td>
<td>2.00</td>
</tr>
<tr>
<td>TOX 415</td>
<td>3.00</td>
</tr>
<tr>
<td>Mean</td>
<td>2.27</td>
</tr>
</tbody>
</table>

- All questions rated on a scale of 1=strongly agree to 5=strongly disagree.
- The “critical thinking” scores were in general better when students were asked to do a research assignment. (Gold = research assgt.)
- Difference significant at 95% level
Results: Ease of collaboration

“Using a wiki made it easy to collaborate with other students.”

<table>
<thead>
<tr>
<th>Course</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM 598W</td>
<td>1</td>
</tr>
<tr>
<td>CSC 216</td>
<td>2 or 3</td>
</tr>
<tr>
<td>CSC 506</td>
<td>1 or 2</td>
</tr>
<tr>
<td>ECI 306</td>
<td>1</td>
</tr>
<tr>
<td>ECI 525</td>
<td>1</td>
</tr>
<tr>
<td>HI 216</td>
<td>3 to 5</td>
</tr>
<tr>
<td>TOX 415</td>
<td>11</td>
</tr>
</tbody>
</table>

- The students with the largest teams (11) thought collaboration was most difficult.
- By the end of the semester, almost all of my CSC 506 students were working individually.
- Different results if given class time to work on submissions?
Results: Adequate Feedback

“I received adequate feedback on the quality of my work.”

- What factors might have influenced this?
Results: Adequate Feedback

“I received adequate feedback on the quality of my work.”

<table>
<thead>
<tr>
<th>Course</th>
<th>Feedback Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM 598W</td>
<td>2.25</td>
</tr>
<tr>
<td>CSC 216</td>
<td>2.07</td>
</tr>
<tr>
<td>CSC 506</td>
<td>2.82</td>
</tr>
<tr>
<td>ECI 306</td>
<td>3.44</td>
</tr>
<tr>
<td>ECI 525</td>
<td>3.00</td>
</tr>
<tr>
<td>HI 216</td>
<td>2.00</td>
</tr>
<tr>
<td>TOX 415</td>
<td>2.75</td>
</tr>
<tr>
<td>Mean</td>
<td>2.66</td>
</tr>
</tbody>
</table>

- In general, the least pleased were those who were required to use the feedback.
  - Key: Gold = req’d. to revise; Yellow = no revision
  - Didn’t seem to matter much who provided the feedback.
- Very little indication of why those not required to revise considered their feedback useful.
Results: Adequate Feedback (cont.)

“I received adequate feedback on the quality of my work.”

<table>
<thead>
<tr>
<th>Course</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM 598W</td>
<td>2.25</td>
</tr>
<tr>
<td>CSC 216</td>
<td>2.07</td>
</tr>
<tr>
<td>CSC 506</td>
<td>2.82</td>
</tr>
<tr>
<td>ECI 306</td>
<td>3.44</td>
</tr>
<tr>
<td>ECI 525</td>
<td>3.00</td>
</tr>
<tr>
<td>HI 216</td>
<td>2.00</td>
</tr>
<tr>
<td>TOX 415</td>
<td>2.75</td>
</tr>
<tr>
<td>Mean</td>
<td>2.66</td>
</tr>
</tbody>
</table>

- In general, the least pleased were those who were required to use the feedback.
  - Key: Gold = req’d. to revise; Yellow = no revision
- Difference significant at 95% level
  - Students required to revise are less pleased with feedback.
Results: Feedback Helpful

“The feedback I received helped me to improve my work.”

<table>
<thead>
<tr>
<th>Course</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM 598W</td>
<td>1.75</td>
</tr>
<tr>
<td>CSC 216</td>
<td>1.87</td>
</tr>
<tr>
<td>CSC 506</td>
<td>2.41</td>
</tr>
<tr>
<td>ECI 306</td>
<td>2.67</td>
</tr>
<tr>
<td>ECI 525</td>
<td>2.50</td>
</tr>
<tr>
<td>HI 216</td>
<td>2.11</td>
</tr>
<tr>
<td>TOX 415</td>
<td>3.13</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td><strong>2.38</strong></td>
</tr>
</tbody>
</table>

- The prose feedback is not helpful in understanding why the COM 598W, CSC 216, and HI 216 students were so favorable.
- The CSC 506 students worried about conflicting feedback.
Conflicting Feedback

“I spent a lot of time on my assignments to make sure they were high quality before I turned them in the first time. The feedback I got from other students was almost always too vague to be of any use. I also often disagreed with what they had to say. Sometimes students would recommend some very off-topic info to add to the wiki. I didn't want to add this info to please one reviewer for fear of then losing points with the others in the stays-on-topic category.”
Peer Review vs. Other Assessment

- Classes that used peer assessment are shown in gold.
  - CSC 216, Programming Concepts—Java
  - CSC/ECE 506, Architecture of Parallel Computers
  - CSC/ECE 517, Object-Oriented Languages & Systems
  - COM 598W, Gaming and Social Networks
  - ECI 306, Middle Years Reading
  - ECI 521, Teaching Literature for Young Adults
  - ECI 525, Contemp. Approaches in Teaching Social Studies
  - HI 216, Latin America since 1826.
  - HI 453/553, U.S. and Latin America.
  - TOX 415, Environmental Toxicology & Chemistry

- We compared students’ reactions to wiki assignments and assessment.
Results

- “The experience of using a wiki helped me to think critically about the subject matter of this assignment.”  
  90% NPR: 2.51, PR: 2.12

- “Using a wiki made it easy to collaborate with other students.”  
  90% NPR: 2.41, PR: 2.00

- “I received adequate feedback on the quality of my work.”  
  NPR: 2.60, PR: 2.68

- “The feedback I received helped me to improve my work.”  
  NPR: 2.44, PR: 2.33

- All questions rated on a scale of 1=strongly agree to 5=strongly disagree.
Conclusion

- Wikis are a powerful collaboration tool that can be used in many courses.
- Research assignments can encourage critical thinking.
- Too-large teams make collaboration awkward.
- Critical thinking appears to be improved through the revision process facilitated by peer review.
- Peer review provides a scalable system for assessing wiki contributions.
New Features Coming to Expertiza

- Game mechanics ...
  - Achievements system
  - Reputation system
  - Leaderboards
- Related feature
  - Microjobs/micropayments
For more info …

- http://research.csc.ncsu.edu/efg/expertiza
- Ed Gehringer, efg@ncsu.edu