CPSC 304 Course
Transformation
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Preparation

- Data Collection
  - Attitudinal Surveys
  - Pre / Post Tests
  - Traditional Assessments (Assignments, Midterms, Final)
  - Learning Management System (Vista)
  - Student Interviews
Sample Attitudinal Survey Questions

- What are the main reasons for taking this course?
- How many hours do they expect to spend on this course?
- What excites / worries them the most in this course?
- How have the lectures / tutorials / clicker questions / textbooks / etc. contributed to their learning?
- What works / can be improved in this course?
Sample Pre / Post Test Questions

- Given a business case, design a data model to capture what data needs to be stored, and how the data can be used.

- Given a sample database or a spreadsheet, how can the data be reorganized to reduce redundancy?

- How can locking be used to ensure data integrity in a database?

- How can data be accessed using formal languages as well as commercial languages?
Learning Management System (Vista)

- Number of visits to a given page
- Number of user sessions
- Average session length
- Most active days
- Most active times
- Most viewed pages
- Most discussed topics
Result: Usefulness of Course Activities / Components

<table>
<thead>
<tr>
<th>Course Activities</th>
<th>Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td>86%</td>
</tr>
<tr>
<td>Clicker Questions</td>
<td>81%</td>
</tr>
<tr>
<td>Tutorials</td>
<td>58%</td>
</tr>
<tr>
<td>Assignments</td>
<td>76%</td>
</tr>
<tr>
<td>TAs’ Office Hours</td>
<td>21%</td>
</tr>
<tr>
<td>Instructor’s Office Hours</td>
<td>29%</td>
</tr>
</tbody>
</table>

Note: data is based on midterm survey with N=58, total class size=91.
How Much Do They Study?

Student Study Times (Actual / Expected)

- Expected Hours
- Actual Hours

Hours/Week

Student Numbers (Ordered by Expected Study Time)
### Data Correlation

<table>
<thead>
<tr>
<th></th>
<th>Pre-Test</th>
<th>Midterm 1</th>
<th>Midterm 2</th>
<th>Post-Test</th>
<th>Final Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. Score:</td>
<td>53%</td>
<td>70%</td>
<td>71%</td>
<td>68%</td>
<td>74%</td>
</tr>
<tr>
<td>Minimum:</td>
<td>12%</td>
<td>24%</td>
<td>26%</td>
<td>32%</td>
<td>44%</td>
</tr>
<tr>
<td>Maximum:</td>
<td>85%</td>
<td>97%</td>
<td>100%</td>
<td>85%</td>
<td>98%</td>
</tr>
<tr>
<td><strong>Correlation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Test</td>
<td>1.00</td>
<td>0.47</td>
<td>0.48</td>
<td>0.48</td>
<td>0.43</td>
</tr>
<tr>
<td>Midterm 1</td>
<td>0.47</td>
<td>1.00</td>
<td>0.78</td>
<td>0.49</td>
<td><strong>0.77</strong></td>
</tr>
<tr>
<td>Midterm 2</td>
<td>0.48</td>
<td>0.78</td>
<td>1.00</td>
<td>0.56</td>
<td><strong>0.81</strong></td>
</tr>
<tr>
<td>Post-Test</td>
<td>0.48</td>
<td>0.49</td>
<td>0.56</td>
<td>1.00</td>
<td>0.61</td>
</tr>
<tr>
<td>Final</td>
<td>0.43</td>
<td>0.77</td>
<td>0.81</td>
<td>0.61</td>
<td>1.00</td>
</tr>
</tbody>
</table>
Making Changes

- Observations:
  - tutorial attendance could be improved
  - TAs required support to conduct tutorials
  - students needed help on project and practice on difficult topics

- Goal: improve tutorial usefulness to students

- Instructional Goal: provide worked examples and require student reflective thinking during tutorial sessions
Tutorial Transformation

- STLF consults with instructor on the tutorial material
- STLF prepares material for the TAs prior to the tutorials every week
- STLF meets with TAs and go over tutorial material every week
- TAs conduct the tutorials
- STLF attends all tutorials and provide support during tutorials
- STLF collects feedback form from students and reviews the material after each tutorial
Strategies Used in Tutorials

- Worked examples: go through entire example exercises with students
- Reflective exercise: have students come up with their procedure of solving problems in their own words
- Application: students apply what they learned in their term project
- Meta-cognitive reflection: students reflect on what has changed in their understanding
Student Feedback Form
Questions (10 mins at end of tutorial)

- What did you not know before this tutorial but you learned from this tutorial?

- What did you find out in this tutorial that was incorrect in your understanding of concurrency control before?

- What is something you are still not sure of?

- (One more question specific to the tutorial.)
Results

- Question: How useful have the tutorials been for your learning? (Tutorial 4)

- 25 students answered the question and 83% of them indicated the tutorials have been useful (from somewhat useful to very useful)

- Attendance increased from around 35 students (Winter 1) to around 60 students (Winter 2) with about the same number of registered students

- Tutorial attendance dropped during transition from classroom tutorial sessions to lab sessions
Next Steps

- Correlate student attendance of tutorial sessions with performance on specific questions in midterms and final exam.

- Provide better TA support and training in engaging students in discussions and interactive learning (e.g. use of Socratic dialogue).

- Develop pre – post tests for each tutorial.

- Investigate the integration of lecture and tutorial (lecture –tutorial) during the lecture hours.

- Have students develop concept maps as they work through the material in the course during the tutorial sessions.