Aropā and PeerWise: Supporting Student Contributed Pedagogy in Large Classes

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4 May 2009
Introduction

- Who we are
- Pedagogic change
- Why change is needed
- Lines of engagement

Peer Assessment

MCQ authoring

Closing remarks
Who we are

- We are a group of Computer Scientists with an interest in education
- Develop tools, which we use ourselves and support others in using
- There are two reasons why technology is used in teaching:
  1. to make it easier to do things
  2. to enable different ways of teaching
Pedagogic change

- The steps in traditional teaching:
  - broadcast knowledge
  - listen to the student echos
  - assign grades in relation to the fidelity of the echos

- can improve the process with better broadcasting, listening to a wider range of signals, improving grade metrics

- **BUT** we are interested in radical changes to the process
Why change is needed

Question the assumptions behind the traditional teaching approach:

- knowledge is stable? (no, knowledge is dynamic)
- possession of knowledge is key? (no, the ability to evaluate and synthesise knowledge is key)
- work is individual? (no, work is collaborative)
- teacher is the authority? (authority undermines deep learning)
Lines of engagement

Study

Student

1-on-1 meeting

Class

Instructor

Lecture

Introduction
- Who we are
- Pedagogic change
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- Lines of engagement

Peer Assessment

MCQ authoring

Closing remarks
Lines of engagement

Introduction
- Who we are
- Pedagogic change
- Why change is needed
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Peer Assessment
MCQ authoring
Closing remarks

Student

Study

Class

Lecture

1-on-1 meeting

presentations
Lines of engagement

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- Student
- Class
- Instructor
- Peer Assessment
- MCQ authoring
- Closing remarks

Steel: Presentations
CSP: 1-on-1 meeting

Aropā and PeerWise: Supporting Student Contributed Pedagogy in Large Classes  EDUCAUSE, Perth, 4 May 2009 – 6
Peer Assessment

- Traditional assignment
- Peer-assessed assignment
- What changes?
- Aropā project
- Main screen
- Grading rubrics
- Student feedback
- What did you like most?
- Dislikes

MCQ authoring

Closing remarks
Traditional assignment

Introduction

Peer Assessment
- Traditional assignment
- Peer-assessed assignment
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- Aropā project
- Main screen
- Grading rubrics
- Student feedback
- What did you like most?
- Dislikes

MCQ authoring

Closing remarks

Aropā and PeerWise: Supporting Student Contributed Pedagogy in Large Classes

EDUCAUSE, Perth, 4 May 2009 – 8
Peer-assessed assignment

Introduction

Peer Assessment
- Traditional assignment
- Peer-assessed assignment
- What changes?
- Aropā project
- Main screen
- Grading rubrics
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MCQ authoring

Closing remarks

Aropā and PeerWise: Supporting Student Contributed Pedagogy in Large Classes  EDUCAUSE, Perth, 4 May 2009 – 9
What changes?

- Increased involvement by student (time on task, time engaged with task)
- Greater variety of tasks undertaken by student
- Reduced delay between authorship and feedback
- Increased volume and diversity of feedback
- More opportunities for reflection
- Raised awareness of own relative performance
- Change in power relations between author and reviewer, student and lecturer
- Greater social involvement
- Rich trace of student performance
- Assessment becomes a part of the learning process
- Department marking budget available for redistributing to remedial tutoring, etc.
Aropä project

- Aropä project running since 2002, aimed at making peer assessment a routine activity throughout the curriculum

- Web-based support tool for managing submission, allocation of reviews, review entry, distributing feedback, monitoring progress, and aggregating marks.


- Wide range of outputs: reports, essays, presentations, digital photographs, posters, legal cases.
Main screen

Introduction

Peer Assessment
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MCQ authoring

Closing remarks

Allocations

“Barney’s Bikes Ltd.” (Reviews due by 5pm May 21, 2008)

Reviewer feedback

- Feedback for “Batou Ltd v. Motoko Ltd”
- Feedback for “Batou Ltd v. Gundarn Corporation”
- Feedback for “Barney’s Bikes Ltd.”
Grading rubrics

Introduction

Peer Assessment
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- Aropä project
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MCQ authoring

Closing remarks

Grading rubric for CIVIL 408A Annotated Bibliographies Document

Title of research topic + An introductory paragraph to the 6 selected articles taken from at least 3 different kinds of source.

- The research title and introductory paragraph comply with the criteria and are clearly stated.
- The research title and introductory paragraph comply with the criteria and are stated.
- The research title and introductory paragraph comply with the criteria and are poorly stated.
- The research title and introductory paragraph do not comply with the criteria. They have not been stated.

Summary of the aims, main points and conclusion for each article + Evaluation of the relevance/usefulness of each article

- The aims, main points and conclusion of have been clearly summarised; At least 5 reference articles have been critically evaluated based on the usefulness or relevance to the research topic.
- The aims, main points and conclusion of have been summarised; At least 4 to 5 reference articles have been critically evaluated based on the usefulness or relevance to the research topic.
**Draft assessment exercise**

Write at least one sentence in response to each of the five questions below (making 300 words altogether) with regard to the draft essay.

1. What is the issue that the draft is addressing. Is it interesting? Do you care about it?

Write your response to the issue in the text box below.

2. Say what you think the argument of the draft is. If the argument is not clear, suggest what a possible argument might be.

State the argument in the text box below.

3. What kinds of reasons, which includes kinds of evidence, does the writer offer to support the argument? You might like to point out the obvious warrant for the argument, if there is one.

Give the reasons in the text box below.

4. Suggest a counterargument to the argument of the draft. This comment may, alternatively, point out unexamined assumptions and/or missing or unacknowledged evidence.

Give the counterargument in the text box below.

5. Identify a characteristic sentence of the writer. Say what you think is good about this sentence, or how this sentence can be improved (your chosen sentence may simply identify a repeated writing fault).

Identify and comment on the sentence in the text box below.
Student feedback

- Anxiety in first-time participants, but
  - High levels of participation (median > 90%)

- Feedback received is not highly valued, but
  - Students see benefit in writing reviews
  - Also value seeing other student work
  - Benefit perceived in reviewing both exemplary and weak work

What did you like most?

- “I liked the way that reading other students work sometimes helped me realise the mistakes in my own work.”

- “It was interesting and beneficial to see what others had written in their answers. Not only did it expand my knowledge of the subject matter but it gave me a better understanding of what makes a good answer.”

- “I really enjoyed being able to see and comment on other students’ work. It has given me a new perspective on the way I read my own work. I have a tendency to throw all my thoughts into an assignment and expect the marker to understand what I mean by wading through it. I think I am already trying to communicate more effectively by being more concise.”
Dislikes

- “Students do not mark properly, some of them don’t even read assignments properly I gathered that from comments I received.”

- “Some people can have different point of views, some people might even have unique view (by thinking into details... while others are just ignoring some facts) and hence produce different marking results.”

- “This process can be fairly time consuming and if, say, it was to be appended to every assignment, it would add significantly to workload, unless there was a corresponding reduction in asst scope.”
Introduction

Peer Assessment

MCQ authoring
- Student generated MCQ bank
- Screenshots
- Results
- Voluntary use
- PeerWise use and exam performance

Closing remarks
Student generated MCQ bank

- Student write MCQ stem and distractors, plus explanation
- Can answer MCQs posted by other students
- Discussion forum with each question
- Rate for quality, difficulty
- Leaderboards: highest rated, most contributed, most answered
Screenshots

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MCQ authoring

Closing remarks

Aropā and PeerWise: Supporting Student Contributed Pedagogy in Large Classes EDUCAUSE, Perth, 4 May 2009 – 19
Aropā and PeerWise: Supporting Student Contributed Pedagogy in Large Classes EDUCAUSE, Perth, 4 May 2009 – 19
Aropā and PeerWise: Supporting Student Contributed Pedagogy in Large Classes  EDUCAUSE, Perth, 4 May 2009 – 19
Screenshots

**PeerWise**

**CompSci 101 Questions**

You are logged in as *pden001*. Log out

**Main menu > Statistics**

**Course statistics**

<table>
<thead>
<tr>
<th>Active users</th>
<th>Total questions</th>
<th>Total responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>434</td>
<td>1049</td>
<td>15587</td>
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</table>

**Top rated questions**

Top 5 rated questions in the system (rated by at least 5 users)  
Highest rating of any of your questions (rated by at least 5 users)

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<th>RANK</th>
<th>QUESTION RATING</th>
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<td></td>
<td>3.9533</td>
</tr>
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</table>
Results

- Results collected for several large courses since 2007
- High voluntary use for study revision
- Participation is strongly correlated with improved exam performance
- Biggest gains in top and bottom quartiles: suggests multiple effects are occurring
- Many high-quality questions
- Broad range of course topics covered

Voluntary use

Introduction

Peer Assessment

MCQ authoring
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- Screenshots
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- Voluntary use
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Closing remarks

Questions Contributed

Aropä and PeerWise: Supporting Student Contributed Pedagogy in Large Classes EDUCAUSE, Perth, 4 May 2009 – 21
Voluntary use

Questions Answered

Number of answers

Date

7-May
9-May
11-May
13-May
15-May
17-May
19-May
21-May
23-May
25-May
27-May
29-May
31-May
2-Jun
4-Jun
6-Jun
8-Jun
10-Jun
12-Jun
14-Jun
PeerWise use and exam performance

Exam performance by quartile, LPA v. MPA

Introduction

Peer Assessment

MCQ authoring
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  • Results
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  • PeerWise use and exam performance

Closing remarks
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Closing remarks

- Approach aligns with broadened educational objectives, not just exam performance; includes both *participation* and *acquisition*-oriented outcomes.
- Challenges traditional notions of fairness and individual ownership, favouring flexibility, choice, and the collective co-creation of knowledge.
- Technology is a key enabler: wikis, on-line peer assessment, and collective MCQ authoring all depend on web technology.
- Class size is not a barrier
- Time demands on instructors are neutral, but care is needed in managing student expectations and workloads.