



THE UNIVERSITY
OF AUCKLAND

NEW ZEALAND

Te Whare Wānanga o Tāmaki Makaurau

PeerWise

Ask | Share | Learn

PeerWise

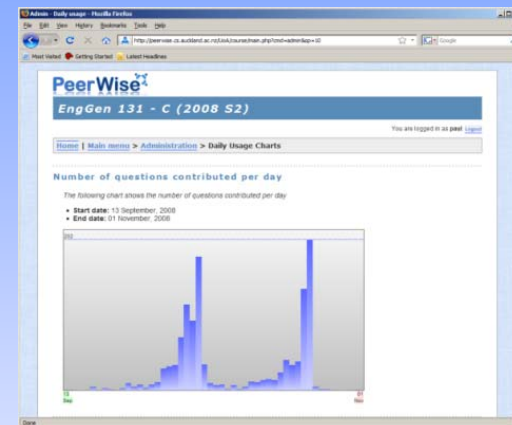
Students sharing and evaluating their MCQs

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Overview

- Description
 - intended benefits
- Demonstration
- Studies
 - usage patterns
 - student attitudes
 - question quality
 - efficacy
- Problems and future work



Feedback

There are 8 comments written about this question

WHEN	COMMENT
11:52am, 28 Oct	Great explanation
9:45pm, 04 Nov	Explanations are top notch :)
5:28pm, 04 Nov	Good question. I fail for it, but helped me though. GREAT EXPLANATION!
2:36pm, 05 Nov	Answering questions like
8:36pm, 05 Nov	The best explanation I've seen. Great effort mate. You've cleared up demerol for me! Cheers :)
8:52am, 06 Nov	Nice explanation!!!!
10:56am, 06 Nov	Sweet question, pointers has suddenly become crystal clear
7:17pm, 28 Oct	Best question I have ever done

< Prev | 1 of 8 | Next >
(Showing 1 - 8 of 8)

Follow

If you would like to follow this author, click the "Follow" button. This will give you access to all of their existing and new questions in the "Followed questions" section of the Main Menu

PeerWise

- Web-based MCQ repository built by students
- Students:
 - develop new questions with associated explanations
 - answer existing questions and rate them for quality and difficulty
 - take part in discussions
 - subscribe to authors they like
 - compete with other students to appear on leaderboards

The screenshot shows a web browser displaying a PeerWise question page. The question is about calculating inches from feet. There are five alternatives (A-E) with their respective percentages of correct answers. Alternative D is highlighted as the correct answer. Below the alternatives is an explanation section.

OPTION	ALTERNATIVE	PERCENTAGE
A	feet = totalInches * INCHES_PER_FOOT; inches = totalInches / INCHES_PER_FOOT;	0.0%
B	feet = totalInches / INCHES_PER_FOOT; inches = totalInches * INCHES_PER_FOOT;	0.0%
C	feet = totalInches / INCHES_PER_FOOT; inches = (feet * INCHES_PER_FOOT) - totalInches;	12.4%
D	feet = totalInches / INCHES_PER_FOOT; inches = totalInches * (feet * INCHES_PER_FOOT);	87.6%
E	feet = totalInches * INCHES_PER_FOOT; inches = feet * INCHES_PER_FOOT;	0.0%

Explanation
You provided the following explanation relating to this question:
The correct answer is (D)
feet = totalInches / INCHES_PER_FOOT;
inches = totalInches * (feet * INCHES_PER_FOOT);
If the input value is 100, then the number of feet and inches would be calculated as:
feet = 100 / 12 = 8
inches = 100 - (8 * 12) = 4
Another way this could be done, which is similar to the example Paul did in class with the seconds and minutes, is to use the % operator

The screenshot shows three leaderboards from the PeerWise interface. Each leaderboard has a table with rank, name, and score.

Most questions answered		
RANK	QUESTION ANSWERED	NUMBER OF QUESTIONS YOU HAVE ANSWERED
1	645	14
2	528	
3	445	
4	372	
5	238	

Most "answered" question contributor		
RANK	TOTAL NUMBER OF ANSWERS	TOTAL NUMBER OF ANSWERS TO ALL QUESTIONS YOU HAVE CONTRIBUTED
1	278	278
2	237	
3	190	
4	178	
5	180	

Most "agreed with" critic		
RANK	AGREEMENT WITH COMMENTS	SUM OF AGREEMENT RATINGS OF ALL COMMENTS WRITTEN BY YOU
1	80	14
2	40	

Intended benefits

- To students

Intended benefits

- To students
 - focuses attention on learning outcomes

"What I found most interesting was how other people structured their questions. It kind of **made me think** about what kind of **topics or concepts** people felt **were important to the course**, hence their choice of making a question on a particular topic."

Intended benefits

- To students
 - focuses attention on learning outcomes
 - express understanding in their own words

" When I try to **create questions**, I realized that I have to **fully understand the topic.**"

"The **biggest learning experience** for me was setting up my multi-choice question...

...in the end it was a lot of help because **i was just about able to answer any question that was on the same topic as my question"**

Intended benefits

- To students
 - focuses attention on learning outcomes
 - express understanding in their own words
 - question bank for drill and practice revision

"I answered over 100 questions, it was a quick way to test my knowledge and if I got the answer wrong the explanations **helped me learn** something I wasn't too sure with."

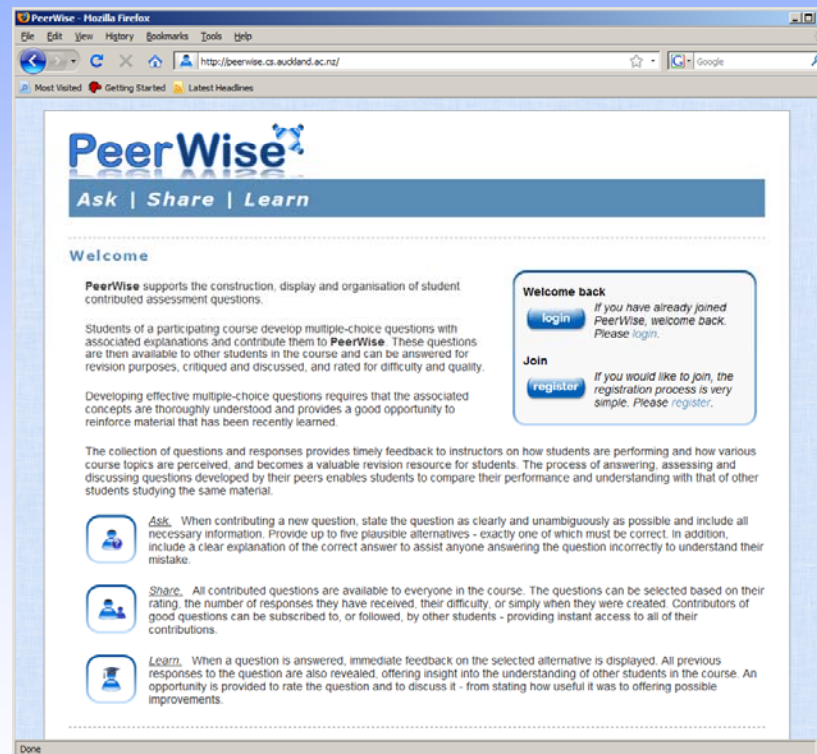
Intended benefits

- To students
 - focuses attention on learning outcomes
 - express understanding in their own words
 - question bank for drill and practice revision
 - peer comparison

"Being able to see how other people answered was great as it allowed me to **recognise at which level I was at compared to everyone else**"

"The biggest benefit of using PeerWise was getting an **understanding** of the kind of **level of** questions and **knowledge that is possessed by other students**"

Demonstration



The screenshot shows a Mozilla Firefox browser window displaying the PeerWise website. The browser's address bar shows the URL <http://peerwise.cs.auckland.ac.nz/>. The website features the PeerWise logo at the top, followed by the tagline "Ask | Share | Learn". Below this, a "Welcome" section provides an overview of the platform's purpose: supporting the construction, display, and organization of student-contributed assessment questions. It explains that students develop multiple-choice questions with explanations, which are then available to other students for revision, critique, and discussion. The site also highlights the benefits of using PeerWise, such as receiving timely feedback and comparing performance with peers. A "Welcome back" box offers a "login" button for returning users and a "Join" section with a "register" button for new users. The "Join" section notes that the registration process is simple. Three key features are detailed: "Ask" (submitting questions with clear alternatives and explanations), "Share" (questions available to all students, with options to follow or subscribe to good questions), and "Learn" (immediate feedback on answers and the ability to rate and discuss questions).

PeerWise - Mozilla Firefox
File Edit View History Bookmarks Tools Help
<http://peerwise.cs.auckland.ac.nz/> Google
Most Visited Getting Started Latest Headlines

PeerWise

Ask | Share | Learn

Welcome

PeerWise supports the construction, display and organisation of student contributed assessment questions.

Students of a participating course develop multiple-choice questions with associated explanations and contribute them to PeerWise. These questions are then available to other students in the course and can be answered for revision purposes, critiqued and discussed, and rated for difficulty and quality.

Developing effective multiple-choice questions requires that the associated concepts are thoroughly understood and provides a good opportunity to reinforce material that has been recently learned.

The collection of questions and responses provides timely feedback to instructors on how students are performing and how various course topics are perceived, and becomes a valuable revision resource for students. The process of answering, assessing and discussing questions developed by their peers enables students to compare their performance and understanding with that of other students studying the same material.

Welcome back
If you have already joined PeerWise, welcome back. Please login.

Join
If you would like to join, the registration process is very simple. Please register.

- Ask.** When contributing a new question, state the question as clearly and unambiguously as possible and include all necessary information. Provide up to five plausible alternatives - exactly one of which must be correct. In addition, include a clear explanation of the correct answer to assist anyone answering the question incorrectly to understand their mistake.
- Share.** All contributed questions are available to everyone in the course. The questions can be selected based on their rating, the number of responses they have received, their difficulty, or simply when they were created. Contributors of good questions can be subscribed to, or followed, by other students - providing instant access to all of their contributions.
- Learn.** When a question is answered, immediate feedback on the selected alternative is displayed. All previous responses to the question are also revealed, offering insight into the understanding of other students in the course. An opportunity is provided to rate the question and to discuss it - from stating how useful it was to offering possible improvements.

Done

Intended benefits

- To staff

Intended benefits

- To staff
 - unique insight into
 - what students feel is important
 - the capabilities of students, and what they are learning

Intended benefits

- To staff
 - unique insight into
 - what students feel is important
 - the capabilities of students, and what they are learning
 - large relevant question banks, rated and discussed by students
 - ENGGEN 131, UoA Second Semester 2007, 6 weeks:
 - 570 students
 - 1,700 questions
 - 35,000 answers

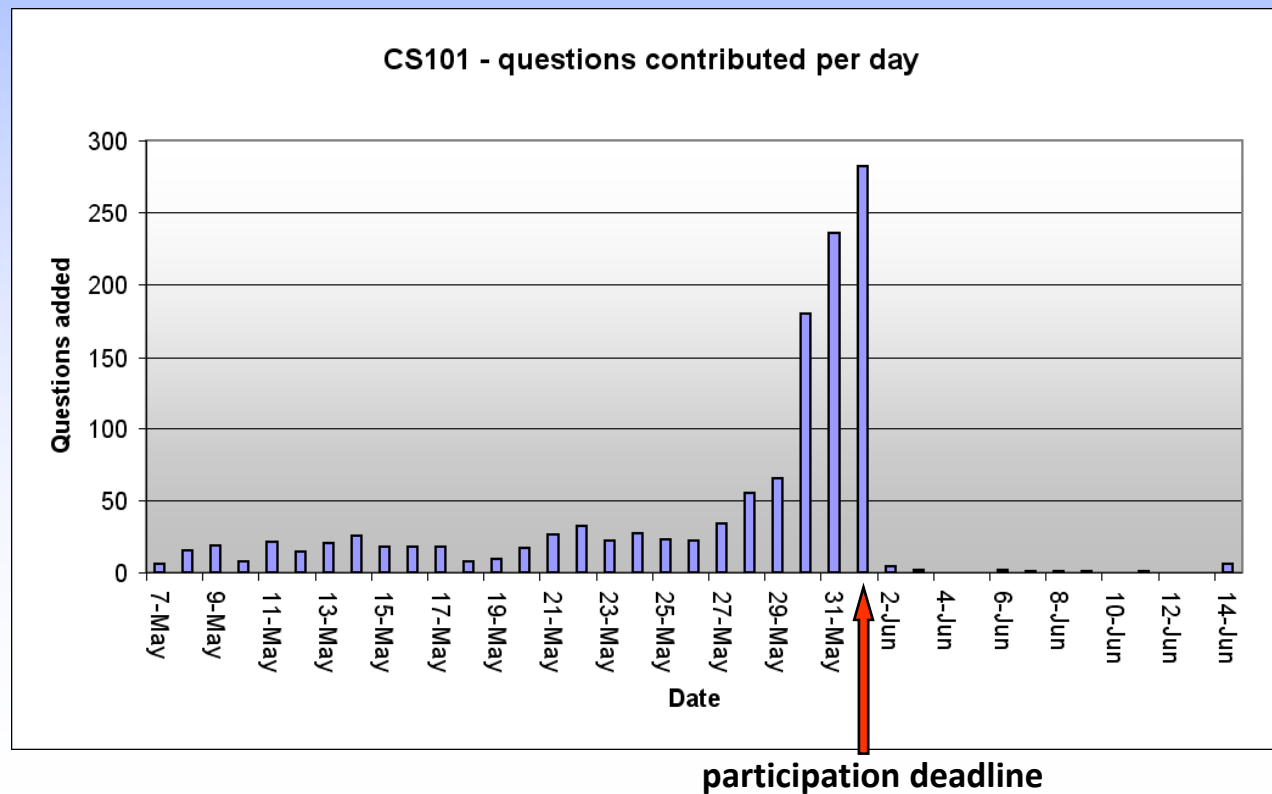
Studies

- Do students use PeerWise voluntarily?
 - usage patterns
- How do students feel about this activity?
 - student attitudes
- Are students developing good quality questions?
 - question quality
- Is activity correlated with performance?
 - efficacy

Usage Patterns

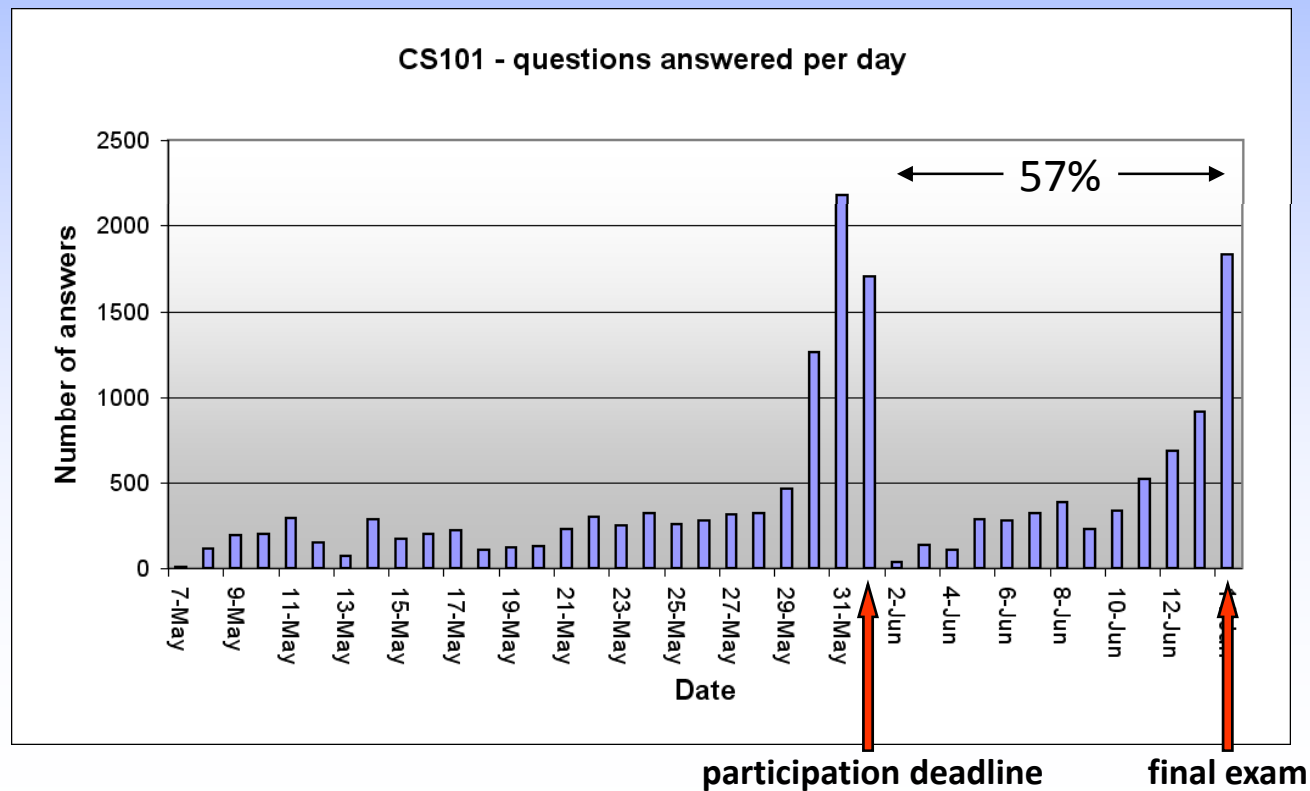
Usage patterns

- Do students use PeerWise voluntarily?
 - COMPSCI 101 course, UoA First Semester 2007 (530 students)
 - Requirement: 2 questions, 10 answers

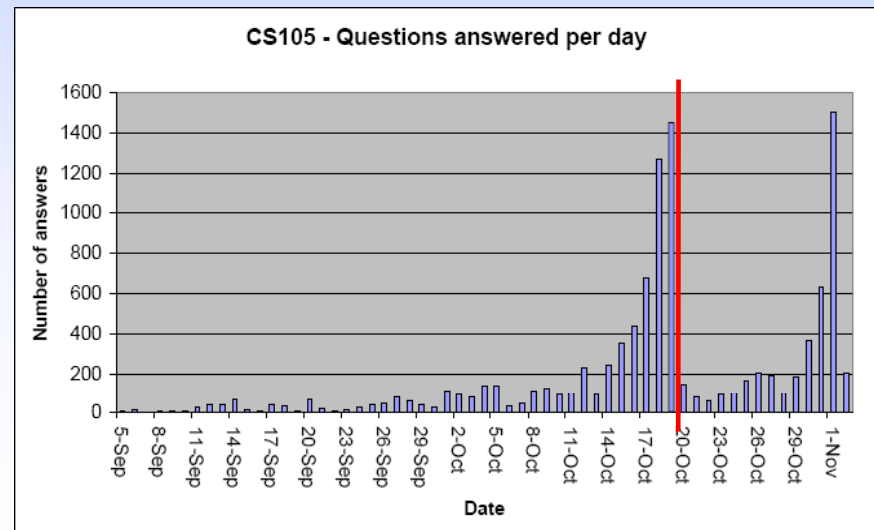
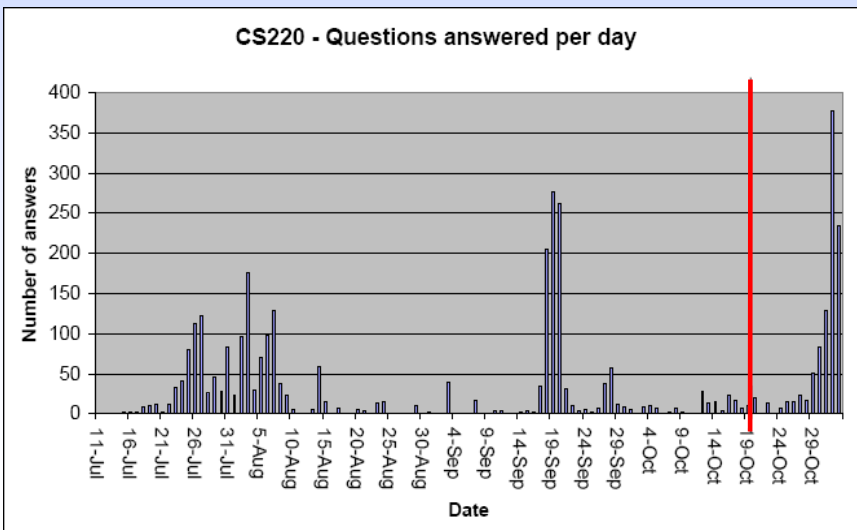
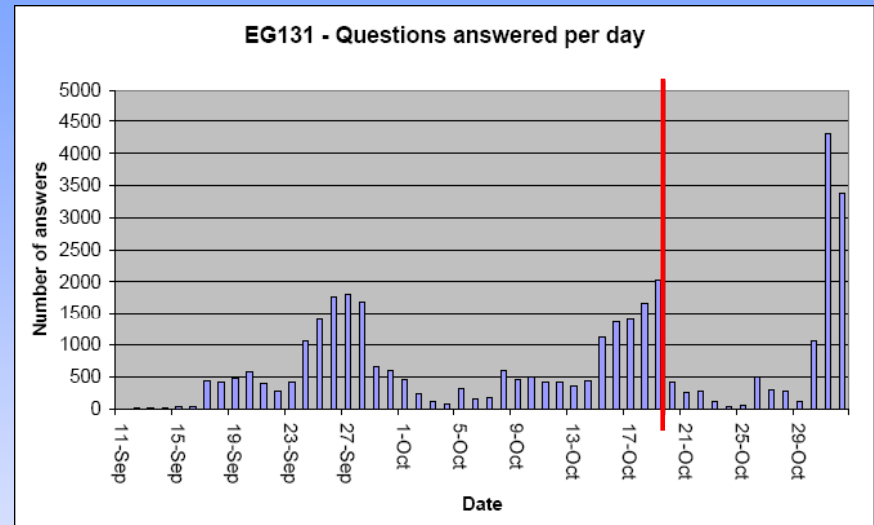
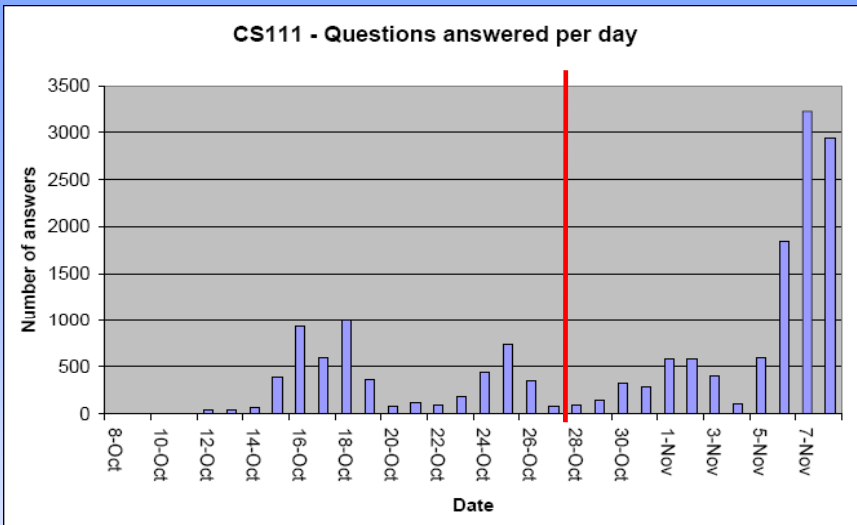


Usage patterns

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Usage patterns



Student attitudes

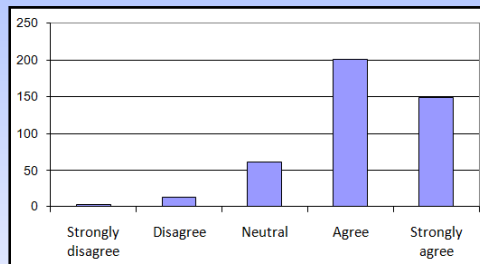
Student attitudes

- Perceptions of the PeerWise activity
 - EngGen 131, UoA Second Semester 2007
 - Requirement: 2 questions, 20 answers
 - Likert scale survey (n = 439):
 - Developing new questions helped me learn
 - Answering other student's questions helped me learn
 - The ability to read and write comments was useful
 - I would like to use PeerWise again next year
 - Open-ended comments

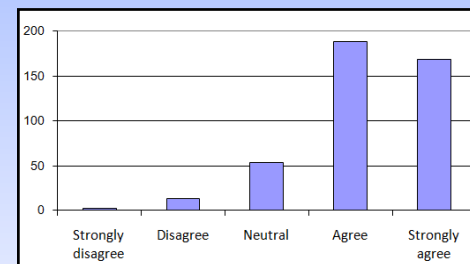
Student attitudes

- Survey results (n = 439)

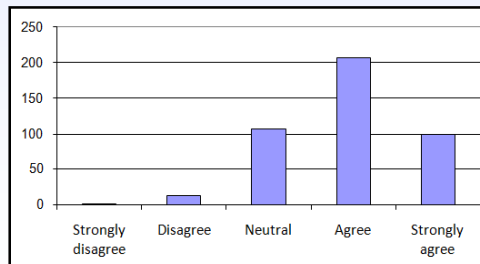
Developing new questions helped me learn



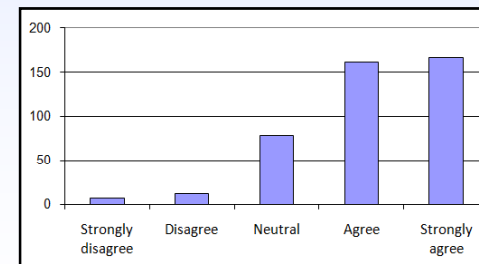
Answering other student's questions helped me learn



The ability to read and write comments was useful



I would like to use PeerWise again next year



Student attitudes

- Open ended comments
 - “What do you believe are the biggest benefits of using PeerWise?”
 - 279 written responses
 - Coded for themes – two most common themes:
 - “studying / exam revision” (35%)
 - “assists learning” (16%)

Student attitudes

- Open ended comments
 - “studying / exam revision”

Student attitudes

- Open ended comments
 - “studying / exam revision”

“Good, more **interesting way to study**. Not a subject that is easy to sit down and work on before exams, Peerwise is a **good way to see how much you know.**”

“The **variety of questions** that i encounter greatly prepare me for the exam”

“The **large database** of peerwise questions provides a great resource for exam revision.”

Student attitudes

- Open ended comments
 - “studying / exam revision”
 - “assists learning”

Student attitudes

- Open ended comments
 - “studying / exam revision”
 - “assists learning”

“Learning about different topics; it is sometimes **easier to learn if you have to think** about each question, rather than simply being told in the lecture.”

“yes, because you **learn from your mistakes.**”

“useful for **developing understanding** and **testing yourself**”

Question quality

Question quality

- What is the quality of the student generated questions?
 - a high quality repository will be a better study/revision resource
 - CS1 course (taught using Java) at UoA First Semester 2008
 - 617 questions, participation only
 - We examined every 10th question
 - 61 questions

Question quality

- Examples

Question quality

- Examples
 - good questions

Question

Which of the following loops *could* you use to cycle through **all** elements of the following array **without** going out of bounds and causing the program to crash?

```
int[] array = new int[15];
```

Assume that in all cases, all code is inside the square brackets.

Average rating: **3.93**
 Total responses: **108**
 Total ratings: **73**

Comments

Alternatives

Alt A 5 (4.63%)	<pre>int i = 0; while (i <= array.length) i++; // code }</pre>
Alt B 22 (20.37%)	<pre>for (int i = 0; i < array.length; i++) // code }</pre>
Alt C 46 (42.59%)	<pre>for (int i = array.length - 1; i >= 0; i--) // code }</pre>
Alt D 17 (15.74%)	<pre>for (int i = array.length; i > 0; i--) // code }</pre>
Alt E 18 (16.67%)	<pre>int i = 1; while (i < array.length) i++; // code }</pre>

★★★★★★★★★★	Sneaky. Very good, although it is not how one normally thinks of looping through an array, it is a common pitfall and very well highlighted. Well explained as well.
★★★★	Good testing of understanding of loops. Awesome.
★★	while I think the question is quite confusing, this is a great question (and very great explanation by the way).
★★	Nice question. A way of looping I hadn't considered until now, but still applicable and within the scope of the course.
★★	Thinking about the various different increments and conditions which can be used in a loop! I think it's a nice change from the usual loop questions that normally involve an ascending value of i. Brilliant.)
★	Good questions to understand loops and array... Good explanations as well... thank you...
★	Great question
★	oh nice trick there ! :P
	Great question, took me ages! Good explanation.

remember. 1) When created, the length of the array, or starts from a starting point of 1. In this case, where we created values are 0-14.

the array. The index 0, the first index of the array. So every number from 14

is correct.

length, which means it can be the last index is 14, thus when it starts with an out of bounds

has been rendered in 'for'

would it completely cycle

in 14 which is correct for the

check index 0. It will stop

completely through all values

be correctly at 14 to prevent

++ means that it will increment the index until the conditional stops this loop.

Question quality

- Examples
 - good questions
 - poor (but useful) questions





Average rating: 0.40
 Total responses: 14
 Total ratings: 10

Question

What is the appropriate boolean variable following returns false:

`!A || B && !B || A`

Alternatives

Alt A  2 (14.29%)	A = False B = True
Alt B  3 (21.43%)	A = True B = True
Alt C  0 (0.00%)	A = False B = False
Alt D  9 (64.29%)	None of the above

Explanation

The Answer is A:
 When A = False, B = True;
`!A || B && !B || A =>`
`(True) || (True) && (False) || (False)`
`=> True && False = False`

Comments

★★★

Check this page. && is higher than ||.
<http://java.sun.com/docs/books/tutorial/java/nutsandbolts/operators.html>

so the equation is $A + B!B + !A$, which becomes $A + !A$, which always evaluates to true.

So it doesnt matter what values you put into A and B, the expression is never going to be false.

★

I think that the && operation has a higher priority and so will be evaluated before the ||
 i.e. `(!A) || (B && (!B)) || (A)`
 havent double-checked in textpad though...

★

As explained by the person above me who linked to the sun page, as that expression stands, it cannot be false. In bracket form it would look like: `(!A || B) && (A || !B)`.

Of the answers you gave, none of the above is the correct one. :P

Author's reply

Sorry everyone..thanz for the reply..i've posted the new version of this question. Feel free to check it out n comment on it (i've 'repaired' my understanding, i hope i got it right this time :D)

ya && is at a higher lvl than || so always do && so in this case the answer can only be true no matter what

Wow that actually helped me alot lol. Totally forgot about the order of && and ||

Question quality

- Examples
 - good questions
 - poor (but useful) questions
 - questions improved by others

Question

//What is the output?

```

Point[] pts = new Point[3];
pts[0] = new Point(100, 200);
pts[1] = new Point(200, 300);
pts[2] = new Point(300, 100);

```

```

pts[1] = pts [2];
pts[2] = pts [0];
pts[0] = pts [1];

```

```

System.out.println(pts[0]);
System.out.println(pts[1]);
System.out.println(pts[2]);

```

Explanation

pts[1] = pts [2]; pts[1] --> 300 , 100.

Average rating: 2.83
 Total responses: 27
 Total ratings: 23

Comments



Haha, good question based off class example. lol

However! The explanation is lacking.

It should be made quite explicit that when you make an assignment of one object equalling another object, that the pointer value is copied exactly at that moment in time. It does NOT create a link to whatever the object on the right side of the expression happens to equal after the expression took place.

i.e,

If we say that:

Pts[0] points to a memory address starting at AA0000,
 Pts[1] points to a memory address starting at BBAA00,
 Pts[2] points to a memory address starting at CCBBAA,

Then when we perform the expression: Pts[0] = Pts[2]. we are saying copy the memory address in Pts[2] RIGHT NOW. So Pts[0] is now equal to CCBBAA.
 If we then say Pts[2] = Pts[1], then Pts[2] changes memory address to: BBAA00.

Pts[0] does not change. It is still equal to CCBBAA.

Author's reply

Yep, entirely based on the confusing class example!






Btw, thanks for the detailed explanation!

Hopefully this helps the other members that are still confused after my pretty vague explanation (sorry! XD)

the first two options are the same!!! and I still don't understand why my answer of A or B is wrong after reading the explanation provided by the writer

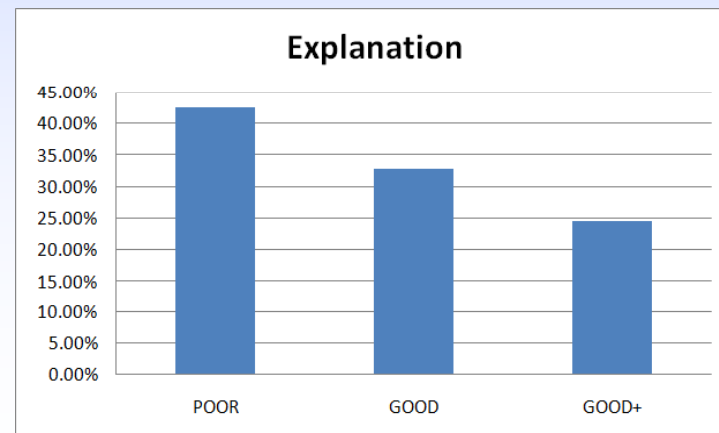
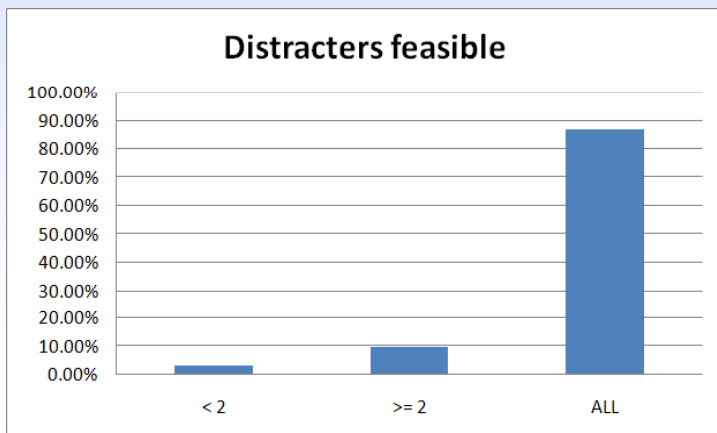
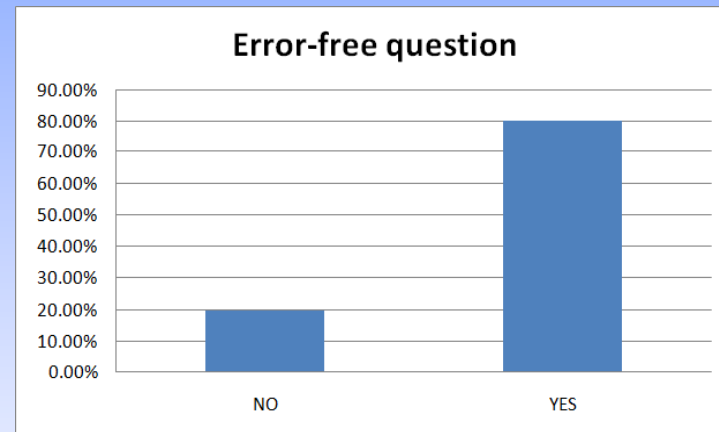
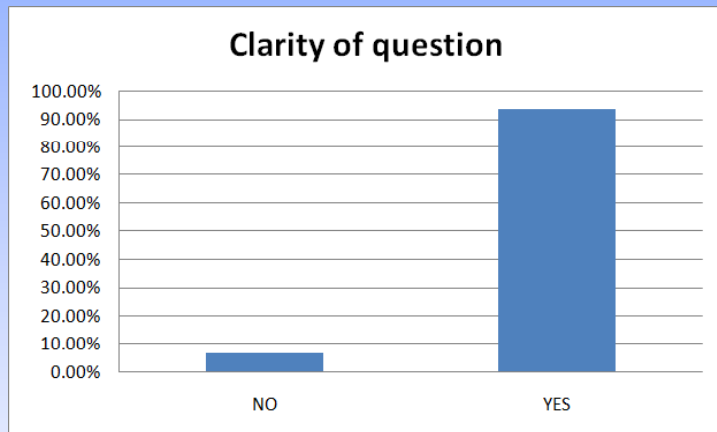
The explanation is not good enough, it is very confusing

Alternatives

Alt A  6 (22.22%)	200 , 300 , 100 ,
Alt B  0 (0.00%)	200 , 300 , 100 ,
Alt C  1 (3.70%)	300 , 100 , 200 ,
Alt D  20 (74.07%)	300 , 300 , 100 ,
Alt E  0 (0.00%)	200 , 100 , 100 , 300

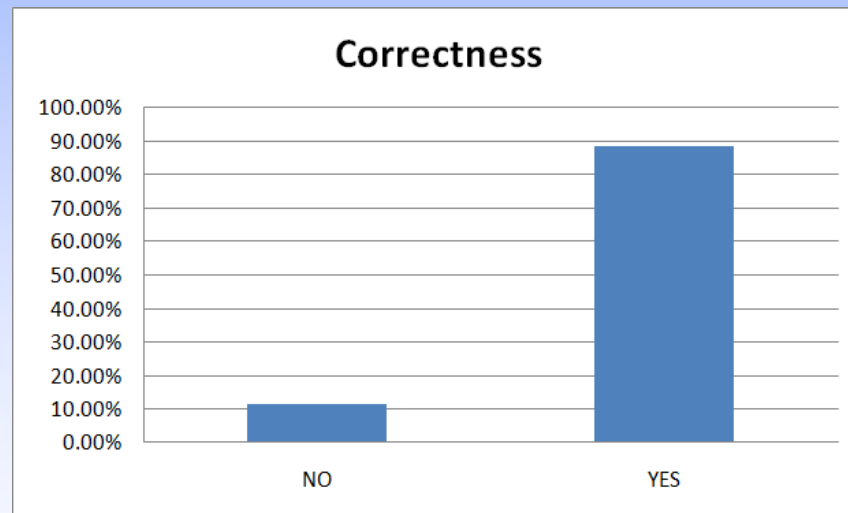
Question quality

- Results



Question quality

- Results
 - 11% of the questions (7 of 61) had incorrect answers



- In all cases these errors were discovered

Question quality

- Student perceptions of quality
 - How effectively do students rate questions?
 - Can students avoid poor quality questions?

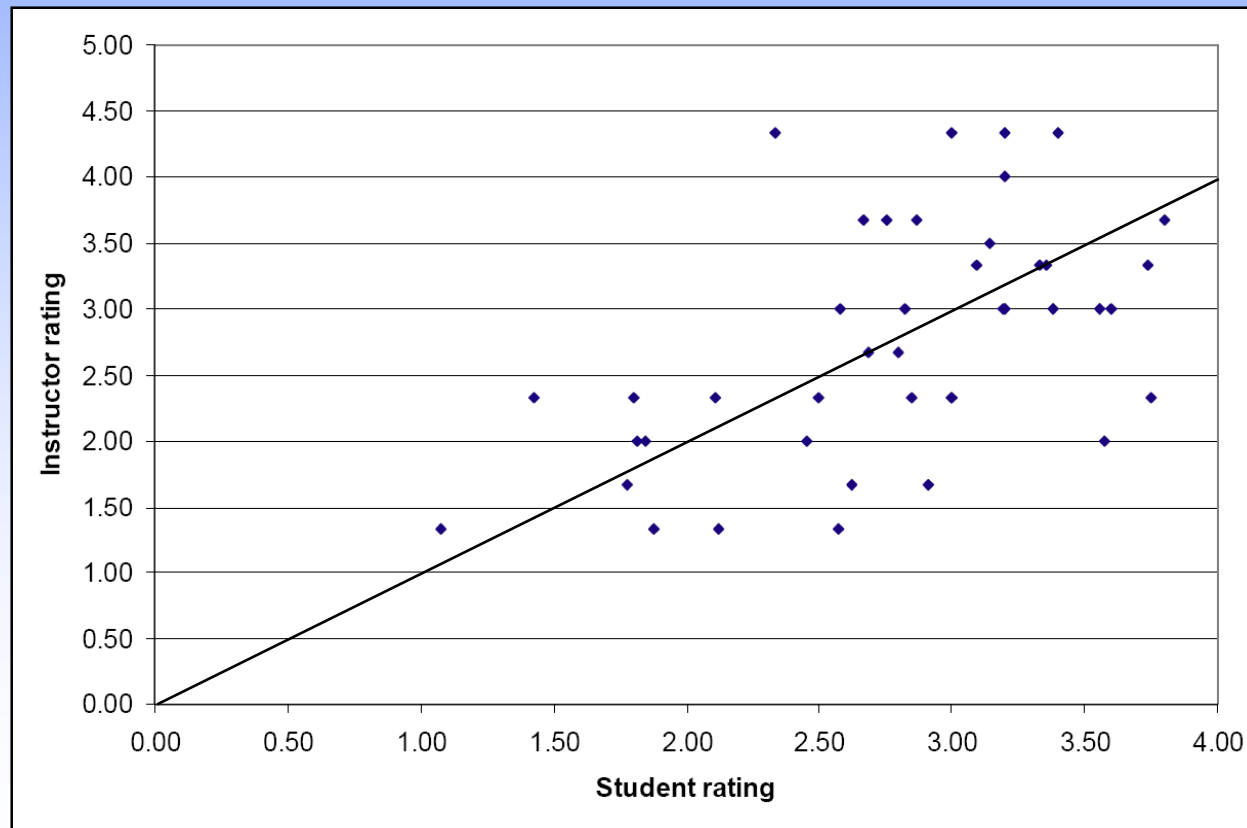
RATING
Given that you have selected the difficulty level for this for a question of this difficulty, on a scale from 0 to 5 (N quality of the alternatives, the quality of the explanation

poor 0 1 2 3 4 5 *excellent*

- We rated questions on the same scale (0 – 5)

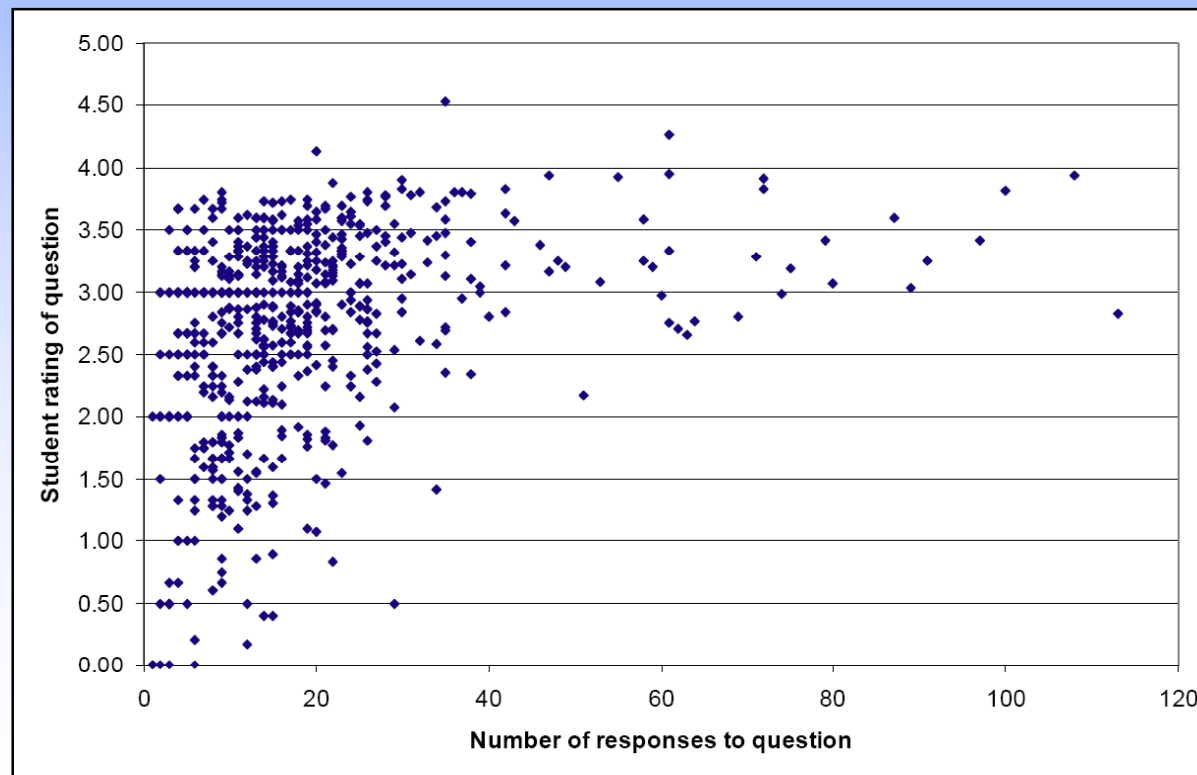
Question quality

- A strong positive correlation, $R = 0.54$



Question quality

- Students use the ratings to decide which questions to answer

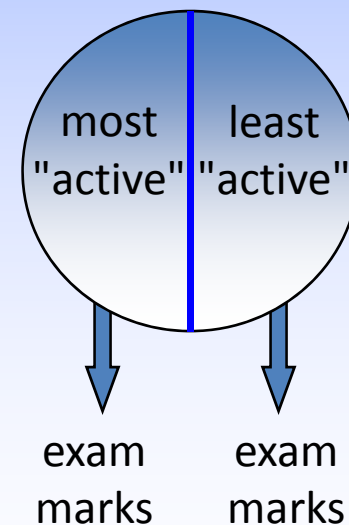


Efficacy

Efficacy

- Do more “active” students perform better in exams than less “active” students of similar ability?
 - We need a measure for “activity”
 - And for “ability”

same initial “ability”



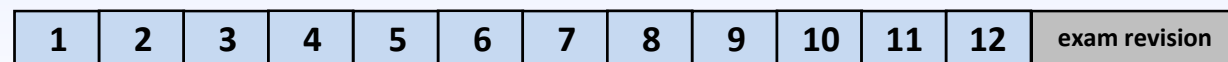
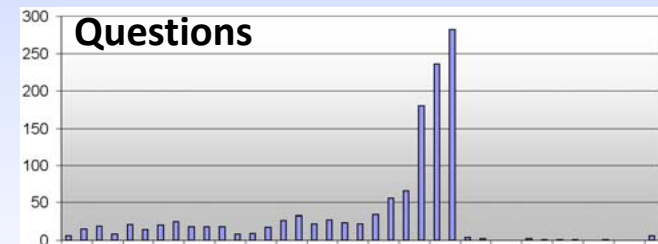
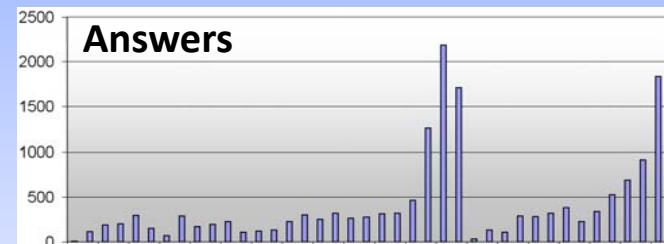
difference of means

Efficacy

- We can measure “activity” in several ways
 - **Q**
 - the number of questions a student contributes
 - **A**
 - the number of questions a student answers
 - **C**
 - the total character count of all comments a student writes
 - **D**
 - the number of days the student is active with PeerWise
 - **CM**
 - a combined measure of all four of the above, based on sum of deciles

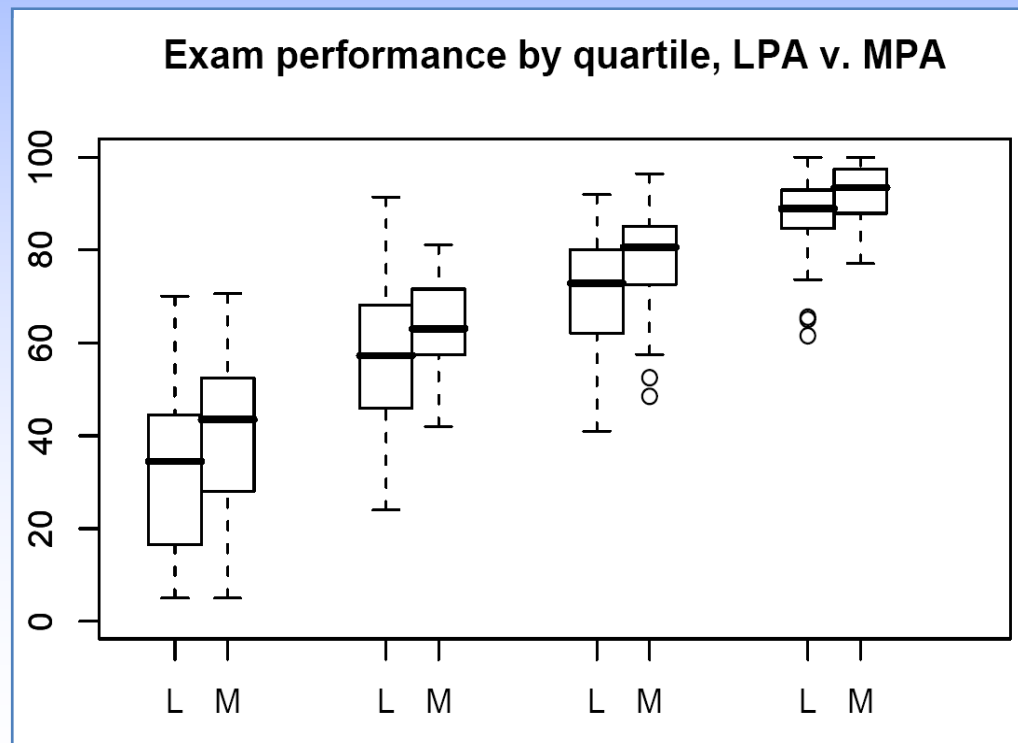
Efficacy

- How do we measure initial “ability” (prior to using PeerWise)?
 - mid-semester test mark
 - group students by quartile



Efficacy

- Results
 - using “CM” (the combined metric)



All differences significant at 5% level

Problems

- We are still learning

Problems

- We are still learning
 - High participation requirements don't work well

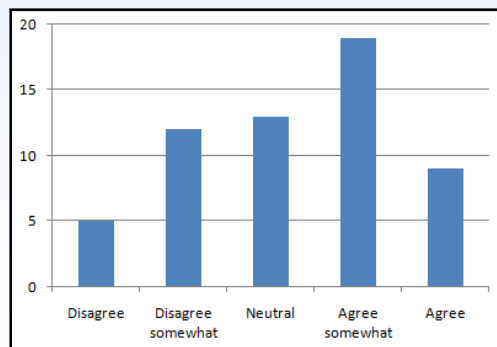
Problems

- We are still learning
 - High participation requirements don't work well
 - One course required 2 questions per week

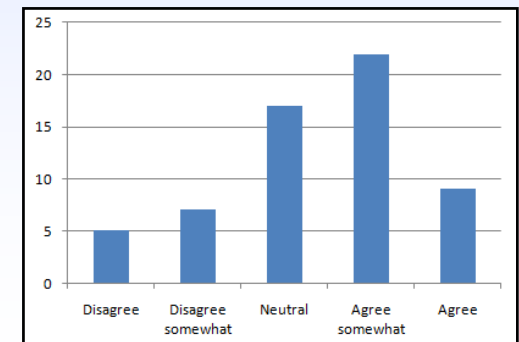
“How about 2 questions for every two weeks...? Seriously **need more time** to actually study”

“Having to contribute two questions per week is discouraging – **i'm only willing to put so much time** towards peerwise”

Developing questions on PeerWise helped me learn



Answering questions posted by others on PeerWise helped me learn



Problems

- We are still learning
 - High participation requirements don't work well
 - Some students lack faith in peers' contributions

Problems

- We are still learning
 - High participation requirements don't work well
 - Some students lack faith in peers' contributions

“In order to maintain a high standard of questions, the posted questions **must be reviewed by staff** and then be approved. In this way all the questions would be very useful.”

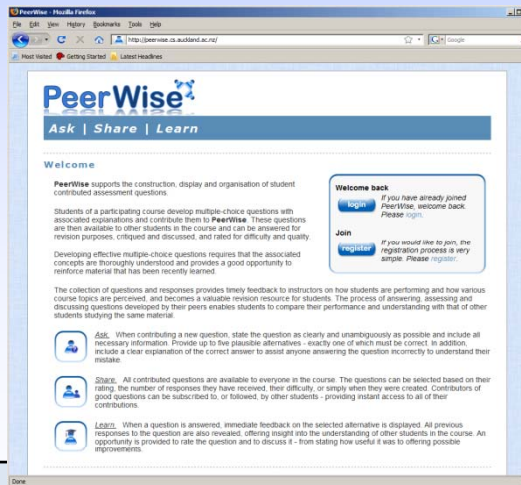
“Its **hard to know how good these questions really are/** how indicative they are of the standard we are expected to know. i.e. without the questions being **rated by STAFF** members.”

Future work

- Creating larger communities
 - Involve students at multiple institutions sharing the same repository
- Randomized controlled trial for efficacy
 - Underway with CPSC and BIOL at UBC
- Feedback from instructors
 - What is needed?

Thank you

- Questions?
 - I am in room 215 of CS building
 - Email: paul@cs.auckland.ac.nz
 - Also feel free to talk to Rosie Redfield (Life Sciences Centre)



<http://peerwise.cs.auckland.ac.nz>