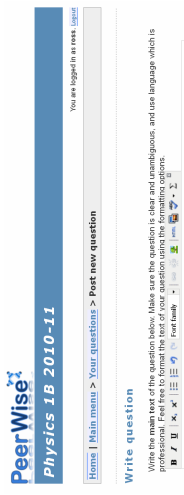


What is PeerWise?

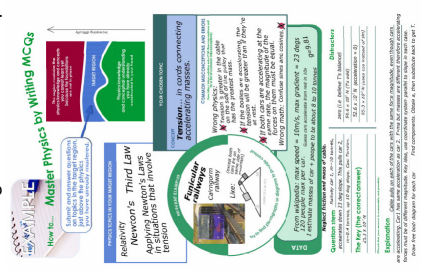
PeerWise is a free, online multiple choice question (MCQ) authoring and sharing system. Students create their own questions using the tools in the online repository. Students then answer, rate and comment on their peers' questions, making use of the system's Web2.0-like functionality (such as discussion threads, ratings-based sorting, and the ability to 'follow' authors).



Question	Answers	Correct	Wrong	Unanswered	Unattempted	Attempted	Correct	Wrong	Unanswered	Unattempted	Attempted
1. A nucleus of a certain element contains 10 protons and 10 neutrons. How many electrons does it contain?	10	0	0	0	0	10	10	0	0	0	0
2. A nucleus of a certain element contains 10 protons and 10 neutrons. How many electrons does it contain?	10	0	0	0	0	10	10	0	0	0	0
3. A nucleus of a certain element contains 10 protons and 10 neutrons. How many electrons does it contain?	10	0	0	0	0	10	10	0	0	0	0
4. A nucleus of a certain element contains 10 protons and 10 neutrons. How many electrons does it contain?	10	0	0	0	0	10	10	0	0	0	0
5. A nucleus of a certain element contains 10 protons and 10 neutrons. How many electrons does it contain?	10	0	0	0	0	10	10	0	0	0	0

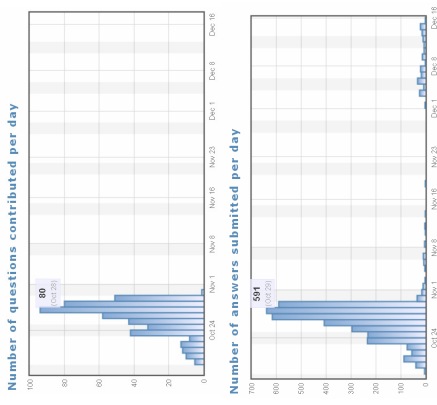
How did we introduce the system?

PeerWise was introduced to freshman students using a group activity in one of the course's weekly workshops. Simple exercises were used to build cognitive 'scaffolding', including how to choose topics of appropriate difficulty for questions, and what characteristics make a good MCQ. An example question was given to the students to use as a template. This was a lengthy and sophisticated problem, rather than an exercise or a brief conceptual question: this had the effect of setting the students' expectations of the expected quality of the expected quality of submissions at a very high standard. Levels of engagement during the workshop activity were very good, with a notable 'buzz'.

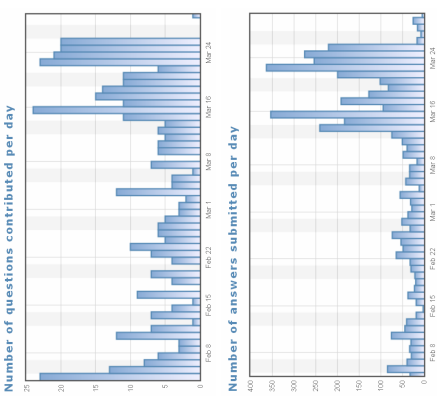


How did the students make use of the system?

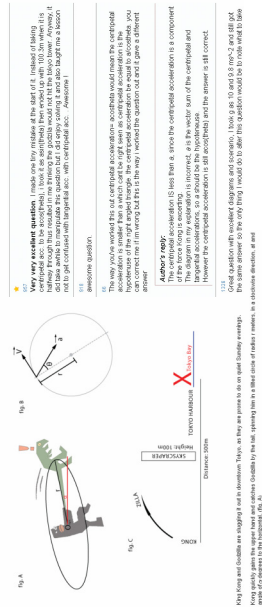
We used PeerWise in two consecutive semesters of introductory physics (with essentially the same cohort). In both cases the assessed coursework task was: write 1 question, answer 5 questions, comment on 3 questions. In the first semester, the assessment deadline was mid-semester. Thereafter, engagement decreased markedly:



In the second semester, the task deadline was set at the end of the semester. Engagement levels remained healthy throughout the duration of the course, despite the assessment contributing only 1% of the course mark:



What standard of questions did they write?



The general quality of the student submissions was high (probably influenced by the complex example problem). The majority of the questions were true problems (rather than exercises), requiring synthesis of ideas from different course topics and extended working to solve. Most of the problems were richly contextualised, often in a humorous manner. The best submissions were of truly exceptional quality, displaying great creativity and sophisticated engagement with the physics: they also inspired relevant online discussions in which student difficulties were addressed and often resolved.

Does using PeerWise influence course result?

Cohort	Number of students	Mean exam score*	Standard error	p value	Effect size
1A (N=193)	104	63.2	1.6		
HPA†	89	53.6	1.6	<0.001	0.29
LPA					
1B (N=182)	94	61.9	1.8		
HPA	88	46.8	2.4	<0.001	0.36
LPA					

* all scores expressed as percentages
† HPA / LPA denote higher / lower than median PeerWise activity

Causative influences of PeerWise are very hard to isolate: however, we can look for correlation between higher and lower PeerWise activity and performance on the course final exam. For both the first and second semester courses (1A and 1B), students who were more active in PeerWise performed significantly better in the exam than those who were less active. Positive performance differences were not restricted only to the best students: the distinction was also seen for students in the lowest ability quartile. Student opinions of the system were generally positive, with the broad perception being that authoring questions was more beneficial than answering other students' questions.

