

A Clicker Convert in Comp. Sci.

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Experiences to Share

■ Context:

- Integrating clickers into 2nd-year course, typically ~80 students
- Started W07, W12 is 4th time
- Surveyed student opinions at end

■ Terms and conditions

■ Mechanics

■ Survey results



Why CIS*2750?

Software Systems Development and Integration

- Suffered from:
 - Difficulty in engaging so many students
 - Boredom with Powerpoint
 - Low lecture attendance since course notes posted on the web
- Saw clickers used semi-successfully by colleagues
 - Thought I could fix the “issues”



Terms and Conditions

- Course outline conditions
 - How clicker marks factor into final grade
 - Web page with details, registration link
- Policy on “clicker fraud”
 - Observed in another class, student with fists full of clickers!
 - Clicking was mandatory and for marks
- Handout (2 sides)



Course Outline

- Start with normal components of grade: 4 assignments + 2 midterms + final exam
 - If you **opt out** of clicking, that's your grade
 - If you **opt in**, grade = participation @ **10%** + other components all scaled to 90%
 - Tried **5%**, but 10% seems much more motivating
- To avoid making opters-out feel disadvantaged, *and* give safety net to those who start strongly but cease clicking...
 - Calculate grade both ways and take max
 - Now, nothing to complain about from either side!



Calculating the Clicker Marks

- Each question was worth 2 marks:
 - 2 marks for correct; 1 mark if incorrect
 - Special “**open questions**” worth 1 mark for any response
 - Opinion poll, discussion starter, topic motivator, not expected to know answer yet
- A buffer was added to absorb “issues”
 - Clicker mark multiplied by 115%
 - Accounted for absences, technical problems, lousy questions, etc.



Problems solved by T&C

- Afraid too few participants without marks
 - Marking scheme emphasizes participation over right answers, but stays within Senate rules re “*quality* of performance, not merely *activity*”
- Wanted to make clicking *optional*
 - Some against clickers from prior experience, can’t/won’t commit to regular attendance
 - Grade calculation is beneficial for adopters, but not harmful to opters-out → Win/Win!
- Instructor’s administrative burden
 - 15% buffer covers all problems → 0 complaints



Mechanics

- Making up clicker questions
- Running each session
 - Starting the **iclicker** software
 - Showing the questions
- Collecting the results




Making up clicker questions

- With current model clicker, limited to multiple choice
 - “#” marks “open question”
 - Questions and answers go in **.csv file** for use by iclicker and igrader software
- Like to print out and display via doc cam
 - Alternatively, insert into Powerpoint file
 - Two screens is ideal!

Running each session



- Windows laptop
 - How to start iclicker.exe with right .csv file?
 - Drag 'n drop onto .bat script
 - Opens iclicker → “Start new” or “Continue”
- Powerpoint slides have icon alerting students to clicker question(s) coming
 - Count down “5-4-3-2-1” vs. preset time
- Run igrader and export spreadsheet



Results

- Participation rate
 - W07: 5% weight → 36% initially, 48% by end
 - Clicking students less likely to drop!
 - W10: 10% weight → 68%, **85%**
- Grades raised one “notch” (C+ → B-) **23%**
- “Were the terms/conditions fair?” **94% YES**
- “If you clicked, were you glad/regretted?”
96% GLAD
- Total of **zero complaints** about marks or technical problems
- No incidents of fraud observed (*by me...*)



Conclusion

- Clickers definitely improved course, am now “clicker convert”
 - Student reaction overwhelmingly positive
 - Additional hassle for Inst. was quite tractable
 - Moderated pace of “slide-turner” boring delivery
- Benefited everyone, not just participants
 - “Clickers **help the instructor** know if the students are following the lecture.” **87%** (strongly) agree
 - “Clickers **help the students engage** with the lecture concepts.” **97%** (strongly) agree

CIS*2750 Software Systems Development and Integration [0.75]

Course Outline for Winter 2012

INSTRUCTOR		COURSE LINKS		
Bill Gardner		Policies	Office Hours	Class Schedule
office	Reynolds 105	Ombuddies	Clickers	Grades
phone	824-4120 x52696	Lecture Notes	Assignments	Exams
e-mail	wgardner@socs.uoguelph.ca			
web	www.socs.uoguelph.ca/~wgardner			

Calendar course description

Policies

Course topics

Textbooks

Determination of final grade

Assignments	42%	Examinations	58%
A0 due Jan. 16	2%		
A1 due Jan. 27	10%		
A2 due Feb. 13	10%	Midterm I (Feb. 17)	15%
A3 due Mar. 16	10%	Midterm II (Mar. 21)	15%
A4 due Apr. 2	10%	Final exam (Apr. 17)	28%
Optional clicker participation (will scale the above components to a total of 90%)			10%

Students found committing **clicker fraud** will be handled according to the policy on academic misconduct, and are liable to forfeit their participation mark and instead receive only 90% of the other grade components. Possession of multiple clickers will be taken as *prima facie* evidence of fraud involving the actual owners of the clickers.

(See over for content of Clickers web page on course website)

Clickers for Winter 2012

This course features the optional use of clickers for this educational objective: In a large class, using clickers makes it possible for the instructor to obtain immediate feedback on the class's understanding, and thereby adapt the lecture, enhance an explanation, provide additional illustrations, etc. Of course, you are also checking your own understanding at the same time, which may help engage you more in the course content. This can improve the educational experience for all students.

Clicker use will commence in the second week of lectures. The university has standardized on i>clickers. You need to buy one, new or used, then there is no additional per-course registration fee. When you are finished using it, you may resell it to the bookstore to get back half the cost.

REGISTER YOUR CLICKER [[here](#)]

NOTE: Students who opt out of clicker use, or who start using it and then fall off, will not experience any grade penalty; they still have the possibility of obtaining a grade of 100% without using clickers.

Clicking for marks

Any clicking is good, but clicking a right answer is better.

Of the total of Q clicker questions given in all lectures, if you register R right clicks and W wrong clicks, then your participation mark will be $P = \min(100\%, 115\% * (2R + W) / 2Q)$. This formula has two features:

- Right clicks are worth twice as much as wrong clicks, but wrong clicks are still worth something.
- A built-in buffer of 15% is provided to absorb any and all absences (whether involuntary or discretionary), technical problems, etc. **No other adjustments will be considered for such eventualities, and your opting into clicker use constitutes your consent to this policy.**

Your grade G will be calculated from assignments and exams according to the course outline. You will receive whichever is *greater*, G or $0.9G + 0.1P$, thus weighting clicker participation at 10% if you choose to participate that way. **There are no other ways to obtain participation marks.**

Warning re fraud

This policy is reproduced from the course outline:

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Both the students who give their clickers and those who possess them will be reported. Note that conviction for academic misconduct, even if there is no grade penalty, always results in having a letter placed in your file by the Dean.

Why not let us use web>Clicker on our cell phones and save some \$\$\$?

This technology is not attractive in our context. Instead of buying the clicker unit once, you would still have to buy a per-course licence. There is a substantial list of drawbacks to the Internet-based solution as opposed to wireless communication in the immediate classroom. See “Considerations” on [i>clicker's website](#).