

A New Blend

An introductory statistics course integrating a MOOC and active learning sessions, with seasoning from the students' areas of study

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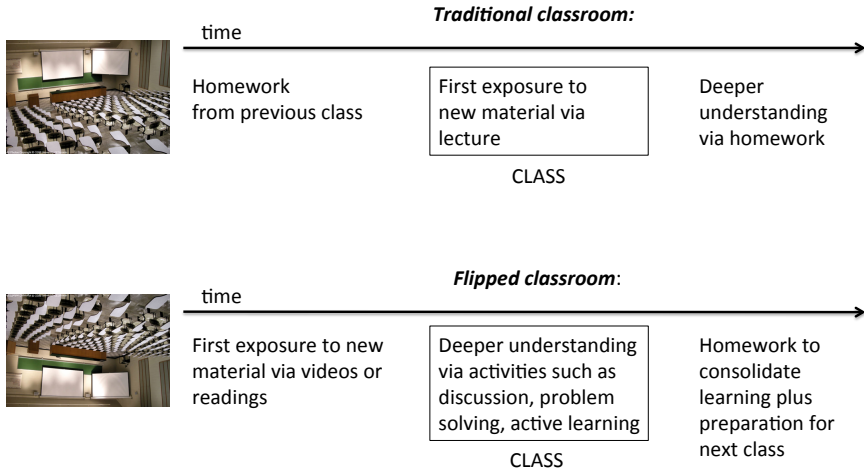
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Blended learning with a flipped classroom



(Adapted from Bruff, 2012)

The online component: Good practices learned from teaching a MOOC

The MOOC: *Statistics: Making Sense of Data*, co-taught by Alison Gibbs and Jeffrey Rosenthal on Coursera.

- ▶ Clear learning objectives, for the course and for each module
- ▶ Short modular videos (8-15 minutes recommended)
- ▶ Use in-video quizzes:
 - ▶ Formative, no-stakes self-evaluation, reinforcing what was just heard
 - ▶ Immediate feedback
 - ▶ Helps keep learners focused and engaged
- ▶ Encourage mastery learning
 - ▶ Frequent assessments
 - ▶ Questions chosen randomly from a large bank
 - ▶ Immediate feedback
 - ▶ Unlimited attempts allowed

Materials mass tested with 60,000 learners.

The new blend: Online components

Clarity:

- ▶ User's guide to the course – the importance of weekly consistency
- ▶ Weekly announcements and to-do lists
- ▶ Learning objectives and lists of content

The online learning resources:

- ▶ Videos with in-video quizzes
- ▶ Weekly quiz, unlimited attempts, randomly chosen questions
 - ▶ Encourages mastery learning and accountability

Connecting the online and in-class components:

Research has shown that success relies on strong cohesion between the online and in-class components. (Bruff et al., 2013)

- ▶ The muddiest point forum

The new blend: Class time

Two sections of the course taught in flipped classroom format, organized by disciplinary interest:

- ▶ Health & Life Sciences
- ▶ Environmental Sciences

Practical constraints:



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The new blend: Class time

- ▶ Address the muddiest points
- ▶ Develop conceptual understanding through “Peer Instruction”:
(Crouch & Mazur, 2001)
 1. Instructor poses question.
 2. Students reflect on answer and then commit to an answer, typically using a personal response system.
 3. Instructor reviews responses.
 4. Students discuss their answer with their peers and commit to an answer.
 5. Instructor reviews responses, explains as necessary.
- ▶ Problem solving in small groups

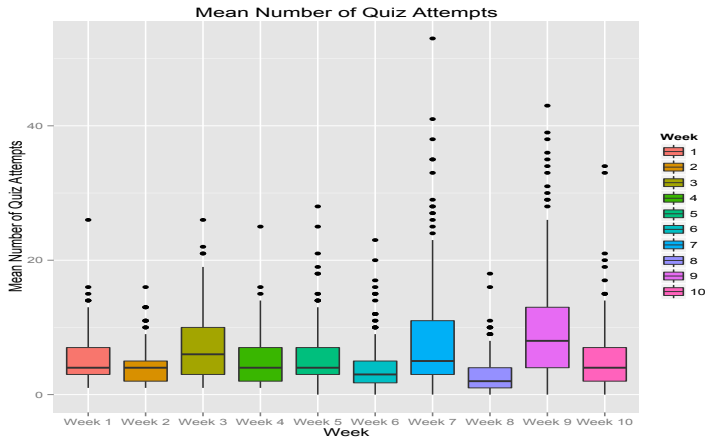
“I thought I was following. It all made sense when you were talking. But it’s different when you’re given a problem and have to solve it yourself.”
- ▶ The TAs circulated during discussions and problem solving to engage with learners and keep them on task.

SATS-36 Results

Post - Pre	N	Mean	Std Error
Affect	38	0.34	0.17
Cognitive	38	0.13	0.14
Value	38	0.13	0.09
Interest	38	0.14	0.13
Effort	38	-0.69	0.16
Difficulty	38	-0.00	0.12

- ▶ Affect increases.
- ▶ Effort decreases.

Data: Quiz reattempts



- ▶ Students persist in reattempting quizzes (median reattempts is 5).

Muddiest point?



One flipped classroom resource:

- ▶ Bruff, Derek (2012). "The Flipped Classroom FAQ." CIRTL Network, 15 September 2012. Retrieved from <http://www.cirtl.net/node/7788>.

Examples of instructors using other instructors' MOOCs in blended learning environments:

- ▶ Bruff, D.O, Fisher, D.H. McEwen, K.E., and Smith, B.E. (2013). Wrapping a MOOC: Student Perceptions of an Experiment in Blended Learning. *MERLOT Journal of Online Learning and Teaching* 9(2).
- ▶ Ithaca S+R (2013). Interim Report: A Collaborative Effort to Test MOOCs and Other Online Learning Platforms on Campuses of the University System of Maryland. Retrieved from http://www.sr.ithaca.org/sites/default/files/reports/S-R_Moocs_InterimReport_20131024.pdf.

Peer Instruction:

- ▶ Crouch, C. and Mazur, E. (2001). Peer Instruction: Ten years of experience and results. *American Journal of Physics* 69(9), 970-977.