Enhancing Student Engagement

Raazesh Sainudiin

Department of Mathematics and Statistics
University of Canterbury

29 May 2009
UCTL, University of Canterbury
Christchurch, NZ
Part 1 - My Educational Philosophy
   Already aligned with Kuh’s High-impact Practices
   Problem with my Philosophy and a Solution

Part 2 – A Lesson Plan for Deep Learning: Bi/tri-nomials
   Deep learning := Concrete/Kinesthetic/Peer/Visual/R-W
Already aligned with Kuh’s High-impact Practices

Collaborative Project
Writing-intensive Courses
Undergraduate research
Already aligned with Kuh’s High-impact Practices

Collaborative Project

Writing-intensive Courses

Undergraduate research

Already met in 2007 and 2008 versions of STAT 218: Computational Methods in Statistics
See student Research Reports UCDMS 2008/5 and UCDMS 2009/5 (including a recent submission to a peer-reviewed Stats. Ed. Jnl.!)
Problem with my Philosophy and a Solution

Problem:
The immediate student feedback says the course is too difficult.
Problem with my Philosophy and a Solution

**Problem:**
The immediate student feedback says the course is too difficult.

**Solution:**
Make the course lighter in 2009:
- cover fewer topics but deeply and
Problem with my Philosophy and a Solution

Problem:
The immediate student feedback says the course is too difficult.

Solution:
Make the course lighter in 2009:

- cover fewer topics but deeply and
- eliminate the research project and written report
Problem with my Philosophy and a Solution

Problem:
The immediate student feedback says the course is too difficult.

Solution:
Make the course lighter in 2009:
- cover fewer topics but deeply and
- eliminate the research project and written report
Problem with my Philosophy and a Solution

Problem:
The immediate student feedback says the course is too difficult.

Solution:
Make the course lighter in 2009:
- cover fewer topics but deeply and
- eliminate the research project and written report

Focus on the high-impact practice of:
**Deep** learning by complementing traditional **Read-Write (R-W)** style of teaching-learning with (cf. UCDMS 2009/6):
- **Concrete** and **Kinesthetic** learning in lectures and labs
Problem with my Philosophy and a Solution

**Problem:**
The immediate student feedback says the course is too difficult.

**Solution:**
Make the course lighter in 2009:
- cover fewer topics but deeply and
- eliminate the research project and written report

Focus on the high-impact practice of:
**Deep** learning by complementing traditional **Read-Write (R-W)** style of teaching-learning with (cf. UCDMS 2009/6):
- **Concrere** and **Kinesthetic** learning in lectures and labs
- **Peer** learning with **Visual** Cognitive Tools in lectures/labs
Problem with my Philosophy and a Solution

**Problem:**
The immediate student feedback says the course is too difficult.

**Solution:**
Make the course lighter in 2009:

- cover fewer topics but deeply and
- eliminate the research project and written report

Focus on the high-impact practice of:

**Deep** learning by complementing traditional **Read-Write (R-W)** style of teaching-learning with (cf. **UCDMS 2009/6).Val:**

- **Concrete** and **Kinesthetic** learning in lectures and labs
- **Peer** learning with **Visual** Cognitive Tools in lectures/labs
- **Learning community** (extra-curricular **numb3rs club**)
A Lesson Plan for Deep Learning: Bi/tri-nomials

Lec 1. Quincunx History (Galton late 1800s, UC student-built07)

Lec 2. Peer-learning with Quincunx (guided chit-chat 10 mins.)

Lec 3. Mathematical Description of guided chit-chat (30 mins.)

Lec 4. Algorithmic Description for weekly lab (10 mins.)

Lab 5. Interactive Visual Cognitive Tool to reinforce Lec 3&4

Ext 6. Supportive extra-curricular learning community: numb3rs
A Lesson Plan for Deep Learning: Bi/tri-nomials

Lec 1. Quincunx History (Galton late 1800s, UC student-built07)

Lec 2. Peer-learning with Quincunx (guided chit-chat 10 mins.)

Lec 3. Mathematical Description of guided chit-chat (30 mins.)

Lec 4. Algorithmic Description for weekly lab (10 mins.)

Lab 5. Interactive Visual Cognitive Tool to reinforce Lec 3&4

Ext 6. Supportive extra-curricular learning community: numb3rs

Hopefully, this will achieve the goal of deep-learning where the students are confident in a co-operative mathematical/statistical analysis of problems they may encounter in their professional careers as Statisticians from fundamental principles.