New Ways of Teaching

Cristina Adriana Alexandru
Cristina.Alexandru@inf.ed.ac.uk
Schedule

- Motivation: disadvantages of traditional ways of teaching
- Presentations by our invited speakers:
  - Dr. Adam Carter (EPCC): Online learning
  - Prof. Judy Robertson (Education, Informatics): Classroom talk
  - Prof. Bob Fisher (Informatics): The “Flipped Classroom” (also an active learning approach)
- Quectures, developed by Dr. Heather McQueen
- Peer Learning
- Discussion
“Traditional” teaching in the sciences

- Lectures, tutorials, labs
- Lectures present theory; students listen passively
- Tutorials give the opportunity to put theory in practice, exercise and collaborate with peers
- Labs involve more individual work, and are usually an opportunity to try out technology
- Tutors and lab demonstrators must step up and explain concepts which are not clear to students.
“Traditional” teaching in the sciences - some advantages

- Traditional lectures (Bonwell (1996), Cashin (1985), Wood (1989)):
  - Can communicate the intrinsic interest in the topic, thus motivate
  - Can include research results or material not otherwise available
  - Organisation of the material can help make a point, draw conclusions
  - Can exemplify the way of working of a profession
  - Comfortable (less threatening) to students
  - Are economic: hundreds of students at once, large amounts of information

- Tutorials and labs involve active learning, and can help develop numerous skills (e.g. team work, communication, time management)
- Tutors and lab demonstrators are approachable, there to help answer questions
“Traditional” teaching in the sciences - some disadvantages

- Evidence that traditional lectures (Bonwell (1996), Cashin (1985), Wood (1989)):
  - Are poor at stimulating thought or changing attitudes
  - Involve passive, not intellectually engaging learning, easy to forget information
  - May lead to student attention falling off after 15-25 minutes
  - Are not appropriate for higher levels of learning (e.g. analysis, synthesis) or complex material
  - Assume uniform learning pace and levels for the students
  - If using slides, irrelevant information may detract attention, watching slides may lead to neglect of interaction, speed may lose some students (Xingeng 2012).
“Traditional” teaching in the sciences - some disadvantages

- Students may expect all answers from the central figure of the instructor, and not really understand
- Tutorials address group needs, difficult to offer equal opportunity to individuals
- Inappropriate for students with limited availability, or distance students

=> Useful to also consider and try out “new ways” of teaching
Talk by Dr. Adam Carter: “Online Learning”
Talk by Prof. Judy Robertson: “Classroom Talk”
Talk by Prof. Bob Fisher: “The Flipped Classroom”
Time for a break!
The “Quecture” approach

- Developed by Dr. Heather McQueen from School of Biological Sciences
- Trialled 2nd year Genetics course with very positive results: more of her students preferred quectures to other approaches to teaching
- Main idea: “Thinking is not driven by answers but by questions.” ([http://www.criticalthinking.org//](http://www.criticalthinking.org//))
- Shares elements with the ‘flipped classroom’ approach:
  - Requires online preparation before class
  - Involves peer instruction style activities during the class (quecture)
  - (Some of) the theory is delivered online before the quecture
- However, two differences:
  - Theory is (also) delivered during the class, for more difficult notions
  - Encourages students to formulate and discuss their own questions during the quecture and online in between quectures (also see peer learning).
- Interesting or difficult questions are discussed in the following quecture
The “Quecture” approach

**Advantages:**
- Encouraging students to develop their learning by being reflective (i.e. higher level of learning)
- Encouraging behavioural/attitudinal change in responsibility for learning (during but also in preparation for class by asking/answering questions)
- Developing communication skills
- Combining advantages of traditional and ‘flipped’ approach regarding the presentation of theory, as well as those of ‘flipped’ for peer instruction
- Feedback to teachers about questions which still need answering
- Students “feeling more part of the lecture”

**Disadvantages:**
- Motivating students to work ahead of class
- Motivating students to ask and answer questions on online forum
- ... Can you think of others?
Peer learning

- Peer learning is centred on the sharing of knowledge, ideas and experience between students of the same or different levels.

- Some advantages:
  - Learning a lot by explaining things to one another.
  - Developing transferrable skills (communication, planning, time management, facilitation) which foster lifelong learning and contribute to their employability.
  - Developing a sense of community and relieve anxiety about university life.
  - The onus is more on the students who become more in charge of their learning.
  - Easier to manage more students by fewer members of staff.
  - Works well with online learning.
Peer learning- my experience from InfPALS (Informatics Peer Assisted Learning Scheme)

- Students in higher years who “facilitate” sessions for 1st year students
- Facilitation = providing exercises, encouraging group work and coordinating student work; advising on learning strategies and university life
- Advantages for 1st year students:
  - Active learning
  - Improving understanding of course material, revision
  - Meeting and collaborating with peers, making friends
  - Adapting easier to university study and university life
  - Safe space where to ask questions
  - Being advised by older students who have passed through same experience
- Feedback (2016-17): students liked most the clarification of doubts, group work/peer learning, the friendly and helpful facilitators with experience.
Discussion

For a course that you are currently teaching, consider the following:

- Which of the described approaches could be used in it?
- What would be the advantages and disadvantages (challenges)?
- Would the approach(es) require adaptation, or combining? How?

(Group work)
Resources


- On Quectures:
  - http://www.criticalthinking.org/
  - Teaching matters blog (2016): “Quectures: Teaching through questions”
  - Teaching matters (2016): “Experimental interactive learning “Quectures””

- On peer learning: Boud, David, Ruth Cohen, and Jane Sampson. Peer learning in higher education: Learning from and with each other. Routledge, 2014, pp. 3-6