


Teaching Quantitative Economics

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Plan for the session

Introduction
Teaching quantitative methods by engaging students


- Case studies
- Difficulties
- Running classes
- Data
- Curriculum

Technology
Assessment



In small groups: challenges and opportunities of teaching quants modules

....


Teaching quants and engaging students: case studies 

Make quants relevant

- Use of case studies, media clips etc. to

• **Case study**

[Fare dodgers take Paris Métro for a ride with insurance pots against fines](#)


What do students find difficult? 

Right-answer syndrome.
Only interested in the answer, rather than the method for finding it
In statistics: not always clear what we mean by "right answer" – scope for discussion


Problem-solving.
As opposed to memorising proofs

Critical values.
What is meant by a "sampling distribution"?
The rôle of the Normal distribution.


The link between theory-economics-data.
Correlation and causation (ie identification).

Different ways of running classes 

- **Weekly problem sets**
 - Students take lead in discussing solution
 - Favour depth to coverage of questions: provide solutions to deal with questions not covered in class
 - Discuss tasks more widely than the actual questions asked
 - Be aware of pressures from other modules
- **Computer labs**
 - Problem based approach
 - Students drive their learning
 - GTA to favour learning rather than delivering solutions
 - Close engagement with students

Engage with data 


- Engage students with current data
- Link statistical analysis to interesting/useful issues
- Examples
 - [Arts funding council](#)
 - ["Boris" bikes data](#)
 - [Civil aviation data](#)

Curriculum 


Where on the spectrum from pure theory to very applied?
nb may have more than one stream, so need to fit in with department's plan

How much should students be estimating equations or handling data?


Choice of textbook
Classic example of Hotelling competition – they are all the same


Engage students with technology 

- [Audience response system](#)
 - Short and long questions in lecture or/and classes
 - Break up lecture and engage students
 - Test for knowledge and understanding
 - Commercial products (e.g. turningpoint) vs freeshare (mQlicker, Polleverywhere, Letsfeedback...)
- Multiple choice quizzes
 - Provide practice opportunity and immediate feedback
 - Delegate learning and focus on important issues
- Excel support
 - [Normal distribution](#)
 - [Poisson distribution](#) and others....

Assessment 

- Does the exam test the learning outcomes?
- Do the teaching and coursework prepare students to the relevant learning outcomes?
Sounds obvious but often not the case!
- Projects
 - Make students engage with data
 - [Length of human hug](#)
 - [Length of "Boris" bike hire](#)
 - ...

Any plans for the future? 

Fare dodgers take Paris Métro for a ride with insurance pots against fines 

The Paris Métro system is one of the most high-tech in the world but it is proving no match for fare dodgers who are beating it with a wheeze from the 17th century.

Enterprising free-riders are paying into low-cost insurance funds that reimburse their fines if they are caught without tickets...

The self-styled *mutuelles des fraudeurs*, usually bands of friends, colleagues or students, remain small-scale but the RATP, the Paris transit authority, is losing an estimated €80 million (£70 million) a year to those who leap the turnstiles.


The *mutuelles*, of which there are said to be more than a dozen, depict themselves as radical leftists or libertarians who are fighting for free public transport.

"We all pay €7 a month to a common fund which is used to refund members who are fined," Frédéric, a 22-year-old student, told the newspaper *Le Parisien*. "At the end of the year there is only about €3 left in the fund."


...Fraudsters get away because the Métro has relatively few staff, compared with the London Underground. Dodgers are only caught if they run into one of the roving teams of inspectors.

There are 968 inspectors on the whole Métro, tram and bus system. Although they often wear plain clothes and hide around the corner, this is not enough to deter fraudsters.


Daily Métro users are subjected to checks only about once every six weeks and expert dodgers say they can usually avoid the inspectors anyway....



In the US, on average, how long does it take for a McDonald drive-through order to be served?



1. 62 seconds
2. 152 seconds
3. 189.5 seconds
4. 241.7 seconds



How long does the average human hug last?




According to recent research the average human hug lasts three seconds. Information and details about this research can be found, among others, through these links:


[The Telegraph article](#)

[Dundee University Press Release](#)

You are asked to carry out some inferential statistics to test whether the average human hug lasts three seconds.



How long are bicycles hired for (on average) on the Barclays Santander Bicycle Hire scheme?



Two years ago London introduced the Barclays London Bicycle Hire scheme that gives people the opportunity to hire bicycles from various docking stations in London. The scheme intends to promote the use of bicycles in London as a way to reduce traffic, congestions and to improve people's fitness.

The scheme is designed to favour the use of the bicycles for a short period of time, usually less than 30 minutes. In fact, after paying the access fee of £2, the first 30 minutes of usage are free and it costs £2 to hire the bike for each extra period of up to 30 minutes.

You are asked to use inferential statistics to estimate the average length of bicycle hire.

