

## Iain Embrey

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## My teaching experience:

2008-2009: 2x weekly tutorial classes of five first-year mathematicians at Warwick University.

2009-2010: PGCE (Birmingham University) – a full year dedicated to the development my teaching skills.

2010-2015: Five years as a full-time 11-18 maths teacher at Swanshurst school in Birmingham; including reflective practice, formal and informal appraisal of other staff, and substantial engagement with and leadership of cpd.

2011-2012: Study toward MEd (Master of Education) degree, awarded with distinction at Birmingham University.

2016-2019: c.3x weekly workshop classes of 20-40 first-year economists at Lancaster University.

2007 onwards: substantial paid and voluntary experience as a sports coach, in orienteering and in paddlesport. Qualifications here include Lv4 orienteering coach, Lv2 paddlesport coach, coach educator, and coach assessor.

## Some teaching achievements and feedback:

### University

Student evaluation results:

- Explanations: 4.4/5                      ○ Makes the subject Interesting: 4.3/5                      ○ Is contactable: 4.5/5
- Additional Feedback via Head of Department:

*“I just received the aggregate evaluations for Econ102 Macro and several comments mention how good your tutorial sessions were.”*

### Secondary school

- GCSE Mathematics teaching:

*Across the school, 11% of yr 10 pupils achieved their forecast and 50% achieved within one grade of it; of these my middle set achieved 40% on forecast, and 88% within one grade of it.*

- A-Level Mathematics teaching:

*I took over the underperforming D1 module, and within two years the module average points score had risen from 50.5 to 115.6 [1 AS grade  $\equiv$  15pts].*

- GCSE Mathematics leadership:

*As Yr 10 Maths coordinator: 0/297 pupils graded U on both Yr10 mock GCSE exams (cf. 18 in the previous year), despite 9 failing to achieve a SATS level 2 by January of their year 9 (cf. one in the previous year).*

- A-Level Mathematics leadership:

*AS overall average point score up from 69.6 to 82.2;  
A2 overall average point score up from 185.5 to 210.*

### Student Feedback

A comment representative of those collected via anonymous written feedback from a sixth form class:

*“Very enthusiastic; Great way of getting the work across; Happy and makes you want to learn; Great at explaining work; Motivative [sic.]; Great passion for maths which encourages you to work; Brilliant!!!!”*

## **A philosophy of teaching:**

The objective of teaching is to facilitate learning.

Learning is an increase in the weighted average level of all skills and abilities that it would be desirable for a learner to possess.

The weighting of each skill is determined by the professional judgement of the teacher, with regard to the learner's own desires, and with regard to the views of colleagues, parents, curriculum-setting institutions, award-granting institutions, and any other relevant considerations.

Corollary 1: Ancillary activities such as planning, assessment, reflection, administration, paperwork, and evidencing should be carried out until the point that their marginal benefit on learning no longer exceeds the opportunity cost of the time that could otherwise be spent on alternative ancillary activities.

Corollary 2: Subject-area expertise and pedagogical expertise are complements, and their optimal input shares within the learning production function are determined by the needs of the learner.

Corollary 3: An educator's teaching philosophy is manifest through the map from the set of possible learners to the skill-weighting functions that (s)he ascribes to each them. An educator's pedagogical style is the means through which (s)he seeks to maximise the learning of the students under their stewardship.

## **My teaching philosophy:**

1). I place substantial weight on deep understanding of the subject material, and minimal weight on the rote regurgitation of facts. In my experience the former achieves a lasting expansion of the learner's skills and knowledge, and it also improves their capacity to accumulate additional skills and knowledge in the future – in contrast the latter provides little lasting benefit.

2). I generally weight the accumulation of transferrable skills above 'the answer' to any particular problem. As such, my emphasis is on supporting learners to derive solutions and explanations, rather than on the accuracy with which they carry out that problem-solving process on any given occasion.

## **My pedagogical style:**

In order to achieve 1) I seek to:

- foster a safe learning environment in which questions are respected, valued, and encouraged;
- encourage and scaffold peer interactions through which learners challenge and develop their understanding;
- set tasks which focus on explaining, evaluating, challenging, applying, and deriving knowledge, rather than recalling or repeating memorised facts and techniques.

In order to achieve 2) I seek to:

- emphasise problem-solving techniques rather than outcomes – for example, if 'stuck': start by writing down a summary of that which I know from the question together with that which I am trying to show, then attempt to work from either side towards the other. If still 'stuck': write down a list from your notes of all the definitions, formulae, or approaches that could possibly be relevant. If still 'stuck': organise a joint study session with a friend or two to compare progress and bounce ideas off each other;
- explicitly identify those key skills and techniques that will underpin a large amount of future study, as distinct from those that are specialised to the present situation. For the former it is especially important to sign-post self-help approaches toward mastery. For example, differentiation to find maxima and minima is a pervasive undergraduate economic tool, and it requires little preparation on my part to demonstrate that an internet search for "differentiation practice PDF" returns as its first result an excellent progressive resource with examples and solutions. It takes little further effort to emphasise the importance of mastering this skill *now*, and to scaffold this by requiring all those present to set a reminder on their phone for the time that they will set aside to do this.