A Stab at 'Promoting Motivation'

One of Maths' Weakish Links

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‘Task-Motivation’ in Mathematics

Every element of mathematical activity involves some aspect of ‘the working of the human mind’.

Given a task which a participating student regards as as **‘accessible’, ‘attemptable’, and ‘attainable’** then a successful completion of the task – either acting as an individual or as a member of a team – can result in the participant experiencing an **emotional sense of personal satisfaction** and an associated well-being state-of-mind.

Here **“Task-Motivation”**, or briefly “Motivation”, is viewed as the drive to embrace tasks which can be imagined likely to result in a repeat attainment of this emotional sense of personal satisfaction and of well-being state-of-mind.

Firstly, "**A Big Picture**" example:

'A Level' Maths entries - Years 2001 –> 2012

Males : Females gender ratios

'A Level' Maths - Total entries **Males 528531**

Females 340171

Males : Females ratio 1.55 : 1, or roughly 3 : 2

[Comparable 'A level' Physics data

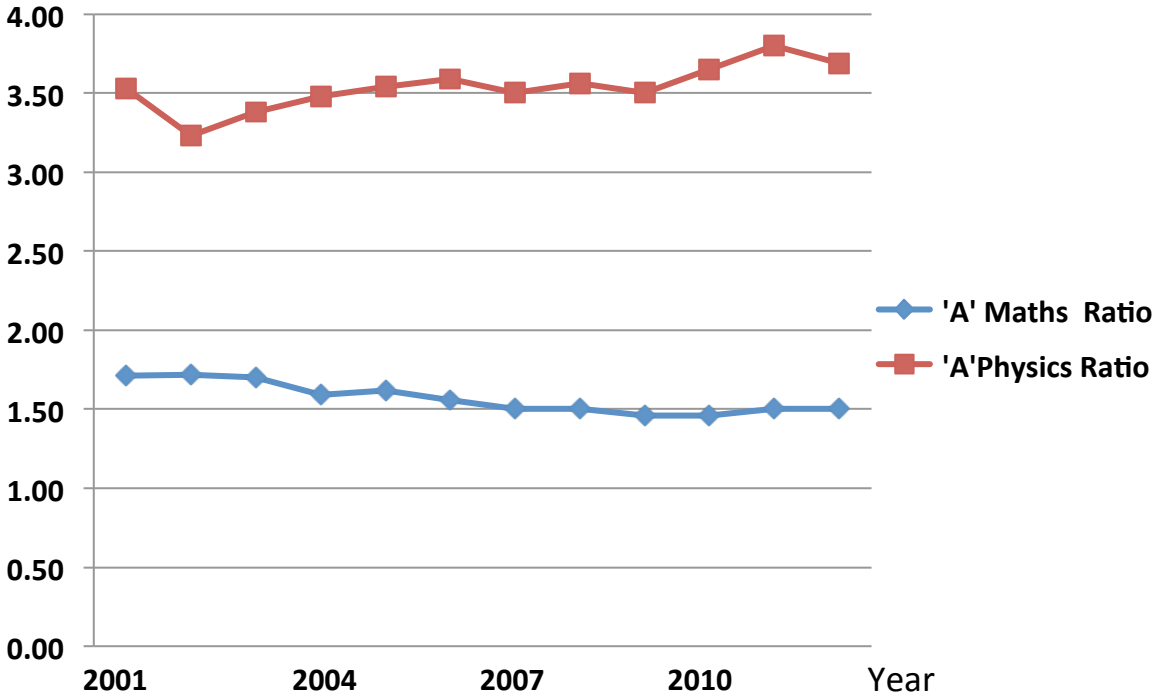
'A Level' Physics - Total entries Males 309244

Females 86680

Males : Females ratio 3.57 : 1, or roughly 7 : 2]

‘A level’ entries - Maths & Physics

M : F gender ratios



Gender ratios away from 1 suggest differential gender motivations – worthy of investigation at another time.

Secondly, “**A Small Picture** ” example : **(!)**

A “MathsJam” favourite – The “Hanging Picture Puzzle”.

We require to hang a picture by single string over two pegs, at the same level (as shown), such that if the string is removed from either peg then the picture will fall to the floor.

Two Contrasting Presentation Approaches

No 1. For **Participative Learning**: "an initial exploratory session is run-through with a succession of **presenter-questions** being posed and **participant-responses** volunteered".

Participation usually results in a **sense of ownership** . The progression becomes instinctively **remembered** rather than having to be consciously **memorised**. Success breeds success resulting in development of confidence which feeds future **motivation** to go on to achieve further success **(☺).**

No 2. For **Passive Learning**: "**a verbal set of instructions** and **an appropriate sketch** are provided, both require to be **memorised**".

Here, **no sense of ownership** is generated. Successful learning depends on **adequate recall** of both the instructions and the sketch.

Alas : For many pupils, memorised details which are not refreshed can quickly fade and may result in potential **demotivation (☹).**

“Not needing to tell the students everything !”

Every approach can usually benefit by way of the presenter **“not needing to tell the students everything”**. This provides the students with opportunities “to assist”, in part or in whole, in the completion of the particular task in hand .

Finally, an echo from the past

The preceding view reflects that quoted in obituaries to Walter Lederman 1911 – 2009 as the advice that he gave when encouraging a mathematics colleague at U of Sussex to embark on the writing of his first text-book.

The author recalled the advice as “I should write what was necessary to help the student understand. **I need not tell the whole truth,** but I must never lie! It was sound advice… ”