

The Teachers' and Students' Perspectives

CBM marks a student according to his/her degree of certainty (or 'confidence') in each answer. At UCL:

Degree of Certainty :	C=1 (low)	C=2 (mid)	C=3 (high)	No Reply
Mark if correct :	1	2	3	(0)
Penalty if wrong :	0	- 2	- 6	(0)

Such a scheme rewards students who reflect to the point that they can either :-

- (a) justify a high level of certainty so that they are prepared to risk a penalty if wrong, or
- (b) identify reasons for reservation so that they lower their confidence and eliminate risk.

Both ways they gain by thinking more deeply and by correctly judging reliability. A student who distinguishes reliable from uncertain areas of knowledge does better than one with the same number of correct answers who cannot judge this correctly.

CBM discriminates more significant levels of knowledge than does mere correctness. Roughly :

3=knowledge 2=uncertainty 1,0=ignorance -2=misconception -6=delusion !
or **3,2=usable knowledge 0,1=unusable knowledge -2,-6=dangerous knowledge**

In assessment, CBM weights uncertain answers less than confident ones. This reduces the variance due to 'guessing' and increases the statistical reliability of exam results. This has been replicated in many research studies and borne out in analysis of exam data at UCL. CBM scores have been found to be the best predictors of 'number correct' on a separate set of questions, as well as of CBM scores.

Students really like the fairness and critical probing embodied in CBM. They appreciate the option to avoid penalties by opting for low confidence, and the wake up call of a -6. They know that a confident misconception is worse than acknowledged ignorance. They improve the ability to judge and express reliability, which is a valued communication skill in any discipline. We find no evidence at all in our data of gender bias, sometimes a concern of teachers. If diffident or overly self-confident students lose out at the start, our data show that they soon learn to calibrate their judgements nearly optimally.

Practical Issues

- For **experience and practice** with CBM, publications, etc. see www.ucl.ac.uk/lapt
- CBM is applicable to every discipline. Misplaced confidence is a problem everywhere, from language comprehension to medicine or engineering, and even (dare I say it) politics!
- You don't need new questions or styles - existing question banks are fine
- All **objective question styles** (provided they have right/wrong answers) are suitable
- If you think Objective Testing only tests factual learning try **BMAT**: www.ucl.ac.uk/lapt?bmat1 ©UCLES
- You can use CBM with exercise files you maintain on your server, while **using the software at UCL**
- ... or you can install and maintain the full programs on your own server
- ... or you can just send a file to cusplap@ucl.ac.uk to run from either a public or restricted site
- Your students can access exercises from a **VLE** and see just their own results
- You can allow students to run exercises offline from a **CD-ROM or hard drive**, with downloaded files
- Exercise files are easily adapted from any systematic **text/graphic/HTML/WebCT/Moodle** format
- An **authoring tool** and **exercise manual** help you with the full flexibility of Q types and feedback
- For **summative tests**, 'number correct' and CBM scores are readily compared for standard setting.
- **Optical Mark Reader** CBM cards are available (www.speedwell.co.uk) with free software from UCL.
- Advice & assistance is always available: email cusplap@ucl.ac.uk