Value-added or Value-taken-away?

Once upon a time, a young maths teacher joined a sixth form college. He knew that student entry requirements for such colleges varied greatly around the country; those for his institution were not so high as to be exclusive, and being an idealistic young teacher, he was glad about that.

'Some places are real exam factories,' he was told by his Head of Department. 'We care about exam results, of course, but we realize that education is much more than that.'

And so the young man settled into his teaching. His students were a real mixture of abilities – he felt that some were sure to get good As, but others he felt were borderline to pass. He wondered how his grades for his first year would look.

'Don't worry!' said a psychology teacher friend, 'We've got a value-added system in place. Yes, we have weaker students than a lot of other places do, but thanks to using the VA system, it's a level playing field.'

The young man felt reassured; but then he looked at the target grades this VA system had given to his students, and he felt unsure again.

'My most able students have been given target grades that are well within their capabilities, while the lower end by ability have targets that seem unrealistically high,' he thought.

He had another word with his Head of Department. 'Yes,' his boss said with a sigh, 'You're right. The way to sort this out is for the target grades to vary from subject to subject – but that's not the way that they do it. With our value-added system, it's one size fits all! Which is bad news for maths...'

'What do you mean?' the young man asked. 'Doesn't the system even things out?'

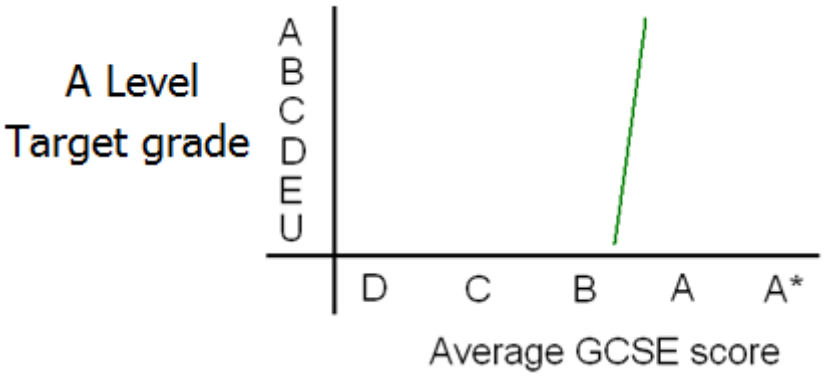
'To come up with the target grades, the VA system plots the scatter diagram for the previous year of a student's eventual A Level success against their average GCSE score.'

‘We might expect a good positive correlation there’, said the young man.

‘Indeed. Then the line of best fit becomes a way of allocating target grades for the year ahead. For each of our students, an average GCSE score on arrival maps to a target grade for the end of their course. Now, with our VA system,’ said the Head of Department carefully, ‘Each student gets the same target grade for each subject that they take.’

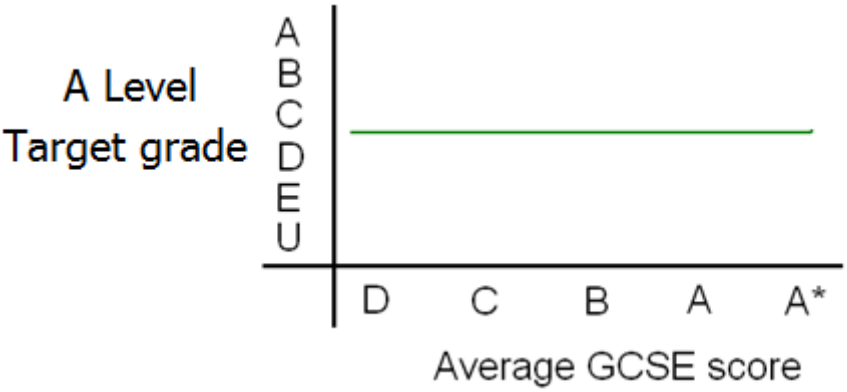
‘Doesn’t that seem fair enough?’ asked the young man.

‘I’m going to take a crazy example here – suppose each subject were to be given its own line for allocating target grades, and suppose the Maths-Only line were to be chosen as this:



What would maths departments who cared only about value-added do here? They would rush to recruit the weaker students, because they would achieve their value-added target so easily. The top end however, would be almost guaranteed to underachieve against their inflated target grade, and would look unattractive when seen only in value-added terms.

Let me try another crazy example. Suppose the Maths-Only line for allocating target grades were to be chosen like this:



Now everyone wants the top end students, because they will be overachieving with almost no effort against their target grade. The weaker students, however, have an impossible task to look good.'

'So everything,' the young man said, 'Depends on the gradient of the target grade allocation line that you take. If you have a steep line, colleges who recruit mainly the bottom end will look marvellous, while if you have a flat line, then the colleges that recruit mainly strong students look excellent. So what happens with us?' cried the young man, alarmed.

'Well,' said the Head of Department, 'The Maths-Only line of best fit for A level grade achieved against average GCSE in reality is steeper than the line of best fit for all subjects together. Look at these national results from the past – lots more As in maths, and more Us.

Media / Film / TV Studies AS-level grades, 2007

All	12.4 (-1.3)	25.1 (-1.0)	29.3 (0.4)	19.4 (1.2)	8.8 (0.5)	5 (0.2)

Mathematics AS-level grades, 2007

All	29.7 (-0.6)	15.7 (-0.1)	14.2 (-0.3)	12.8 (0.5)	10.9 (0.5)	16.7 (0.0)
	A	B	C	D	E	U

So our VA system uses an artificially flat line for the maths VA, and that penalises us, as a college that is less selective and less exclusive.'

'But surely,' the young man cried, 'all we have to do is to point this out to the value-added system organisers, and they will see how unfair it is, and change it! They must, surely, adjust the gradient of our maths line to make it fair!'

The Head of Department smiled. 'Do you think I haven't tried?' he said gently. 'I get a polite reply. But their system is up and running, they have hundreds of schools who buy into their way of doing things – it would cost them too much to change.'

'But that means,' the young man said, 'That as a college that takes on lots of weaker students, our value-added score is almost certain to be low!'

The Head of Department looked at him hard. ‘Maybe the entire exercise of trying to sum up a thousand hours teaching in one digit will always be suspect. So remember what I said – there are lots of ways to measure good education, and a statistic is only one of them...’

(The author is aware that there are a number of different value-added systems available, each with their own methodology, that may well differ from the above.)

Jonny Griffiths, jonny.griffiths@ntlworld.com, May 2012

890 words