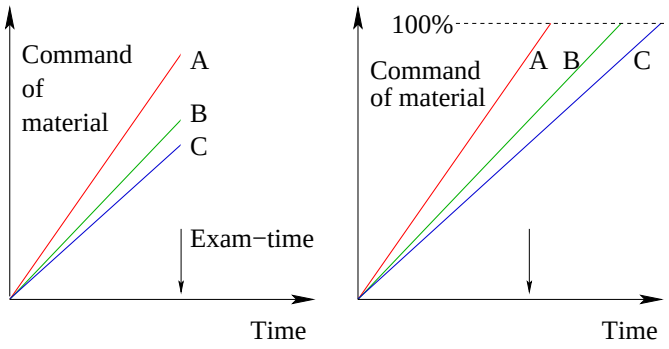
# Everyone Should Get an A

David MacKay

Imagine a University – call it Camwick – where all students arrive with straight A grades. They are successful, enthusiastic, and curious. By the time they leave, only one third still receive straight As. The other two thirds get lower grades, do not enjoy their studies, and are not fun to teach.

Is Camwick University a success? Camwick could point to its excellent teaching assessment scores and argue that it is 'adding value': students emerge knowing more. Future employers love the University's policy of assigning grades – the University ranks its students, saving companies the bother of assessing job applicants themselves. But should a University be a sorting service? Isn't something wrong with an institution that takes in mainly A-quality input and turns out less than half A-quality output? If a University fails to turn out as much A-quality enthusiasts as come in, is it in fact a place of intellectual *destruction*, throwing away the potential of the majority of its students? What are the roots of this destruction?




(a) Traditional system (b) An educational system

Figure 1. Everyone can get an A, regardless of learning rate, if their education is not halted by exams.

## Exams

I would recommend that Camwick consider abolishing traditional exams. In the current system, Camwick teaches Anna, Bob, and Charlie, who are all smart, then examines them; Anna comes 'top', Bob 'second', and Charlie 'third'. Perhaps Charlie, given a little more time, would have figured out the material, but he wasn't quite ready when the exam arrived – perhaps because other courses consumed his attention.

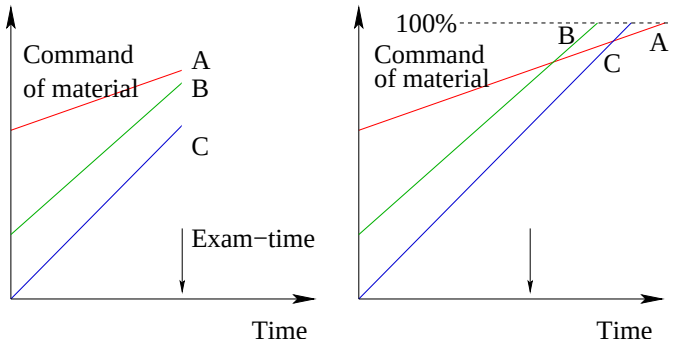
Bob's response to his 'failure' is to adopt strategies of little educational value: he parrot learns, he crams, and he asks lecturers to tell him what's going to be on the exam. The exams become the focus of attention, even though the purpose of Bob's going to the University was learning.

Charlie's response is to give up on doing 'well', and coast through University, no longer understanding everything. He loses self-worth and resents the University for making him feel bad.

Some courses at Camwick assign grades using continuous assessment instead of exams. But continuous assessment has the same effect as exams on Bob and Charlie. So course grades based on continuous assessment should be abolished at the same time as exams.

If Camwick had no exams, the focus of attention would have to be elsewhere. How about education, for example? Students could spend their time at Camwick exploring subjects that interest them, and attending classes that offer something they want to know about, free from the stress and misdirection of the exam system. Lecturers would at all times be friends rather than adversaries. [When I was an undergraduate at Cambridge, I asked a physics lecturer to clarify topic $N$, which I felt had not been covered clearly. His response: 'That's what I love about $N$: some students get it, some don't – so we get beautiful bell-shaped curves in the exam'.]

Of course, the extreme suggestion of abolishing all exams will not go down well: 'What about standards?' 'How can we get funding if we do not test people?' 'How do we award degrees that people will respect?' Traditionalists might say that students appreciate exams for the targets and feedback. Well, there's nothing to stop us giving students targets or feedback. We can provide events just like exams, if students want them – self-administered tests, for example, would allow students to check how well they have assimilated all the material in a course. Other systems of targets and feedback that students enjoy include project work, problem-based learning, and portfolio-based assessment.




(a) Traditional system (b) An educational system

Figure 2. Everyone can get an A, regardless of starting ability.

As a compromise, let's modify our proposal a little: **Camwick should become a place where the only achievable grade is an A**. I'm not recommending that we simply give everyone an A. It's a crime to let standards slip. When I say everyone should get an A, I mean that everyone should be allowed to get *to* an A.

Think back to Alice, Bob, and Charlie. Alice grasped most of the material in the course and achieved an A. Given a little more time and a little less stress, Bob and Charlie could probably have grasped it all too, and become equally strong masters of the material. What good does it do Bob and Charlie to record the fact that they were a little slower than Alice? Wouldn't it have been better, educationally, to give Bob and Charlie a little more time and help, so that they achieved the same A standard?

Does a bus-driver-training school *rank* its graduating drivers? No, it ensures that all attain the standard required of a bus-driver. Would you like to be treated by a C-grade doctor? No, everyone wants an A-grade doctor! So doctors and drivers are (I hope!) trained and trained and not let out until they are A-grade in standard. Why should other professions be treated differently?

Figure 1a shows the command of the material of each student as a function of time in the traditional system. A traditional exam interrupts the learning process, and Bob and Charlie are recorded as having achieved a lower standard. Figure 1b shows the same students in an exam-free system, assuming they learn at the same rate as in the old system. Each student takes a different time to achieve full command of the course material. Every student has the satisfaction of achieving full command of the material.

The difference between the two systems is also striking if we assume that students start the course at different levels of ability. In figure 2, Albert comes from a privileged background and already knows half the course material when he arrives. Brenda and Catharine arrive at a lower educational level. Brenda and Catharine are actually faster learners than Albert, but, as figure 2a shows, the traditional exam system rewards Albert with the A grade ('congratulations, you started first!'), and brands Brenda and Catharine failures. In the 'Only A-grades' system, everyone attains an A-grade in due course; and Albert isn't actually first to finish.

The information about 'who finished when' could in principle be retained in order to provide some sort of student-ranking service to employers, but I would strongly urge the destruction of all such records. Only the achieving of an A grade should be recorded, nothing else. Why?

1. Because being ranked creates stress.

2. Because students who are competing with each other for ranks may be reluctant to help each other learn. In contrast, in the 'Only A-grades' system, the top students lose nothing if they help their peers; indeed, they may gain in several ways: peer-teaching strengthens the students' grasp on material, and often speeds up the whole class.

3. Evidence that a student is a quick learner may well make itself evident in her transcript without rankings being made: Alice, covering material quickly, will have time to take extra courses. So in one year she'll accumulate a slightly fatter sheaf of A-grade qualifications.

4. What value are rankings? If future employers want students to be formally evaluated, they can pay for an evaluation service. Why ruin a great institution? The very best students might like grades too, as they enjoy being congratulated. But the 'only A-grades' system will congratulate them too.

These ideas are not new, nor are they unprecedented. In many German Universities, first- and second-year courses have no grades, no obligatory course-work, and no obligatory exams. End-of-course exams are provided only as a service to students, to help them find out if they have indeed grasped the material and are ready to progress to the next stage.

In practice, how should we organize courses so that everyone reaches 100% mastery? For Bob and Charlie's benefit, the average pace probably has to be reduced. Figure 3 shows one way of organizing the material in stages, so that a class is kept together. Whenever Alice has completed the material in a stage, she can spend

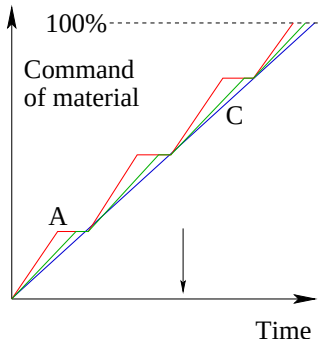



Figure 3. Possible course plan. This scheme assumes that the students have rates of progress ranging from A (fastest) to C (slowest). Every two weeks, a consolidation period is inserted to ensure that C has assimilated all the learning objectives. Alice can use the consolidation period to pursue other interests or act as a peer-teacher.

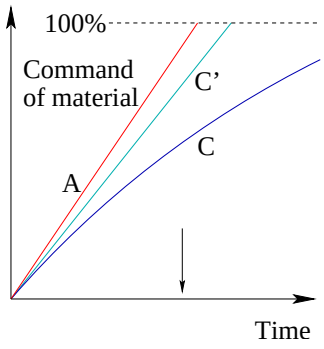



Figure 4. A stitch in time saves nine. Curve C shows Charlie's progress in a course taught at the pace that is ideal for Alice. The more Charlie is left behind, the slower he learns. By the end of the course, there is a big gap between A and C.

Curve C' shows Charlie's progress in a course taught at the pace that is ideal for him. Just a small decrease in class pace allows the big gap between Alice and Charlie to be eliminated.

time on other interests, or can help other members of the class.

Camwick staff who say 'we can't possibly cover a full degree course if we reduce the pace!' should bear in mind that, had Bob and Charlie gone to a less prestigious University, they probably would have got first-class degrees. How can this paradox – going slower and arriving at almost the same time – be explained? I suspect an important factor is this: struggling students get ever slower if we pile on new material before they have assimilated the old. For example, 2nd-year Lagrangian dynamics is difficult to absorb if one hasn't grasped 1st-year Newtonian dynamics. So the steady linear progress assumed in figures 1–3 is a poor model of Charlie. The more Charlie is left behind, the slower he learns. This means that the true difference in pace between Alice and Charlie need not be very big. If Charlie gets lost and left behind, we are wasting everyone's time by having him sit in classes where new material is presented. A stitch in time saves nine (figure 4).

Teaching methods must be modified to ensure that everyone in the class benefits. I advocate interactive teaching: students are asked questions and encouraged to ask questions and to be active participants in their own learning. It's not enough to ask a question and let one person in the class (Alice!) answer it. The whole class must have the chance to think, puzzle, and discuss; the teacher must ascertain the level of understanding of the whole class. In large classes, I find Mazur's voting method works well: a lecture is centred on two or three carefully chosen questions with multiple-choice answers. Students discuss a question with their neighbours, then all vote. The vote informs the lecturer whether previous material has been understood. Diversity of votes can seed a useful discussion.

To conclude, here are a few further advantages of the educational approach advocated here:

- Happy, curious, and self-motivated students are fun to teach.
- At present, British students have little choice of university teaching and assessment style: all universities give out grades. Shouldn't we offer them a choice? Some students would like the chance to go to a place with high standards where only A-grades are awarded.
- If some universities adopt student-centred educational policies and stop ranking students, perhaps these attitudes will spread to schools, with consequent benefits to pupils, and in due course, to universities. Dumbed-down A levels could be replaced by educational programmes that ensure that everyone attains their maximum potential and feels happy about it.
- Happy graduates who get A grades are likely to become grateful alumni donors.