

# Why mastery MATTERS

A high level of success on a daily basis is necessary if we want students to achieve well in the long run, says **Colin Foster**

It's easy to become confused as to what successful learning in school should look like. Let's suppose a child comes home from school one day and tells their carer, "I got 80% in a maths test today!" According to many people's thinking, this would place them in a category of mathematical genius. The person at home is likely to say, "Well done, that's great – let's celebrate!" But before they crack open the chocolate biscuits, we should think about this scenario a little more carefully.

Let's suppose that this test result wasn't a fluke. Let's imagine that they consistently obtain marks of around 80% on their mathematics tests, week after week. A bright mathematical future surely awaits them, no? Maybe – but maybe not.

What I'm going to discuss here isn't specific to mathematics. It could just as easily apply to any other subject that's hierarchical – where what you learn next week will be built upon what you've learnt today.

## Focusing on the gaps

I'm going to adopt a 'glass half empty' perspective when considering this student's success, by focusing on the 20% of content they *didn't* get right. Those missed marks may have been an accumulation of little slips.

Perhaps they related to content covered in class that the student missed, due to absence. Or it could have just been down to a tricky topic that none of the class really quite got, whereupon the teacher told them 'not to worry,' since they'd understood 'the majority of the topic'.

The problem here is that if the *next* bit of learning depends on *this* bit being understood, then that

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missing 20% may set a ceiling of 80% on whatever the student goes on to learn next. With the best will in the world, the student might then not have much chance of getting more than 80% of the next topic right, if 20% of it depends on things they already didn't make sense of in the first topic.

Even if they manage to *maintain* their achievements, they might still end up

with only 80% of 80% on their next assessment, amounting to a distinctly less impressive 64%.

The sad thing about how these percentage changes accumulate is that '80% of 80%' amounts to only 51%. By the time our student has covered three topics, they'll be barely managing half the content.

After 10 topics, that proportion drops to 11%. And that's assuming the

student is *absolutely perfect*, in the sense that they work hard at everything, and never forget anything that they've successfully learnt. Even if we assume that they'll keep earning those 80% scores forever – which is *highly* optimistic – they'll still end

up down to 51% after just three topics. This might perhaps explain why so many students seem to begin a school year or unit of work quite successfully, before things start to trail off all too quickly. It can sometimes be less obvious that this is happening, however, due to switches in the content that's being studied.

For the sake of variety, school subjects will tend to move quite frequently between different areas of content. If our student's 80% was earned after studying algebra, and the curriculum then suddenly shifts over to geometry, we might not pick up on the problem quite yet. But once we return to algebra, that's when they'll start to suffer for that missing 20%.



## How mastery helps

The implication of all this is that we perhaps shouldn't have been quite so satisfied with that initial 80%. If the 80% meant that our student didn't understand, or couldn't do *one in five* areas of content – well, maybe that's not such a great result after all. Complacency over 'sort of getting' things may be setting students up for more serious problems further down the line.

This doesn't mean we need to take a discouraging, negative perspective on students' achievements. We still want to celebrate students' achievements, praise them for their efforts and celebrate success at all levels – but if we move on to new material, assuming that what we've just covered is secure because students' scores were mostly around 80%, then we risk doing them a disservice.

Spending the extra time needed to ensure *real* mastery – say, 95% – can make a huge difference. A 95% success rate over three successive areas of content, each completely dependent

on the previous one, will leave us with 86% success at the end. There's an enormous difference between *settling* for 80% success and *striving* for 95%.

## Cumulative subjects

Granted, not all subjects are as hierarchical as mathematics; some may be more cumulative. If I had gaps in my knowledge about the Tudors, for example, that wouldn't hamper my learning around WWII. But

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it's still true that an historian who makes false statements around a fifth of the time; an engineer who has seen a fifth of their buildings fall down; or a doctor who has presided over 20% of their patients dying unnecessarily *isn't exactly ideal*.

Being 80% right isn't actually that good in any real-life situation where

knowledge genuinely matters. We wouldn't be happy with that success rate for any professional we've paid to deliver a certain level of service.

We have to avoid seeing school as a kind of preparation for a pub quiz. You can guess your way through a multiple choice pub quiz without knowing all that much of the material and still do reasonably well – or even win, given that everyone else is in the same

boat. And after all, it's just a bit of fun...

When preparing students for life, we should want to aim considerably higher than being right 80% of the time. We want students to know some things for sure – but also know that, like all of us, there are many more things that they *don't* yet know, which they'll need to look up or go out and discover for

themselves. Knowing what you don't know is an essential life skill.

## When to move on

Getting 80% on a prerequisite knowledge check may mean that you seriously need to review the content before moving on. Very often, the reason that students can't do one thing is that they don't know some other thing that they're supposed to have encountered previously. They can only work with what they have available, within the limitations of whatever existing skills and knowledge they have at the time.

'Mastery' is a word that's bandied about quite a lot. It takes longer to aim for mastery before moving on, but doing so is more satisfying for students because they feel that they *really* know something.

This then raises students' levels of self-confidence to where they should be, and lets them get used to being right most of the time – except in situations where they know that they *don't* know the answer, and thus need to check. Because we don't want to turn out students who simply coast through life by bluffing and hoping for the best, and whose utterances need constant fact-checking by others.



## ABOUT THE AUTHOR

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