

53 Powerful Ideas All Teachers Should Know About

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Research can help student learning

Item 16 presented evidence that suggests that, on average, research strengths, of the individual teacher, the department or the institution, do not on their own benefit student learning much or at all. Three riders to this conclusion need to be emphasised here. The first is that weasel term 'on average'. Data about the relationships between teachers' research strengths and their teaching strengths encompass some researchers who are also wonderful teachers, but also, unfortunately, some researchers who are dreadful teachers or who simply do not give a damn about teaching. Some strong research departments organise things in such a way that their students are closely engaged with the research, while others treat research as a parallel enterprise undertaken in different buildings. These contrasting practices tend to cancel each other out when measuring average effects on student learning.

The second rider is that strong research environments tend to have other benefits: they tend to be able to hire the best academics, they have more money (though they do not always spend it on teaching), they have better libraries, they have better labs and students can often spend more time in them. Research attracts prestige, and money, and facilities, and students are likely to get better jobs afterwards and earn a lot more, whether or not they learnt more, and so research

strengths attract the best educated students many of whom are more highly motivated to do well and have the study skills to do well. And so on and so on. It is not a level playing field. It is actually much easier to make even quite poor teaching work fairly well if you have these other advantages – but benefits to students are not, in the main, a direct consequence of the research going on, and rarely because the teaching is actually any better or even any different for that matter.

The third rider is that educational research evidence is not like Physics evidence – it does not describe eternal verities or absolute rules that the universe always follows – rather it describes what tends to happen given the way things currently usually operate. If you were to operate differently then the outcomes might be very different. Most observers of higher education could point to contexts where research obviously benefits students – the problem is that they are not the norm and not common enough to influence findings 'on average'. For example in the UK the staff-student ratio is more advantageous in research strong institutions, and this ought to benefit student learning. However lecture class sizes are actually larger in the research élite than in 'teaching' oriented institutions, and class size negatively predicts student performance. But large classes are not inevitable – they are a consequence of, for example, traditional

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research universities offering fewer courses and of choosing not to spend resources or academic time on students. It would be possible for the research élite to organise smaller classes, but they often choose not to.

This item is therefore not about what happens on average, but what sometimes happens – how research strengths can benefit student learning provided things are configured appropriately.

One of the arguments about the way research strengths benefit student learning is that researchers understand how knowledge is created (because they create it themselves) and so they use teaching methods in which the learning process is more like research, which, it is argued, is inherently more engaging and effective. It is also sometimes argued that ‘teaching oriented’ institutions do not understand about this and are incapable of supporting such ‘research-led’ learning.

This argument has at least some truth in it: it probably really is more engaging and effective to learn through doing research and projects and through discovery and solving problems and so on, rather than through being lectured at. However there is no evidence that students are more engaged where research is strong, not because learning in a research oriented way is not efficacious, but because it is actually not more common in research rich environments! The educational practices known to benefit learning have been found to be no more common where research is stronger. One of my daughters went to an

élite research university and the first ‘research-like’ activity she engaged in was her final year project and she had no research training preparation for it whatsoever. The world’s leading researcher on the topic of her project actually worked in her own department – but was abroad doing research for the entire duration of her project and did not respond to emails. It is far from inevitable that research strengths lead to more research-like learning – and in some contexts it is obviously not true,

What seems to matter is that students are given research-like assignments, that they are given training in how to conduct them, and that they are given support as they work out how to learn in that way. Elaborated versions may involve students in running a peer reviewed student journal, mounting an annual conference at which student papers are presented, and all the other surrounding features of scholarship. However web sites that have collated some of the best examples in the world of ‘research-led’ teaching do not in the main describe the practices of élite research universities, but those of much more modest contexts where they are prepared to put in the time and trouble to make research-led learning work. The fact that an institution has research strengths is actually a poor predictor of whether it uses such radical research-led teaching and learning methods. As a teacher, you do not have to have a vast research grant and a team of researchers working for you in order to adopt such pedagogic practices. Indeed many of the pedagogic practices you can find on web sites about ‘research led’ teaching seem very like

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‘active learning’, ‘resource based learning’ or ‘project based’ learning of forms that have been used for decades in institutions with no research pretensions.

There are other examples of clear benefits from research that seem to work in a rather different way and which do indeed demand a very strong research environment. Amongst the most famous is the UROP programme at MIT. UROP stands for ‘Undergraduate Research Opportunities Programme’. About 80% of undergraduates at MIT get to undertake some real research work in a real research group at least once while they are at MIT – and the rich benefits have been well documented. There are many versions round the world of what MIT does but none on their scale. But let us be clear here. First, this has nothing to do with the content of their taught courses or the curriculum. Their UROP projects are about whatever research is currently going on at MIT. Second, it is often done for pay or as volunteering – it is in the main outside the formal educational process and assessment system, though it is possible to gain academic credit. Third, it is supervised by researchers in the same way a research assistant would be supervised – it is not considered ‘teaching’. Fourth, it is paid for out of research grants, not the teaching budget. And finally, its benefits are mainly to do with developing research aspirations and research skills – students are more motivated towards an academic or commercial research career. That is a very worthwhile thing for MIT to achieve, but it is not the same as arguing that students learn more on their Maths 100

course. What this, and many other such ‘research engagement’ enterprises achieve, seems impressive – but also seems largely independent of studying on parallel taught courses that are often as conventionally didactic, lecture dominated and test-driven as anything you could find anywhere. The vast majority of the undergraduate learning experience at MIT is unchanged. And of course to offer such opportunities to 80% of all students you have to have an absolutely vast research enterprise. Except as a small scale add-on for a few lucky students, what MIT is doing is beyond the reach of 98% of the world’s universities.

Finally, there are aspects of the facilities that are associated with high-status research universities that can provide undergraduates with learning experiences that are simply beyond the reach of everyone else. When I was at Oxford, History undergraduates could be working on an essay in their second year using the most extraordinary medieval primary resources. Materials Science undergraduates could, in their routine lab work, use a large suite of electron microscopes, and were trained to do so by technicians funded through research grants. Up the road at Oxford Brookes University the same subjects had to be taught in very different ways because they lacked the research facilities to allow more than a glimpse of such resources or opportunities to more than a select few. The nature of the learning process that can be arranged can be quite different where research facilities are so rich, provided there is a will to arrange them – and often there is no

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such will. In Chemistry at Oxford, for example, the undergraduate labs were very poor indeed, and all the investment had been in the labs for Doctoral students. There is a famous anecdote about a Physics Professor at Harvard who, discovering some students in the corner of the lab escaping from the tedious set lab recipes, and doing their own thing, barked at them “See here, we’ll have no experimentation in this laboratory!” Having wonderful facilities does not necessarily change the mind-set of the teachers about whether it is worth allowing students to use them, or even to think for themselves.

Even here, then, the issue is not just whether research strengths bring extraordinary facilities, but whether there is a commitment to make them available to benefit

undergraduate education. There are institutions where undergraduates never even see the research facilities.

To conclude, the argument is therefore not whether research helps student learning. At the moment, on average, it does not. But it clearly can if the researchers can be bothered, and it clearly can if teachers who are not researchers can be bothered. Some forms of benefit are beyond all but the research élite but most are simply good pedagogic practice that involve students actively in exploring knowledge and the world. In the main these pedagogic practices do not require a parallel research enterprise on a grand scale or teachers who publish in prestigious journals.

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