

OPINION

Promoting learning: what universities don't do

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Universities seek to promote student learning, but assessment and credentials can undermine students' intrinsic motivation to learn. Findings from research on how people learn, mindsets, expert performance and good health are seldom incorporated into the way universities organise learning experiences.

Introduction

After decades of undergraduate teaching, I retired in 2016. It seems an appropriate time to reflect on the positives, negatives and fundamental issues concerning undergraduate education.

In 30 years at the University of Wollongong, I taught a variety of subjects in the humanities and social sciences, for example environmental politics, computers and society, scientific controversies, happiness, and media, war and peace. Before that, at three different universities, I did a limited amount of teaching in physics and mathematics.

The positives of being a university teacher are easy to identify. For me, they were engaging with students eager to learn, helping them gain insights about subject matter and life, and designing courses to help students become self-motivated learners. A bonus for me as a teacher was learning the subject matter and being continually refreshed by contact with student learners. Also positive is interaction with colleagues with similar passions for helping students learn.

The negatives are equally easy to identify, including dealing with students who care more about getting by than learning, coping with ever larger classes, and handling the administrative tasks associated with teaching, which seem to become ever more onerous. Marking can often be tedious, even though I managed to design assignments that made it more pleasurable (Martin, 2014).

The day-to-day experiences of teaching, positive and negative, are one thing. But underlying the experiences are deeper processes. Some of these I knew about from the beginning, whereas others I only discovered during my teaching career. It is these deeper processes that I address here, in the following sections: credentials and assessment; how people learn; mindsets; expert performance; and health.

Credentials and assessment

Studying at university is supposed to be about learning, about acquiring understandings and skills valuable for later in life or for their own sake. Ideally, assessment tasks are supposed to provide both an incentive to learn and feedback on learning. Credentials provide a certification of achievement.

The trouble is that assessment and credentials often undermine learning (Kohn, 1993). Let's take a step back: ideally, students should be or become self-motivated learners, pursuing their studies with focus and determination, even enthusiasm. This is certainly possible as shown by the energy with which people learn about topics they care about outside of formal education, for example sport, hobbies or diseases. However, when students come to university, they are subjected to a syllabus designed by others, and the symbols of learning can displace learning itself.

Assessment can be disastrous for self-motivation. Instead of studying because of intrinsic interest, students are driven by assessment tasks. When exams are over, few students continue to study. Many students have no interest in anything not assessable. Universities are not solely responsible, because assessment-driven studying is cemented through years of prior schooling, but universities do little to counteract reliance on assessment as a motivator.

Ultimately, most students want degrees, the culmination of years of assessment-driven studying. Again, the symbol of learning displaces the substance. Imagine what would happen if degrees were abolished – perhaps replaced by performance portfolios or examinations for entry into professions – and university classes were available solely for their contribution to learning. Enrolments would drop precipitously.

The problems with credentials are long-standing (Collins, 1979; Dore, 1976). I knew about them before I became a teaching academic. Like many others, I did what I could within the system. For most classes in Australian universities, assessment is required, and there are expectations about the sorts of assignments and examinations that should be set. Within these limits, I sought to design stimulating assessment tasks and, over the years, gradually developed approaches that would enable and encourage at least some students to become highly engaged and go beyond the usual expectations. Despite these efforts, most students continued to be driven primarily by assessment tasks.

If I have been such a sceptic about assessment and credentials, why did I remain in a university job for so long? The answer is that an academic career gives considerable freedom, which can be used in various ways. I used my job as an opportunity to innovate in teaching methods (within limits) and to orient some of my research and writing to audiences outside academia. But that is another story.

Over three decades of university teaching, I kept on the lookout for research that might provide insights about learning. Not being an education researcher myself, I often relied on popular accounts.

Learning

In 2014, Benedict Carey's book *How We Learn* appeared. Carey worked as a science writer, including for the *New York Times*. He decided to find out what researchers have discovered about learning. *How We Learn* is an eye-opener. For me, what was significant was how few of the research findings about learning are applied in university courses.

One basic finding is that learning is greater when studying is spaced out over time rather than bunched together. In practical terms, this means it is more efficient to study a little bit each day rather than cram the night before an exam. For a long time, teachers have been saying this to students, so this finding is not surprising, but the details are fascinating. As well as showing the benefits of spacing out study sessions, researchers have looked at fine tuning of the spacing, for example whether it is better to do 30 minutes on a topic once a day or 60 minutes every two days.

Then there is the testing effect. While studying, one option is to do a self-test, posing questions on the topic you're studying. If you spend 20 minutes studying, you can allocate some of the time for self-testing. Experiments show this detracts from learning in the short term but after a week of studying, those who spend part of the time self-testing retain much more.

Learning occurs when you're studying but it also occurs when you are not, as your unconscious mind engages with the material. Studies show you can enhance this 'incubation' process by ending your study sessions in the middle of a topic. Because the topic is incomplete, your unconscious mind spends more time processing it.

Maximising the effects of spacing, self-testing and unconscious processing can enable a student to learn much more or to learn a specified amount in less time. Furthermore, there are other learning skills canvassed by Carey, all based on findings by learning researchers. So why aren't these skills taught in primary school? Why haven't university teachers caught up with this research and incorporated it into their teaching? Why do millions of undergraduates spend untold hours using inefficient learning techniques and remain uninformed about research findings? Part of the answer is academics' focus on content in their teaching. The mechanics of learning are treated as a separate or lesser matter, addressed by specialist learning support advisers recommended for weaker students. Then there is another factor: few academics take any interest in how to use research findings to enhance their own learning.

Mindsets

Carol Dweck, a psychologist, has analysed two contrasting mindsets, namely views people have of themselves: 'fixed' and 'growth' (Dweck, 2006). People with a fixed mindset believe that talents are constrained by genetics, so some people are naturally smart and others less so. Some children with a fixed mindset fear failure because it might show they are not as smart as they believe. These children

will sometimes not attempt a task, thereby avoiding failure. At the undergraduate level, this can manifest in students saying, 'I didn't study much for this exam'. Why would students undermine their own performance by not studying? The answer is to protect their self-image. If they do well, they reaffirm their intelligence, whereas if they do poorly they can blame lack of study.

People with a growth mindset treat failure differently: they assume it means they need to work harder. Those with a growth mindset are more likely to persist with tasks, even when they are doing poorly. In the long run, the growth mindset leads to better performance.

Australian university marking systems constantly rate and rank performance on assessment tasks. If anything, this encourages a fixed mindset, with some students seeing a mark as a reflection of their innate abilities. Seldom are students repeatedly assessed on the same task, enabling them to see the benefits of continued effort.

More fundamentally, many Australians believe that performance reflects innate qualities. Some academics pick out 'bright' students in their undergraduate years and encourage them to continue to advanced studies, rather than helping all students to adopt a growth mindset. Indeed, the very idea that teachers might try to help students change their attitude towards intelligence is alien.

Expert performance

For several decades, there has been an increasing amount of research on what is called 'expert performance', which is demonstrated high-level competence in well-defined skills (Ericsson *et al.*, 2006; Ericsson and Pool, 2016). The top levels of expert performance are exhibited by, for example, chess grandmasters, Olympic athletes and classical musicians with careers as soloists. A common assumption is that innate abilities are required for such stellar performance, but this is challenged by studies showing that thousands of hours of practice are required to become a world-class performer in any well-established, competitive field. Furthermore, the practice needs to be of a special sort. The most effective type of practice is called deliberate practice, which involves intense concentration in trying to master skills at the edge of one's current ability under the guidance of a master teacher. For a pianist, routinely playing through scales or

performing at a cocktail bar does not count as deliberate practice. Working on difficult passages does.

The implication of research on expert performance is that for learning advanced skills, the key is developing a habit of undertaking regular deliberate practice, done privately. Concert pianists may practise several hours per day throughout their performing careers. Waiting until

the day before a concert is woefully inadequate.

If university education is to become a means to enabling the development of advanced skills, then fostering a habit of regular practice at the boundaries of one's abilities is vital. Yet this is distant from what goes on

in most classes. Far from practising skills regularly, most students procrastinate and then put in long study sessions before exams. When classes are over, they stop studying.

A typical one-semester course might involve a few dozens of hours of classes, with an expectation to study a few dozen hours outside of class. This can be enough to acquire some basic knowledge but is far short of what is required to become really good. Hundreds and then thousands of hours of practice are needed. The problem is that few university courses inspire the dedication for this sort of ongoing effort.

Another problem is that many assessment methods do not involve repeated attention to weaknesses until they are eliminated. A violinist will practise a difficult passage for days or weeks until it can be played perfectly. However, a student submitting an essay normally receives a mark and some feedback but then never revisits the same essay, instead moving on to another topic. For becoming a better writer and thinker, it is valuable to return to the same piece of work, revising and polishing it, taking into account feedback from readers. This is what often occurs with academic articles submitted for publication. Undergraduates usually miss out on this sort of training.

People with high intelligence scores often can improve more rapidly than others: they seem to benefit more from training. But this holds only initially. For advanced skill development, intelligence becomes less crucial. Instead, it is the deliberate practice that makes a difference (Ericsson and Pool, 2016: 233-236). The implication is that universities, by rewarding quick learners, are missing out on enabling students to develop habits of continual practice that are essential for the most advanced levels of performance.

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When it comes to university teachers, deliberate practice is uncommon. Most academics teach but do not regularly practise teaching. How many teachers go over and over the same lecture or lab presentation, revising the content and practising their delivery, under the periodic scrutiny of an experienced teacher? I didn't do this very often, and I'm not aware of many colleagues who do. Yes, many put long hours into preparing their lectures, but few practise delivering them, obtaining feedback from students or master teachers. Few academics study research into methods of student learning to work out ways to adapt the curriculum and delivery to maximise it.

Mind, brain and health

Should students exercise? It would be good for their health – and for their thinking. There is a large and growing body of research showing that physical activity is vital for human health and wellbeing. It is the most reliable way to improve mood and is well documented to improve happiness for most people.

Beyond the benefits for the body, exercise is good for the mind. It reduces depression and anxiety and improves mental acuity (Macpherson, 2017; Ratey, 2008). It is therefore a good way to improve the capacity for study and for better thinking.

However, relatively few students exercise regularly. When assignments are due, or exams are looming, students may spend long hours studying without any activity beyond their fingers. This is not good preparation for a lifetime of learning, not to mention good health.

Students are compelled, by assessment tasks, to learn specific content, so why not compel them to exercise, for their own good? However well intended, compulsory exercise might only turn what should be satisfying into a chore to be avoided when there's no pressure. More promising would be to turn a campus into an activity-intensive space, with encouragement to develop personal or group training routines. Parking might be provided at a more distant location, to encourage walking or cycling.

Some universities provide encouragement for physical activity, for example excellent gyms, jogging circuits and secure bicycle facilities. Still, only a minority of students takes advantage of these opportunities, in part because exercise is seen as an optional extra rather than a core aspect of being a learner.

A few academics set a good example, riding bicycles to work or frequenting the gym. All too many, though, seem to operate on the dualistic idea that the mind is separate from the body. It's just not dignified to get hot and sweaty.

There are several other aspects of health that promote better learning, including restful sleep (important for solidifying memories), good diet and avoiding excessive drugs. To some, this might seem like an abstemious approach to university, not having any fun. "Fun" seems to have become identified with damaging activities such as binge drinking and staying up all night. Dedicated athletes look after their diet and sleep, at least while in training. Why should dedicated scholars be any different?

What universities don't do

The rationale for university teaching is that students will acquire knowledge and skills to become more capable workers and better citizens. Hence it is strange that the way universities are set up, with modules of content to learn in set time frames, all leading to a certificate at the end, undermines the intrinsic motivation to learn. Despite much rhetoric about lifelong learning, few students are set on a path to maximise their learning in the long run. Students learn instead that studying is an unpleasant necessity, to be avoided as long as possible and only undertaken when assessment tasks loom.

Meanwhile, much media attention is devoted to scandals such as plagiarism and falling standards. Questioning the credential system is not newsworthy.

The discrepancy between the goals and reality of undergraduate education makes me reflect on radical ideas raised in the 1960s and 1970s. Ivan Illich in *Deschooling Society* (1971) provided a critique of professionalised education, arguing that learning would be enhanced by getting rid of schooling and replacing it with learning in the community, for example in homes and workplaces. Helping children to learn would be collective responsibility rather than undertaken only in schools and universities (Holt, 1977, 1981; Reimer, 1973). In practice, a great deal of learning now occurs when individuals pursue hobbies and when they take on jobs. It is often said that universities may provide a credential to get a job, but what you need to know is learned on the job. This highlights the role of credentials as screening mechanisms, reproducing the class structure.

Deschooling Society was radical when it was published and remains so today. The education system has a stranglehold over officially certified learning in most fields. It remains to be seen whether information about learning, mindsets, expert performance and health will be incorporated into credential systems or provide a challenge to them.

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