# Teaching for very long-term retention and better ways of thinking

David Hardman

RADFORD ARGUES that psychology needs to be of greater value to psychology students, regardless of whether they intend to enter professional practice. He also suggests that psychology should be part of everybody's education, on the basis that human behaviour lies at the heart of the most serious problems facing humanity. I agree very much with these general points, but in considering what the content of a psychology degree should be I believe we should also bear in mind some realities about the nature of human learning. In what follows I shall first briefly review some of the literature on how well students' remember material over the very long-term (i.e. weeks, months, and years). In the second part, I shall argue (a) that evolutionary psychology should be at the heart of the curriculum, and (b) there should be a greater emphasis on techniques and methodologies.

## How well do students remember what they learn?

The early months and years following a degree course are characterised by a steep fall in the amount of material that can be successfully recalled, though after a few years the rate of forgetting declines and test performance stabilises at above-chance levels (Conway et al., 1991). Research from other disciplines indicates that a considerable amount of material may also be forgotten *during* a degree course. Walstad and Allgood (1999) found that American college students who had taken a course in economics scored on average well below the pass/fail threshold when tested in their senior year. Likewise, a Canadian study of medical students found that a 'considerable' amount of first year material had been forgotten by the third year; moreover, re-tests at the third year showed that the rate of forgetting differed between topics, with scores for Neuroanatomy showing a decline of 46.5 per cent on the first year, as compared to declines of 13.1 per cent and 16.1 per cent for immunology and physiology, respectively.

Unfortunately, the essay-based exam component of British Psychology degrees, and much HE generally, may act against very long-term retention by encouraging 'cramming' rather than deep learning strategies. Conway et al. (1991) found that the grades obtained from the coursework component of a cognitive psychology course reliably predicted very long term retention, whereas grades from the exam component did not. High grades obtained on coursework predicted better very long-term retention, whereas poorer performing students tended to also forget more with the passage of time. Newstead and Findlay (1997; cited in Newstead, 2002) found that the use of deep learning strategies declined over the course of the semester whereas surface strategies increased. An American study of marketing students by Bacon and Stewart (2006) identified those that had learned material at a deep level, and found that these showed the highest level of retention.

The research described above suggests that, rather than adding content to the psychology degree, we should perhaps be considering reducing the content of the degree and ensuring that students study the remaining content in greater depth. This depth before breadth strategy has been recommended by American researchers for both marketing (Bacon & Stewart, 2006) and economics (Hansen et al., 2003), with this

last study actually consulting economists as to what could be dropped from the typical course. However, there are reasons why such a strategy may currently be hard to implement on British psychology degrees. For one thing, Society accreditation of psychology degrees is dependent on showing that a wide range of topics are being covered, with no consideration as to the potentially detrimental effects of such a breadth-first approach (detrimental, perhaps, even for the quality of intake to the postgraduate professional programmes that the Society is trying to support).

Because the first year of a degree does not count towards the final award, and because departments typically offer optional courses to students in their final year, most degree programmes place all the core Society material into the second year.[2] Although some final year options may continue to develop understanding of core areas, this is not guaranteed and so the final year of the degree may well be a year in which much core material is forgotten.

## Some suggestions regarding the psychology degree

*Evolutionary psychology*

One problem with the criteria for accreditation is that they are too conservative. They reinforce the division of psychology into silos labelled 'cognitive', 'social', 'developmental', and so on, a division that is reinforced by modularisation. In my view, these divisions inhibit students from developing a holistic view of Psychology (and, indeed, psychology with a small 'p').

If there is one topic that can really help us to understand mind and behaviour in a holistic sense, including the relationship between human and non-human minds, then it is evolutionary psychology (EP). EP is all-encompassing, helping us to make sense of phenomena in psychology's various fields. Whilst EP is at a relatively early stage of development, it is not so much its findings that are important to relate to students but, rather, EP as a way of thinking. However, as with other aspects of higher education universities may need to compensate for inadequacies at school level. Richard Dawkins has recently described schools' inadequate teaching of basic evolution as 'a scandal' (Dawkins, 2008), so it may be that basic evolutionary principles need to be taught (perhaps at first-year level) before introducing EP.

At present, however, the topics listed for the Society qualifying examination only mention evolutionary psychology as something that could be covered in the context of biological psychology. This is not good enough: EP deserves to be at the heart of the psychology degree.

*The skills component*

Radford mentions the kind of skills that are considered to be useful, particularly in relation to the employment context. Although the psychology degree does address skills to some extent, I believe many courses could do this in a much better way. For example, by moving towards a depth-first approach, as described above, more room could be made for project-based work of various kinds that enable such skills to be developed (for more on this, see Bacon & Stewart, 2006).

There are many other skills, in terms of ways of thinking, that psychology can offer, but there is no guarantee that these are covered in any given curriculum. Sometimes we teach ways in which thinking falls short of some criterion, and the psychological reasons why that might occur, but often there is less emphasis on teaching the means by which thinking can be improved. I believe that the teaching of topics such as cognitive and social psychology could emphasise these skills to a greater extent than they currently do, perhaps by cutting back on some of the

[2] On some courses, the final year contributes more to the degree award (reflecting the students' progression) than does the second year, which effectively means that non-core material counts more towards the overall award than does core material.

specific findings that are taught. The kinds of things I have in mind are as follows (this is not, of course, an exhaustive list).

- *Argumentation:* Critical thinking is often stated as a desired aspect of degree courses. However, this often seems to be equated with the concepts taught in research methodology, such as distinguishing correlation and causation. In fact, this specific example is just one aspect of *critical argumentation*, which deals with the ability to construct strong arguments and identify weak ones (see, e.g. Walton, 2006). I believe it would be of great benefit to students to be able, for example, to identify arguments that present opinion as evidence or that rely on appeals to popular opinion. A background in critical argumentation is useful for life generally, as well as academia specifically.
- *Signal Detection Theory (SDT) and Social Judgement Theory:* SDT began as a way of analysing people's ability to distinguish weak auditory or visual signals against a 'noisy' background (Macmillan & Creelman, 2005). Where this is encountered in psychology, it is usually in the context of sensation or perception, but students who are fortunate enough to be exposed to SDT may not be aware of just how widely SDT can be applied. For example, SDT has applications in medical diagnosis (e.g. identifying tumours from X-rays) and the prediction of offender recidivism (e.g. specifying a risk threshold on the basis of existing evidence).

  In similar vein, one of the most robust findings in all psychology is that the use of statistical rules to make judgements about recurring situations almost invariably outperforms human judgement, including expert judgement. Even rules statistically derived from a person's previous judgements will outperform that person's future judgements (Dawes et al., 1989). The study and application of this phenomenon is known as Social Judgement Theory.
- *Bayes' theorem:* I could have mentioned probability theory more generally just here, although students do get some exposure to probabilistic thinking as part of statistics and methodology. However, Bayes' theorem is of particular interest because it tells us how we should update our beliefs in the light of new evidence. This is important in many domains, but evidence indicates that people do not update their beliefs appropriately when they rely on their intuitions (Hardman, in press).
- *Game theory:* Game theory provides a way of analysing behaviour in situations where competition or coordination is involved. Its origins are in economics, where the behaviour of rational actors is analysed, but new variations have developed called *behavioural game theory* and *evolutionary game theory*. Not only do these forms of game theory have wide application, but they are ways of thinking that help us develop a holistic understanding of human (and animal) behaviour.

## Conclusion

I have not discussed the important issue of whether higher education should be about purely academic exploration or whether it should have some social purpose. However, I do think it is possible to give an education that has utility in terms of personal development, postgraduate professional programmes, and future employment, whilst maintaining a serious academic core. One way to do that, as I have tried to describe, is to focus a bit more on helpful ways of thinking, and not just on existing findings regarding mind and behaviour. Training in how to think that actively engages the learner should produce the kind of deep learning that is more likely to be retained in the very long-term. However, I doubt whether the kinds of changes suggested here, particular in regard to a more depth-first approach, can

be applied within the constraints determined by both GBR and institutional requirements. The role of the Society in determining (and holding back?) the psychology curriculum needs some serious consideration.

**Address for correspondence**
David Hardman, London Metropolitan University, Department of Psychology, Old Castle Street, London E1 7NT
E-mail: d.hardman@londonmet.ac.uk

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