

## Throw Away the Spoon! Making Life Difficult for Students

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*'Spoon feeding in the long run teaches us nothing but the shape of the spoon'*  
E.M. Forster (cited in Halonen, 2002, p.48)

### Introduction

In this article I suggest that there is truth to the oft-made complaint that modern universities are spoon-feeding students. I review the distinction between deep and surface learning, and suggest that some aspects of teaching and assessment practices may encourage the latter. In the second half of the article I look at evidence for a central role of self-discipline in academic success and argue that spoon-feeding should be replaced with “desirable difficulties” for students. In addition, several other ways of fostering long-term learning are discussed.

### Deep versus surface learning

In recent years, discussions about university teaching have often concerned the extent to which contemporary students are being “spoon-fed” by lecturers. Consider for example the recent comments by Lady Deech, the independent adjudicator of the Office of the Independent Adjudicator for Higher Education. She suggested that the growing problem of plagiarism can be attributed to a dulling of the spirit of inquiry, caused by “a diet of handouts and PowerPoint presentations” (The Times, 18<sup>th</sup> October 2006). Furthermore,

*Taking down notes in longhand from a book in the library was better than cutting and pasting from the internet, she said, because it required students to “digest” material.*

I believe that Lady Deech is quite right in her comments. I would like to discuss this issue in relation to the distinction that is often made between ‘deep’ and ‘surface’ learning (Marton & Säljö, 1976). In the university environment surface learning is associated with doing a task merely because it is a requirement, rather than because it might be intrinsically interesting; thus, the level of engagement with the task is less than wholehearted. Surface learning is also characterised by maintenance rehearsal; that is, trying to remember something by simply repeating it over and over in the

hope that it will stick. Students whose motivation is primarily external (e.g. to get a better job) tend to be surface learners and engage less with the material (Walker, Greene, & Mansell, 2006).

By contrast, deep learning is associated with task engagement for its own sake, because it is interesting or enjoyably challenging. Deep learners engage in elaborative rehearsal, meaning they engage with concepts, try to make links with their existing knowledge, and try to understand how academic material might relate to their own experiences. Students who are intrinsically motivated to study a subject tend to engage more deeply with the material (Walker, Greene, & Mansell, 2006; also Silvia, 2006, pp. 69-73). This kind of information-processing is known to result in more permanent memory retention (e.g. Nyberg, 2002; Roediger, Gallo, & Geraci, 2002; Zimmer & Engelkamp, 1999).

### **Are we fostering surface learning?**

Despite universities' rhetoric about turning students into independent learners, some of our practices seem designed to do the opposite. For instance, people of my generation<sup>1</sup> and earlier typically recall that when we were assigned to a task, such as a group research methods project, we attended an initial briefing with our supervisor and then just went away and got on with it. In other words, our student group would take the entire responsibility for designing our materials, testing participants, analyzing the data (without a computer package to help), and writing our reports. Then we submitted our work. If we got something wrong, then that was explained in the feedback, reflected in the marks we received, and we tried to do better next time.

By contrast, a typical student group now seeks supervisor approval at every stage. They want to know if they have constructed the materials correctly, how many participants they should find, how they should brief and debrief the participants, and how they should analyze the data. Furthermore, they often want their supervisor to check their computer printouts to determine whether they have done the analysis correctly, and may ask if the supervisor will read through their work prior to submission. I daresay that lecturers may have encouraged this behaviour out of a genuine intention to assist an increasing number of less able students who would not have entered university prior to the expansion of higher education. If this is the case, then many of us now feel trapped by a monster of our own creation. The impact on our workloads is substantial, but we have also contributed to a culture in which students do not think for themselves<sup>2</sup>.

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<sup>1</sup> I graduated in 1990. Based on conversations with colleagues elsewhere, the changes in students' expectations seem quite widespread across the sector.

<sup>2</sup> Unfortunately, students may also get accustomed to spoon-feeding at school and/or at Further Education colleges. In fact, new students sometimes comment on the *lack* of assistance at university.

Let us now consider those ubiquitous handouts that are said to play such a central part in our alleged spoon-feeding culture. I am less concerned with brief handouts that provide little more than a summary of an area plus readings, than with the more fulsome kind, typically involving a whole set of detailed PowerPoint slides. Students who do not have a handout because they missed the lecture, or because there weren't enough handouts, or they lost the handout, frequently give the impression they have been deprived of something vitally important, despite the fact that the module handbook indicates the broad range of topics and specifies the readings. In my own first year teaching, I have received better evaluations when I provided handouts, as compared to when I did not, yet the students themselves have not performed any better at exam time<sup>3</sup>.

Students often fail to appreciate that the handout is largely a collection of material garnered from other sources. However, any suggestion that they actually read the original sources is likely to be greeted with a look of intense disappointment or stunned mystification. Of course, I should emphasise that I am not talking about all students, but nonetheless there are a worrying number who do behave this way. I am unaware of any research that has systematically examined the effect of handout provision on student performance. It might be quite hard to isolate an effect from the general educational culture in which handouts are provided.

However, one clue regarding students' attitude to study might be gleaned from research into how students approach online quizzes. Some textbooks now have associated online material, including quizzes. Virtual Learning Environments such as WebCT and Blackboard also allow lecturers to set up their own quizzes. However, a study by Brothen & Wambach (2001) found that the more such quizzes were taken by students in an *unsupervised* setting, the worse they performed on exams! But taking quizzes in a *supervised* setting seemed to benefit the students (Brothen & Wambach, 2000). A subsequent survey of students found that those taking quizzes in unsupervised settings used a variety of "cheating" strategies, such as "using the textbook whilst taking the quiz, copying and/or printing the quiz to share with other students (they were allowed multiple attempts), using a publisher-provided online glossary, and working in groups" Guring and Daniel (2006, p.49). In other words, students took a surface approach to learning when taking unsupervised quizzes. I suspect that handouts may have the same effect.

Although lecturers may regard one major function of assessment as motivating students to learn, students themselves are less likely to see assessment this way (Maclellan, 2001). Whatever good intentions students begin with, these tend to dissipate as time passes and exams approach, and deep approaches increasingly give way to surface learning (Entwistle and Entwistle, 1991). In other words, students

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<sup>3</sup> One of my colleagues has suggested that some lecturers actively collude with spoon-feeding because they themselves want to be popular, and so are happier when they feel that students depend on them.

tend to learn only what they think they will be tested on, a phenomenon referred to as *backwash* (Biggs, 2003, p.140).

These results are supported by other similar findings. For instance, Newstead & Findlay (1997, cited in Newstead, 2002) presented students with the Approaches to Study Inventory on a weekly basis throughout the semester. This found that deep approaches declined week-by-week until the surface approach dominated. Furthermore, despite what we might tell students, it is not clear that we actually reward them for taking a deep approach. Newstead and Findlay (*ibid.*) also found that the best performers in Year 3 were those who took an *achieving* approach to their studies, whereby they did whatever they thought was necessary to get a good mark. A more *meaning*-based approach to study did not correlate significantly with performance. Some of the shortcomings in our assessment systems are reviewed by Newstead (2002, 2004) and Laming (2004).

As Newstead (2000) has noted, the timing of our assessments may also act against long-term learning. Modular courses have examinations at the end of the semester, not long after students have encountered the material that they will be tested on. There is evidence that end-of-semester testing may not be the best way to assess long-term retention. Conway *et al.* (1997) tested psychology students following 4 lecture courses and 3 laboratory research methods courses. One of the lecture courses was subsequently retested at the end of the following semester. For the lecture courses, successful test performance at the end of the first semester was associated with episodic recall, whereby the individual has a specific memory of the time and place when the material was encountered (“remembering”).

However, when students were retested at the end of the following semester the people who performed most successfully said that they “just knew” the answers (“knowing”). The shift from remembering to knowing was predominant among students who had obtained firsts in the original test, though there was some movement in other classes too. Only students with firsts and upper seconds improved their performance from the first to the second test.

The results were somewhat different for research methods courses, where successful students at the end of the first semester tended to just know the answers. It is likely that such project-based courses, in which particular skills are applied in various domains, lead to procedural learning, whereas regular academic topics are more likely to result in declarative learning (see also Bahrck and Hall, 1991).

Generally, it appears that students forget material rather quickly. Conway, Cohen, and Stanhope (1991) found that former cognitive psychology students had about 60% accurate recall for concepts when tested 3 months after course completion. However, performance fell rapidly during the subsequent 3 years to a level of about 30% accuracy. Repeated tests over the following 9 years found that performance

remained at about 30%, though possibly this might flatter to deceive in relation to what would normally be the case, because repeated testing is one way to consolidate memory (Roediger & Karpicke, 2006). Bacon and Stewart (2006) likewise report that most of the learning acquired during a consumer behaviour course was lost within two years.

### **The role of self-discipline in educational success**

At London Metropolitan University there has recently been a change in university policy as regards assessment, a change that presumably is intended to improve rates of progression and retention, but which I believe may do the opposite. Previously, students were unable to achieve more than a bare pass on any resit forms of assessment. Now students can resit an assessment and be awarded a full mark above the basic pass, as though this were the first time they had taken that assessment. For certain topics (typically those they find difficult), some students now openly admit that they are not really working for the main exam, but are planning on taking the summer reassessment. Occasionally, students walk out of the main exam early, saying that the paper is too hard and they will come back for the resit.

Sadly, these students may be deluding themselves. A well-known failing of most people is that we are poor at predicting how long it will take us to complete some task. This is true of governments, corporations, and individuals. We fall victim to the *planning fallacy*, whereby we envisage all the things we will do in the future to bring about our goals, but fail to foresee the things that might prevent us from doing so (including our own sloth and susceptibility to distracting temptations). In one investigation, psychology students were asked when they expected to submit their honours thesis, and were also asked when they thought they would submit if “everything went as poorly as it could.” Only 30% of students submitted their thesis by the predicted time. The average completion time was 55 days, 22 days longer than predicted. This was also 7 days longer than the prediction made under the worst-case scenario. Students also showed a high level of confidence in their duration estimates (Buehler *et al.*, 1994, Studies 2 and 3).

The planning fallacy can be thought of in terms of *temporal construal theory* (Trope & Liberman, 2003). This says that when we think about events in the distant future we tend just to consider a few abstract features. Thus, an exam several months down the line may be viewed as an important event for which we will work hard. Nonetheless, because the event is distant and abstract a student may feel little sense of urgency, and so may not feel compelled to begin the work that will be necessary for the exam. By contrast, when we think about near-future events we think more in terms of concrete and incidental details. However, for the student who has not begun working long in advance, the sense of urgency associated with more concrete thoughts about the exam may have arrived too late. Unfortunately, a university policy that fails to encourage self-discipline in relation to exam preparation may

simply be perpetuating some students' bad practices, rather than giving them a chance to do better.

In fact, there is now plenty of evidence that self-discipline is a major factor in student performance. In one classic study, Mischel, Shoda, and Rodriguez (1989) measured how long four year-olds could delay their desire for a single marshmallow now in order to obtain two marshmallows when the experimenter had returned from a short errand. The longer the children waited, the better adjusted they turned out to be when they were tracked down as adolescents. They were more socially competent, cognitively able, self-assertive, and better able to face up to challenges. On the other hand, the children who had grabbed the marshmallow were more likely to be deficient in these same qualities, including being prone to jealousy, envy, and bad temper. They were also still unable to delay gratification (see also Kirby, Winston, and Santiesteban, 2005; Peters, Joireman, and Ridgway, 2005).

Other research has shown that self-discipline is a stronger contributor to academic performance than IQ. Duckworth and Seligman (2005) investigated these two variables in two ethnically and socio-economically diverse groups of American eighth-grade<sup>4</sup> students. A composite measure of self-discipline was created based on measures of impulsiveness and self-control provided by the students, parents, and teachers. One group of students also completed an IQ test. IQ and self-discipline were not significantly correlated, but both were correlated with academic performance. Furthermore, self-discipline showed a higher correlation than IQ, and continued to predict performance even when IQ was controlled for. Self-discipline also predicted which students would improve their grades over the course of the school year, whereas IQ did not.

The authors conclude that

*Underachievement among American youth is often blamed on inadequate teachers, boring textbooks, and large class sizes. We suggest another reason for students falling short of their intellectual potential: their failure to exercise self-discipline.... We believe that many of America's children have trouble making choices that require them to sacrifice short-term pleasure for long-term gain, and that programs that build self-discipline may be the royal road to building academic achievement (p.944)*

## **Desirable difficulties**

However, it is surely hard to foster self-discipline in a culture where we are constantly trying to make things easy for students. Along these lines, Robert Bjork recently told the UK's Psychology Learning and Teaching conference that we need

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<sup>4</sup> Eighth grade in the US equates to about age 13.

to introduce “desirable difficulties into the curriculum”<sup>5</sup> (for a conference report see Cleland, 2006). For example, in a study by Simon & Bjork (2001) students learned to type three keystroke patterns, each within a given time, on the number pad of a computer. Some students were assigned to blocked learning whereby each block of practice trials was devoted to a given pattern. Other students were assigned to interleaved learning, whereby practice trials on a pattern were randomly interleaved with the other patterns. When asked to predict performance on a test given 24 hours later, better performance was predicted for students in the blocked learning group. However, whilst the short-term acquisition of learning was better for this group, they actually performed worse on the later test than students in the interleaved learning condition.

One lesson of this study is that introducing some apparent difficulty into a task can lead to better performance. A second lesson is that the modularised system of education may act against long-term learning. Modularisation is essentially a form of blocked learning. Furthermore, modularisation largely denies students the opportunity to build bridges across the various topics within their discipline.

A third lesson is that we should be wary about students’ claims that a particular practice will benefit their learning (such as *needing* a handout). This lesson has also been demonstrated in other studies. For example, Conway and Ross (1984) found that students who took a study skills course believed their study skills had improved, whereas actually little or no change had taken place. In fact, on measures of academic performance there was no improvement relative to a control group. However, when the students were asked to retrospectively rate their pre-course level of study skills, they remembered them as being worse than they actually were. This appears to have caused, at least in part, an illusion of improvement in students’ self-assessments.

Such results indicate that students do not necessarily know what is in their best interests (see also Kornell and Bjork, 2006), yet universities nowadays are so concerned with the student “experience” that we spend a considerable amount of time listening to, and acting upon, what students tell us. Journals and newsletters devoted to teaching and learning matters often contain reports on innovations or interventions whose success is measured by what students thought about them. Such results tell us nothing about whether an improvement in learning has taken place and, as such, are largely worthless. This is not to say that we should not ask students about their experiences. A genuine learning experience that is pleasant is obviously to be preferred to a genuine learning experience that is not pleasant, but the nature of learning is that sometimes it is just unavoidably difficult, discomforting, and not always pleasurable.

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<sup>5</sup> A brief report on the conference, including Bjork’s talk can be found in *The Psychologist*, August 2006, p.463.

Robert Sternberg has argued that educational institutions overemphasise the academic, and neglect the creative and the practical (e.g. Sternberg, 1997). True understanding of academic material should surely involve more than just being able to *evaluate* or *discuss* a given theory (typical terms used in exam questions); it should include being able to apply the material or think creatively about it. Sternberg's (2006) cognitive psychology textbook and accompanying instructor manual includes examples of factual, analytical, creative, and practical questions. Here are some examples for the topic of memory:

**Factual** What is distributed practice?

**Analytical** What are the advantages of distributed practice over massed learning? What are the disadvantages? Explain.

**Creative** Imagine a world in which people best remembered items in the middle of a list, rather than those at the beginning or end. Could proactive and/or retroactive interference explain such a pattern of forgetting? Why or why not?

**Practical** Based on what you know about distributed learning and encoding specificity, how could students manage their study time so that they could maximally recall the material studied?

Clearly, each type of question requires the student to think about the material in a different sort of way. Intriguingly, when Hedlund *et al.* (2006) investigated the use of *practical intelligence* measures in a business school admissions test, they found that the gender and ethnic differences that are observed on traditional IQ tests were either absent or greatly reduced. Thus, these kinds of questions may be considered of benefit in addressing the needs of a diverse student body.

Creative and practical questions may also have the additional benefit of being harder to plagiarize. Nonetheless, there are a few students who appear to be bewildered when confronted with a practical question like the one above. It is hard to know whether they are genuinely unable to think about the practical implications of what they have learned (which might indicate lack of understanding), or whether they are so unfamiliar with this type of question that they are simply afraid to try and answer it. Emails I have received from such students typically say *I don't know what you expect* or *There are so many things I could draw on and I don't want to get it wrong – can you tell me what I need to write about?* In extreme cases, a few students have submitted essays that simply ignore the question set, and treat the task as one in which they simply describe or evaluate some theory (in the traditional manner).

There is an obvious word of warning about the kind of measures described above. Presenting students with desirable difficulties might lead to lower satisfaction ratings from the students. On the other hand, greater prior knowledge has been linked to higher levels of interest in texts (Silvia, 2006, p.80), though texts that lack any



challenge may also be less interesting to more knowledgeable people (McNamara et al., 1996).

Before closing this section, I would like to briefly register a comment made by a colleague on an earlier draft of this essay. He expressed discomfort with the notion of self-discipline, and said he would rather emphasise the notion of education as “self-discovery”. I agree that this is important, though would argue it is not incompatible with also fostering self-discipline. However, I suspect that fostering self-discovery may be harder within the English and Welsh 3-year degree programme. Perhaps the Americans have got this aspect right; their higher education programme begins with a year in which students can study a wide variety of different topics. Along the way, ideally, students decide what it is that really interests them and then pursue this as their main topic of study. By contrast, our students have committed themselves to a programme prior to arrival. Sometimes, they may not really be interested in what they have chosen (but felt they had to choose something) or they may find they are disappointed with what they did choose (in which case they may attempt to switch programmes several weeks into the semester, thereby causing themselves a lot of hard work in catching-up with missed topics).

### **Other potential remedies**

In this section I shall describe some other possible ways to enhance students’ long-term learning of material, most (but not all) of which are mentioned by Bacon and Stewart (2006). Not all of these are directly related to the issue of dependency in spoon-fed students, but are worth repeating here. One recommendation is to develop a pedagogy that *requires* deep learning early and frequently. These might include “team learning” approaches and “semi-structured classroom-based experiential learning techniques”.

Another technique that requires a deep approach is problem-based learning (PBL). There are a number of features of problem-based learning, one of which is that students acquire information through self-directed learning (for a brief overview of PBL see Schwartz, 2004). A recent meta-analysis of the effectiveness of PBL was reported by Dochy et al. (2003). One finding from this study was that PBL led to less knowledge being acquired, but the knowledge that was acquired was retained more strongly. Furthermore, there was a very robust positive effect on skill acquisition.

Related to this last point, many lecturers could genuinely benefit their students by trying to teach less. This is a second point made by Bacon and Stewart: *Sacrifice breadth for depth*. Students are more likely to be forced into a surface approach if they do not have the time to elaborate on initial learning. Much of the time we move from topic to topic, without attempting to build on what has gone before.

Thirdly, we should attempt to ensure that the prerequisite for a module is taken just before the module itself, in order that knowledge is not lost in the intervening period.

Fourthly, Bacon and Stewart suggest that course content is focused on the concepts and tools that students are likely to encounter in their first job. Again, this is because knowledge is more likely to be lost if it is not clearly relevant to the environment the student inhabits following graduation.

Fifthly, repeated testing over time has been shown to lead to better retention of information and should encourage students to relearn the material (e.g. Cull, 2000). Furthermore, assessments could be spread over a wider time frame. However, there may be a delicate balancing act to be made here. What would be undesirable is if such an approach chips away at students' intrinsic motivation. Above all, we should find ways to reward students who wish to explore topics that they find interesting for their own sake.

Lastly, given that some effective teaching and assessment techniques may be less popular with students, institutions need to take a broad view of how they evaluate their teaching staff.

## **Conclusion**

In many ways, modern universities – especially the new universities – have come to resemble an old-style welfare state. Students increasingly expect to be the recipients of resources as a *right*. This manifests itself in other ways aside from the expectation of a handout, such as expecting that a lecturer will be able to give time to see a student who has turned up unannounced, that lecturers can't expect students to see them on days when there are no lectures, or that a lecturer should be able to read coursework submissions in advance to prevent the student submitting anything that is weak or contains errors. Just as overly-generous welfare payments deter some people from acting on their initiative, so students in a *handout culture* may fail to learn to take responsibility for their own learning.

Across the sector university administrations themselves are coming to resemble the kind of bureaucracies that oversee welfare states, with all systems being directed from the top, and leaving little room for flexibility or innovation at the bottom. Although university administrations claim to be more business-like, they frequently seem to ignore the fact that successful businesses are characterized by flexibility, not rigidity. Unfortunately, the move towards greater managerialism in university administrations may be their own way of dealing with the pressures created by bodies such as HEFCE and the Quality Assurance Agency.

However, as far as teaching and learning practices are concerned, the first step to change is to recognise that there is a problem and to seek solutions. While

structural issues such as the modular nature of many degree courses may impose constraints, the strategies suggested here for enhancing long-term learning hopefully offer some hint of how things might be done differently.

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