Paper 5: Research informed teaching

Here in Paper 5: Research informed teaching we consider some of the implications of the educational research that has been examined in previous papers. Oxford academics have developed many diverse, innovative and interesting teaching practices in response to the demands of their discipline and the needs of their students, and this paper includes illustrative examples.

Paper 6: Tutorial teaching supplies an account of tutorial teaching and its place in Oxford. Paper 6 may be particularly useful to tutors new to Oxford or unfamiliar with undergraduate tutorial teaching.

Introduction

It is impossible to reduce to simple formulae the knowledge, understanding, and creative academic judgement that results in good teaching. Educational research can, however, help us to understand the student experience of learning, and supply fresh opportunity for reflection on the principles that underpin our approaches to teaching.

Good university teaching, in whatever form it takes, is ultimately derived from an academic’s own thinking and uniquely creative response to three sorts of question. These are: questions about the scope and nature of the disciplinary knowledge that is being taught; questions about the potential in different kinds of teaching contact with students; and questions about students’ learning needs, including the need for social interaction.

Questions about the nature and scope of disciplinary knowledge.

Under this head, some of the questions that academics consider include:

- How can the subject that my students are reading with me, and the specific topics within it, help students to understand my discipline as a whole?
- What are the principles of fundamental importance that I am asking students to understand, and what are the best examples or illustrations of these principles that I can identify?
- How can this subject and these topics help students to understand what, in my discipline, counts as knowledge, evidence or truth?

Questions about teaching and learning opportunities:

Under this head, some of the questions that academics consider include:

- What opportunities or constraints are afforded by tutorials, seminars and lectures? How can I make the most use of those opportunities? How might I overcome the constraints?
- What aspects of the subject warrant attention in this teaching context? A tutor might consider which elements of a topic are so difficult to grasp that they might best be discussed with students in tutorial; or identify a schematic framework to assist with understanding the topic, best presented in a lecture.
How can I help students to understand why we are doing what we are doing? Would written information about my aims be useful?

What sort of feedback are my students receiving? Is it sufficient? Is it timely? Are they able to make use of it?

Questions about student learning needs:

Under this head, some of the questions that academics consider include:

- At this stage of their development what do my students most need to learn to be able to do? What will help my students to learn how to do it?
- What barriers or impediments to learning might my students be facing?
- How will I enable students to collaborate with each other to enhance their learning?

The presage/process/product model

John Biggs has proposed an interesting framework for thinking about teaching and learning, the so-called ‘3P’ model. This model identifies three key stages in the learning and teaching relationship that demand consideration. In relation to the first stage, presage, we should consider factors that are present prior to learning taking place. In relation to the second stage, process, we should consider factors that are present during teaching and learning. And in relation to the third stage, product, we should consider the outcomes of learning.

![Presage/Process/Product Model Diagram]

- **Presage**
  - Characteristics of the Student
    - (e.g. previous experiences, current understanding)
  - Students' Perceptions of Context
    - (e.g. good teaching, clear goals)
  - Course and Departmental Learning Context
    - (e.g. course design, teaching methods, assessment)

- **Process**
  - Students' Approaches to Learning
    - (how they learn, e.g. surface/deep)

- **Product**
  - Students' Learning Outcomes
    - (what they learn, quantity/quality)

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Encouraging deep approaches to learning (see Paper 2: Student Approaches to Learning and Paper 3 Conceptions of Learning)

By taking into account matters such as the choice and description of task and the style of feedback, university teachers can, and do, exert real influence over students’ decisions whether and when to adopt deep or surface approaches to learning.

We saw in Paper 2 that students do not adopt deep and surface approaches to learning because they have deep or surface learning personalities but because different approaches are a response to students’ learning environments. For example, a significant study of university mathematics students by Professor Diana Laurillard showed learners switching between deep and surface approaches according to their perception of the learning circumstances in which they found themselves. In similar vein, other studies of tasks as varied as essay writing and student medical diagnosis have indicated that student perceptions of the academic tasks they have been set affect both how they approach them, and the measure of success that they achieve.

Taken together, what all of these studies suggest is that there are two significant elements affecting the approach to learning that students adopt: the students’ own conception of the task in which they are engaged; and the nature of the task that they have been asked to undertake.

Teaching that sets out to elicit a deep approach to learning will therefore be attentive to two interrelated questions:

- What explicit or implicit messages about the nature of learning are being communicated?
- What are students being asked to do?

Ramsden has provided a useful overview of the way in which academics’ approach to teaching influences student approaches to learning.

<table>
<thead>
<tr>
<th>Knowledge creation and transformation are encouraged by:</th>
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<tbody>
<tr>
<td>Teaching and assessment methods that foster active and long term engagement with learning tasks</td>
</tr>
<tr>
<td>Stimulating and considerate teaching, especially teaching which demonstrates the tutor's personal commitment to the subject matter, and stresses its meaning and relevance to students</td>
</tr>
<tr>
<td>Clearly stated academic expectations</td>
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<tr>
<td>Opportunities to exercise responsible choice in the method and content of study</td>
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<tr>
<td>Interest in and background knowledge of the subject matter</td>
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<td>Previous experience of educational settings which encourage these approaches</td>
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Information replication is elicited through:

<table>
<thead>
<tr>
<th>Eliciting a surface approach</th>
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<tbody>
<tr>
<td>Assessment methods emphasising recall or the application of trivial procedural knowledge</td>
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<tr>
<td>Assessment methods that create anxiety</td>
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<tr>
<td>Cynical or conflicting messages about rewards</td>
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<tr>
<td>An excessive amount of material in the curriculum</td>
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<td>Poor or absent feedback on progress</td>
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<tr>
<td>Lack of independence in studying</td>
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<tr>
<td>Lack of interest in and background knowledge of the subject matter</td>
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<td>Previous experiences of educational settings which encourage these approaches</td>
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Despite our best intentions it is remarkably easy to adopt practices that unintentionally divert student energies into surface approaches. In the modern university, the exponential increase in the size of the knowledge base of the disciplines poses difficult questions about what can and should be covered in undergraduate curricula. Academics’ awareness of the ever-expanding boundaries of their discipline presents what is perhaps the most common hazard in university teaching, curricula and practices dedicated to ‘covering the ground’.

Individual tutors may have limited scope, in the short term, to modify existing curricula that they believe to be overloaded. We can, however, take steps to ensure that our own approaches to teaching them are sound. In the context of tutorial teaching, the problem of ‘covering the ground’ surfaces as a perception that tutorials are somehow supposed to deal with every point of importance that the student has encountered in his weekly reading.

Aside from the problem of curriculum overload, various other causes may underlie such a perception. Tutors dealing with under-motivated students may be tempted to use tutorials to quiz them on their coverage of the reading. Where tutors are not also examiners, they may lack knowledge of the examiners’ priorities and feel they owe it to the students to attempt to cover everything. Reasons of special significance for first time tutors may be a lack of familiarity with the subject matter so they are not clear what to prioritise, or an absence of opportunity to discuss the course and its objectives with other more experienced tutors.

Whatever lies behind a tutor’s approach to teaching, however, students’ responses will likely correspond. Faced with a tutor determined to traverse as much material as possible in a tutorial, students may well conclude that comprehensive coverage of factual matters is the single most important aim for this course and adopt the necessary surface approaches to cope. A similar and equally rational response will meet the tutor who supplies an overloaded reading list in the conviction that this represents a rigorous approach to scholarship; in the face of unrealistic demands, a realistic student strategy is to revert to superficial learning.
Ramsden has cautioned that although it has been shown to be remarkably easy to teach in ways that encourage surface approaches, there is no guarantee of success for the tutor who seeks to encourage the emergence of deep approaches. Deep approaches, he argues, ‘are fragile things; while we can create favourable conditions for them, students’ previous experiences and other unmeasured factors may mean that they remain unexercised’. But tutorial teaching, perhaps, gives us greater opportunity to encourage favourable approaches than is enjoyed by university academics elsewhere. Where tutors give consideration to tailoring tutorials to students’ needs, and where they are careful to ensure that tutorials are conducive to deep approaches to learning, a tremendous diversity of practice results.

If you would like to read about some relevant examples of Oxford teaching, please refer to Appendix 1.

Student motivation

Not all inquiry into the processes of university student learning has dealt with directly intellectual factors. There have also been useful studies of the nature of student motivation, and of the impact of social context on student learning.

Alongside the development of greater understanding about how students learn has developed new understanding of student motivation. It is argued that student motivation is not an unalterable aspect of student personality (‘he’s lazy, she’s unambitious’). Nor is it generally perceived as a straightforward behavioural response to environmental stimuli in the form, for example, of good marks.

Instead, student motivation is believed to be constructed by the student ‘in a dynamic way based on a process of self-appraisal of situations’. Students act upon their own judgement of what is important in light of their personal needs and values; and upon their own appraisal of their chances of success or failure.

As tutors we do not enjoy dominion over our students’ perceptions of their personal needs and values. But we do possess a considerable degree of control over the nature and the scope of the educational activity that we ask them to undertake. A student working on tasks which she believes to be both worthwhile and, with a reasonable degree of effort, achievable, will be more highly motivated than a student labouring over tasks believed to be meaningless, overwhelming, and doomed to failure.

Varied and meaningful tasks undertaken in a context supportive of intellectual risk taking are most likely to elicit high levels of student motivation. Such teaching is often innovative, but it does not chase innovation for innovation’s sake. Rather, it comes from consideration of student learning needs in relation to the specific subject matter being read.

If you would like to read about some relevant examples of Oxford tutorial teaching, please see Appendix 2.
Social interaction in learning and teaching

Research on the social context of learning has emphasised that learning takes place through interaction with other people and with the culture of faculties, departments, and, by implication, colleges. As Nicol has summarized it:

Learning is now understood to be situated in academic and disciplinary contexts that influence...how [students] construct interpretations of how they are supposed to learn, what is worth learning and what it means to be a student.vii

Whilst good tutorial teaching has many elements in common with other forms of university teaching, what makes it unique is its element of personal interaction. Every tutorial is a unique series of transactions, deriving their particularity from students’ and tutors’ own knowledge and experience, their capacities to learn from and to inform the other, and the nature and quality of the relationship that they enjoy.

In a paper published in 1989, Chickering and Gamson summarised the implications of some fifty years of American research into higher learning. Among the seven fundamental principles of good undergraduate teaching that they identified were four strongly interpersonal factors: personal contact between students and tutors; the communication of high expectations; respect for diverse talents and approaches to learning; and developing co-operation between students.viii

The first three of these have long been assumed to be an integral part of the Oxford tutorial system. The fourth principle, co-operation between students, is sometimes spoken about as the weakness of tutorial teaching. However, as many tutors appreciate, it is possible to conduct tutorial teaching in such a way that a great deal of student collaboration can be encouraged.

Understanding the struggle to learn (see Paper 4: Intellectual and Ethical Development in the College Years)

Do William Perry’s insights affect the way that we might approach our work as tutors?

Perry did not, and could not, supply a blueprint for teaching according to the needs of students situated at different points on his scale. What his work offers, however, perhaps more than any other paradigm of educational research, is a basis for working with students with empathy and compassion.

What may appear to tutors to be a student’s almost obdurate desire for black and white answers, a refusal to engage in serious thought, or disregard for the intellectual values of the academy, may be the outward expression of a very threatening internal struggle. Perry’s study reminds us of how profoundly undergraduates are affected by the intellectual challenges that they face on the path of scholarship, and the turmoil that many encounter in the process of maturing towards adulthood.
Beyond this, in the realm of the immediately practical, tutors who are able to recognise key stages in intellectual development may better understand why their students produce the sort of work that they do, and may then create their own teaching strategies to respond to it.

Perry suggests that where a student is confronted by tasks requiring an understanding of the nature of knowledge beyond that of their current stage of intellectual development, they will simply not know what they are being asked to do. It is as if tutor and student are simply talking past each other, neither able to comprehend the nature of the other’s understanding. This may explain why students often seem not to comprehend the nature of feedback that they are offered and why they also seem unable to act upon it. But if it is the case that such students do not yet understand what they are being asked to do, Perry’s work suggests that, given time, most capable students will.

Perry argues that it is of profound importance to students’ development that the criteria for judging the quality of work are made clear, and constantly reiterated. Without repeated stipulation, he implies, students will remain disorientated and confused by apparently unintelligible expectations. What is thus required on the part of the tutor is unremitting clear guidance – and continuing patience.

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i J. Biggs, *Teaching for Quality Learning at University* (Buckingham: Open UP and SRHE 1999) p. 18

ii D. Laurillard *A study of the relationship between some of the cognitive and contextual factors involved in student learning* Unpublished Ph.D thesis, University of Surrey


iv P. Ramsden *Learning to Teach in Higher Education* (London: Routledge, 1992) p. 81

v Ibid., p. 80


vii D.J. Nicol UCoSDA Briefing Paper 45 *Research on Learning and Higher Education Teaching* April 1997

viii A.W. Chickering and Z.F. Gamson *Seven Principles for Good Practice in Undergraduate Education* (Racine, Wisc.: Johnson Foundation, 1989)
Introduction

We supply two examples here of the way in which Oxford academics approach the task of fostering deep approaches to learning.

The first example, from Dr Richard Young, (Reader in Criminology) illustrates how it is possible to modify the rigid format of lectures so that the lecture hour can be used to stimulate students to collaborate with each other in active problem solving exercises.

The second example from Dr Paul Buckley (Lecturer in Engineering and Fellow of Balliol) illustrates the relationship between research and tutorial teaching in the apparently simple questions that Dr Buckley poses for his students.

Dr Richard Young (Reader in Criminology)
Interactive lectures

At the time that we interviewed him, Dr Richard Young was University Lecturer in Criminology. For several years, whilst teaching both in Oxford and, previously, in Birmingham, he had been experimenting with interactive approaches to undergraduate lectures.

Dr Young generally worked with groups of between 20 and 80 students, but he had found that interactive lecturing worked well with much larger groups and in any physical setting.

Dr Young’s aims for his lectures were to nudge students towards a ‘deep’ approach to learning by stimulating their interest in the legal problems they were being asked to address, and helping them to develop and apply the conceptual tools they needed to deal with those problems. Whilst he acknowledged that one of his secondary objectives was to convey information, it was generally not his primary aim. In his view, the legal information that students need has to come largely from their own reading, of primary and secondary legal materials. He therefore regarded lectures as an opportunity to encourage students to engage with problems in the field, to understand the personal and social implications of arguments they encountered, and to stimulate them to compare their approaches to problems with those of the “authorities”.

Some of what Dr Young did in lectures was, he frankly conceded, simply a means of getting students interested. At the beginning, he might invite students to explore their own preconceptions by asking for a show of hands to find out how many students thought they had committed a crime. More and more hands would rise as he took students through a series of criminal offences, from the most serious to the most trivial: by the time he reached infractions of parking and speeding rules, most students would have admitted that they too were ‘criminals’.

Dr Young found this sort of approach useful to alert students at the outset to the need really to think in his lectures. But the real work started when he invited students to
grapple with difficult issues in a structured series of small-group discussions. Typically, he would outline a criminological problem and ask students to discuss with those seated around them how it might be resolved. Each small group appointed a ‘rapporteur’ to take notes and to present the results of their deliberations. A time limit was set for the discussion, but it was a flexible one and if a lively argument was still in full spate, students would be allowed to continue it. Some of the rapporteurs would then be invited to give their group’s response. Splitting the students into small groups encouraged them to develop and refine their arguments through working together, and enabled every student to participate, including those for whom addressing the student group at large would prove too daunting.

Following what was often a spirited plenary debate between different groups, Dr Young built on the initial discussion by introducing further academic argument. His aim at that stage was to foster a deeper understanding of how academic ideas could be used, and to encourage the students themselves to determine the arguments’ limitations. The students might be asked to apply the new arguments to the problem they had been working on, or they might be asked to think through a new issue. Sometimes Dr Young would ask the students to continue their work individually, or sometimes they would reconvene in their small groups.

Dr Young found student feedback on his lectures to be extremely positive, whilst at the same time quite revealing of student understandings of lectures’ role and functions.

Most of the feedback evidenced students’ tremendous enjoyment of the opportunities for thought that his lectures presented, but it was also suggested in feedback that there were less time-consuming ways of transmitting information. Such comment reveals the extent to which students bring distinct expectations of teaching into higher education. Recognising that his students did, however, need to orient themselves towards the informational content of his lectures, Dr Young supplied comprehensive handouts. In doing so, he felt he was able to be clear about his lectures’ content whilst nevertheless liberating himself and his students from the mundane business of transmitting and transcribing detailed argument.

When he first started working in this way, one of Dr Young’s concerns was that his students would decline to participate, or that their discussions might not be productive. Experience has proven quite the contrary. Having spent some of his early lectures anxiously prowling the hall to monitor student discussions, Dr Young is now confident about the benefits of the interactive approach.

Dr Paul Buckley (Lecturer in Engineering and Fellow of Balliol)  
**Tutorial questioning strategy**

The relationship between research and teaching is both long-assumed and increasingly called into question, so it is interesting that tutors we have interviewed have drawn on their research activity to formulate strategies for helping students to consolidate their understanding. This example illustrates how good tutorial teaching derives both from a tutor’s understanding of the knowledge structure of his discipline and from consideration of how the discipline appears to students.
From the perspective gained from his research in non-metallic materials, Dr Paul Buckley recognises that mechanical engineering textbooks tend to present their arguments as though everything is made out of steel. In his view, students need help to separate out concepts that are, as he puts it, “usually jumbled up” in their core texts.

He therefore challenges his students to interrogate textbook problems from a range of different angles. So he might ask, ‘Supposing [the structure] was made out of chewing gum, would you get the same answer?’

Dr Buckley’s use of this apparently simple questioning strategy discourages his students from reliance on rote-learning. Pursuing such questions helps Dr Buckley’s students to see the in-built bias in the text book explanations, and thus to build a more complete ‘mental picture’ of scientific principles. Moreover, such questions, challenging the framework of the reading that students will have undertaken, indicates to students that tutorials are not a forum to check up on what they have read, but a forum in which real interrogation of knowledge can take place.
**Introduction**

We supply two examples here of the way in which Oxford academics use their knowledge of their discipline, the resources in their environment, and their understanding of their students’ needs, to create unique approaches to tutorial teaching.

**Dr Ngaire Woods (Lecturer in Politics and Fellow of University College)**

**Collaborative critique of key texts**

Tutors’ often tacit knowledge of what students can find difficult to grasp, and their sense of what students find most interesting to explore, guide the ways in which they draw upon their own disciplinary knowledge and the resources in their environment.

Dr Ngaire Woods told us about her strategy for teaching first year students. She has several aims for these tutorials: to encourage students to abandon the assumption that everything that is printed in a book is unquestionably true; to help them to create a detailed understanding of a particular argument; and to nurture their confidence in generating their own views of authoritative academic writing.

Her students work in teams of three or four, together preparing a critique of a key text. Dr Woods then invites the author of the text to the students’ tutorial, and the prepared critique is presented by the group. Finally, the author is invited to respond to the students.

In the process of preparing their argument, Dr Woods’ students learn about more than the subject matter under discussion: they also learn about teamwork and the value of collaboration. In her view, working collaboratively is an important skill in itself, but Dr Woods also sees it as a vital resource in the short term when the students come to prepare for examinations. Debating with each other, she believes, helps students to fully engage with material, and internalise their own understandings of it.

Dr Woods is attentive to the student perception of these tutorials. At the end of this exercise, Dr Woods discusses it with her students to see how they have experienced it. She might then modify it for subsequent groups.

**Dr Heather Viles (Lecturer in Geography and Fellow of Worcester)**

**Exploring ‘academic literacy’**

After some decades of discussion about the nature of the ‘study skills’ that underpin academic communication, recent research has emphasised the importance to students of learning to appreciate the conventions of academic argument within their discipline.

Academic writing requires much more than just knowing the scholarly protocols. Appreciating the conventions of academic writing means, for instance, knowing what counts as evidence and why; how examples are used; and how arguments are framed. It
means gaining a level of fluency in discipline-specific discourse: the way physicists write for physicists or linguists argue with linguists.

Dr Heather Viles promotes this sort of awareness in her geography students from the beginning of their first year course. She sets them a deliberately wide variety of reading: a chapter each from a range of textbooks, a variety of articles and an extract from a web site, perhaps.

Dr Viles’ students are expected to discuss not only the content of the reading they undertake but also its structure, approach and purposes. Her students are expected to make an assessment of its style, to examine its use of graphs, diagrams and photographs, and to consider how the literature is or might be used for differing purposes.