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Editor’s introduction

Dr Deesha Chadha

Welcome to the tenth edition of HERN J’s prize-winning essays. In this volume, we gather together essays exploring teaching in a variety of settings, but joined by a desire to place the student at the heart of the educational experience. Each of these educators has questioned the learning that takes place within their respective settings and what they can do, as teachers to enhance that experience. They have reflected deeply. The reflection itself becomes a form of conceptualisation which is required to make meaning. Schön (1987) refers to this reflective conceptualisation as ‘a kind of improvisation, inventing and testing in the situation strategies of [ones] own devising’ (p.37). Every author demonstrates how they have stepped outside of their disciplinary comfort zone and searched for something outside of themselves – always with the feeling in mind that the status quo is at best ordinary and translates as a simplistic relationship between teaching and learning. According to Ashwin (2015), reflective teaching has the potential to enhance the life chances of the students with whom we work and through their reflections the authors have revealed a hidden truth within themselves that has allowed them to be braver as educators and explore the unknowns within their practice for the betterment of their students.

The theme of technology enhanced learning is creatively dealt with by two of the authors. Hanna provides a critical evaluation of her practice in global health by drawing on relevant academic literature concerned with the research-teaching nexus and inquiry-based learning; course material to describe the hackathon and its related components; and student evaluations to reflect on the overall module experience. She concludes with some final reflections and preliminary thoughts of what it would take to institutionalize research-based teaching and learning in my department in a more sustainable manner. In his essay, Nathanial illuminates the importance of striking a balance between both traditionally focused teaching methods and technology enhanced learning and teaching in geography. His essay draws from experience and student feedback gained co-coordinating and designing a master’s programme in Australia, extensive lecturing experience spanning three countries, and a detailed literature review.

Developing a better understanding of the student and adapting ones teaching practice to better accommodate that understanding is a theme taken up by Oisin, Miranda and Charlotte. Oisin reflects on the research of educationalists like Biggs, Allan and Barnett among others; psychiatrists like Bion; and the anthropologist Bateson. Oisin evaluates the application of group and network analysis as a key consideration for the environment, learning experience and teaching strategies in a small group, discursive seminar in the English department. In her essay, Miranda analyses her experience as a first-time Graduate Teaching Assistant from the department of English leading seminar groups comprised of first year undergraduates, and how the lack of confidence from both her students and herself may have affected the pedagogical experience. She discusses how a new and challenging environment, negatively influences both
student and teacher, creating a ‘perception filter’ which distorts one’s ability to see one’s own progress. Charlotte meanwhile, examines some of the challenges faced in teaching a Chinese politics course to Chinese graduate students. In reflecting on significant issues in the content and delivery of teaching, language acquisition problems and the classroom environment, her essay goes beyond existing reductive approaches which criticise the ‘rote learning’ and ‘passive-receptive learning style’ of ‘Confucian heritage cultures’.

In this volume, effective teaching methods to enhance discipline-informed transferable skills are explored by Shaihan, Hana and Sam. Shaihan reflects on the assessment process by placing it within the frame of existing research on oral examination procedures, in particular the large body of work concerning medical education. By identifying the positive and also the negative components of current practice he proposes an updated approach for use on future student cohorts. Whilst Hana, analyses the reasons for students’ poor writing skills, and explores different ways she attempted to improve these skills amongst students studying English, and uses anonymous student surveys and feedback as well as teaching observations to examine the effectiveness of my teaching practice. She concludes the essay by presenting ideas on how to further improve her students’ writing skills within this particular module. The aim of Sam’s essay is to critically evaluate teaching of statistics which is the cornerstone of the scientific method and namely sampling distributions on an undergraduate psychology degree. The essay critically reflects on teaching using the ‘decoding the disciplines’ framework and the case study presented uses data in the form of Sam’s personal perceptions of student learning of this concept, as well as student feedback and feedback from teaching observations.

A working definition of teaching places emphasis on teaching being centrally about an inability to escape without learning or developing (Cowan, 1998). Something about the teacher continually changes as they journey through their taught practice. The authors have presented their journeys travelled as teachers in these essays and have revealed what is possible when accepted norms are challenged. The words of T.S. Eliot (1942) ring true for the collection of essays in this volume:

We shall not cease from exploration  
And the end of all our exploring  
Will be to arrive where we started  
And know the place for the first time

The authors have spoken with honesty and passion about their explorations. We very much hope you enjoy reading their essays.

**Bibliography**


Carrying silk to Suzhou? Reflections on teaching Chinese politics to Chinese students

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Abstract
This essay will examine some of the challenges faced in teaching a Chinese politics course to Chinese graduate students. It is based on the module in Contemporary Chinese Politics I taught at King’s College London from January to April 2014, to a class of MSc students, most from mainland China. These students, familiar with the lived realities of Chinese politics but unfamiliar with the study of the discipline, often seemed unengaged or even sceptical in seminars. In reflecting on significant issues in the content and delivery of teaching, language acquisition problems and the classroom environment, this essay will go beyond existing reductive approaches which criticise the ‘rote learning’ and ‘passive-receptive learning style’ of ‘Confucian heritage cultures’. Instead, it will try to develop a deeper and more nuanced understanding of the reasons for lack of participation in class, as well as to reflect on ways of overcoming barriers to student engagement in the module in future years. Data will be drawn from teaching observation feedback, online student feedback and seven in-depth interviews with individual students from the Politics MSc module.

Key words: Chinese students, Chinese politics, seminars, student participation, student engagement

Introduction
In January 2014, I taught an introductory-level lecture course on Contemporary Chinese Politics in the Lau China Institute, King’s College London. This module was composed of 10 one-hour lectures, followed by 10 one-hour seminars. Somewhat surprisingly, of the 19 MSc students enrolled on the course, 13 came from Mainland China. When the Lau China Institute was established in 2008, it was not envisaged that over three-quarters of its MSc students would originate from Mainland China. After all, why would so many Chinese people want to come to all the way to London to learn about China? However, since the first students arrived in 2011, the pattern has remained: nearly 80 per cent of recruitment is from the People’s Republic of China. This has posed unique challenges for teaching and research in the Institute, and perhaps nowhere more so than in the teaching of Chinese politics.

When I began my role as Lecturer in Chinese Politics at King’s in September 2012, I felt aware of the issues I may face in teaching Chinese politics. Having already taught the subject to undergraduates in Cambridge, I was familiar with the assumptions Western students made about China: that it must move away from Communism towards liberal democracy as though on a preordained trajectory; that Chinese citizens are brainwashed by the state; and that
China’s one-party system is monolithic and incapable of meaningful adaptation. Other politics lecturers have remarked on similar issues. Fischler (2012) comments on the ‘egocentrism’, defined as the lack of awareness of different but equally valid perspectives, among US students encountering Chinese politics for the first time. Sullivan (2012) too notes that Chinese politics appears so ‘alien’ to Western students that they lack empathy, such that ‘their subsequent egocentrism inhibits critical thinking’ (Sullivan, 2012). Already familiar with these issues, I was prepared to have to help my students go beyond the black-and-white thinking of much Western media coverage in order to develop their understanding of the actual complexities and contradictions of contemporary Chinese politics.

However, these were not the problems I encountered in teaching Chinese politics to Master’s students at King’s. Instead, most students were well-versed in the complexities of everyday politics in China, through their own lived experiences. What they lacked was twofold: an understanding of the discipline of political studies; and a faith that many of the course readings (and perhaps the lecturer) could tell them anything meaningful about Chinese politics. In seminars, these students often seemed unengaged, sometimes sceptical and occasionally occupied in something altogether different. It was difficult to persuade many students to speak during whole class discussions, and in group exercises they were frequently reticent and uninvolved.

The purpose of this essay is to investigate the causes and some of the effects of Chinese students’ lack of participation in seminars, through a critical analysis of the case study of my Contemporary Chinese Politics module, and to suggest some possible ways that this could be overcome in future teaching. I aim to go beyond existing non-discipline-specific literature on teaching ‘passive’ Asian students used to ‘rote-learning’ (Yee, 1989; Holliday 1994; Biggs, 1996; Liu, 2006), to explore how and why Chinese students may feel uncomfortable or unwilling to participate specifically in classes on Chinese politics. In doing so, I consider not only the disciplinary context, but also significant issues in the delivery of teaching, students’ language abilities and the classroom environment. In order to analyse these issues, I draw on my own teaching experiences, peer and tutor observations, and student online evaluation forms submitted at the end of the semester, as well as one-to-one interviews conducted with seven students from my module in June 2014.

I begin with a review of the literature on the learning styles of Chinese students, and the ‘problems’ this is perceived to create in the international classroom, as well as briefly examining pedagogies of politics education. I then provide background information on the module and the teaching strategies I employed, before critically analysing student engagement. I discuss the reasons for Chinese students’ lack of engagement, and attempt to identify particularly successful or unsuccessful teaching practices in terms of facilitating participation. In the last section, I reflect on the possibilities for overcoming barriers to student participation in future politics teaching.

**Chinese students in the global context**

The achievements of Asian, and especially Chinese, students are well documented. Students from China, Hong Kong, Taiwan and Singapore consistently perform well in mathematics,
languages and science, both in their countries of origin and abroad (Medrich and Griffith, 1992; Stevenson and Stigler, 1992; Stevenson and Lee, 1996). Nonetheless, the stereotype exists among Western teachers and scholars that students from ‘Confucian-heritage cultures’ are passive in class, rely heavily on rote-learning and memorisation, are predominantly extrinsically motivated, are unlikely to challenge the teacher’s explanations and show less aptitude for critical thinking than their Western counterparts (Beeby, 1966; Watkins and Hattie 1981; Biggs 1987, 1991; Chan, 1999). Kember (2000) quotes from the minutes of a course planning meeting in a Hong Kong university:

‘Students in Hong Kong…expect lecturers to teach them everything. They have little desire to discover for themselves or avail themselves of the facilities available to them…They wish to be spoon-fed and are spoon-fed.’

Similar stereotypes appear in scholarly articles. Dunbar (1988) suggests on the basis of no clear research evidence that, for Asian students, learning;

‘manifests in rote memorisation of facts, formulae, rules, tracts and schema…Unifying principles are overlooked, and emphasis on detail is encouraged. Learners are conditioned to accept and respect what the teacher presents as correct.’

In explaining this apparent difference between Asian, especially Chinese, students and their Western classmates, research has focused largely on the question of ‘learning styles’. Western observers have suggested that students from Asia use primarily rote-based, low-level cognitive strategies, both in their native education systems and when studying abroad (Murphy, 1987; Pearson and Beasley, 1996). This is sometimes reductively ascribed to cultural factors: Nakamura (1964) concludes that ‘Chinese thinking’ is typified by ‘emphasis on perception of the concrete’, ‘non-development of abstract thought’, and ‘emphasis on particulars not universals’ (cited in Redding, 1990: 76). Chan (1999) suggests other features of supposedly traditional Chinese culture which shape students’ non-participation in class: Chinese culture is, she claims, based on ‘self-effacement’ drawn ‘from the Confucian value of modest behaviour’. This means that students ‘refer to themselves as “not worthy” before their teachers…[and] prefer not to express their true opinions so as not to embarrass or offend others...’ (Chan, 1999).

A related interpretation blames Chinese educational institutions for students’ uncritical and reproductive learning style. The restrictive teaching and learning context, in which docile students are spoon-fed material in overcrowded classrooms and taught never to question their teacher, as well as the need to excel in a highly competitive learning environment, leave the Chinese student ‘little choice but to resort to rote learning’ (Yee, 1989). According to Martinsons and Martinsons (1996), it is those most able to ‘regurgitate’ information from the teacher who do well in China. Rote learning, that is, ‘learning in a mechanical way without thought or meaning’, leads to excellent examination grades in the Chinese system, but ultimately means that the learner fails to account for the real meaning of the material studied (Biggs, 1994).
More thoughtful empirical research into the ‘learning approach’ of Chinese students has led to more complex findings (Biggs, 1994; Kember, 2000). The literature on learning approaches suggests that there exist two broad approaches to studying: first, an orientation towards deep comprehension of the meaning of the materials studied; and, second, an orientation towards mere reproduction of the materials for the purposes of assessment (Richardson, 1994). Using the Study Process Questionnaire (SPQ), an instrument designed to measure approaches to learning, Chinese and Hong Kong students in Australian universities were compared with native Australian students. The results, which showed no significant difference between the two groups in overall learning approach, suggested that Chinese students actually frequently employed ‘deep’ learning strategies over the common stereotype of rote learning, and that when students did rely on memorisation, this enabled them to attach meaning to the material and was accompanied by an intention to seek deeper understanding (Kember, 2000; Ramburuth and McCormick, 2001). This memorisation strategy was therefore qualitatively different from ‘rote learning’.

An alternative explanation for the use of memorisation and the adoption of ‘surface’ learning approaches is that students adopt this strategy when they perceive that the assessment requires them to reproduce bodies of material. Of course, this does not apply only to Chinese students: the work of Laurillard (1997) and Entwistle and Tait (1990) suggests that students frequently adjust their learning approach on the basis of their perception of the task to be performed. In the Chinese context, Kember points out that the two explanations may act in concert: memorisation is used to deepen students’ understanding, but is also employed more frequently when lecturers design curricula in response to their perceptions of students as being capable only of rote-learning (Kember, 2000). The possibility of Chinese students responding in this manner to teachers’ interpretation of their abilities should not seem too surprising in light of the stereotyped assumptions about Asian learners expressed in the course planning meeting minutes quoted above, and the advice given in manuals for lecturers of international students (for example, the influential work of Ballard and Clanchy, 1997).

How do these understandings of the learning styles of Chinese students and the stereotypes of Western teachers and scholars relate to the practice of teaching Chinese politics? Sullivan, a UK-based politics lecturer, expresses the common goals of politics teaching as wanting students to acquire a sense of political complexities, see beyond news coverage of politics, and develop the skills necessary to engage critically with information from official and other sources. He identifies four major objectives of lecturers: student engagement, active learning, assessment and student satisfaction (Sullivan, 2012).

In all four areas, the learning approaches and classroom behaviours of students are relevant. First, degrees of engagement and activeness of learning will be shaped by students’ willingness to participate in seminars, challenge lecturers’ explanations and grapple with discussion questions. Astin defines engagement as the ‘physical and psychological energy the student devotes to the academic experience’ (Astin, 1984). Recent research has demonstrated that the more active students are in their learning process, the greater success they will have (Weir and Baranowski, 2011). This idea has laid the pedagogical basis in politics, as elsewhere, for a focus on ‘experiential learning’, based on Kolb’s (1984) model, including a wide range
of activities such as role playing, problem solving and collaborative discussion. While some traditional one-way lecturing may be necessary, it is clear that this is not always the most effective method of learning (Fischler, 2012).

Second, different methods of course assessment and students’ perceptions of these may determine the students’ choice of deep or surface approaches to the material studied, with corresponding effects on their engagement in class (Laurillard, 1997; Kember, 2000). Finally, student satisfaction in turn depends on the first three areas: if students engage with the course, participate actively and collaboratively in seminars and take part in clear, fair assessments with appropriate feedback, they are more likely to report satisfaction. This is true of most subject areas, but specific research on the pedagogies of political science has suggested that active learning, collaborative problem-solving and role-play may be particularly effective in enabling students to analyse the actions of political actors and retain information about the functioning of unfamiliar political systems, as well as enhancing student interest, generating a stimulating classroom atmosphere and encouraging positive student feedback (McCarthy and Anderson, 2000).

**Module aims and methods**

Drawing on these ‘experiential learning’ approaches, and on the insights gained from teaching Chinese Politics in Cambridge, I developed the loose syllabus of my predecessor into a focused module on Contemporary Chinese Politics which I taught for the first time in 2013. The module aimed to introduce the dynamics of Chinese politics from 1900 to present day, apply relevant theories to China’s political development, and analyse critical viewpoints from both Chinese and Western perspectives. I divided the course into two halves: the first five weeks focused on historical developments before 1978, while the second five weeks examined China’s Reform Era. Each lecture with the full cohort was followed by two separate one-hour seminars, with 7-12 students in each seminar. I saw the aim of the lectures as exposing the students to the knowledge that I would bring to the classroom, whereas the seminars had two purposes: first, to provide structured discussions, giving students the opportunity to question my knowledge and the set readings; second, to engage them in a series of collaborative problem-solving exercises which would help to combine improvement of skills with the acquisition of knowledge and the generation of interest and motivation. My hope was that students would contribute different perspectives drawn from their different backgrounds, challenge each others’ views as well as mine and those of the scholars whose works we read, and learn from each other.

Unfortunately, teaching the module for the first time, I found that seminars rarely produced the active debates and engagement which I had hoped for, so I introduced changes in 2014. Student feedback reported a lack of interest in some historical material, so, as I was reluctant to remove essential historical content, I decided to introduce one or two short weekly news articles as starting points for discussion, which I hoped would provide contemporary relevance. I added more up-to-date context to key debates, and provided more detailed discussion questions before the seminars so that students could structure their reading appropriately. I also reduced the amount of required reading, from two or three articles a week to just one, in the hope that students would come to class better prepared for debate,
having done fewer readings more diligently. However, although these changes did bring improvements, many students remained unengaged and did not participate actively in seminars.

It was noticeable that the students who participated least were mainland Chinese students. In both years, online survey feedback complained about the ‘apathy’ and ‘lack of involvement’ of Chinese classmates. One comment read:

‘Seminar sessions need more than four people contributing to a discussion. I run out of things to say as I am also not an expert in the topics we cover. It seems Chinese classmates know more but don’t say anything’.

Why were Chinese students less motivated to participate in the course? Were they simply, as the literature suggests, passive and in need of ‘spoon-feeding’? Or were there other, more complex issues which prevented students from more active participation? In the next sections I first examine specific problems with the content and format of my politics module, before analysing general issues affecting Chinese MSc students in the classroom at King’s.

**Chinese students studying Chinese politics**

There were several issues specific to the teaching of Chinese politics which acted as a barrier to the participation of Chinese students. The first was the fact that, unlike European and North American students, few had any disciplinary background in politics or, more broadly, social sciences. Even their ideas of what constituted ‘politics’ as a domain of study differed from mine and from the literature, as evidenced by online student feedback requesting more focus on current affairs, international disputes and the role of individual leaders in historical events, while expressing surprise at our coverage of issues such as peasant protests and the political uses of nationalism. It was difficult for me to create a syllabus which introduced political science to those unfamiliar with the discipline and, at the same time, introduced China to recent politics graduates. I struggled to find a balance between relevant political theories and specific contemporary Chinese contexts, especially within the confines of just one required reading a week. This was not made easier by the fact that the Chinese students were much less familiar with twentieth-century Chinese history than I had expected, so there was a good deal of differing background material to be covered for everyone.

A second issue related to the ‘political’ nature of Chinese politics. Based on my previous experiences of teaching in a Chinese university, I had expected Chinese students to be nervous of talking openly about ‘sensitive’ political issues, and this may have been a contributing factor in their reticence. However, a far more serious issue was the question of expertise. Some students seemed sceptical in class, and I had the impression that they doubted my credentials as an expert on China. When I engaged in a thought experiment of studying Britain in a Chinese university, taught by a young Chinese woman, I could see their point. In many ways, the students were the real experts on Chinese politics, and I was an outsider. This was obvious from the polite surprise expressed when I pronounced a Chinese sentence correctly, and emerged in an eye-opening way from interviews conducted after the module ended. Unfamiliar with political science, some students had found it hard to apply
the analytical frameworks I introduced to the real life contexts of Chinese politics they had experienced (some of which they did not acknowledge as being worthy of serious study), and they had therefore disengaged, assuming I was uninformed. This explained a pattern I had observed in class, where students would, if pressed, contribute a personal anecdote instead of an argument based on the literature, and then withdraw from discussion.

Worse still, I – or at least my choice of literature – was seen as biased. Two Chinese students expressed concern at the ‘Western views’, perceived as criticising China, of the set readings. This surprised me, since most pieces were analytical not polemical. I suspect Chinese students were influenced by preconceived ideas about ‘Western views’, just as my Cambridge students had been influenced by preconceived ideas about China, as well as the contrast between critical politics analysis by Western scholars and the paeans to the Communist Party more frequently encountered in China. These may have been exacerbated by language problems (discussed below), which meant that students could not always follow the subtleties of a text. Moreover, although no student thought that I personally was biased against China, the pains I had taken to maintain a scrupulous neutrality between opposing schools of thought actually further reduced participation, since students found it difficult to argue with me – not because they were socialised to be uncritical of the teacher’s view, but because I did not present a view of my own. As one student commented: ‘you never tell us your opinion, so it’s difficult for us to debate with you’.

The problem was therefore complex. Students had practical experience of Chinese politics but did not know how to analyse their experience or apply conceptual frameworks, and they readily dismissed the frameworks I supplied as ill-informed, not relating to their experiences and being based on biased Western views. While I avoided being seen as biased myself, in not discussing my own opinions of debates I also removed the opportunity for students to question my views. None of these problems were related to the kinds of ‘spoon-feeding’ and ‘rote learning’ issues discussed in the literature, but stemmed from the nature of the discipline, perceptions about expertise and bias, and issues in my own teaching methods. With hindsight, it would have been better to address some of these challenges head-on in the first class, particularly the question of relative expertise. As a young, new lecturer, I had been reluctant to confront this issue for fear of losing students’ respect, but on reflection it would have been better to tackle the ‘elephant in the room’ more directly. Had I explicitly acknowledged Chinese students’ superior awareness of the lived realities of China’s contemporary political landscape, I might have been able not only to stimulate reflection on the roles of teacher and student in the learning process, but also to encourage a greater degree of participation by making Chinese students aware that they had something of value to contribute – something which could work in tandem with my own expertise in the Western political science literature and the historical material. Furthermore, incorporating more of my own empirical research into my teaching, along the lines recommended by Healey (2005), may have better outlined to students my own area of contemporary expertise.

The notion of ‘bias’ may be more difficult to address, since the syllabus must include various core works of Western scholarship and these will inevitably differ from even the most critical works that can be published in China under the Communist Party. Some students suggested
including the works of more Chinese scholars, which is worth consideration, though I am wary both of presenting Chinese texts alongside clearly more rigorous Anglo-American works, and of establishing a false dichotomy between Chinese and ‘Western’ views. One answer may again be to discuss the problem directly in class, perhaps with an explicit debate over the nature of ‘bias’ in both Chinese and Western scholarship. I had already tried to introduce more Chinese perspectives by using Chinese news articles, and this is something I may expand in future teaching. While I am hesitant to abandon neutral presentation of debates so that students may argue with me, I may need to explain my deliberate impartiality to students, and I hope that this may also address a further problem, that of assessment. Two students commented that they found it difficult to disagree with ‘Western views’ in their assessed essays, as they assumed they would be penalised for this. This relates to the idea, discussed above, that students adjust their learning approach to (their perception of) the needs of the assessment. By clarifying my own neutral position, I may be able to convince students that the essay should not be an exercise in regurgitation of received ideas, and this could have a consequent effect on students’ willingness to engage in class.

**Non-discipline-specific participation issues**

Apart from issues related to the politics content of my module, there were several other, more general challenges which contributed to Chinese students’ lack of participation. One issue which I failed to anticipate would impede seminar discussions was problems with language proficiency. Despite English language prerequisites for programme entry, it became clear that many students struggled with language-related issues, and those whose native language was English (or, at least, a romance language) dominated discussions. Online feedback from students highlighted this: many struggled with length and vocabulary of set readings, and some felt nervous in class because of their lack of fluency. Others commented that they failed to understand parts of my lectures, a problem which also emerged in teaching observation feedback. In attempting to deliver my lectures with enthusiasm, I had overlooked the need for clarity of delivery. In my first year of teaching, my PowerPoint slides contained little text, and were available only after the lecture, as I preferred the delivery to be fresh, and the students to listen rather than read during lectures. However, in the second year I found that making the files available beforehand allowed students to familiarise themselves with key vocabulary, while textual clues on slides helped those who struggled with aural English to follow the spoken content. I made an effort to provide printed as well as spoken instructions for seminar tasks, and, after receiving feedback from a teaching observer, I also consciously slowed the pace of delivery. This seemed to make a difference to student understanding, with some improvement in seminar participation (although not necessarily active engagement).

The seminar environment may also have contributed to the lack of participation. I noticed that those who had studied only in China before coming to King’s spoke less in seminars than those previously educated in Western universities, regardless of area of origin. This was not an issue of Asian students needing to be ‘spoon-fed’ or having been taught not to question their teacher, but more a question of familiarity with teaching methods. Interviews with students revealed that seminar-teaching was comparatively rare in the Chinese education system and students were unused to this style of learning and unsure of their role within it. As they saw it, it was the lecturer’s role to speak, and the student’s to listen. They were therefore
hesitant to speak during class discussions, and I found that when I tried to overcome this by calling on individual students by name to participate, this would cause embarrassment and would sometimes lead to that student not attending class, presumably for fear that they would be compelled to take part. In retrospect, it would have been better to have been clearer at the start of the semester about the role that I expected students to take during seminars, and to emphasise the importance of this student role in contributing to learning not just for the students themselves but for their classmates (O’Neill and McMahon, 2005). If student learning styles are at least partly determined by the nature of the assessment and the learning environment, as discussed above, then clear communication of students’ roles within that assessment and learning is essential to assist students in adopting appropriate approaches. There are obvious implications here for those who dismiss Asian learning styles as ‘surface-based’ and ‘passive’ without examining the role of the teacher in communicating expectations.

In my classroom, many Chinese students sat towards the back, even when I encouraged students to move so that they were facing one another, which made it difficult to create the informal atmosphere I had intended. This also meant that, in group work, Chinese students would work with each other unless I asked them to move around, and while I tried to organise groups to ensure a mix of ethnicities, with 13 of 19 students from Mainland China this proved challenging. In addition, this related to the language problems above: some Chinese students preferred to be in groups with each other so that they could converse in Chinese, and while I strongly discouraged this as exclusionary, I was reluctant to ban it altogether since this was the only time some students seemed to engage with the material under discussion. Again, a clearer policy from the beginning of the course on the need to translate all Chinese used in class may have been helpful.

A further general explanation for some students’ lack of engagement emerged from interviews. A problem with asking for voluntary participation in interviews of this nature is that it tends to be the most active students who take part, and the voices of those who did not participate in class remain unheard. Nonetheless, while no student interviewed said that they themselves did not care about doing well in their MSc, several commented on a perceived lack of motivation from their classmates. I was told by Chinese and non-Chinese students that, for many of the Chinese postgraduates in the Institute, achieving a good grade was not the purpose of their year in London. Instead, making business and personal contacts, exploring London and gaining life experience was their aim – one which, at times, conflicted with the need to study. As one student expressed it: ‘these guys are not here to learn, they are here to do business and have fun...They don’t do the readings so of course they can’t discuss them in class – when they even come.’ It is difficult to see what an individual lecturer can do to combat this attitude, beyond attempting to make early classes so interesting that students are drawn to attend and participate almost in spite of themselves.

It should be noted that none of the reasons I have discussed for lack of participation are essentially ‘cultural’. Despite the negative focus on ‘Confucian-heritage cultures’ in much relevant literature, I found that students from Taiwan, Japan and Singapore had a much higher rate of participation in classes than those from mainland China, and those Chinese students who had previously studied abroad participated more than those who had not. This
suggests that, in addition to specific issues in the teaching of Chinese politics discussed in the previous section, mere familiarity with pedagogical methods and the expectations they place on the student, as well as the language and motivation issues discussed above, were much more important factors than any intrinsically ‘inherent culture’ issues. I consider such cultural explanations for students’ non-participation at best reductive – particularly in the context of twentieth-century revolutions in Chinese education and teacher/student roles – and at worst actually harmful, as the examples of setting curricula in accordance with ethnocentric ‘spoon-feeding’ stereotypes discussed in the second section demonstrate.

**Conclusion**

Throughout this essay I have tried to analyse the causes of Chinese students’ lack of participation in seminars, and reflect on more and less successful ways of overcoming these barriers to student engagement. By focusing on a case study of my MSc module in Contemporary Chinese Politics, I have gone beyond existing literature on the ‘passivity’ of Asian students to demonstrate several important discipline-specific issues, as well as providing a more nuanced account of some more general causes of non-participation, which I hope will assist others to probe more deeply beyond crude stereotypes of Chinese learners. In considering my own teaching practices, as well as a body of literature on pedagogy, student engagement and ‘active learning’ in the field of political science, I have made several tentative suggestions for revisions to the module. I will conclude by drawing these together into recommendations for future teaching.

One of the best ways to strengthen the module, and perhaps other politics teaching, would be to consider more direct ‘framing’ of the course, especially in the initial lecture and seminar. A clearer statement of my expectations of the students and their role in the learning process, particularly in the context of seminar exercises, would be helpful. Also useful at the very start would be explicit consideration of the expertise all students bring to the classroom (through lived experiences, disciplinary background or other factors), and how this relates to the role of the teacher. I will also consider further how the first lecture could be structured around a direct introduction to the discipline of political science, and an examination of how this may relate to China, rather than a mere historiographical guide. In a later seminar, open discussion of the perceived biases of the texts under study, and an exploration of the lecturer’s position as a ‘neutral’ guide, would perhaps facilitate discussion.

More careful consideration of the classroom environment, in tandem with clearer direction at the start of the module, would assist in creating an atmosphere of informal, collaborative work, while a clearer policy from the start on mixing up groups of ethnicities and the use of languages other than English in the classroom would help students to understand their role and responsibilities. Paying attention to the linguistic challenges of non-native speakers, by ensuring clear delivery and instructions and discussion of important terms, is also essential. At the same time, features of the course which attracted positive feedback from students and observers must not be lost: enthusiastic involvement of the lecturer and a good rapport with the class; a wide range of topics covered; a good mix of lectures and ‘activities’; and the use of interesting contemporary news media as well as older scholarly texts. Finally, while there is little that can be done by individual lecturers to address the motivation to study of
some students, as Chair of the Lau China Institute’s Teaching Committee, I have led the introduction from 2014-15 of a percentage of final marks based on class attendance and participation, and it may be hoped that this will encourage some less-committed students at least to attend. Nonetheless, this blunt approach must not replace careful consideration of the causes of non-participation, and must be used in concert with directed teaching strategies designed to enhance the learning of all students.

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Bringing students into research by hacking global health

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Abstract
This essay is an evaluative case study reporting on the preparation, execution, and evaluation of a Global Health Hackathon as a teaching method piloted as part of the ‘Introduction to Global Health’ undergraduate module in the Department of Social Science, Health & Medicine at King’s College London. I provide a critical evaluation of my practice by drawing on relevant academic literature concerned with the research-teaching nexus and inquiry-based learning, course material to describe the hackathon and its related components, and student evaluations to reflect on the overall module experience. I conclude with some final reflections and thoughts of what it would take to institutionalize research-based teaching and learning in our department in a more sustainable manner.

Keywords: Inquiry-based learning, research-teaching nexus, hackathon, global health, undergraduate

Introduction
Intrigued by the scholarly work concerned with ‘linking research, practice and teaching’ to enhance students’ learning, I decided to make research a central component of the ‘Introduction to Global Health II’ undergraduate module offered by the Department of Social Science, Health & Medicine at King’s College London in Spring 2014. Together with my students, I organized our first Global Health Hackathon with funding from the College Teaching Fund (CTF). Our hackathon focused on finding simple technological solutions to common global health problems. The goal was to assist in closing the ‘know-do’ gap in global health through innovative Knowledge Translation and Exchange (KTE) methods.

Hackathons originally started in the IT community as computing marathons where programmers, project managers, and graphic and interface designers collaborated intensively on software projects to design the next ‘killer app’ within thirty food-fuelled hours (Leckart, 2012). They are now beginning to be employed widely in educational (LSE, NYU, MIT), creative (BBC News Hack, Music Hack Day), corporate (Facebook), and government (National Hack the Government Day) sectors. I set out to pilot this novel methodology in our ‘Introduction to Global Health II’ module in order to foster a participatory approach to learning and allow students to collaborate in interdisciplinary teams to invent or redesign tangible outputs. Our overall aim was to support students in their continuing professional development and provide them with research and technological experience, while also expanding their knowledge in global health more effectively.
This essay offers a description of and reflection on the hackathon as a method for teaching. I first provide an overview of the literature concerned with the ‘research-teaching nexus’ and ‘inquiry-based learning.’ Subsequently I outline the module briefly and then describe the hackathon itself. I will conclude with some reflections and thoughts of what it would take to institutionalize research-based teaching and learning in a more sustainable manner.

**Linking research with teaching to achieve better learning outcomes**

*The research-teaching nexus*

While previously research and teaching were perceived as discrete activities (Brew, 2003), current pedagogical approaches emphasize that the two domains can enhance each other if properly intertwined (Marsh and Hattie, 2002). Research is believed to enrich teaching, especially when teachers transmit their own research outcomes to the students and thereby influence the students’ attitudes toward knowledge (Visser-Wijnveen, 2010; UKPSF, 2012). Teaching, on the other hand, is considered to be a practice that can effectively influence research through the creation of spaces that foster critical thinking and discussions about research and related strategies (Sproken-Smith and Walker, 2010). Here a form of pedagogy is emphasized that ‘functions to integrate research and teaching by reconceptualizing students and instructors as compatriots in the search for knowledge’ (Justice *et al.*, 2007).

Different conceptual frameworks have been created to illustrate the research-teaching nexus. For instance, Griffiths (2004) distinguishes between four forms of teaching that increasingly lead students toward participating in research: *Research-led teaching* allows teachers to build the content of the curriculum on their specialist research interests; *research-oriented teaching* highlights how knowledge is generated in the field and provides students with the opportunity to learn about their teachers’ current research projects; *research-based teaching* provides the opportunity to design curricula around inquiry-based activities; and *research informed* teaching permits students to learn the course content through actively participating in research projects. Healey (2005) further developed this framework by merging the different teaching forms into a model that connects curriculum design with the research-teaching nexus on two axes (Fig. 1). One axis organizes approaches to linking teaching and research depending on the degree to which students are treated as active participants or as audience. The second axis organizes the approach as emphasizing research content or research process and problems.
Several scholars argue that learning is most effective when students are engaged in research as active and reflective participants, while others point out that evidence is lacking with regards to the success of the linkage. Marsh and Hattie (2002) refer to a meta-analysis investigating the connection between teaching and research among university academics and conclude that ‘[t]he common belief that research and teaching are inextricably entwined is an enduring myth. At best, research and teaching are very loosely coupled’. They discuss an important rift between theory and practice, and call for further systematic investigation.

The promotion of inquiry-based learning
Building on the insights gained from research about the benefits and obstacles of the research-teaching nexus, scholars, academic administrators, and institutions increasingly promote ‘inquiry-based learning’ (IBL) in higher education. IBL is an umbrella term spanning various pedagogical approaches emphasizing the importance of students’ investigative work through learning that involve question-driven rather than topic-driven activities (Aditomo et al., 2011). The concept is defined in various ways; Spronken-Smith et al (2011) define IBL as teaching approaches ‘in which learning is stimulated by a question or issue, learning is based on constructing new knowledge and understanding, the teacher’s role is one of a facilitator, and there is a move toward self-directed learning’. Similarly, Oliver (2008) proposes that IBL refers to approaches in which ‘some form of problem or task serves as catalyst for student engagement and participation (…), learning comes as a consequence of the information processing that occurs as students work to explore the problem setting and to seek a solution’.

IBL is based on constructivist educational theory that encapsulates the notion that ‘what the
The learner has to do is to create knowledge’ (Biggs, 2003; Levy and Petruli, 2012). Learning how to create knowledge follows a process of ‘scaffolding’ during which the initial support provided by the teacher tapers off over time while profound and independent learning increases simultaneously (Spronken-Smith and Walker, 2010). Students who adopt a deep approach to learning hone their skills to understand and interpret the underlying meaning of phenomena by working conceptually bringing main ideas, themes, and principles into a conversation with each other. Surface learners, on the other hand, tend to focus on getting a particular task done with the aim of meeting the course requirements with minimal engagement with the material (Marton and Saljo, 1976; Golding, 2011).

The report of the Boyer Commission (1998) was among the first to forcefully advocate for achieving deep learning by tasking undergraduate students in the US to create knowledge, rather than to simply listen to lectures. The report recommends making research-based learning the standard; constructing an inquiry-based freshman year; building on freshman foundation; removing barriers to interdisciplinary education; linking communication skills and course work; using information technology creatively; culminating with a capstone experience; educating graduate students as apprentice teachers; changing faculty reward systems; and cultivating a sense of community. A decade later, the Higher Education Academy in the UK similarly called for new forms of research-based learning and teaching for undergraduate students so as ‘to cultivate awareness of research careers, to train students in research skills for employment, and to sustain the advantages of a research-teaching connection in a mass or universal system’ (Ramsden, 2008).

Reviews of ongoing IBL approaches in higher education have identified a number of techniques. Aditomo et al. (2011) distinguish between eight forms of IBL tasks including scholarly research, simplified research, literature-based inquiry, discussion-based inquiry, applied research, simulated applied research, enactment of practice, and role playing. Studies investigating students’ perceptions of and attitudes toward moving from a ‘learning paradigm’ to a ‘discovery paradigm’ (Hodge et al., 2008) have largely established that learners acquire knowledge most effectively when engaged in their own research projects. Regularly highlighted benefits include increased confidence, intellectual advancement in operating like a researcher, development of critical thinking and problem-solving skills, and understanding scientific mechanisms and underpinnings, both conceptually and in practice (Brew and Jewell, 2011; Healey et al., 2010; Justice et al., 2007; Spronken-Smith and Walker, 2010; Visser-Winjveen, 2010). However, reviews also show that in many cases students are not actually aware of their teachers’ research, experience the workload as too high, are confused by varied assessment products, and do not perceive their investigations as authentic research, but rather as an imitation thereof (Levy and Petruli, 2012; Healy et al., 2010; Spronken-Smith et al., 2011).

Notwithstanding these challenges, scholars largely agree that IBL is a promising approach forward in allowing students to develop skills in self-reflection, critical thinking, the capability to engage in independent inquiry, responsibility for their own learning and intellectual growth and maturity (Spronken-Smith and Walker, 2010).
Involving undergraduate students in research: A Global Health Hackathon

Our introductory module in global health introduces undergraduate students to the key concepts and debates in global health, investigates the knowledge-to-action gap, and uses case studies to illuminate health inequalities and the political, economic, social, and structural forces that perpetuate these disparities. The key educational aims are to introduce students to major concepts and deliberations regarding how to define global health and how it might be secured; introduce them to the knowledge-to-action gap in different fields in global health and strategies that aim to close it; provide students with the skills to critically evaluate such initiatives and to identify the role of key stakeholders in shaping them; demonstrate the value of interdisciplinary approaches to global health; and, last but not least, provide insights into the use of particular methodological and epistemological tools in the production of global health research. To achieve these learning outcomes, students are required to attend lectures and seminars, study assigned readings at home, and submit research papers.

While this format lends itself well to more traditional teacher-centered approaches with a focus on knowledge transmission, I found that it left little room for students to independently construct knowledge and derive new insights in the field of global health. In order to develop a more dynamic approach to teaching and learning and, thereby, bring students into the world of research, I collaborated with them to carry out the Global Health Hackathon (14 February 2014). Following this event, I asked students to critically engage with their research outputs. For their mid-term examination (24 February 2014), they each created infographics to display their innovative solutions with the help of new software. The infographics were later printed and displayed to the Department and College as part of the SSHM Seminar Series. Finally, each student had to submit a graded essay (24 March 2014) describing, analyzing, and critically reflecting on their research outputs by embedding them into wider global health discourses, employing the concepts that were presented throughout the term.

Twenty-two third-year Study Abroad students (18 female; 4 male) from the US attended the module. Most of them (11) were enrolled in science-related disciplines while only four were enrolled in the social sciences and humanities at their home universities. Curious to learn about their motivations for taking our global health module, I asked them at the beginning of the first session to write a short note outlining their motivations and what they hoped to learn about global health. Their motivations for taking the module were diverse but included some common features such as learning more about how globalization is connected to health inequities, gaining a better understanding of how social and political determinants affect health, striving to become better informed clinicians in the future, and learning about health systems. Their learning goals encompassed learning about large global health issues, what can be done to solve global health problems, how one can get engaged as a professional, how

1 The module was only open to Study Abroad students as our BSc in Global Health and Social Medicine had not yet been officially launched.
2 Science disciplines included biology, neuroscience, mathematics, biomedical science, psychology, and biochemistry; Social science and humanities disciplines included English, American studies, and political science.
global health is connected to other aspects of life, and the health gaps between countries.

As none of the students had prior knowledge about global health, I designed and planned learning activities that were more transmission-based at the beginning of the term to provide a solid overview of the field. Based on this, we gradually moved toward independent learning through inquiry and research. In order to monitor teaching and learning effectiveness, I incorporated a number of evaluation methods throughout the term. In the following section, I will describe the different elements and their alignment by focusing on our hackathon.

Preparations for the Global Health Hackathon

Preparing students for the Global Health Hackathon required a participatory action approach. I involved students in the project from the very beginning, not just as participants but also as leaders and decision makers. Through such an active approach to learning I hoped that they would become more proficient with the use of technology, engaging in interdisciplinary collaboration, and being innovative and output oriented. I also included one of our MSc student as co-applicant on the CTF grant and, later, as teaching assistant to help with the conceptualization and realization of the hackathon. She was responsible for working with an undergraduate teaching assistant to help with the organization of the event by recruiting postgraduate students from other departments as volunteers, developing training materials, creating a blog featuring the hackathon and its results, and organizing an infographics exhibition. My rationale was to provide postgraduate students and teaching assistants with the opportunity to translate their theoretical knowledge into practice by working in collaboration with undergraduate students and within a limited time frame. Additionally, I wanted them to gain tutoring and organizational skills while learning how to merge academic knowledge with business experience.

Four weeks before the hackathon took place, the undergraduate students had to form working groups of five to six members. Their first task was to formulate a well-structured ‘hackathon challenge’ that they would like to tackle during the event. This turned out to be more difficult than I anticipated as the students’ first challenge-formulations produced extremely broad and rather unmanageable research problems. However, instead of simply taking the reins into my own hands, I quickly developed a three-stepped approach.

First, each student was asked to formulate a well-structured challenge related to a concrete context and email it to me for feedback prior to the next session. Specifically, they had to identify a particular field in which knowledge is translated and exchanged, locate ‘blockages’ that hamper important health related knowledge to be properly exchanged and translated into practice, and highlight elements of this problem and the ways they are related to other structural issues in the identified field. Second, during the following session, students had to present their challenges to their working groups in order to discuss them critically. Based on their discussion, they had to pick the two best challenges for further investigation throughout the rest of the week. Third, the session before the hackathon was conceptualized as a two-hour workshop during which each group discussed their two selected challenges by focusing on the following five questions: Who is your target population? What is the KTE related challenge and its components? Where does the target population interact with the problem?
When does the problem occur and why? How does the problem unfold and how does it affect the target population? Once they had a good understanding of the challenges, each group had to select one of them for the hackathon.

The developed ‘hackathon challenges’ included: (1) Resource allocation problems in the medical field that hamper the effective sharing of medical supplies between hospitals and clinics in South Africa; (2) the neglect of HPV vaccination in resource-poor settings like Uganda; (3) the lack of locally relevant evidence on autism and its treatment; and (4) sexual education in the US that bridges the gap between authoritarian and peer-to-peer approaches to sexual education. Following the workshop, students had to read up on their selected problems by engaging with the academic literature, reports, and relevant websites. In the meantime, I distributed the selected challenges to the postgraduate volunteers and two professional digital designers. I expected them to reflect on the challenges and recommend tools and software to the students for the day of the hackathon.

**Hacking global health**

The hackathon turned out to be an exciting and inspiring full-day event. After the workstations were set up and the agenda of the day introduced, the hackathon started at nine o’clock. Throughout the morning and early afternoon students gathered in their work groups where they were joined by one or more volunteers to further refine their challenge and its components and to discuss ways in which the respective problem could be improved. They began to formulate possible recommendations that could be made to solve or improve the situation, to outline the pathways that would need to be created in order to allow the possible solution to actually change the problem; and to think about whether or not the recommendations would actually have the capacity to change the flow of knowledge. There was an immense buzz in the room as students and volunteers discussed and refined their challenges and began to think about possible solutions.

While lunch was provided, no official break was scheduled in order not to lose the momentum of the heightened adrenalin and attention. Over the course of the afternoon, the teams agreed on a possible solution for their challenge and set out to refine its components and to gain a better understanding about how each component would add to solving the problem. Moreover, they started with building prototypes or actually functioning technical solutions with the help of the volunteers. The goal was not to have a fully functioning tool but a solid outline that would not require much more tweaking before becoming ‘reality’. At five o’clock in the afternoon, each group had to present their challenge and respective solution formally.

The outcomes were impressive and included: (1) A platform that would enable hospitals and clinics in South Africa to record their inventory and prioritize specific local needs to facilitate exchange, while at the same time giving the Ministry of Health and private donors access to this information to circumvent resource waste in some sectors and inadequate supplies in others. (2) A new HPV vaccination program that would reach girls in schools as well as girls who dropped out early through free texting services, a buddy program, and an interactive website that includes vital educational material, a registration and location platform, and a tool for appointment reminders. (3) A web-based platform that offers global information
about autism and a questionnaire that would allow community health workers rather than researchers or clinicians to gather locally relevant data on autism to expand the evidence base through surveys and testimonies. (4) A sexual education website that bridges peer-to-peer and more authoritarian approaches currently employed in the US through a needs assessment and research component, safe and anonymous spaces for information gathering and sharing, and interactive components between users of the platform through ‘show’ and ‘tell’ components as well as content trending.

I was amazed by how much the students learned over a very short period of time about particular diseases, challenges related to providing adequate healthcare in particular settings, benefits and limits of current knowledge exchange strategies employed by global health interventionists, and the targeted use of new and interactive technologies and communication methods that could enhance information flow and thereby improve clinical practice. While able to provide insight into key concepts, debates, and problems in global health through lectures and readings, I could have never transmitted such in-depth and complex knowledge through a traditional lecture-based approach alone.

**Evaluation of the module**

To evaluate the hackathon and overall module experience I employed a number of strategies. (1) On KEATS, the King’s College London online educational portal, a message board for discussion was created that allowed students to exchange ideas and opinions with other participants. (2) An anonymous mid-term in-class feedback form was distributed to gain insight into student satisfaction and learning, and to modify teaching practices if necessary. The form included a mix of free-response and quantitative questions. (3) A similar anonymous in-class feedback form was handed out at the end of the semester to allow students to provide feedback on the module as a whole. (4) Students were encouraged to meet with me during office hours to discuss the course, share ideas for the assignments, and talk about any difficulties that were affecting their work. Here, I will only report the results of the final module evaluation due to the limited space.

In total fifteen students filled out the questionnaire. The following table shows student ratings regarding enjoyment, learning, and reading material, rating their answers on a scale of 1 to 10 where 1 equals ‘not a lot’ and ten equals ‘a great deal.’ The results indicate that students had an overall positive experience and that there exists an almost ideal alignment between enjoyment of the module and learning with how difficult the readings were perceived.

**Table 1: Enjoyment, learning, reading materials**

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<td>How much did you enjoy the module?</td>
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<td>How much did you learn from this module?</td>
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<td>How difficult did you find the reading material?</td>
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In order to evaluate the preparation for assignments and fulfilment of the module aims/objectives, students rated their answers on a scale from very well (1), quite well (2), not very well (3), and not at all (4). Moreover, they had the possibility to provide written feedback for each of the categories.

Table 2: Preparation and aims/objectives

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<td>How well did the module prepare you for the assignment?</td>
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<td>How well did the module fulfill the following: To introduce students to key concepts and debates regarding what global health is and how it might be secured</td>
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<td>How well did the module fulfill the following: To introduce students to the knowledge to action gap in different fields in global health and strategies that aim to close it?</td>
<td>9</td>
<td>5</td>
<td>1</td>
<td></td>
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<tr>
<td>How well did the module fulfill the following: To provide students with the skills to critically evaluate such initiatives (strategies to close the know-do-gap) and to identify the role of key stakeholders in shaping them</td>
<td>9</td>
<td>5</td>
<td>1</td>
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<tr>
<td>How well did the module fulfill the following: To demonstrate the value of interdisciplinary approaches to global health.</td>
<td>9</td>
<td>6</td>
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The overwhelmingly positive reaction to the delivery of content was also reflected in the written feedback, which included two additional categories: ‘Three good things about this module were...’ and ‘Three things about the module which could be improved were...’ In the following, I will present the written feedback based on thematic analysis and by focusing on the topics that received most attention by the students.3

The ‘content and content delivery’ of the module received most attention and resulted in exclusively positive feedback. A student wrote for instance, ‘good background given on global health and enjoyed the close look at certain diseases’ while others highlighted the ‘current research base’ of the lectures and the interesting material and wide range of topics covered. Another topic that received almost as much feedback was ‘preparation for assignments.’ Many students indicated that they enjoyed the assignments, praising them for being creative and different from what they were used to, allowing them to think about global health in a vast variety of ways, and giving them the opportunity to employ new skills. A typical response was, ‘The assignments were very well explained and a good measure of our course’. However, almost as many comments were provided with regards to the wish for more preparation and guidance, and to explore a greater diversity of topics rather than focusing only on the hackathon challenge. One student recommended, ‘More strict guidelines for the hackathon and more software teaching for infographics’ and someone else noted, ‘I enjoyed the hackathon and the group work with it. I also enjoyed the infographic assignment.'
I would have liked a bit more preparation and guidance to aid in the experience. I probably overestimated the technological savvy of some of the students, assuming that they would be able to familiarize themselves with the software faster and more independently. Consequently, I consider the feedback as extremely valuable and will make sure to set more time aside to provide students with additional training and, thereby, allow independent learning to happen at a slower pace.

Other topics that generated a great number of responses included my ‘teaching style’, which was described positively highlighting that I presented the material in an organized, interesting, and interactive way, that I took enough time to meet with students individually, that I answered questions thoroughly inside and outside the classroom, and that I showed great patience. One student expressed for instance, ‘you were a great teacher and taught at a level which everyone could learn and relate to.’ The course readings sparked more diverse comments. It was positively noted that they were enjoyable and pertinent. One student remarked, ‘I really enjoyed the readings and thought they were quite accessible and interesting’. More critical reflections indicated that the readings could have been more approachable and were ‘sometimes dull’ not always relating to the class discussion and ‘sometimes didn’t feel applicable to the final paper’.

The topics ‘hackathon’ and ‘group work’ with peers and the volunteers were also widely commented on indicating that the gradual development of a community of learners was indeed valued and considered important. Typical comments were: ‘the idea of a hackathon was novel and a creative way to learn’; ‘I enjoyed the hackathon and infographics – they were different from the typical papers and exams and allowed for a lot of creativity’; and ‘hackathon and infographic gave opportunities to use new skills and work with others’. One student suggested involving the volunteers not only during the hackathon but also in some of the seminar sessions throughout the course. This is an interesting suggestion as it would allow for the community of learners to become more consolidated and reach beyond the classroom.

Less frequent comments referred to the ‘lectures’ and ‘learning’. Several students reflected that they learned a lot from the lectures and that the guest lecturers were well chosen and their presentations very interesting and informative. A student wrote, ‘everything was new to me and I was enthralled the whole time!’ while another one wrote, ‘I am not a ‘science person’ but I felt comfortable in this class because it approached global health from so many disciplines’. One person would have preferred more lectures while someone else suggested including additional guest lectures to be exposed to a wider range of teaching styles. The comments made apparent that lectures continue to play an important role in students’ learning and that they can be enjoyable and stimulating. Thus, a move toward ‘discovery-based learning’ should not deprive students from lectures, but rather offer a balanced mix between lectures, seminars, and more independent research-based learning.

The analysis of the comments shows that more ‘traditional’ aspects of learning and teaching were highlighted by the students while crucial IBL concepts like ‘new forms of assessment’, ‘creativity’, ‘interdisciplinarity’, ‘skills’, etc. received a lot less commentary. Yet, despite the shortage of comments with regards to these newer teaching and learning techniques, this
Reflections and outlook
My aim of piloting the Global Health Hackathon was to cultivate an interactive, research rich environment in which students could engage with the lecture material and new technologies in practical ways. Through a participatory action approach it was possible for both undergraduate and graduate students to become proficient in critical thinking as well as in ‘21st-century skills’ including on-the-spot thinking, presentation skills, working with different software, creating prototypes for websites and apps, and distributing their work. I consider these not only to be important academic skills but also resume and career building experiences.

Such a research-based approach required me to consider teaching and learning together with assessment strategies to ensure the suitable alignment of learning outcomes, teaching and learning activities (Biggs, 2003; UKPSF, 2012). While I put a lot of thought into sequencing the various elements to ensure an appropriate alignment with the learning outcomes, students made important recommendations for future improvements. Firstly, approaches that use communication skills, information technology, and software creatively need to have a solid training component inbuilt. Such training would allow students to become more confident in the use of technology and, thereby, focus more on content and tangible outcomes. Secondly, in order to consolidate the bonding experience between students and volunteers, working groups could remain active throughout the semester to further develop newly acquired skills. This would expose undergraduate students to more interdisciplinary learning while graduate students could gain additional experience as apprentice teachers. Thirdly, it is important to choose course readings and other information materials not only with a focus on whether they are up-to-date and aligned with a particular session, but also by connecting them with the assignments more effectively.

Besides aiming to improve my own teaching along the lines mentioned above, it is important to contemplate how to make research-based approaches to teaching part of my department’s education strategy. First of all, it would be vital that we begin to perceive undergraduate students as co-developers of our teaching and research, and engage them in our line of work beyond the classroom. This, in turn, would require that colleagues within the department and across the college promote a culture allowing for inquiry-based and interdisciplinary teaching and learning. At the same time, it would be necessary to take existing structural barriers into account such as the lack of funding for teaching related activities provided by the college and other academic funding bodies or the emphasis on research and publications dictated by the Research Excellence Framework. ‘Constructive alignment’ has to happen inside the classroom as well as at college and even national levels if inquiry-based learning is to be instituted in a sustainable manner in UK higher education.

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Oral examination as a component of the student assessment in undergraduate Biomedical Engineering

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Abstract
Oral (‘viva’) examinations are frequently used for assessment of students in some subject areas (for example medicine) and for some qualifications (for example the PhD examination) but have largely fallen out of favour for general examination of undergraduates. As module co-lead for an undergraduate signal processing course, I faced the problem of individually assessing students’ computer programming course-work assignments while still allowing them to work collaboratively. To this end a viva examination taking the form of a short interview was introduced at the end of the course, during which students were asked detailed questions about the work that they had submitted. The interview was also used as a means of getting feedback from each student on his or her learning experience. In this case study report I reflect on this process by placing it within the frame of existing research on oral examination procedures, in particular the large body of work concerning medical education. By identifying the positive and also the negative components of current practice I propose an updated approach for use on future student cohorts.

Keywords: oral examination, viva, coursework assessment, biomedical engineering

Initial design of Signal Processing Module: what was done
Signal Processing is an important subject for students of Biomedical Engineering, consisting of a mix of theoretical knowledge and practical (primarily computer programming) skills. It is taught as a second year module within the BEng in Biomedical Engineering offered by King’s College London. This is a new course and the second year students discussed here are its first cohort, for this reason the class was rather small, consisting of 11 students. It is hoped that in subsequent years class sizes will rise to approximately 30. I am one of two lecturers teaching this module: we share responsibility for design of the syllabus and assessment methods as module co-leads, and each teach half of the lectures. The module is designed to impart knowledge but to also teach students how to apply this knowledge in practical scenarios. Hence we decided that the teaching should consist of a mix of lectures and practical classes (labs), with the small class size allowing the lectures to have a strong interactive component. In the weekly labs students were given a problem sheet consisting of a number of questions (usually 5-7) related to theory learned in the previous lecture. They were asked to write computer code or modify code supplied to them, to solve these problems. The classes were two hours long but the tasks were designed to take approximately four hours, with the students expected to finish them as homework and submit a written report. Both
within the classroom and while at home the students were encouraged to work collaboratively in order to aid the learning of both the students with strong programming skills (who can learn by teaching) and those with less experience, who can gain practical help from their peers. This type of approach is particularly relevant to computer programming tasks given the heterogeneity of prior experience present in the student group, a common issue with computer skills Schumacher et al. (2001).

Brown and Knight (1994) argue that assessment ‘is at the heart of the undergraduate experience’ since it ‘defines what students find important, how they spend their time, and how they come to see themselves as students, and then as graduates’. Certainly in my experience of this module, our assessment methods were the principal concern of most of the students, keen to get a good grade above all else. This motivation can be turned into a constructive learning environment by aligning the curriculum, teaching and assessment methods (Biggs 3003) to achieve ‘a balanced system in which all components support each other’. In designing assessment methods for the module, the practical and theoretical aspects were given equal weight of 50 per cent. The theory assessment was done using a written exam designed to probe knowledge and understanding (ie not just factual recall). Assessment of performance for the labs was less straightforward since we wished to ensure that i) the students produced workable code, ii) this code implemented the theory correctly, and iii) each student understood how their own solution worked. A substantial written report containing answers to each question with the code as an appendix would be one option, however timetable pressures on the students mean that it is not reasonable to ask for a detailed report each week. Instead we asked for a report consisting only of the answers to the questions (this could be numerical answers or images, graphs, etc. depending on the task) along with the code used to generate these solutions. In order to probe understanding, an oral examination (referred to hereon as the ‘viva’) was also included in the assessment. This took place once, at the end of the module and the grade given accounted for 20 per cent of the mark for the labs ie 10 per cent of the module grade. The viva lasted for 20 minutes and was conducted by a panel of two members consisting of one of the two module lecturers plus one teaching assistant. The class was split in two and randomly assigned to either panel. Questioning in the viva focused on one particular question from one lab, selected in advance as one for which the student had obtained a good mark. The students were not told in advance which question this would be, but they were permitted to bring all of their solutions into the viva with them. Questioning was designed to verify that the work was their own and to probe the depth of their understanding. In order to reduce variability, a loose structure was adopted with a set of marking criteria introduced – an example viva score sheet outlining this structure is given in Figure 1. Additional questions eliciting feedback on the labs and the course in general were also included to take advantage of the fact that the viva was an excellent opportunity for getting personalised feedback to assess the student’s overall experience of the course. In order to reduce potential anxiety the first question asked in each viva was designed to break the ice by asking for feedback, allowing them to turn the tables and be critical of us. Marks were awarded according to a predefined list of priorities (see Figure 1) however all four examiners (both panels) met after the process to discuss performance of all students and come to a consensus on the marks to be awarded to each.
Design of this module was carried out a year ago, and it was first taught in the academic year just passed. The design process was guided by experience and consultation with peers. Researching and compiling this more detailed case report has allowed me to reflect on this whole process, drawing in my own experience and also placing it in context of the considerable education literature. The literature relating to oral examinations will be reviewed next, followed by a reflection on my own practice in light of what is uncovered, ending with some recommendations for changes to be made in light of this.

**Figure 1** Evaluation form used in signal processing module viva.

<table>
<thead>
<tr>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

**Discussion Questions**

1. Which was the most difficult Lab for you and why?
2. Pick randomly a question from one of the labs and ask the student: Could you tell us how did you implement this question, which MATLAB commands you were using and why?
3. What did you enjoy most about the labs? What would you change about them?

**Score Considerations**

- Clear answers
- Knowledge of MATLAB commands
- Understanding of the Image Processing concepts explored in the labs

**Comments**
Oral examination as an assessment tool

Today the word ‘exam’ almost certainly conjures images of rows of nervous students sat quietly at single seat desks, but it wasn’t always so. Indeed a history of examinations at the venerable institutions of Oxbridge by Stray (2001) indicates that ‘in medieval Oxford and Cambridge all examinations were public, oral and in Latin’. The shift from an adversarial oral assessment to a standardised written one in Oxford and Cambridge can be attributed to multiple factors, but Stray identifies four in particular:

1. A change from ‘socio-moral judgement’ of the candidate to one of cognitive ability

2. The rise of mathematical sciences and the positivist, Newtonian worldview

3. Increasing student numbers

4. Politics (Oxford held on to viva examinations for longer, in part at least to maintain contrast with their rival who embraced change more quickly).

Of these probably only two and three are relevant here: the mathematical nature of the physical sciences makes them amenable to examination by written problem solving instead of oral debate. The time consuming nature of serial viva exams (students must be assessed one at a time) compared with parallel written exams is also a key issue. Due to rising student numbers, by the 1820s in Oxford which held on to the viva for longer than Cambridge, examiners were ‘working for almost half a year’ to clear the resulting backlog (Stray 2001) and this remains an often cited reason for excluding viva exams as we shall see.

Today the written exam has come to dominate summative assessment in most subjects. However as research into educational methods has grown, this has not been without reflection. For example Pressey et al. (1932) questioned the ability of written exams to comprehensively test a candidate’s education learning outcomes and professional skills, suggesting instead a system including both written and oral exams. It is important at this point to define precisely what is meant by ‘oral assessment’; in his excellent review of literature on this theme Joughin (1998) pointed out that two different types of quality could be assessed using an oral examination:

i. The student’s command of the oral medium itself (ie language skills)

ii. The student’s command of content, demonstrated orally
Figure 2: Graphical depiction (author’s) of the six dimensions of oral assessment (Joughin 1998). Two of these dimensions (1&5) consist of separate categories, though any one oral exam may contain elements corresponding to more than one. The other dimensions are continua, characterized by their poles.

1. PRIMARY CONTENT TYPE
   - Knowledge & understanding
   - Intrapersonal Competence
   - Problem Solving
   - Interpersonal Competence

2. INTERACTION
   - Presentation
   - Dialogue

3. AUTHENTICITY
   - Contextualized
   - Decontextualized

4. STRUCTURE
   - Closed
   - Open

5. EXAMINERS
   - Peer Assessment
   - Authority based Assessment

6. ORALITY
   - Presentation
   - Dialogue

The first category is a long established and unavoidable method for assessing language skills. This essay concerns the second category, namely those in which ‘the object of assessment is not the oral ability of the student but rather the students cognitive knowledge, understanding, thinking processes, and capacity to communicate in relation to these’ (Joughin 1998). Accordingly the six identified dimensions of oral assessment are depicted graphically in Figure 2 (this is my own graphical representation of Joughin’s dimensions).

With reference to the primary content type, Joughin remarks that ‘because oral assessment allows probing it seems particularly suited to measuring candidate’s understanding’; that it may be preferred when ‘there is a particular need to ensure that the responses are actually the candidate’s; and that oral exams can assess ‘the ability to think on one’s feet’. These were all perceived benefits that influenced my decision to include the viva for signal processing in the first place, and I will come back to reflect upon the signal processing module assessment within this framework.
**Figure 3:** The 3P model (presage/process/product) of teaching and learning as given by Biggs (2003). Assessment has been highlighted (not in the original). Viva exams as a method for improving student learning

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**Viva exams as a method for improving student learning**

Another facet of viva examinations is their potential for promoting different types of learning. Following the constructivist school as popularized by Biggs, we can consider learning via the ‘3P model’ given in Fig. 3 which attempts to describe how teacher and student factors both influence learning. Students can be described as taking either a deep or surface approach to learning (Marton and Säljö, 1976) and in general the deep approach to understanding is what is really desired; teaching and assessment methods can result in promotion of either type of learning. Constructive alignment occurs when the curriculum and teaching are aligned with the desired learning outcomes, and when the assessment methods selected effectively test these. Biggs gives hypothetical examples of students that typically take a surface approach, being focused into deep learning because a different type of assessment is being used. As a result considered use of oral exams could encourage students towards deeper learning approaches. An example of these concepts being put into practice for the development of a curriculum for orthodontic registrars (Chadwick, 2004) combined many types of assessment (including oral) to ensure that ‘the teaching methods used and the assessment tasks are aligned to the activities assumed in the learning outcomes.’

In a similar vein Laurillard suggests that learning is like a dialogue between student and teacher (Laurillard, 2013) and that the student’s responses can quickly unravel upon questioning, but this process aids learning. Joughin also makes this case in an HEA report on
oral assessment and to a much greater extent within his PhD thesis (Joughin 1998; Joughin 2003). In looking at oral assessment from the student’s perspective Joughin found that ‘the anticipation of being questioned can increase students’ efforts to understand what they are studying’ and that ‘students can experience oral assessment as more personal, more demanding, and more satisfying than written assignments’. A clear (anecdotal) demonstration is a quotation from a student: ‘In the written work I would just put it down and think, ‘I don’t really understand this anyway but I’ll just quote from the book and put it in.’ I wouldn’t do that in the [oral assessment] because I’d be worried that somebody would ask me, ‘Well what do you mean by that?’ (Joughin, 1998).

Concerns over validity, fairness and reliability
Regardless of efficacy, any assessment method must also demonstrate validity (that it objectively tests only the criteria under evaluation), fairness (that there is no bias) and reliability (that outcomes are repeatable, or consistent over time). Such concerns over oral examinations have been expressed over a long period of time, from those voiced in Cambridge in the late 18th century (Stray, 2001) up until the present day. In order to explore this more fully it is instructive to consider niche areas in which viva examinations continue to find common use, these include law (Butler and Wiseman, 2003; Henderson, et al. 2002) and marketing (Pearce and Lee, 2009) but most prominently medicine and the assessment of undergraduate and postgraduate research projects (primarily the PhD viva). These two areas will be used as a means of furthering the discussion now.

Oral examinations within Medicine
Although some countries have seen recent movement away from oral assessment (Spike and Jolly, 2003), the vast majority of postgraduate medical examinations in the English speaking sphere require one (Memon et al., 2010). Medicine has a dual nature of academic discipline and professional practice; both can be assessed by oral examinations heavily weighted towards the contextualised pole of the ‘authenticity’ dimension. But how can we be sure that the assessment methods used are generating the desired outcome? In trying to answer this question, medical educators have generated a fairly large body of literature, though this is not uniformly true across disciplines. In reviewing the literature, Hutchinson et al. (2002) found that a disproportionately large amount of the relevant research came from just one of the British Royal colleges (the Royal College of General Practitioners, in particular referring to the oral component of the MRCGP certification assessment) and that there is a relative lack of published work from other disciplines.

Hutchinson’s review found few reports in the literature evaluating the validity of assessments though there were two interesting reports on predictive validity – ie how well assessment scores can predict future performance as a doctor. One of these analysed data on General Practice doctors in Quebec and found those physicians who had performed well in their exams (a combination of written and oral tests) went on to prescribe fewer inappropriate medications (Tamblyn et al., 1998). Clearly this type of study is very difficult to perform, and is hard to apply to any assessment method.

Reliability is of more specific concern for oral assessment, since there is a perception that
oral exams are lacking in this respect. In a remarkable direct test of reliability (Allen et al., 1998), students undertaking the MRCGP exam were tested twice, four weeks apart and the scores correlated. This study found that there was excellent correspondence between the two examinations. This type of ‘test-retest’ validation is encouraging but the sample was rather small. In reality convincing cohorts of students to sign up to be examined twice (plus the faculty time taken to do the assessment) means that it isn’t really feasible on a large scale. Another study by Wass et al. featuring the MRCGP exam (2003) focused on reliability as a function of the number of examiners. ‘Generalisability theory’ (a type of statistical analysis) was used to conclude that the current (at the time) practice of three oral exams each with two examiners was ‘just about acceptable’. They found that actually using multiple examiners per oral exam does not help to improve reliability, since perhaps two examiners together will tend to reach a consensus that does not necessarily imply reliability. They found ‘case-specificity’ – that an exam would test too few skills to adequately assess each candidate – was the chief source of variability and suggested that moving to five oral exams each with one examiner would lead to substantial improvements.

To better understand reliability it is necessary to look at the decision making process used by examiners; a study of this again using the MRCGP oral exam as an example (Yaphe and Street, 2003) found that examiners tended to quickly form an opinion on the student’s competence based on initial ‘stem’ questions, then steer subsequent questioning to refine this decision. This was echoed by another study of the MRCGP (Simpson and Ballard, 2005) which indicated that this practice of steering the questions tended to mean that examinations focused more on ‘knowledge’ and less on ‘decision-making’ which is an issue if this is not the purpose of the assessment.

A way to limit such effects is to make the viva more structured (towards the ‘closed’ pole). The now commonly used ‘Objective Structured Clinical Examination’ (OSCE) (Harden et al., 1975) was introduced in 1975 as an alternative to candidates being assessed for their performance in inspecting a small number of real patients in a hospital, different for each student. The OSCE is a rigidly structured set of multi-station practical exams where each student visits the same set of real or simulated patients. The key innovation was the imposition of a rigid structure, with each candidate seeing exactly the same patients, asked the same questions and marked against the same score scheme. Along similar lines Tutton and Glasgow (1989) showed that introducing structured oral exams (SOEs) caused large improvements in reliability. Echoing the findings of Wass et al., Tutton and Glasgow also showed that the main source of reliability was not a ‘rating’ error (examiners disagree) but a ‘sampling’ error (candidates don’t see enough cases to make a reliable judgement). A student centric study of first year undergraduate Indian medical students (Shenwai and Patil, 2013) found that introducing a rigidly structured viva reduced the anxiety of candidates since they ‘knew that all the students will be assessed by the same set of questions’.

The issue of student anxiety is related to the last of the major questions that need to be answered: ‘is it fair?’ As well as being morally desirable, Esmail and May pointed out in a commentary article (2000) that equity of assessment will be increasingly scrutinised in today’s more litigious society. An early study found that there was no evidence for racial bias
Wakeford et al., 1992) in the oft-studied MRCGP oral exam although certain subgroups, principally those born in the Indian subcontinent, performed less well than their peers. Further investigation (Roberts et al., 2000) found that linguistic ambiguities coupled with the fact that questions were 'necessarily ambivalent in terms of eliciting different discourses' led non-native English speakers to give responses that weren't intended by the examiners, resulting in lower scores. Thomas et al. also found no evidence of racial bias (1993) but they did find that confident students scored better and that higher levels of anxiety correlated with lower scores, but only in men. They could not explain this apparent gender bias but speculated 'examiners are less tolerant of anxious men than of similarly anxious women'. It is not clear if this is just an issue with oral exams; indeed another review of the subject (Davis and Karunathilake, 2005) stated 'there is no evidence that orals are more stressful than other exams'. Memon et al. (2010) make fifteen recommendations (based on a wider literature review) to help improve fairness, reliability and validity. These can be compressed into some summary statements:

- To ensure validity oral exams are best used for assessment of reasoning and decision-making
- To ensure reliability wide coverage of potential topics should be used, examiners should receive formal training, methods should be structured and standardised, and inter-examiner variability should be monitored
- To ensure fairness, potential sources of bias must be considered and monitoring must be put in place to identify different responses from identifiable subgroups. Language ability must not be a factor, however it is reasonable to require ability that is commensurate with that needed for professional practice.

To conclude this review of the medical literature we must note that medicine is generally moving towards more structured and standardised (rather than ‘free dialogue’) assessment. There are authors who clearly have a negative view of oral assessment – the review by Davis and Karunathilake (2005) represents this point of view rather comprehensively - but there are others who are strong viva advocates. An exemplary opinion piece from the latter camp by Birley (2001) suggests that many findings of poor reliability and bias are due to having large numbers of students. Birley claims that the ability to tailor questioning to each student - the view of the viva as a dialogue - is key to its success, and that in his department assessing each student twice by independent panels allows reliability to be ensured. Clearly this doubling of resources is not practical for large numbers of students, and Birley suspects that this is the real reason for the relative demise of the viva. Indeed this is one of the key causes highlighted by Stray for the viva’s historical decline in Oxbridge.

**Viva exams in assessment of research projects**

Apart from medicine, the other major field in which viva exams are routinely used is for assessing research projects. The PhD viva is the most obvious example, but vivas also find use for assessment of longer undergraduate projects; Mahmood (2009) recommends their use for verification of authenticity of authorship (ie to avoid plagiarism) in this context. I myself had
such an experience while an undergraduate at the University of Cambridge studying Natural Sciences (graduated 2003). The main stated purpose of the viva in that case was also to determine ‘authenticity of authorship’ of my final year project; I found the discussion of my work with a senior academic to be a validating and hugely confidence boosting experience. Studies of the PhD viva process (eg Jackson and Tinkler, 2001) have also found that the PhD viva increased confidence in students’ own work; my own PhD viva was a similarly positive experience, as were those of many colleagues working in the field of Medical Physics. On reflection my good experiences as a student undergoing viva examination have clearly influenced my views on the subject, and were a factor in the decision to introduce a viva for the signal processing module.

Other studies into the PhD viva process have taken a rather more negative view, for example Morley et al. (2003) describe vivas as having ‘notorious unreliability and potential for sex, race and other stereotyping and discrimination’ (emphasis added) and give many anecdotal accounts of clear abuses of power relationships. These accounts highlight obvious failures to adhere to good practice, but they don’t necessarily indicate that the system itself is to blame. Key recommendations from Morley et al. are that viva exams should be recorded (perhaps via video or audio transcript) and that both students and examiners be trained in best practice; this echoes recommendations from Esmail regarding medical exams. Finally it should be noted that there could be a cultural difference between Arts Humanities and Social Sciences (AHSS) subjects and the Natural Sciences; indeed it has been shown that Natural Sciences vivas tend to last considerably longer than those from AHSS (Jackson and Tinkler, 2001; Morley et al., 2003). The suggestion is that in the sciences ‘it is the research, rather than its writing up in the thesis, that is being assessed and requires, on average, a lengthier oral examination’ (Morley et al., 2003). Perhaps this difference in ‘what is being assessed’ explains the existing variance in perceptions and attitudes towards vivas. Along this line Jackson and Tinkler interviewed many academics and students asking the question ‘What is the purpose of the PhD viva?’ but found little consensus.

Reflections on the signal processing viva

A good place to begin this reflection is to describe the signal processing viva within the dimensions of oral assessment framework (Figure 2). The viva was designed primarily to assess understanding and knowledge, and to make a judgement on authorship authenticity. It was conducted as a dialogue between student and examiners, allowing for probing questions (this was a primary reason for inclusion). In terms of authenticity (as a dimension of oral assessment) the process would probably be classified as rather decontextualized (Joughin mentions PhD vivas in this regard). It was partially structured; Figure 1 shows that certain questions and the order were predefined but examiners were allowed to elaborate and take questioning further. The assessment was authority based, and the ‘orality’ of the viva was secondary to the written lab reports on which the students were answering questions, especially since they were allowed to bring these with them and read from them as they wished.

But what does this description tell us? Taking the stated aim first, on reflection superficially at least the viva worked well. It was possible to see whether the students understood their
answers or not. In fact at least two out of the eleven students demonstrated a much greater
degree of understanding than their written reports would have implied, and received a
boosted score as a result. One of these two was always highly vocal in lectures but in that
setting he never seemed to show the level of understanding that he did in the viva. Perhaps
this was down to the viva being a more serious occasion, thereby prompting more thoughtful
responses, or perhaps he was moved to learn the concepts more deeply in preparation. It is
certainly true that for this particular student cohort, the assessment and in particular ‘what
they need to remember’ was of great importance. They were very anxious about the viva since
they hadn’t experienced one before, but interestingly this anxiety seemed only to appear in the
few days before the event. As such, the students took a short-term view – just doing enough to
meet their most immediate requirements. Certainly if the viva is only on the students’ minds
in the days before the event, the extent to which it can influence their study is limited. It has
subsequently become clear from marking the written examinations (not strictly the subject
of this report) that many students exhibited ‘rote learning’ tendencies, attempting to answer
questions by replicating set-pieces from lectures in inappropriate contexts. This too indicates
that many are taking an undesirable surface approach to learning some aspects of the course.
Their short term outlook could be a sign that the students had too high a workload – indeed it
was not uncommon for electronic submission of their lab reports to be received at 4am before
the 9am deadline (though it could equally indicate poor time management). Overloading
students with lengthy and frequent coursework would stop them from taking a deep approach
to learning – it would be an example of poor alignment to use Biggs’ terms. A joined up review
of the curriculum – ie not just of this module in isolation – has been mooted.

What of reliability, bias and fairness? In terms of anxiety, though some students
seemed nervous to begin with they quickly relaxed and the tone was intentionally non-
confrontational. On reflection most commented that they had found it a painless, and in
some cases an enjoyable experience. The loose structure imposed may have acted to reduce
variability: the signal processing viva was more structured than typical research project vivas,
but rather open in comparison with the structured oral exams employed in medicine. A key
finding by Wass et al. (2003) and Tutton and Glasgow (1989) was that a major source of
unreliability is sampling bias – the fact that only one question was asked of each student and
that these were different for each is contrary to the good practice suggested by those authors.
A difference though is that these questions were selected in advance with knowledge of how
each student had performed in the report. As such this is not a case of random sampling
but one of carefully selected probing. Still though there were unfortunate moments. The
students were first asked which lab was more difficult, before focusing on one question; in
one case the student flagged the question that was pre-selected for further probing as the one
they had found hardest. It seemed unfair to continue questioning on this line, but we had
already prepared questions and agreed the structure; in the event we continued (the student
performed well) but then moved to a secondary question to allow a second less stressful
attempt. The aspect I found most difficult was translating my perception of performance into
a numerical grade. Although a mark scheme had been circulated (see Fig. 1), this was loosely
structured and more of a guide. The post-viva debrief in which all examiners met to discuss
marks really highlighted the differences in what each of us was looking for – one examiner
in particular seemed at variance with the other three. Clearly this is a concern, and in future
a more precise set of marking criteria would need to be agreed a priori. On the day it made the debrief itself more important – it allowed us to debate and assign marks on an equal footing, a process that on reflection I did fairly grade each student. Wass et al. (2003) imply that consensus isn’t necessarily the same as reliability, so may disagree, but they primarily refer to unconscious consensus rather than explicit discussion. The debrief also ensured that judgements were not solely based on initial impressions (a shortcoming highlighted by Yaphe and Street, 2003) and could instead have a reflective component. The viva score was worth a maximum of 10 per cent of the overall marks for the module and as such it was not a ‘high stakes’ examination. Many researchers including Davis and Karunathilake (2005) (medical exams) and Morely et al. (2003)(PhD viva) reflect that a single high stakes viva lacks fairness, but many others have implied that as a component of a balanced assessment scheme it can work well.

A possible side effect of the viva is to practice communication skills that are of primary importance in later life (Crosling, 1995). ‘Decontextualized’ vivas have limited use in this regard (compared with more direct tests of professional practice). Here I would offer the argument that this interview does closely resemble academic job interviews that I have participated in (as a panel member and interviewee) and close questioning is also a definite part of speaking at any scientific conference!

One final reflection on the process is that it served as an excellent means for getting course feedback. Although questions about course feedback were introduced with secondary importance, my module co-lead commented that upon reflection ‘Feedback from students both in terms of how well they understood some concepts, ideas and applications, but also about how much they liked the labs and what they would propose to improve them’ was the primary positive output from the process – an opinion that I agree with. In this regard the viva could be viewed more as a personalised exit interview for the module - this is cited as an important type of feedback (Light et al., 2009) and I definitely found it more useful than responses to evaluation questionnaires - however Light et al. note that it is generally impractical to do this for all students.

**Recommendations for future practice and concluding remarks**

The last point made above leads to a key reflection, and one which is an undercurrent in much research on vivas – the process was very labour-intensive and would not scale well with expected increases in class size. Without having the benefit of a small class, aspects such as the marking oversight and personalised questioning would come under pressure. Ultimately I think that while it was a useful experience it will not be used in future years – echoing the observation made by Birley (2001), despite the various arguments for and against, time pressure will likely lead to the removal of this viva. The course will likely be rebalanced to make the written exam have more overall importance - perhaps a 60:40 split rather than 50:50 with practical work - making it less likely that the student can do very well by submitting practical work that they don’t fully understand. The viva was a good means of both assessing and also helping to improve the student’s understanding and so perhaps this points towards the use of the oral medium for formative rather than summative assessment. A possible approach would be for one student to present their results to the others each week, allowing
for peer assessment. Module feedback can perhaps still be obtained by performing a small sample of exit interviews. Overall alignment of the module may also be improved by altering the structure of the required lab report, asking for more explanatory text and a more detailed report at the expense of fewer questions per week. As this module evolves in the future I expect that many iterative changes will occur. The process of reflection documented in this essay has allowed me to begin.

References


On blended teaching and learning across postgraduate Geography studies

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Abstract
This essay critically explores the practice of blended teaching and learning and how it has been applied by the author in his past and current practice in higher education. In an increasingly technology dependant world, the essay illuminates the importance of striking a balance between both traditionally focused teaching methods and technology enhanced learning and teaching. The essay draws from experience and student feedback gained co-coordinating and designing a Master’s programme in Australia, extensive lecturing experience spanning three countries, and a detailed literature review. The study concludes that blended learning can significantly enhance the teaching and learning experience, but finding the modality between traditional and technology enhanced practice requires strategic thinking, reflection and careful planning.

Key words: blended teaching and learning, technology enhanced teaching and learning, higher education, geography

Introduction
This evaluative case study critically explores blended teaching and learning and how I have applied it in my past and current practice in higher education. The case study primarily analyses practice in the field of Geography. Geography draws students from both the physical and social sciences and in my experience tends to generally include a good balance of gender and a wide mix of both international and domestic students. This variety of students and the gender balance helps to instil confidence in the broader applicability of teaching observations as it represents a diverse group of students. Geography’s involvement in both physical and social science further helps to delineate the potential scope for this essay.

This case study draws lessons learned from my higher education teaching and practice experience. My experience spans over 1500 classroom hours and includes four years lecturing at Hokkaido University in Japan, two years part-time at the University of Queensland in Australia and my current position as a full-time Lecturer at King’s College London. The essay begins with a short methodological section, then it examines the literature surrounding blended learning before providing a critical discussion of my own teaching practice in general and my use of blended teaching and learning including the development of effective strategies used to enhance the student experience. This section draws from evaluative data including student evaluations, teaching observations and self-reflection. The essay concludes by offering recommendations for other practitioners aiming to adopt blended teaching and learning methods into their practice.
Methodology

The primary methods used in this essay included a detailed desk study of blended teaching and learning, analysing student evaluations from two higher education institutions, teaching observations and personal reflections from the author. In order to increase confidence in the research findings, the study employed triangulation (Creswell, 2009). Triangulation was conducted between student feedback in the classroom, teaching observations and through personal reflections. Triangulation provides the research with a method to verify findings through ‘convergence, corroboration and correspondence of results from different methods’ (Darlington and Scott, 2002).

I also used my own personal experience and teaching reflections to inform the analysis. Personal experience is a key component of the qualitative research process (Denzin and Lincoln, 2005). Behind the theory, analysis and methodology personal experience situates how the researcher approaches the world (Silverman, 1999). The personal experience of the researcher, however, must always be understood to be influenced by gender, social class, race and ethnicity (Denzin and Lincoln, 2005). As outlined above, this study draws from substantial classroom experience in higher education spanning three continents and four universities primarily in the field of geography, covering both the physical and social sciences. The study recognizes that knowledge and facts cannot be separated from the researcher’s experience and expectations or the social and political contexts in which they are collected (Alversson and Skoldberg, 2000). The use of triangulation helped to verify data sources and reduce bias in data analysis as the essay developed.

As with any research, I recognize a number of limitations to the analysis. Although the research findings derived from the data have been triangulated with the best sources of data available, the research could have been significantly strengthened with student interviews and more primary data that was focused on blended learning and teaching. This additional data was not obtained due to time constraints associated with ethics approval and the limited period designated to complete the Post Graduate Certificate in Academic Practice in Higher Education (PGCAPHE). The research could have been further strengthened with a more in-depth literature review, however, this was not completed due to the limited word count. Nonetheless, the essay draws from a variety of literature and data sources to inform its analysis and I believe that it provides a useful perspective on blended teaching and learning in practice.

A review of blended teaching and learning in the literature

Bliuc et al.’s (2007) study into the students’ experiences of blended learning in higher education identified that blended learning is a contested term. Despite the ambiguity of the term, there are a number of definitions that offer guidance. For the purpose of this essay, I have selected the following definitions as they resonate with my practice and experience.

Whitelock and Jelfs (2003) give three definitions of blended learning. These definitions, however, could simply describe good teaching practice in a contemporary university setting, as much as describing something innovative.
They include:

- combining traditional learning with web-based or online approaches,
- using a variety of media or tools in an e-learning environment, and
- a combination of a number of pedagogic approaches, regardless of the learning technology employed.

Various authors and institutions have researched and written on blended learning using these three groups of definitions. Singh (2003) comments on the latter two definitions, talking of blended learning as combining a variety of delivery modes and pedagogical approaches to provide a more effective learning experience for participants. As a lecturer in higher education, I have found both of these groups of definitions useful in my work, both in lecturing and in developing and implementing courses.

Singh (2003) uses Khan's Octagon (2002) to help clarify the mix of different aspects to be considered in developing and analysing blended learning programmes. This is shown in Figure 2.

**Figure 2: Khan's Octagonal Framework (Khan, 2002)**
I feel that Khan’s diagram is a useful summary and overall guide for teaching. It describes good teaching – the basis of a programme that responds to the educational pressures and opportunities I strive for in my practice and is especially relevant to the interdisciplinary nature of geography. Students working or wanting to work in geography, generally come from a wide variety of backgrounds. They are often geographically dispersed and want to access new knowledge, processes and skills that they feel will better equip them to respond to the multi-faceted, complex challenges they will face when they enter the workforce.

Holley and Oliver (2010) argue that blended learning is a useful tool for students to negotiate their educational experience when adequately supported by teachers and the institution. Holley and Oliver state that apart from preparing students for technology centred workplaces, blended learning provides new spaces for students and teachers to control learning and teaching.

It is important to recognize that for some, these new spaces can be intimidating and provide barriers unless supported, but for those who are comfortable with the use of technology they can also offer innovative opportunities for students to engage with content. In a game that I developed for teaching the interconnected impacts of water, food and energy development in a river basin (see Thebasinchallenge.com), students who played this game reported that it helped them to reimagine the linkages between and amongst these resources and greatly facilitated learning. As one student noted ‘The Basin Challenge game was a fantastic class. The game made our group think about the linkages across water and food in a really fun environment. I’ll be playing this again when I get home and sharing it with my friends!’

Although some students found working with the technology difficult, when adequately supported, the feedback from students was positive and it was reported that they felt a sense of empowerment by using a combination of technology and traditional learning. In my own observations I have found that using blended learning in practice helps to add energy and variety to the classroom and motivates my teaching. Both the challenge of working across these two types of teaching and the positive feedback from the students has boosted my overall satisfaction and therefore improved my teaching.

Al-Qahtani and Higgins (2013) study entitled Effects of traditional, blended and e-learning on students’ achievement in higher education, found that blended learning offered both higher student satisfaction and higher student achievement than either traditional or e-learning approaches. Al-Qahtani and Higgins (2013) argue that the flexibility and variety within the blended learning approach facilitates effective learning and increases motivation amongst students. Bernard et al.’s (2009) meta-study on Blended Learning and Osguthorpe and Graham’s (2003) analysis both emphasize that effective blended learning offers ‘pedagogical richness, access to knowledge, social interaction, personal agency, cost effectiveness, and ease of revision.’ In my practice I have found the same benefits of utilising a blended learning approach. Student evaluations have given me especially positive feedback for the ease of revision and the ease of preparation that blended learning offers. As one student noted ‘The use of KEATs in this course was fantastic and much better than the other classes I have taken. It gave me easy access to the readings and really helped my learning.’
Throughout my teaching, I have used various online tools to facilitate revision with students. These tools primarily draw from institutional supported platforms such as Blackboard and King’s E-Learning and Teaching Service (KEATS). By ensuring that classroom material is available and easily accessible on these platforms students are able to learn and revise at their own pace and take control of their studies in ways that traditional teaching does not easily allow and this has proved very popular.

**Critiques of Blended Learning**

Oliver and Trigwell (2005) critique the concept of blended learning on two fronts. They introduce a dichotomy of ‘unblended’ versus ‘blended’ learning, and claim that blended learning focuses on the form of instruction, over the learner. I appreciate this critique, but do not feel that it means the concept is not useful, simply that:

- the idea of blending different types of instruction and pedagogy should be seen in terms of them being located on continua or dialectically related, rather than in mutually exclusive groups; and

- there is a need to focus on the needs and interests of learners, the interdisciplinary nature of the curriculum material to be presented, and the skills of the teacher to decide on the most educationally effective match in terms of choosing a suitable mode of instruction, rather than adhering to any one mode, believing it for whatever reason to be the most effective.

Bliuc et al. (2007) state that limited research has been conducted into the holistic aspects of blended learning. They further argue that there remains limited consensus about the main components that identify and evaluate the links between blended learning practice and student comprehension, and more holistic research is needed into what constitutes effective blended learning in practice. Although this study has been delimited by time and word count, I recognize the points raised by Bliuc et al. (2007). The multiple definitions of blended learning make it difficult to analyse, but I argue that its lack of a clear definition also gives it strength, in that it can be applied and adapted to various situations without being constrained by a specific set of guidelines or rules. I argue that the concept of blended learning is used in a very pragmatic way that accepts all of the groups of definitions presented earlier (Whitelock and Jelfs, 2003).

A final critique to be reviewed in this essay was identified in the early emergence of blended learning practice by Govindasamy (2002). Govindasamy (2002) states that ‘Faculty members cease to exist as mere instructors, and often are forced to assume the role of content experts, instructional designers, graphic artists, media producers, programmers, and instructors.’ This extra workload that is placed on educators who choose to engage with blended learning practices can be a huge disincentive. The extra workload and the non-traditional teaching skills required can also cause blended learning and teaching to be rushed and poorly implemented.

I recognise that not everyone has the necessary technological skills nor the time to implement
blended teaching and learning effectively. For me, however, I find that the extra time and skills required to develop effective blended teaching and learning improves my own teaching satisfaction and the satisfaction of the students and therefore I consider it time and effort well spent.

**Discussion**

Before starting the Postgraduate Certificate in Academic Practice in Higher Education (PGCAPHE), I approached teaching in a relatively atheoretical way, largely informed by my own experience. Through the PGCAPHE I have come to understand the theoretical and conceptual underpinnings presented in the literature as I seek to better understand and improve my own practice.

Drawing from Chickering and Gamson (1987) I have used seven principles to guide my teaching practice and critically reflect and evaluate my own teaching. These principles include:

1. Encourage contact between students and faculty.
2. Develop reciprocity and cooperation among students.
3. Uses active learning techniques.
4. Give prompt feedback.
5. Emphasise time on task.
6. Communicate high expectations.
7. Respect diverse talents and ways of learning.

Each of these principles and their applicability to my practice is explained in the corresponding numbers below.

1. A key component of my teaching has been to encourage students to interact with faculty. I feel that faculty-student interaction is an important step in developing student confidence and modifying some of the power structures that exist between a lecturer and a student. Arguably some power structures are necessary, for example, in cases of marking and in order to keep academic policies. In my experience, however, students gain confidence through interaction with faculty where power is relaxed and respect is given for a variety of opinions and voices to be heard. This, more open classroom, in turn facilitates learning. As one of my tutorial students noted when reflecting on what they found important in the first year of higher education ‘Being able to easily contact and engage with the lecturers is reassuring even if I never need to contact them.’

2. Developing reciprocity and cooperation among students is an important part of effective
learning in higher education (cf. Knowles, 1973). Through both formal and informal group and paired work I encourage cooperative learning where students interact and learn from each other during classes. Students have consistently favoured this approach in my evaluation forms.

3. I understand active learning as requiring students to actively think and engage, through activities, with the learning process (Prince, 2004). Active learning can be contrasted with traditional lecturing in which students receive information passively. I use a number of active learning techniques in my teaching including paired discussions, problem-based and inquiry-based learning (cf. Smith and Walker, 2010), and formative assessment and presentations. As one of my students noted ‘Nate’s classes pushed us to think critically across a number of sustainability topics and connect them to the broader messages in the course.’

4. A key component of all my assessment and teaching activity is feedback. Following from Brown (2004), I design assessment that is learner-centred and focused on the ‘evidence of achievement rather than the ability to regurgitate information.’ I recognise the importance of strong feedback to students and, as much as possible, being available for meetings and consultations. Furthermore, following from Biggs (1996) I recognise the need for teaching and learning activities to be aligned with assessment. This alignment adds direction, meaning and motivation to the courses.

5. Emphasising time on task is another important, but often overlooked component of my teaching. In higher education students often struggle with effective time management. Students also sometimes pay insufficient attention to time expectations from teachers. In my practice I have more recently learned to emphasise the importance of time on task and carefully explain expectations and potential time requirements. In response to feedback from students, I currently also work with students to ensure that they have good time management skills and realistic expectations of the time required to complete an assignment.

6. I believe that communicating high expectations and then being consistent with the operationalization of those expectations is a key component in higher education and something that I strive for in my practice. Students should expect to be fairly challenged by their work. In my teaching feedback at London School of Economics (LSE), students reported that they consistently felt challenged in my classes and this environment increased their level of satisfaction. Reflecting on my own time as a student I was most satisfied by lecturers who challenged me, even though at the time I found it occasionally overwhelming!

7. In my teaching I emphasise the importance of combining verbal and non-verbal representations of knowledge using mixed-modality presentations. As stated by Moreno and Mayer (2007), ‘student understanding can be enhanced by the addition of non-verbal knowledge representations to verbal explanations’. In order to lead to effective construction of knowledge, my teaching employs a heavy focus on interactive multimodal
learning environments that allow learning to occur between the teacher and the learner and vice versa. Mayer and Moreno (ibid.) identify types of interactivity in multimodal learning environments including dialoguing, manipulating, searching, and navigating. These types of interactivity are fundamental to effective learning and assessment opportunities for diverse students. For example, dialoguing encourages two way interactions between the teacher and learner. As mentioned above, I also use innovative teaching tools such as game theory. This is important in all learning and assessment opportunities especially with diverse students. Dialogue helps to set the pace of learning for students and provides opportunities to reinforce key messages and to understand assessment feedback.

In summary, I recognise the need to think multi-dimensionally, in terms of both understanding the needs of potential students; the barriers and enablers provided by the institutions in which I work; resources, technologies and pedagogies available; and what I may and may not do, ethically speaking to meet these needs. In the next section I present a critical account of blended teaching and learning with reflections from my own practice.

My early experience with blended teaching and learning required working online with students to undertake at least a component of a masters programme in Australia. This master’s programme included students who were participating from remote rural towns and urban cities often separated by great distances across the wide Australian geography. In utilising blended teaching and learning in this environment, an understanding of Kahn’s Octagon subsequently helped me to be aware of the need to not be seduced by technology. When teaching online, it was very important for me to focus on the programme curriculum and to make certain that it was of the highest educational quality possible, looking at technology simply as a means to an end to overcome problems of distance and time rather than as an end in itself.

Throughout my practice I have been informed by the practical advice of Carman (2005) when it comes to designing the pedagogical environment in which this curriculum material was used. The five key ingredients of having live events on line; ensuring there are self-paced activities online or supported by CDs; encouraging collaboration between participants (either online, by phone telephone, Skype, email, or face-to-face); including opportunities for participants to self-assess their learning (through, for example, reflective journals); and making reference materials readily available (Carman, 2005) are a useful checklist for practitioners.

Student evaluations at King’s, LSE and from my time in Australia consistently identified the importance of strong support and communication in blended learning teaching. So and Brush (2007) support these observations in their study of the critical factors related to student perceptions of blended learning. They identified that course structure, emotional support, and communication were the key to student satisfaction of blended learning. In my own practice I have consistently worked to improve my communication with students and offer support. I have found this to be particularly important in a blended learning environment as students come from a variety of backgrounds, cultures and with different sets of languages. Clear communication and support for blended learning teaching and practice has proven to
be essential to student satisfaction. Both communication and support, however, can require significant amounts of time and therefore limits have to be placed on the amount of time that is spent on these activities and where needed institutional support must be utilized. So and Brush (2007) also identified the importance of a clear course structure to student satisfaction. I have also found this relevant in my own practice. The need to clearly identify the course structure and set expectations early in the module is a component of building trust with the students.

Pedagogical principles help direct the practice of good teaching (Govindasamy, 2002). When I was teaching part-time students in Australia, their feedback indicated that they overwhelmingly preferred blended learning classes compared to on-line and distance. As mentioned above, this is in line with the findings of Al-Qahtani and Higgins (2013).

One of the challenges in teaching both part-time and full-time students is developing a sense of cohesion both between students and across the various subjects in the interdisciplinary field of geography. At King’s we run a field trip at the beginning of the first semester. Like regular classes, the fieldtrip also incorporates aspects of blended learning. In preparation for the fieldtrip I ask students to read material online, to post online discussions and we also encourage students to use social media such as twitter to discuss the fieldtrip informally. This fieldtrip is seen by the students as a crucial aspect of the programme, allowing them to gain a better understanding of the underpinnings of the programme and the role of technology in teaching, as well as getting to know the staff and other students (Carman, 2005).

While teaching in Australia, I also ran a field trip in the first semester, however, part-time students who were all working full-time and living throughout Australia, generally found it very difficult to keep up with the pace of required study at post-graduate level while maintaining their working and home lives. In order to assist part-time students, written learning guides for each module were prepared in such a way that students could work through the material at their own pace without the need to sit in front of a computer. Audio recordings of the lectures also allowed part-time students to listen to presentations while driving or doing other activities. This has received very favourable feedback. The learning guides contained reflective exercises that were discussed in the weekly online classrooms and the audio recordings were also supplemented with PowerPoint slides, giving a mix of individual work and live, online group discussion (Carman, 2005). Part-time students indicated that video recordings of lectures were more useful when the presentation was more interactive, or there was a guest presenter discussing material that is not in the learning guides.

I have observed that the critique of blended learning by Oliver and Trigwell (2005) produces a dichotomy of blended versus unblended learning and mode of instruction over the learner, which is of little help in my reflection on my work to date. To me, it has been obvious that I am working in a complex educational environment and that I am constantly juggling the transdisciplinary dictates of the geography curriculum, along with the needs, interests and situation of the learners and my teaching to decide on the most educationally effective match in terms of choosing a suitable mode of instruction to meet these demands. In essence I feel that it is important to find the right mixture of blending learning, teaching and institutional
arrangements to create a teaching–learning environment that best suits both my needs and the needs of my students. Through reflection and teaching observations, I am also learning practical lessons about teaching and learning on a daily basis in my practice.

**Recommendations for future enhancement of practice**

Building on the seven principles outlined above from Chickering and Gamson (1987), I have noted seven additional practical issues that are important to implementing and enhancing blended teaching and learning. These include:

- **the use of games.** As mentioned above, I have used an online game that I developed to enhance the learning experience with regards to the complex trade-offs that exist between development and ecosystem services. When implemented with correct support and clear instructions this game has proved to be very popular and an effective learning and teaching tool. The game has helped to engage students, stimulate discussion and also improve my enthusiasm for teaching. As a result of the positive experience with this game I am continually looking for innovative ways to engage students in the curriculum.

- **the difficulty of producing good quality material and delivering it to isolated students in a reasonable amount of time.** While delivering part-time courses in Australia to students in remote areas, where internet is not fast and materials are large in size, it was often difficult to produce new materials for the course and have them delivered to the students in a timely manner. I found that part-time students, due to their schedules, often required materials early. This could partly be overcome by using material presented by lecturers in the previous year. However, students would then not have access to any improvement or modifications to the course in the current year.

- **the challenge of collaboration among part-time students on problem-based group project work.** This becomes even more daunting when the students are all physically separated, have busy schedules outside of study, and may not have studied for some years. However, student evaluations showed that students generally felt that they learnt a great deal from the interaction with other students from differing backgrounds and that a modified group approach is worth pursuing.

- **students having difficulty regularly reading and digesting programme material in time for the weekly online classroom session.** This made interaction and discussion somewhat constrained and they generally found that although the online classrooms were worthwhile attending, improvements needed to be made in the on-line discussion approach. More use could be made of written discussion boards, where students can make contributions at a time that best suits them.

- **use of online platforms such as blogs, social media and online discussion groups.** These were seen as a very useful way of maintaining contact, facilitating discussion and keeping students up to date with the programme. Some students reported who were less comfortable with technology and with interacting with computers reported that these tools were cumbersome. However, with adequate support and explaining the value of
these tools in today’s marketplace most students responded positively.

- virtual field trips. I have video-recorded field trips that other students have undertaken during previous teaching and courses for viewing during the semester by current students. These films often contain a mixture of a dedicated film made on a separate trip to the sites, plus supporting footage of the trip taken by participants. This allowed me to properly present the most important aspects of the trip while providing a ‘live’ feel and stimulating discussions. As with other electronic learning material, this is not as good as the hands on experience, but it is an acceptable alternative.

- reflection of pedagogy. A key component to effective blended learning and teaching practice has been using the first classes to undertake learner analysis amongst students. This can be done through a variety of questionnaires available online or by simply asking the students to reflect and share examples on how they learn. I have found this task especially useful in allowing the students to reflect on different forms of pedagogy and also to help me shape the classroom experience. Often the diversity in the class forces me to identify different mixes of traditional and technology enhanced learning.

Conclusion
The mix of approaches I have adopted and continue to adapt accommodate different student learning styles and circumstances, while communicating the curriculum that make up the various programmes in which I have taught. In general, I feel that my experience with blended teaching and learning and the reflections I have presented in this essay bears testimony to the good advice offered by authors discussed earlier (eg Carman, 2005; Chickering and Gamson, 1987; Khan, 2002; and Singh, 2003).

Importantly, I have found that when teaching across disciplines and universities, blended learning really is both a student and teacher-centred activity, that certain pedagogic tools are best suited to particular curriculum topics and that blended learning is as much about blending teaching and focusing on the whole situation in which you are working, as it is about focusing on the needs of the student. My role as a lecturer has been to make sense of the educational milieu in which I am placed. Khan’s (2002) octagonal perspective of blended learning helps me to do this, as does realising that blended learning and teaching simply make good business sense in the competitive world of post-graduate education, especially when being technologically fluent is an important criteria for employment.

In addition to these observations, it is important to remember that effective institutional arrangements are needed to underpin and enable this process. Without the support of the institution, effective blended teaching and learning is a difficult uphill battle.

References


Sampling distributions as a threshold concept in learning classical statistical inference: an evaluative case study report

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Abstract
Statistics is the cornerstone of the scientific method and part of the syllabus of all Bachelor of Science degrees. For many students statistics is anxiety provoking, and they lack confidence with a topic that they may find to be troublesome. Part of the reason for difficulties with learning statistics is that it involves many conceptually difficult concepts, the linkage between which is only clear with a detailed understanding of certain key threshold concepts. Failure to sufficiently understand threshold concepts may be restrictive and result in a bottleneck in learning. The aim of this essay is to critically evaluate teaching of sampling distributions on an undergraduate psychology degree. This threshold concept is key to understanding the classical approach to statistical inference. In this essay I critically reflect on teaching using the ‘decoding the disciplines’ framework. This case study will use data in the form of my personal perceptions of student learning of this concept, as well as student feedback, feedback from teaching observations and consideration of student performance on the module and their research project. Recommendations for future enhancements to practice, are made based on the consideration of the data.

Key words: statistics, sampling distribution, threshold concept, troublesome knowledge, bottleneck

Introduction
Statistics is the cornerstone of the scientific method. Rather than being a body of knowledge, science is a process whereby theoretical explanations are developed, tested, refined and then further tested and refined. There is no general agreement about how science works but most of modern science, or at least the version taught to students studying scientific degrees in higher education, is based on a neo-positivist view of the world that stems from Karl Popper’s theory of falsification. This approach is generally referred to as the hypothetico-deductive model. Popper posited that theories are developed through an inductive process based on observation. These theories are then used to generate hypotheses that can be tested via an experiment, with the aim of falsification. The aim of falsification is because it is not possible to prove that a theory is true. Instead, the strongest test of a theory possible is to attempt to disprove it – that is, to falsify it. Popper summarised this approach eloquently as: ‘No amount of observations of white swans can allow the conclusion that all swans are white, but the
observation of a single black swan is sufficient to refute that conclusion’ (Popper, 1935).

Statistics provides the mechanism by which we can describe and interpret the data generated as part of an experimental or even observational study – it allows us to test the hypothesis generated from our theory. Statistics is a branch of mathematics that grew out of the attempts of gamblers in the 17th century to beat the odds, and led to the first attempts to develop a theory of probability. It is these theories of probability that we now use in hypothesis testing – for example, to determine the probability that swans of a colour other than white exist.

As a central feature of the scientific method, all science degrees include teaching of the fundamental principles of statistics. However, statistics is regarded by many as being difficult to understand and anxiety provoking, particularly by non-specialist students who may not have studied mathematics at A-level. The scale of the problem is illustrated by the fact that students’ worries about learning statistics have generated a field of research in itself (Onwuegbuzie and Wilson, 2003). Indeed researchers in the area have even developed various psychometric scales for quantifying the level of anxiety induced by studying statistics (for example STARS; Cruise, Cash and Bolton, 1985).

Often students are surprised by the amount of statistics taught on undergraduate science degrees, particularly students beginning social science degrees. This is likely to, at least in part, stem from students preconceptions about science as a body of knowledge rather than a knowledge generating (and testing) process - a misconception that is likely to be addressed during the course of the degree.

Training in statistics and scientific research method in general takes up a considerable portion of undergraduate teaching on science degrees. For example, whilst studying for my first degree in psychology the first and second year of study involved two hours per week of lectures specifically on statistics, and a further three hours of research methods practical sessions that heavily involved data analysis. All together training in research methods and statistics accounted for more than a third of all direct teaching contact hours during the first two years on my degree. This was, and a decade later still is, fairly typical of psychology degrees. This level of training in research methods is also fairly typical of other science degrees. Though for some social science degrees the proportion of research methods training involving statistics is likely to be less, due to a greater focus on qualitative research methods.

Anxiety about statistics may act as a barrier to learning, as it may reduce the motivation to learn and ultimately may impact on performance on assessments. There is a need to identify the important concepts that can lead to a transformation in understanding. These concepts have been termed threshold concepts (Meyer and Land, 2003). It is important for students to understand these concepts as they can open up learning in the subject, make it more stimulating, and learn to appreciate the subject from the perspective of an expert. Furthermore, these concepts, which are inherently difficult, may create bottlenecks for learning – points at which many learners get stuck, and further learning is restricted (Middendorf and Pace, 2004). It is important to identify these concepts in order to structure learning in such a way as to ensure that students have the maximal likelihood of achieving
understanding of the concept.

While statistics is a branch of mathematics, misconceptions of statistics based on students' mental representation of mathematics can cause problems with students learning and understanding of the core concepts within the discipline of statistics. Much of the misconceptions surrounding statistics stems from students' views of statistics as being mathematics. Student experience at school, particularly for those that have only studied mathematics to GCSE level, has typically led them to view mathematics as a single discipline, including statistics. Kennedy (1998) describes the problem as such ‘[Students] view statistics as a branch of mathematics because it uses mathematical formulas, so they look at statistics through a mathematical lens. What they are missing is the statistical lens through which to view the world, allowing the world to make sense’. The overarching aim of any undergraduate course in statistics is to equip students with this statistical lens.

My current position at King’s College London involves teaching intercalating medical students participating in a one year degree in either psychology or neuroscience and neuropsychology following their second or third year of a medical degree. Approximately 30 and 20 students respectively take these courses each year. While all of the students will have covered some aspects of statistics in their medical degree, the core concepts covered are different to those in psychology – or at least the perspective from which the concept has been approached and the terminology used is different. The expectation is that students achieve a level of knowledge and understanding that is commensurate with students graduating. Essentially this means that learning outcomes expected at the end of the second year of the degree need to be achieved within one year. In terms of hours, this means cramming the 80 to 100 hours of teaching typical for a psychology degree into around 35 hours on the module I teach. This is possible partly because the course is oversubscribed; only students performing well in the first and second year of their medical degree are successful in securing a place on the course. Furthermore, to have gained a place at medical school nearly all of the students will have studied mathematics at A-level, in which they would have achieved a B grade or higher.

This essay will focus on a particularly important threshold concept in statistics, namely sampling distributions. Grasping this concept is essential for students to understand the statistical principles of hypothesis testing, and the core concepts of the standard error, confidence interval and p-value.

The next section will fully define the notion of a threshold concept and will discuss why sampling distributions are a threshold concept, and how they lead to a full understanding of the core concept of inferential hypothesis testing. The subsequent section examines whether the concept of sampling distributions acts as a bottleneck in students learning and, using the ‘decoding the disciplines’ framework (Middendorf and Pace, 2004), critically evaluates my own teaching of sampling distributions using personal reflection, student feedback, observer feedback, and student performance as evidence. Finally recommendation for future enhancements for practice will be made.
Threshold concepts in student learning

The idea of a threshold concept in student learning was introduced by Jan Meyer and Ray Land. They define a threshold concept as:

‘A threshold concept can be considered as akin to a portal, opening up a new and previously inaccessible way of thinking about something. It represents a transformed way of understanding, or interpreting, or viewing something without which the learner can progress.’ (Meyer and Land, 2003)

A threshold concept is distinct from the idea of a core concept. A core concept is something that must be understood and integrated with existing knowledge for understanding of the subject to progress. However, a core concept would not in itself be transformative to the way in which the student views the topic. That is not to say that a core concept cannot be a threshold concept, but that not all – probably relatively few – core concepts are also threshold concepts.

Meyer and Land use cooking as an example. Nearly everyone knows how to cook but few people probably understand that cooking essentially involves the physics of heat transfer. Once the concept of heat transfer is grasped it can be transformative in the way in which this aspect of cooking is viewed. For example, in the future when watching a cooking programme, once the concept of heat transfer is understood, one might focus on the saucepans chosen by the chef. Specifically the properties of the saucepans that are likely to affect heat transfer such as width, depth and thickness and material of the base. Previously only the ingredients and the order in which they are combined may have been noticed.

In this example heat transfer is the threshold concept that leads to a change in the perspective with which cooking is viewed, whereas temperature itself is a core concept. It is important when cooking to understand the temperature at which to cook food — too high a temperature and food will be burnt black on the outside, but raw on the inside. However, it is the understanding of heat transfer itself that is transformative to the way in which cooking is viewed. It leads to a transformed and deeper understanding closer to that of an expert chef, rather than a merely procedural one.

The main characteristics of a threshold concept are that it is:

**Transformative** – Once the concept is understood its effect on students learning is transformative and leads to a significant qualitative shift in the perception of the subject and core concepts within the subject.

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1 Cooking is a good example to use in relation to statistics teaching. Statistics teaching on undergraduate degrees is widely referred to as the ‘cookbook approach’ to statistics since the procedural approach taught is akin to a recipe. The idea is that even students that fail to grasp the threshold concepts that allow them a deep understanding of the topic are still able to perform the correct statistical analyses.
Troublesome – The concept may be troublesome in that may be alien, or until the concept is understood it may appear counter-intuitive or incoherent.

Irreversible – The transformative nature of the concept on the learners perspective mean that it is unlikely to be forgotten, and is difficult to unlearn.

Integrative – The change is perception caused by understanding the threshold concept enables the learner to understand the between concepts that were previously perceived to be unrelated.

Bounded – The concept is likely to sit within a demarked conceptual space, that may serve to identify the boundaries of the discipline.

The characteristics mean that threshold concepts are useful in examining learning and teaching within a discipline. They may be helpful in designing the curriculum of a module. Threshold concepts may pose as bottlenecks in learning. While a bottleneck is not necessarily always due to a threshold concept it seems likely that many of the bottlenecks in learning result from difficulties with understanding threshold concepts, that reduces the students ability to understand the principles underlying and linking core concepts in the discipline that may ultimately prevent the learner from developing an expert view of the topic or discipline. Obtaining a deeper understanding of the discipline requires the mastery of understanding various threshold concepts in the discipline.

Sampling distributions as a threshold concept
Prior to discussing sampling distributions as a threshold concept in statistics learning, it is important to briefly introduce the topic of statistical inference, the central role of the concept of sampling distribution, and its relation to several core concepts.

One of the basic premises of classical statistical inference is that it is possible to generalise findings from a sample drawn from a specific population to that population as a whole (Figure 1). That is, we can make an estimate for the value of a certain quantity in the population (eg the height of adult males) by calculating that quantity in a sample drawn from that population. Two factors influence how good our estimate of the population value is: bias and precision.

If the sample has been randomly drawn from the population, we can be fairly certain that there is no systematic bias towards selecting men that are either short or tall. Therefore, the estimate of the population value will be unbiased and the difference between the estimate from the sample and the true value for the population will be purely due to chance. Bias is a core concept in statistics and is readily understood by students. This is likely to be because students are familiar with the concept of bias and demonstrating the impact of a biased sample on making inferences from a sample about the population is easy, whereas a theoretical leap in understanding is not necessary.

The concept of precision, the second factor influencing how well a sample estimate represents the true population value, is also relatively readily understood by students on a basic level.
It is common sense that an estimate will be to some degree imprecise, even if it is not biased. The difficulty arises when students need to learn how to quantify the precision of a sample based estimate. The statistical term for precision is the standard error of the estimate. All undergraduate students taking science degrees are taught the formula for calculating the standard error of the sample mean. With a calculator few students struggle to do this. They also find it straightforward to calculate a confidence interval, which provides a range of values within which we can be fairly certain — usually 95 per cent certain — that the true population value lies. A further step is to use an estimate from a sample and its standard error representing the precision of the estimate to perform a hypothesis test. For example, comparing mean heights from a sample of adult men and a sample of adult women it is possible to perform a significance test for the hypothesis that men are on average taller than women.

The standard error, confidence interval and p-value are all core concepts in statistics. Calculating the former two is trivial with a calculator, and with a little training calculating the latter is relatively straightforward as well. Knowing how to calculate these statistics is useful, and having a vague understanding of their meaning is essential. However, understanding the underlying principles that allow their calculation is the key to unlocking understanding of the entire premise of inferential statistics.

The underlying principle is that estimates of the quantity from the sample follow a known distribution – referred to as a sampling distribution. Specifically, this means that if we had taken multiple repeated samples from the same population and looked at the distribution of the estimates from each sample they will follow a particular distribution. Returning to
the example of adult male heights in the population, rather than taking one sample from the population multiple samples could have been drawn and the average height for each calculated. With a sufficient number of samples we would have observed that the distribution was approximately Gaussian (ie the bell curve or normal distribution). Furthermore, if we calculated the average of the differences of each of the sample means from the true population mean height for males (the standard deviation) we would have observed that this value is the same as our estimate of the standard error. Fortunately, in practice we do not need to know the true value of the population and draw repeated samples to work out the precision of the estimate from each sample. Making some simple assumptions about the sampling distribution, statisticians have derived the formulas that allow us to calculate the standard error, and thus confidence intervals and p-values using a single sample. For students to understand the classical approach to statistical inference they need to move beyond viewing the analyses performed as the application of certain mathematical formula to a statistical perspective where each sample estimate is a random quantity drawn from a sampling distribution, that allows us to perform statistical tests and make inferences about the population.

Understanding the concept of repeated samples and the sampling distribution is transformative because it acts as the statistical lens through which core concepts can be understood more fully and allows the student to move away from viewing statistics through a mathematical lens. Kennedy (1998) describes his own revelation in learning about sample distributions as 'akin to the experience I had when I put on my first pair of eyeglasses — suddenly everything was sharp and clear'. Prior to understanding sampling distributions the idea of drawing repeated hypothetical samples from a population is likely to be troublesome. A world of hypothetical samples is likely to be alien to most students and therefore conceptually difficult. Furthermore, without it other core concepts such as the standard error and confidence interval are likely to also be troublesome. Understanding sampling distribution is also likely to be irreversible, in that it is unlikely to be unlearned. Understanding sampling distributions is definitely integrative. It allows the learner to understand the linkages between the core concepts of precision/standard error and how this relates to confidence intervals and significance tests.

The concept of sampling distributions is also bounded. It demarcates the classical approach to statistical inference. For example, the Bayesian approach to statistical inference does not involve hypothetical repeated samples and sampling distributions. Therefore sampling distributions act as a curriculum boundary since Bayesian methods are not taught to undergraduate social or psychological science students.

Having demonstrated that the concept of sampling distributions is a threshold concept in statistics teaching the next section involves a critical reflection of my own teaching strategies regarding this concept.

**Critical reflection on strategies for teaching sampling distributions**

Having demonstrated that the concept of a sampling distribution is a threshold concept in statistics learning, this section evaluates whether the concept acts as a bottleneck to learning on the module on which I teach to undergraduate psychology and neuroscience and neuropsychology students. The ‘decoding the disciplines’ model described by Middendorf
and Pace (2004) is used. The framework involves seven steps that pose a series of questions for the instructor. Middendorf and Pace (2004) describe the aim of the model as providing a framework that ‘places disciplines at the centre of discussions of teaching’, and a means by which instructors and other experts within the discipline ‘can be encouraged to be involved in the scholarship of teaching and learning’.

Is there a bottleneck?
As has been described in detail above the concept of sampling distributions is a threshold concept in learning statistics. Since it is troublesome and requires a shift in perspective from the learner it may act as a bottleneck in learning. From my own experience of teaching statistics to undergraduate psychology students I am well aware that students often struggle to grasp the concept of the sampling distribution and its relation to other related concepts. Reflecting more deeply on this issue as a potential bottleneck in learning rather than something that is conceptually difficult it seems strange that I have not focused more of my efforts in module planning on students understanding of this concept.

Examining the learning objectives for my module on research methods and statistics on the intercalated degrees in psychology and neuroscience and neuropsychology sampling distributions themselves are not mentioned at all. However, understanding various core concepts that rely on the principles of the sampling distribution is listed. For example, the first lecture on inferential statistics which introduces the concept of sampling distributions lists understanding the core concepts of standard error, confidence intervals and significance tests as the main outcomes. Sampling distributions are only described in the context of the standard error, and their link to confidence intervals and significance testing is implicit. Furthermore, while later lectures revisit these concepts to reinforce their understanding the concept of the sampling distribution is never revisited.

Students provide feedback from each session on the module. This involves students rating the session on a Likert type rating scale from one ‘Strongly disagree’ to five ‘Strongly agree’ for the following six aspects: i) Were the learning objectives met? ii) Was the material provided useful? iii) Was the session well organised? iv) Were new ideas presented? v) Were ideas communicated effectively? vi) Did the session stimulate your interest in the topic? There is also a free text box where students can write other comments about what the best and worst aspects of the session were.

Examining student feedback from the lecture introducing inferential analysis the potential for a bottleneck in learning is apparent. While overall the ratings for each of the questions were high (all averaged above 4) and many of the comments were positive some of the more negative comments are enlightening. For example, one student wrote ‘Lots of new ideas covered to [sic] fast. Stats not fully explained – don’t understand most of it’. Similar sentiments of the session being either rushed, or the concepts covered being difficult and not understood were conveyed in comments from six other students. Thus, at least seven of the 32 students that completed feedback sheets (out of a total 52 taking the module) found the core concepts to be troublesome, and had experienced problems in understanding. One reason may be that insufficient time was provided to cover such an important aspect of the discipline.
Another is that the core concepts directly covered and the learning outcomes failing to
directly focus on the concepts of the sampling distribution meant that for many students
understanding the core concepts was more difficult.

Further evidence for an apparent bottleneck comes from performance on the coursework
completed as part of the module. Students complete formative assignments during practical
sessions. These involve guided worksheets for various data analysis problems. There is
no practical directly linked to the introductory statistical inference lecture, however, later
practical sessions linked to specific research designs and statistical significance testing methods
do revisit core concepts. As these assignments are formative marks are not collated and
recorded. However, from my experience of running these practical sessions over a number
of years, it is clear that many (probably most) students still struggle to understand these core
concepts fully. Although, after repeated lectures and practical’s most students learn how to
correctly interpret a statistical output. The students have mainly learnt what buttons to press
on statistical software and where to look in the resulting output. That is, they have developed
procedural knowledge of what to do in certain situations but lack a deep understanding of the
concepts. In situations where it is not obvious what to do or where to look many get stuck.
For example, when provided with information about the means and 95 per cent confidence
intervals for a made up example about the IQ of reality TV stars in one practical, many
students fail to realise that if the upper limit of the 95 per cent confidence interval for the
IQ of reality TV stars does not include the population mean of 100 this indicates that the
p-value is less than .05. It is likely that only students with a clear grasp of the concepts and the
underlying principle of the sampling distribution would achieve this insight.

Moving on from my own and my students experience, various academics teaching statistics
have attempted to identify the concepts in statistics courses that students find most
difficult. Dunne, Low and Ardington (2003) surveyed 465 students completing courses
in undergraduate applied statistics at the University of Cape Town in South Africa. They
asked students a variety of questions to gauge knowledge, including one concerning the
central limit theorem which forms the basis for assumptions regarding the shape of sampling
distributions. They also asked students to list the three concepts in statistics that they found
the easiest and the most difficult. Core concepts in descriptive statistics were most commonly
listed as being easy to understand and virtually never as difficult (eg measures of central
tendency). Interestingly many concepts in the area of inferential statistics were often listed
as difficult by many students, but frequently listed as easy by other students. Although
sampling distributions were never mentioned, related concepts such as probability, probability
distributions and significance tests formed part of this list. This apparent divergence in
understanding gives a strong indication that there is a bottleneck in learning for many
individuals.

Defining the learning task
Rather than defining the learning objective (as mentioned above), this step is about defining
the learning task and the implicit aims of the course. That is, ‘this step involves making
explicit and visible the hidden cognitive processes, knowledge transformations, frameworks,
and strategies we as experts use to accomplish the task’ (Sundt 2010). By understanding
differences in the approach to a task of a novice and expert it is possible to identify opportunities to facilitate leaning by getting students to complete tasks that encourage them to think like experts.

Experts in statistics learn to think in the abstract. They understand the principles of sampling distributions and the relation between standard errors and confidence intervals. Provided with data concerning the mean and standard errors for a variable within specific groups I can visualise in my head the sample distribution and gauge the precision of the estimate, construct approximate confidence intervals and even make reasonable estimates about statistical significance for various hypothesis tests. To do this I do not need to remember formulas and perform complex calculations in my head. Instead, through experience I have learnt various heuristics that make this possible. Informal discussions with colleagues would suggest this is commonplace amongst statisticians.

When experts in statistics want to explore the properties of a specific statistical concept or test, and they either cannot visualise the problem or they need a more precise estimate than one provided by simple heuristics, they often perform simulations using computer programmes. Simulations involve setting out the assumptions and relations between certain variable and generating (ie simulating) data while introducing random variability into the estimates. This approach is akin to drawing multiple repeated random samples from a population, except that the population is not a real world population but a hypothetical construction. Statisticians can then interrogate the data generated in order to help them explore the impact of changing assumptions and relations on the data values generated by the simulation. Simulation can be an extremely effective tool since the method can be used to assist students to learn about standard errors and confidence intervals and at the same time embodies the underlying principles of sampling distributions.

**Modelling the learning task**
Getting students to undertake the specific task is the next step. To understand confidence intervals I get students to undertake a simple task using paper clips. I have an envelope containing 100 paperclips, of which 50 are red and 50 are blue. I tell the students that we want to estimate the proportion of red paperclips in the envelope by drawing a random sample of ten paperclips from the envelope. I do this and count the number of red paperclips. Let’s say I draw 3 red paperclips, I tell students that my estimate is that the paperclip population contains 30 per cent red paperclips and ask them whether they think this is a good estimate. Generally they agree that it is unlikely to be biased but that it is unlikely to be a precise estimate.

I then say that perhaps we can investigate the variability of our estimates of 10 paperclips by performing a simulation. We stop for a break, during which I ask students that remain in the room to pass around the envelope and at random take out 10 paper clips and mark down on a piece of paper the number of red paperclips in their sample. Typically about 20 students do this and I then enter the data into a statistical analysis programme. After the break I plot a histogram to display the frequency distribution of the proportion of red paperclips from each of the samples — the sampling distribution. I also work out the mean and standard deviation (a measure of variability in the data that represents the average difference from each data
point to the sample mean) of the distribution of sample estimates. I ask the students whether the mean of the sampling distribution is likely to be a better estimate of the proportion of red paper clips in the paperclip population than my single sample. I also ask whether the shape of the distribution is familiar (it should follow and approximately Gaussian distribution – aka the bell curve), and also whether they think the standard deviation is important. These two questions are important because the standard deviation of the sampling distribution is the standard error, and using the known properties of the Gaussian distribution we can work out that 95 per cent of the time our samples will include the true population value of 50 per cent.

This task models the concept of a sampling distribution. Although statisticians do not need to take repeated samples, classical statistical inference is based on these principles. In getting students to undertake this task I attempt to provide students with an insight into where standard errors and confidence intervals come from. I do not explicitly discuss with the students that this is the statistical lens through which experts think about data, this is purely implicit. It may be that focussing less on procedural knowledge and focussing more on the simulation might be more useful to students.

Practice and feedback
Practice and modelling of the sampling distribution does not occur on the course. As I have mentioned before other key concepts, which rely on the theory underlying sampling distributions, are revisited during subsequent lectures and practical sessions. Feedback to the whole class is provided during the discussion of the problems in the practical sessions and also in general as well as individual feedback on coursework.

There are however several opportunities for further practice and to feedback. These are further discussed in the recommendations section.

Motivation
Student motivation is always a problem with statistics learning. Students who are unmotivated to learn are unlikely to grasp a threshold concept, such as sampling distributions, that are conceptually difficult and require engagement and a high cognitive load to grasp. Lack of motivation can act as a resistance to learning (Sundt, 2010).

One of the main barriers to motivation and engagement stems from student anxiety about statistics. Anxiety about statistics has been shown to predict performance, even after controlling for ability (Onwuegbuzie and Wilson, 2003). Any attempt to increase motivation and engagement will need to either directly or indirectly reduce student anxiety about statistics.

Sundt (2010), suggests two approaches to increasing motivation to learn: situational interest, self-efficacy and goal orientation. Situational interest refers to ‘features of the learning task, environment, or instruction that ‘catch’ interest and those that ‘hold’ interest in a topic. Novel and humorous examples and anecdotes can help maintain the interest of the students. The use of this was noted in my peer observations.
The concept of self-efficacy refers to the person’s own perception of their ability to complete a specific task, or not (Bandura, 1977). Self efficacy has been observed to correlate strongly with statistics anxiety (Onwuegbuzie and Wilson, 2003). A large proportion of students taking the course have fairly low self-efficacy for statistics, at least at the beginning of the course. The tasks I get students to complete during lectures are simple and easy, and the formative assignments completed during practical sessions while challenging are also relatively straightforward. Providing lots of opportunities to succeed and immediate feedback and positive reinforcement following success is aimed specifically at increasing confidence and self efficacy. I tend not to use the third approach of goal orientation. Sundt (2010) talks about ‘mastery of goals’, ‘desire to prove their ability, avoid looking incompetent, and view academic challenge or failure as a threat to their self-worth’.

**Assessing learning**

The next step in decoding the disciplines, and the final one considered here, involves assessing student learning. Other instructors in statistics have noted the distribution of marks for statistics courses as following a bimodal distribution (Diamond, 2011). That is, marks appear to fall into two groupings - students who do well on the exam and students who do poorly, with relatively few students performing in the middle. This observation perhaps reinforces the agreement that there are considerable threshold concepts in statistics as it seems likely the large number of poorly performing students are struggling to grasp some of the fundamental concepts of the discipline. However, such a distribution is not observed on any of the summative assignments completed by students undertaking my module in the last few years. Marks tend to be skewed with most students performing well on all assignments – around 40 per cent of students achieving a first overall. This may in part be due to the large number of students having taken A-level Mathematics — for which they are likely to have achieved at least a B grade — and only high performing students being successful in obtaining a place on the two courses, due to both being oversubscribed.

Reassuringly, it suggests that the teaching on the course is relatively effective in that students are achieving the expected learning outcomes. The deficiencies in teaching sampling distributions highlighted above do not appear to have overly impacted on students. Nevertheless, there are areas where improvements are likely and achievable.

**Recommendations for future enhancement of practice**

In the previous section I critically reflected on my own teaching of statistics, focusing on the threshold concept of the sampling distribution. Evidence drawn from student feedback, observation, and student performance identified some areas where enhancements were possible. The recommendations here are based on the ‘decoding the disciplines’ approach but also include elements highlighted as best practice by Fry, Ketteridge and Marshall (2008). The following five elements were identified: (i) activity and small group work; (ii) testing feedback and misconceptions; (iii) comparing reality with predictions; (iv) computer simulations; and (v) software that allows interaction.

Next year I will modify the inferential statistics lecture to focus less on the procedural knowledge relating to the calculation of core concepts. This will allow for more time to allow
students to participate in tasks involving simulation. Throughout the course I will also attempt to make greater use of activities, such as simulations, and small group work. During lectures I will ensure that I have at least one task.

The worksheets completed during the practical work well at providing a gauge for the success of student learning, and enabling immediate feedback and reinforcement of concepts covered during the preceding lecture. However, there is no practical for the lecture that introduces inferential statistics that covers the concept of the sampling distribution. To accommodate this, I will include a small quiz activity at the end of the session.

Currently statistics tutorials are available with me during February and March for students who require advice on the design and analysis of their research project. As part of this I will encourage students that have performed poorly on their Christmas coursework. I already provide a 1 hour general feedback session for all students. Individual sessions with poorly performing students will provide an opportunity to provide in depth individualised feedback to students.

**Conclusion**

In conclusion, evaluation of my teaching has provided insight into the way in which I have structured students learning in a way that focuses heavily on procedural knowledge. In the future I will aim to cover less in the module in order to focus on the understanding of threshold concepts, such as sampling distributions. Hopefully, by doing less the students may actually learn more.

**References**


The ‘fear of being found out’: crises of confidence among first year undergraduates and first time teachers

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Abstract

This case study analyses my experience as a first-time Graduate Teaching Assistant leading seminar groups comprised of first year undergraduates, and how the lack of confidence from both me and them may have affected the pedagogical experience. The ‘fear of being found out’, i.e., not having sufficient experience in Higher Education and being considered an imposter in a new and challenging environment, negatively influences both student and teacher, creating a ‘perception filter’ which distorts our ability to see our own progress. I discuss how my implementation of a teaching method that I found useful at undergraduate level did not necessarily translate into being appropriate for my own students, as per Brookfield’s hypothesis.

Key words: undergraduate, teaching, GTAs, confidence, perception

Introduction

In the 2013/14 academic year, 23.4 per cent of undergraduate seminars in the English department at King’s College London were taught by Graduate Teaching Assistants; of these GTAs, 89.5 per cent were teaching a first year undergraduate module. Not all of these GTAs will have been teaching for the first time, but they were nevertheless junior in terms of experience, despite teaching nearly a quarter of all undergraduate classes.

One of the key issues for Graduate Teaching in Higher Education is that both teacher and student are new to the environment. GTAs are more likely to teach on a first year module; of course, there are advantages for having new teachers lead new students, especially in terms of the enthusiasm that GTAs generally bring to class, being as they are at the cutting edge of research within their field. However, the disadvantage of putting first time teachers with first year undergraduates is that, potentially, neither side of the class will feel confident in what they are doing. There is a crisis of confidence for first year undergraduates entering Higher Education, as well as a crisis of confidence for the GTAs themselves. Both parties can feel underprepared for university seminars, as they are joining a new environment of learning and have yet to truly understand what is expected of them at this new level. The crises of

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1 I have included seminars but have discounted lectures, workshops and screenings from this calculation. Figures calculated from information found at: https://timetables.kcl.ac.uk/timetable1314/department.html.
confidence from both students and teachers can evoke a perception filter that inhibits both teaching and learning: this filter can be termed ‘the fear of being found out’, and relies upon the idea of ‘imposter syndrome’. This is the concern that many perfectly capable individuals feel when starting something new: they lack confidence in their own abilities and keep expecting someone to notice and reprimand them for not performing at the required standard. This fear is often entirely misplaced, but it is stubbornly persistent, especially among high achievers who have unrealistic expectations of themselves. There is a wealth of such high achievers in Higher Education, and the transition to this new environment can be difficult to negotiate without a fall in self-esteem.

The seminar discussion is in many ways the cornerstone of teaching English Literature in Higher Education, and yet it is one that is fraught with anxiety on the part of both student and teacher. In his article, ‘The Dreaded Discussion: Ten Ways to Start’, Frederick accepts that:

‘We need, first of all, to acknowledge our fears in facing discussion classes: the terror of silences, the related challenges of the shy and dominant student, the overly-long dialogue between ourself and one combative student, the problems of digression and transitions, student fear of criticism, and our own fear of having to say “I don’t know”.’ (1981)

This fear of having to say ‘I don’t know’ is a symptom of the ‘fear of being found out’, both from the point of view of the student and also the teacher. GTAs may feel particularly vulnerable if they have to admit ignorance on a certain topic brought up by a student; similarly, students too often feel concerned that they do not know the ‘right’ answer. There is a performative element to learning in the humanities at university level (as teaching is conducted via lectures and seminar discussions), and this means that there is a far greater potential for students to develop social anxiety in relation to their learning. However, if they are able to face these fears and move beyond them, the seminar discussion can be an immensely validating pedagogical experience.

Crummé, a fellow GTA within my own department of English, discusses the difficulties of teaching first year students. Writing about how she tried to get her students to think critically early on in the term, she recalls how her efforts were frustrated: ‘when I opened the question to the class students were very unwilling to distil a nuanced reading of the text from the allusion in question.’ (2013) Her analysis of this situation is that her students both lacked self-confidence and feared judgement from their fellow students, particularly when asked to present a creative reading as opposed to noting allusions and references. She recognises how such a crisis of confidence arises from new students feeling unprepared for undergraduate study, particularly within the discipline of English, which is rooted in how students often do not learn how to think critically at A-level.

I believe that such a reticence from the students to provide their own creative readings can be linked to Bloom’s revised Taxonomy of Educational Objectives, which places ‘Creating’ at the very top of the Higher Order Thinking Skills (Anderson et al, 2000). By asking students to make creative readings at an early stage in the seminar programme, they are being asked
to skip critical stages of understanding, and are understandably unprepared for such nuanced assessments. No wonder, then, that first year students can arrive at university and experience a knock in confidence: they are asked to complete assignments for which they are pedagogically unprepared. The onus is therefore on the teachers to help students make what Crummé describes as ‘the transition from good studentship to good scholarship’ (2013).

However, the teachers themselves may feel ill prepared to help students make such a transition. Particularly, if Graduate Teaching Assistants are leading seminars for the first time, they are more likely to blame their own methods for a lack of student progress rather than consider the fact that the new students may still be adapting to university learning. Instead, GTAs, such as myself, find themselves panicking and changing their teaching activities or the structure of the class in the terror of their own ‘fear of being found out’ as an inadequate or ineffective teacher.

This can mean that if students are initially reticent to speak up in class at the start of the semester, the GTA can worry that he/she is the one at fault. Of course, it is entirely possible that their method may well be the reason why students are not moving beyond certain thresholds of learning. However, it is also possible that it is the students themselves who lack confidence and are slow at adjusting to a new style of teaching more appropriate for degree level learning. There is something to be said for a teacher to appropriately bridge this gap between secondary and tertiary education environments, but the students themselves must also be willing to adapt, provided that the objectives of the course and the learning outcomes are explained to them, and that they understand what is expected of them. I found during my own first semester of teaching that I was quick to change the structure of the seminar if I felt that the students were not responding well, rather than allowing them to become more comfortable with a new style of teaching. This meant that students may have actually become more confused about the format of the seminar, and perhaps undermined my position as a seminar leader by making me appear indecisive.

**Case study: the Brockbank method**

This case study is a reflection upon how my own lack of confidence hijacked the teaching plan I had made. When preparing for teaching my first semester, I wished to use a seminar format that I had experienced during my undergraduate degree and had found particularly constructive. While in my third term of an undergraduate degree in English and Related Literature at the University of York, I took a module entitled ‘Later Renaissance and Restoration’, led by lecturer Jonathan Brockbank. Brockbank’s teaching method is different from any other tutors with whom I have worked, before or since, and so I outline his format here:

1. Each student is asked to come to class prepared to write down three key words or themes that had occurred to them during the past week’s reading.

2. These named pieces of paper are then passed to Brockbank.

3. Brockbank is then able to lead a discussion based on the nominated interests that students
had, quite literally, brought to the table.

What I found so enlightening about this method was that it increased the confidence students had in their own ideas, and I was fascinated that such a simple method could make such a fundamental change to my experience of learning. Biggs (2003) has written that, ‘[t]he view of university teaching as transmitting information is so widely accepted that delivery and assessment systems the world over are based on it. Teaching rooms and media are specifically designed for one-way delivery.’ (2003, p.22) Having a seminar restructured so radically via the Brockbank method was a breath of fresh air in my first year of undergraduate study, and came right at the time when I needed to build confidence the most.

As an undergraduate student, I found there were a number of positive implications from using the Brockbank method;

• It gave students responsibility for the content of the discussion and their learning within it, giving them greater ownership of knowledge.

• It democratised ideas, and created the notion that the students’ opinions were valid and of equal value with the seminar leader. It gave students an opportunity to propose their own ideas and responses as opposed to reacting to the lecturer’s ideas (which is often approached in an uncritical, positive way, without students questioning the lecturer’s ideas or looking for limitations. For example, ‘I liked the point that she made about...’).

• The Brockbank method meant that the students had to supply their own critical response, as the prompts for discussion came directly from their own analysis rather than someone else’s.

• The leader could create a balanced discussion by using the pieces of paper to see which students have similar or contradictory ideas, and structure debate accordingly.

• This gave students the opportunity to directly engage with each other’s ideas and give feedback.

• It gave an opportunity for shyer students to discuss topics that were of interest to them, rather than staying quiet because the more confident students were dominating the seminar. Brockbank was able to notice who was keeping quiet within the group, and could look at the pieces of paper to instigate a discussion about something they were prepared to talk about.

These positive elements frequently led to excellent seminar discussions that enabled me to understand what a university education could – and should – be like. It facilitated deep learning among my peers and I; one simply could not rely on surface learning during class debates: you had to have formed your own opinions based on independent thought and critical engagement. This concurs with Tyler’s belief that, ‘learning takes place through the active behavior of the student: it is what he does that he learns, not what the teacher does’
(1949). The structure of the class ensured that we were responsible for our own learning; Middendorf and Pace (2004) also make an excellent point when they assert that learners do not fully understand things until they are able to explain them to other people.

Calling on the influence of constructivism as outlined by Steffe and Gale (1995), Biggs’ thesis is that ‘education is about conceptual change, not just the acquisition of information’ (2003). Brockbank’s method helped to facilitate this by ensuring that the student learning process was necessarily wholist rather than serialist; this meant that we were building a ‘bigger picture’ of the themes that were raised within the module and had conceptualised an organisational framework within which to structure our own ideas. Most importantly of all, it introduced a paradigm-shift to our understanding of university learning, from a teacher-centric approach to a student-centric one. Our education was adapting through learning that was enquiry-based: our approach to learning was becoming active rather than passive, and self-directed rather than teacher-reliant.

Above all, this method created an increase in confidence for all members of the seminar group. Tennant, McMullen and Kaczynski describe the ‘traditional liberal’ approach to teaching as one of cultivating individuals who are ‘independent, rational, autonomous, coherent,’ and who also have ‘a sense of social responsibility’ (2009). They also describe the performative elements of a successfully educated individual as ‘a competent and efficacious person, one who has mastered the knowledge and acquired the skills to act in the world with confidence’ (2009). I would say that this is a fair assessment of the positive impact Brockbank’s method had upon the group, although while his was certainly a liberal approach, it was not traditional. In fact, it was his innovations in the classroom that were the root of his success as a teacher. Most importantly, Brockbank’s method favoured Frederick’s belief in the importance of students feeling a sense of ownership over their learning. Frederick pinpoints his primary pedagogic strategy as creating ‘situations in which students have as many opportunities as possible to acquire wisdom for themselves; that is, to own the discovery of a new learning insight or connection and to express that discovery to others.’ (1981). This idea that students should take ownership of their learning became a key threshold concept in my own university education, and it was achieved during Brockbank’s seminars. Consequently, I was determined to incorporate his methods into my own pedagogical practice.

Brockbank’s method had hugely shaped my university learning experience as an undergraduate, and I was keen to try his technique during my own teaching. Brookfield emphasises the importance of still being able to learn new things as a teacher in order to be able to empathise with the learning process, and says that a good teacher will call on their ‘own autobiography as a learner’ in order to gain insight into effective pedagogic practice (2000). Consequently, when I began teaching, I drew on my own autobiography as a learner, as well as my recent experience of being an undergraduate myself. Brockbank had generously allowed me to gain some teaching experience on my MA year at the University of York, by agreeing to let me shadow his module on Victorian Literature and giving me the opportunity to lead two of the sessions. I found this challenging, but very rewarding, and the students responded well when I used the Brockbank method with the group.
Consequently, I did not anticipate any drawbacks to implementing this method when I taught my first full semester at King’s College London, on a module entitled Early Modern Literary Cultures. This was a compulsory first-year module for English undergraduates, and was taught in the Spring Semester. The course convenor, Dr Sarah Lewis, had designed the module to be a broad introduction to the literary practices operating in England between roughly 1550 and 1660. The module explores both how classical and medieval texts had influenced early modern writing, and how early modern writing itself would enable the development of further writing styles and genres, particularly during a period of such tremendous political and social change incorporating not only heavy religious tensions but the age of expansion and travel as well as the birth of capitalism and the growth of nationhood. The texts covered are diverse, from poetry such as sonnets and religious lyrics, to dramatic tragedy and travel writing. It analysed literary culture from the points of view of whole cross-sections of society, from court masques performed for James I, to ballads that would have been sung in public houses.

This module actually had several similarities to the ‘Later Renaissance and Restoration’ module I was taught using the Brockbank method at York, in that it was a survey module designed to introduce first year undergraduates to the Renaissance literary period. Consequently, it seemed natural to employ Brockbank’s seminar format for this first year module at King’s as a way of introducing new students to the seminar dynamic. Yet there was a major drawback to using his method in my own teaching, and one that I did not anticipate. While using Brockbank’s method made me confident as a student, it did not prepare me for being confident as a teacher. It taught me how to contribute good scholarship to a class, but it did not teach me how to lead the class itself. Consequently, I found implementing the Brockbank method with my two seminar groups at King’s College London far harder than anticipated, and discovered the following issues.

My students were unwilling to critique each other’s ideas or develop their own points into a sophisticated analysis of the text (whether out of shyness, politeness, or a genuine lack of insight). When questioned about the ideas they had written down, they had little more to add other than they found a certain topic, theory or idea ‘interesting’. If I tried to push them for a reason why they found it interesting, the students would look confused and sometimes turn to their peers for assistance – who were rarely forthcoming. This may have been because they were only in the second term of their undergraduate degree, and many were still lacking in confidence and were still adapting to the new levels of learning in higher education. My use of the Brockbank method, while implemented for good reasons, failed to understand that the students were fundamentally still transitioning from secondary to tertiary education, and were still in the process of realising what was expected of them at this higher level; this, unsurprisingly, left many of them confused, shy, or, frequently, an impotent combination of the two. Consequently, even in a situation that was deliberately structured to appear democratic and non-hierarchical, where their ideas would be welcomed in a comfortable shared environment, their reluctance to discuss ideas was a product of my approach being ‘too much too soon’. They had yet to gain the skills of critical analysis, and had wanted to come to seminars to learn how to do this rather than immediately being ‘tested’ on it by having me call them out by name and ask them to expand upon the ideas they had written down. The conclusion of this was that what I had intended to foster, in a welcoming environment,
actually became another reason for them to feel intimidated.

I felt rather disheartened after this first seminar, and my immediate decision was not to use the Brockbank method for the rest of the semester. This knee-jerk reaction was done almost entirely out of my fear as a first-time teacher: I thought that if I had two exceedingly quiet weeks in a row, the class would fail to make progress or adapt to the seminar environment, and therefore I changed tact instantly. I instigated the following changes to my seminar structure:

1. Each week, two students were asked to turn up to class with a pre-prepared presentation on the week’s topic as part of their assessment for the module. I began to ask them to also come prepared with a question for the class to discuss after the presentations. This ensured that the onus was on the students to come up with ideas for discussion, and helped to foster increased engagement with the texts.

2. I would pick key passages from the text and allocate them to pairs of students. Then, I would allow them to discuss the passages together for five minutes, before reporting back to the group.

3. I also put them into pairs to consider certain questions about the week’s texts.

The main benefit of this was that it enabled students to build confidence at their own pace. By allowing them the opportunity to discuss ideas with a partner first, students got to hear their own voice in the room and get used to the idea of speaking up in a scenario where the stakes were lower than if they were contributing to the entire group. It meant that they could ‘try out’ ideas on other students first, and see if they received a positive reaction, before sharing them with the rest of the class. This method also had the advantage of giving the students a bit more time to consider their responses to my questions, and I found that my students became more relaxed and more thoughtful in their responses, which was exactly what I was hoping for.

However, should I have continued with the Brockbank method and given the students more of a chance to get used to the technique? I began to reflect upon the readings I had completed for the PGCAPHE course, and to assess if they offered up any other reasons for why the method had not been successful on its first implementation.

1. There is an assumption in pedagogy that we all learn in the same way; specifically, I assumed that what worked for me would work for others, as anticipated by Brookfield. His idea is that teachers should act as facilitators rather than educators, and that his pedagogical task ‘is to help [students] realize that they already know much more than they think they do’ (2000). While I think this concept has a lot of merit, I would hesitate to suggest that it is not always the case: one of the key issues with first year undergraduates is that they do not necessarily know ‘much more than they think they do’, and they have entered Higher Education specifically to make such progress. It is indeed a teacher’s role to facilitate such a transition from secondary to tertiary education, but the assumption of Brookfield that the students will already understand the different approaches of university pedagogy has limitations.
2. This leads us to the question of phenomenography: my students were transitioning from secondary to tertiary education and were still adapting to new learning environments; but, even more importantly, each class is different, and what works for one will not necessarily work for the other. I had not considered the number of factors and different backgrounds that come into play for each particular seminar group, and had presupposed that they would all respond to teaching the same way I had.

3. Middendorf and Pace’s discussion of ‘bottlenecks in learning’ (2004) can also be applied to the idea of bottlenecks in approaches to learning. My implementation of the Brockbank method took them by surprise, and it was something they were unprepared for. None of my students has experienced it before, and it was a difficult pedagogical concept for them to deal with when they still lacked sufficient confidence in the seminar room. Consequently, the bottleneck in their learning came primarily from my decision to change from a more traditional teaching technique, which caught them off guard at a time when they needed to build their confidence.

**Conclusion**

Having reflected further on my practice, I think that if I had persisted with the Brockbank method and given the students more time to adapt to it, it may well have been successful and led to the thoughtful seminar discussions that are the stalwart of the discipline of English Literature. Perhaps, I could have implemented the technique later on in the term, once the students felt more at ease with each other and with hearing their own voices in the seminar room. I do have regrets at giving up on the method so quickly, and I put this down to my own lack of confidence as a PhD student teaching an undergraduate course for the first time.

In fact, what enabled my seminars to become more successful came down to allowing both myself and my students to build each other’s confidence at a steady pace. The opportunity for a reflective teaching environment certainly assisted in this, thanks to my enrolment on the PGCAPHE course while I was teaching. This introduced me to readings such as this one by Frederick, who observes that, ‘[t]he conspiracy of silence is breaking up: we are learning to talk more openly about our joys and fears as teachers, our achievements and frustrations in the classroom.’ (1981) By being encouraged to be reflexive in my practice, it enabled me to consider a plethora of reasons why my teaching had not been as effective as I wanted it to be, and also gave me the ability to find alternative solutions.

Another concept that Frederick introduced me to which helped me to reflect upon my teaching is that, ‘a student’s self-image is always affected by his or her participation in discussions: feedback, therefore, is crucial for self-esteem’ (1981). I would actually expand this further and suggest that the same is also true for teachers. In fact, I found that the two observations I had during the semester (from Dr Anna Mountford-Zimdars, the seminar leader for the PGCAPHE course; and from Dr Sarah Lewis, the course convenor for Early Modern Literary Studies) went far better than I had anticipated. Both observers commented on the successfulness of pair-work within the classroom and praised my rapport with the class. By this point, we were over half way through the semester and both my seminar groups had grown in confidence and had become more familiar with each other. This led to an increase
in my own confidence as a teacher; and this in turn led my students to become even more confident, as they saw how much more at ease I was, and they themselves became more relaxed. This enabled me to reflect on the usefulness of evaluation as a tool to enhance my pedagogical methods. Light, Cox, and Calkins write on how the importance of self-reflection among students is equalled by the necessity of self-reflection by educators themselves (2009.), and it is this realisation which helped me most along my way to becoming a better teacher. At the end of the semester, I was pleased by the student feedback I received from the questionnaire I circulated to my groups. Out of feedback from 27 students, 100 per cent agreed that I ‘stimulated discussion on the subject’, with 96.3 per cent agreeing ‘strongly’. The comments written by the students elaborated on this, with one individual remarking that I was ‘very engaging and great at provoking thought and encouraging discussion.’ I was delighted that my students had felt I had successfully orchestrated discussion, as I believe it is possibly the most important pedagogical method within the discipline of English.

Through careful and unbiased evaluation, we are able to break the perception filter that leads both students and teachers to doubt their own ability within a new learning environment. The ‘fear of being found out’ can be reduced by a conscientious assessment of what is working successfully within the teaching environment and what changes could be made to improve things. By actively engaging with the problems within my own teaching, I was able to negate the idea that I was an imposter who did not have sufficient experience to be teaching in higher education, as the very fact that I was a reflective practitioner meant that I was doing the right thing by responding to my students’ problems and needs. When my student feedback was returned, I realized that I had been worrying unnecessarily; while my lack of confidence had influenced me to make changes within the learning environment, I realized that I was correct to trust my instincts. In order to be successful in our pedagogy, we must strive to see beyond the perception filter that tells us we are imposters, and trust that it is distorting how we feel the rest of the class perceives us; this is true whether you are the student, or the seminar leader.

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References


Rethinking ‘Why can’t these students write?’: Essay writing in undergraduate English seminars

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Abstract
I have taught seminars for the Medieval Literary Culture module at King’s College London for two years. The first year I taught the module, a requirement for first-year undergraduates majoring in English, I was surprised when it was time to mark the students’ written assessments; despite the fact that these students were majoring in English, a writing intensive discipline, a majority of the essays I read demonstrated a lack of understanding of basic essay-writing skills. For this reason, the second year I taught the module I decided to make essay-writing skills a priority in my teaching. This case study analyses the reasons for the students’ poor writing skills, explores different ways I attempted to improve these skills, and uses anonymous student surveys and feedback as well as teaching observations to examine the effectiveness of my teaching practice. I will be teaching this module again next year (for the third time), and so this essay ends with ideas on how to further improve my students’ writing skills within this particular module.

Keywords: essay writing, undergraduates, English majors, seminar teaching, development of writing

Introduction
Essay writing for first-year undergraduates is simultaneously familiar and intimidating. Superficially the task seems simple given how many essays one must write in secondary school, yet the university essay can strike fear into even the brightest of students. Norton (1990) comments, ‘Essay writing is regarded by many students (particularly those in the first year of a degree course) with a certain amount of trepidation,’ and conversations with my own first-year undergraduates corroborate this statement. Norton and my own students agree that essays cause anxiety primarily because of their importance to the student’s final mark. In secondary school a student might write two or three essays over the course of a semester that contribute towards the final mark, sometimes in conjunction with other types of coursework and classroom participation, but in university the importance of a single essay increases drastically, as it is often the only factor used to determine a student’s grade for a module.

I have been a Graduate Teaching Assistant (GTA) for Medieval Literary Culture, a first-year module in the Department of English at King’s for two years. During the first year I did not think a great deal about the essay-writing aspect of the module. As a seminar leader, I was meant to provoke and lead discussions; questions about essays could be dealt with during
office hours or consultations at the end of the semester. When it came time to mark the final essays, I was surprised to discover that despite the fact these students were majoring in English, a writing intensive discipline, a majority of the essays I read demonstrated a lack of understanding of basic essay-writing skills. For this reason, the second year I taught the module I decided to prioritise the teaching of essay writing. This case study analyses the reasons for the students’ poor writing skills, explores different ways I attempted to improve these skills, and uses anonymous student surveys and feedback as well as teaching observations to examine the effectiveness of my teaching practice.

In March 2012, when my students were preparing to write their final essays, I saw this headline in *The Telegraph*—‘Bright students “cannot write essays”, say Cambridge dons’ (Paton, 2012). This headline is not actually ‘news’ to English teachers, who, according to Caron (2008), ‘have lamented for decades that students are ill prepared for writing’ in the context of writing-intensive undergraduate classes. Paton’s article in *The Telegraph* quotes David Abulafia, Professor of Mediterranean History at Gonville and Caius College, Cambridge, saying he was ‘worried about the increasing evidence that undergraduates when they arrive, even at Cambridge, don’t seem to know how to write essays’. Robert Tombs, Professor of History at St John’s College, Cambridge, agrees, saying that students between the ages of 11 and 18 were ‘drilled into writing’, ie, taught how to reproduce formulas, not how to think and articulate their own ideas. Tombs says, ‘One of the things that one notices in student essays is how much damage has been done by the imposition of artificial structures for essay writing.’

The perceived lack of expertise required for teaching writing, as well as the assumed ability of students to learn as they go, encourages less experienced teachers to rely on formulaic methods, or to avoid teaching writing skills at all. Thomas (2000) remarks, ‘Most practicing English teachers were never educated to teach writing,’ and for myself, at least, this is true. While King’s Department of English requires GTAs to attend sessions about teaching first seminars and marking, as well as the King’s Learning Institute ‘Learning to Teach’ programme, none of these classes and workshops offers any information on how to teach your students to write better—nor is the topic even broached as a matter of concern. Burhans (1983) observes;

‘[M]ost college teachers of English seek that level in large measure to avoid as much as possible any contact with the ‘basics’ of reading and writing. Status in most English departments has traditionally been and remains directly proportional [...] to the perceived distance from teaching writing.’

Burhans makes this observation over thirty years ago but the situation has not changed. An article from 2007 points out that by limiting writing classes to one or two semesters in university (or none at all in the case of King’s undergraduate English majors), ‘we silently support the misconceptions that writing is not a real subject, that writing courses do not require expert instructors, and that rhetoric and composition are not genuine research areas or legitimate intellectual pursuits’ (Downs and Wardle, 2007); the assumption is that academic writing is ‘somehow universal’, easily learned and applicable in any module in any
The problem is not going away. Nelson and Weatherald (2014) discuss the concern over students leaving university unable to write either academic essays or professional reports, while writing remains a critical professional skill, whether one pursues a career in English or (to use their example) sociology. A social science study from 1994 (Bulmer et al.) reports that employers consider writing ability to be one of most desirable skills in potential graduate employees in the UK, and this does not appear to have changed. The top four hits of a Google search for ‘top ten skills employers are looking for’ are posts by a university careers service, a job search site, a ‘career empowerment’ site founded by a publisher/author/CEO, and Forbes; all four of these sources agree that writing (as well as critical thinking, a skill developed through essay writing) is essential in today’s job market (Woodcock, n.d.; Target Jobs, n.d.; Hansen and Hansen, 2014; Adams, 2013). As Zinsser (1988) explains, ‘Writing enables us to find out what we know, and what we don’t know,’ making it a highly desirable skill in all fields of study and research.

**Medieval Literary Culture: learning objectives and assessment**

Medieval Literary Culture (MLC) is a required first-year module for King’s undergraduates majoring in English. Students attend a one-hour lecture and a fifty-minute seminar each week, reading a range of texts across the medieval period—poetry, prose, hagiography, lyric, and drama. As a survey course, MLC is meant to introduce students to ‘concepts, ideas and approaches that can be studied in greater detail in the second- and third-years’ (King’s Department of English, 2013). Around 200 students take MLC each year, with varying levels of interest in the subject matter, most of whom having read very few medieval texts previously. As a seminar leader my primary responsibilities for the module are doing the planning and teaching for two seminar groups (one with 14 students, one with 16) that meet once a week for fifty minutes. I also conduct weekly office hours for the students and mark assessments at the end of the course.

The module’s assessment is a portfolio consisting of a 3000-word essay (75 per cent of the final mark) and a 1000-word commentary (25 per cent). Students submit assessments using TurnItIn, a cloud-based service for online marking and originality checking that allows complete anonymity for the students. All 200 portfolios are randomly distributed among six different markers, meaning that most of the work I mark is not by my own students. The assessment guidelines ask the seminar leader to write a detailed comment on both sections of the portfolio and provide feedback using interlinear ‘quick marks’ throughout, as well as giving numerical ratings for understanding and argumentation, selection and coverage, structure and style, and presentation (spelling, grammar, punctuation, references, bibliography).

The module’s timetable gives the students a generous amount of time to plan, write, and revise their coursework (with essay questions released by mid-February and the deadline not until the end of April). Seminars and lectures finish by the end of March, so even if the students wait until then, they have an entire month free of classes to complete their portfolios. When the essay questions are distributed, students are encouraged to consult with their seminar
leaders about portfolios during office hours. Students are also allowed to submit an essay plan (one page maximum) to their seminar leaders to receive personalized feedback. This year, despite my frequent reminders in class and emails outside of class, only four students signed up to do this, and one of these was a no-show. The three students who attended their consultations seemed to find them useful—but what about the other twenty-seven?

**The problem: failing to ‘crack the code’**

Studies show that undergraduates, first-years in particular, struggle with writing university-calibre essays. A four-year case study (Lillis, 2001) reveals that it is unclear to university students what is expected in a good essay. McCune (2004) says that even if students know what makes a good essay, the essay-writing process itself can be unclear. Read et al. (2001) observe that students feel as though they need to ‘crack a code’ in order to comprehend the conventions of academic writing. Their article refers to a study involving 100 students at the University of Keele, which found the greatest challenge for students was not knowing what was required of them when writing an essay (Hartley and Chesworth, 2000).

For advice on essay writing, King’s Department of English directs its undergraduates to the *English Language and Literature Guide to Writing Essays 2013-2014* (Henderson, 2013). While I have my doubts that many of my students have read all forty-two pages of this document, if any of them made it to page 6 they might have been comforted by these words: ‘By reason of your acceptance into a BA or an MA English programme at King’s College London, your excellent skills as a writer have already been recognised: thanks to your hard work at school […] you are already an accomplished writer.’ They might be comforted until, of course, they receive their first semester marks, which may be significantly lower than expected. While I have no doubt the words of the *Guide* are well meant, intended to put anxious first-years at ease, what happens when students receive low marks on essays or even fail? Did those students *not* work hard at school? Do they not have the advantage of already being accomplished writers? While the *Guide* does say that ‘there is still a vast amount to learn about how to write in a clear, authoritative, and persuasive manner’, it is unclear exactly *when* and *how* this learning will occur.

Ideally, students should receive feedback on their essay-writing skills prior to their final assessment, so that they are able to develop as writers without jeopardizing their final mark. This was not the case for one of my students from my first semester of teaching, a seemingly conscientious student who often made thoughtful contributions to discussions in my seminars. Since essays are submitted anonymously, I did not know I had marked this particular student’s essay until I received a frantic email from her, saying she had failed the module (6 August 2013). The student wrote, ‘I’m really shocked as I appreciate the coursework wasn’t my best, but at the same time I never imagined I could have failed! Really I’m worried, because […] I have no idea where I went so horribly wrong.’ She said that she did not understand my feedback and gave me some examples. Finally, she said,

‘I know I have major issues with my formatting, referencing and often with grammar and explanation, and there were areas where I made un-supported [sic] generalizations, and the commentary was weak, but […] I thought that the combined effort on the
whole would count for more than 39 marks!’

I immediately emailed the module convenor and asked for his advice. He replied in an email on the same day, telling me not to worry because he as well as an external examiner had double-checked all fails; I was not alone in thinking this essay did not deserve to pass. Furthermore, he said, ‘The problems the student acknowledges are not minor matters but absolutely key to producing good work.’ The student recognised that she had problems with her writing, referring to structure and format, references, grammar, argument, and supporting evidence, but unlike the module convenor, the external examiner, and myself, she thought her essay still deserved to pass.

Despite this clear failure to ‘crack the code’, whenever I voice my concerns about undergraduates’ essays to senior lecturers and professors, I am encouraged not to waste valuable teaching time on essay-writing skills. That is what the assessment is for—students learn from critical feedback on essays and gradually improve. However, my experience teaching and marking has made me uncomfortable with this procedure. Why were final marks determined through essays meant to demonstrate writing skills the students had not been taught? I decided that when I taught MLC the following year, I would make a point of teaching my students essay-writing skills, even if I had to limit this to five to ten minutes of each fifty-minute seminar.

Case study: teaching essay writing

In the first seminar of this year’s MLC module, I asked my students if they had ever received help with or instruction on writing an essay in university. All thirty students answered ‘no’. Even though this was their second semester in university, with the majority of them English majors, they still had not experienced a writing-intensive class or even advice within a non-writing-intensive class on essay writing. I asked the students via an anonymous survey to tell me at least one aspect of their writing that they wanted to improve, possibly drawing on criticism they had received on past assessments. I discovered that their concerns fell broadly into four categories: style, structure/argument, writing practice, and use/referencing of sources. Most issues fell in the second category: introductions and conclusions, creating an argument, coherent structure, etc. I decided to break down these different aspects of writing an essay, focussing particularly on arguments or thesis statements, and spend five to ten minutes on these topics each week. Below I describe my teaching practice for the four primary aspects of essay writing covered in my seminars: answering essay questions, writing thesis statements, using journal articles, and writing introductions.

Answering essay questions

One of the problems that my previous students had experienced was misinterpreting the assignment, when there was what Nelson and Weatherald (2014) describe as ‘lack of transparency and clarity between academics and students on what constitutes good practice’. Students would see a question such as ‘What forms of love can be found in medieval literature?’ and answer it with a grocery-list-style summary, providing every example of every kind of love they could find in their chosen texts. Lacking an argument or thesis statement, the students were guided by vague, ineffective questions.
I explained to my students that there are good and bad essay questions, and unfortunately they will encounter both during their time in university. Fortunately, it was in their power to rewrite and improve those bad questions. Using the Old English poem ‘The Whale’ as an example text, I wrote a very simple (what I would describe as ‘bad’) essay question on the board—‘What does the whale symbolise?’—and asked the students to consider its analytical component. What might have inspired a question like this? What does the person asking it really want to know about? How can you rewrite the question to make it more analytical and specific?

I demonstrated how I might rewrite the question twice, improving it slightly each time:

- **Original question:** What does the whale symbolise?

- **First rewrite:** What does the whale symbolise in terms of Christian allegory?

- **Second rewrite:** How does the poet use symbolism in his allegory, and what might that indicate about the poem’s intended audience?

After demonstrating a few examples, I distributed a homework assignment consisting of six essay questions, three of which I had purposely made vague, ‘bad’ questions. The students had to decide which essay questions were best and which ones needed refinement. I told them to rewrite the bad questions to make them better, then to rewrite them a second time to improve them even more.

Another seminar leader for the module, Sophia Wilson, observed one of these seminars. In her Peer Observation Report (28 January 2014), she said that I explained the structure of the essay questions well and was clear about what I expected from the students, taking them through the process step by step. However, she warned me about my timekeeping habits. I had planned to spend no more than ten minutes on the essay-writing portion of the seminar, but the discussion lasted about twelve minutes. This put me slightly behind schedule, which caused problems later in the seminar. Sophia voiced her concern that I did not allow enough time for discussing the text for the module. (I had used a medieval text that was not part of the module so that I would not give my students an unfair advantage on their assessments.) This was one of the first seminars, however, and as the semester progressed, I challenged myself to be stricter about timekeeping while continuing to work on essay-writing skills.

**Writing thesis statements**

Before I asked the students to write their own thesis statements, I thought it would be best if they knew how to recognise the qualities of a good one. I used a method described by O’Neill (2011) in a lecture on thesis statements, which used *Harry Potter and the Philosopher’s Stone* as an example text. I distributed a handout with eight of O’Neill’s thesis statements and asked the students to identify what the statement did well and/or what it failed to do. I stressed that a good statement should 1) identify the text, 2) state an argument (not a fact), and 3) identify
the evidence to be used in proving the argument. When I had marked essays the year before, I found that students had a lot of trouble doing the third item and sometimes even the second. One of O’Neill’s example arguments—‘The friendship between Ron and Harry is one of the most important relationships in Harry Potter and the Philosopher’s Stone’—is good in that it identifies the text and is an argument, not a fact, but it fails to provide evidence (ie, how the writer is going to approach the argument). I wanted the students to realise that sometimes thesis statements, like the essay questions, simply needed more refinement. I asked them to write a thesis statement for the poem ‘The Whale’ as homework, using one of the essay questions we had created in class or one of their own.

Fortunately, most of the students did the assignment for class the following week. A challenge I constantly face is making assignments seem relevant to the students (not just to me) so that they will do them. I do not have the power to make assignments count towards the final mark, so students need to perceive assignments as useful if they are going to do them, an issue explored by Sambell et al. (1997) and McCune (2004). The fact that almost all of the students (23 of the 26 present) actually did the assignment signalled that I had been fairly successful in making the assignment seem relevant.

I collected the students’ thesis statements (which were anonymous) and redistributed them so each student had another student’s statement. Then I asked them to provide critical feedback on the thesis statements, the way we had for O’Neill’s thesis statements the previous week. I collected the statements and feedback, and later that day I emailed them all the thesis statements, peer feedback, and my own feedback. The following week I shared a couple of thesis statements from the other seminar group, so they did not have to worry about offending anyone in the room, and asked them to critique the arguments, saying what was good and what needed refinement. This allowed me to discuss some of the common problems I saw with thesis statements in both groups.

**Using journal articles**

In the seminar before reading week, I assigned a journal article to read alongside the required text; this gave the students an additional week to read the article. The journal article focussed on one of the assigned texts (a medieval lyric), which meant I would not neglect the assigned reading while talking about the secondary material. Before providing the journal article to the students, I explained Weir’s pre-reading strategies.

Weir (2011) argues that undergraduates who have never been taught strategies to read journal articles will approach them the same way they would a popular novel, pushing themselves to read every word without first considering the writer’s intended audience, tone, and purpose. Weir suggests these pre-reading strategies for students:

Look at the title and headings.

• Consult the bibliography and footnotes to see what types of sources are used.

• Skim for potentially useful information, especially in the opening sentences of paragraphs.
Most importantly, consider why you are reading the article anyway (for a class discussion, research paper, etc.).

Weir encourages students to identify the habits of the writer before trying to comprehend the content or argument. In response to critics of his strategy who say that his method teaches students to read ‘cavalierly’, he says,

‘I need to read journals carefully and so do you, but most undergraduates do not. Some of them are akin to apprentices learning to approach a new tool for the first time, so let’s not scare them off. [...] If [...] we decode the secret of journals and students consult them more regularly, we’ll be the beneficiaries of our own good deeds.’

Weir’s attitude makes sense to me from my personal experience as an undergraduate. I remember being told to consult journal articles and finding them dry and difficult to follow. Often I would lose interest halfway through (as I tried to read every word) and come away without the information I really needed. Brookfield (2000) argues that one’s own experience is a valuable teaching tool, which he describes as ‘a powerful lens through which we can view our own practices as educators’. As a first-year undergraduate I found journal articles difficult to read without strategies to guide me, so why should I expect my students to find it any easier?

**Writing introductions**

The introduction is the most important paragraph of an essay; in addition to stating your argument, it provides context, signposts the evidence you will use, and (hopefully) captures the reader’s attention. For these reasons, the introduction is particularly challenging to write, and many of my students realised that this was an area that needed improvement.

Last year I observed Kathryn Maude, another GTA for the module, teach a seminar on essay writing. She distributed introductory paragraphs from three different essays to her students and gave them time to read and analyse them. She did not tell the students that all three paragraphs were in fact her own work: two from real papers she wrote while an undergraduate and one that she had made ‘purposely bad’ for teaching purposes. She asked her students which one they liked the best, and they discussed the strong and weak points of the three paragraphs. Some students thought that the ‘purposely bad’ introduction was the best. These students had attempted to ‘crack the code’ (Read *et al.*, 2001), the code being the desired conventions of an academic essay, and they had failed. What I perceived to be a paragraph of vague, unsupported generalisations, lacking a strong argument, these students considered to be a comprehensive list that answered the question and made it universally relevant.

During my office hour one student admitted that prior to our discussion on introductions, she had planned to answer the essay question exactly as the ‘bad’ introduction had done, listing every example of love in the texts in question and attempting to apply her statements universally across the medieval period. Now she knew that was in fact the opposite of what was expected of her. She did not have to ‘crack the code’ because I explained exactly what desirable essay-writing conventions were.
Feedback and reflection for the future

At the end of the semester I asked the students to fill out an anonymous survey on the usefulness of the essay-writing aspect of my seminars. I asked them to rate the different topics I taught on a scale of 1 to 4, 1 being ‘not useful at all’ and 4 being ‘very useful’. I encouraged them to provide further feedback using the ‘keep/skip/add’ format. The lowest-rating topic was journal articles at 3.2 and the highest was a tie between thesis statements and introductions at 3.6, meaning that every topic averaged ‘mostly useful’ to ‘very useful’. A number of students disliked the lessons on journal articles and bibliographies, and a few felt that I had spent too much time on essay questions (‘we won’t have a say over these’), thesis statements (‘important but too much focus’), and introductions (‘most of us do it in high school so it’s less useful’). However, other students specifically commented on the usefulness of these topics. One student said that ‘the research/thesis stuff we did [...] was really helpful—it helped me in all other areas of essay writing’. Some students suggested adding ‘more on forming an argument’, ‘a little more on the depth of essays’, ‘writing paragraphs and general essay structure’, ‘how to write a conclusion’, and ‘more help on where to start with secondary material’.

Overall, the students had found essay-writing lessons useful, and while some felt that these lessons were a distraction from the module’s content, I think this can be improved with better time management on my part. In the student evaluations issued by the English department, I received very positive feedback, thanking me for preparing the students ‘as well as possible’ for the module and for going ‘above and beyond [...] comparable seminar leaders’. Students said that the assessment preparation they had received was ‘really helpful’ and ‘very useful’. I also received suggestions such as ‘Look at the texts in more depth’, which indicated that Sophia’s observation about timekeeping was correct. I was devoting a bit too much time to teaching essay technique and taking away from the time to study the assigned texts. I will be a seminar leader for MLC again next year, and while I plan to continue incorporating essay-writing technique into my teaching, with better planning I should be able to structure these lessons around assigned texts. Also, with a year’s experience I will have a better idea of how long different exercises will take and can practise better timekeeping.

Teachers must make a critical adjustment like that suggested by Grise-Owens and Crum (2012), moving ‘from the problem-saturated, “Why can’t these students write?” to a solution-focused, “How can our curriculum improve writing skills?”’ Instead of being labelled (either by a teacher or by themselves) as ‘bad writers’, students should have access to the necessary resources and training to improve their writing. They must realise that there is room for improvement for everyone, teachers included. Moreover, as Thomas (2000) says, students must learn to see themselves, not their teachers, as the primary editors. It is essential that students learn not only what they need to improve in their writing but how to identify those areas of improvement themselves.

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The Unpredictability of Group Dynamics in a Discursive Classroom

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Abstract
Learning outcomes are now the guiding principles in the organisation of most Higher Education in Britain. They enable student mobility, assessment of courses for quality assurance purposes and the transparency of examinations processes for students. However, some argue that they limit the unpredictable creativity and unexpected outcomes that can arise from the group dynamics of the classroom. This case study draws on the research of educationalists like John Biggs, Joanna Allan, Ronald Barnett among others; psychiatrists like Wilfred Bion; and the anthropologist Gregory Bateson. It evaluates the application of group and network analysis as a key consideration for the environment, learning experience and teaching strategies in a small group, discursive seminar.

Key words: Learning outcomes, unpredictability, group dynamics, network analysis.

Introduction
This essay discusses the importance of the group dynamic in the development of a discursive seminar as a teaching environment, as an influence on students’ learning experience and as a primary consideration in the development of teaching strategies. It opens with an account of the development of learning outcome oriented teaching. This provides a context in which to understand the discussion of the advantages and limitations of the learning outcome oriented approach, which constitutes the second section of the essay. In light of this discussion the third section will present a reflective case study of an undergraduate seminar group. This case study will look at two examples of patterns of communication that emerged in the group. The first will demonstrate the formative effect that an inter-personal relationship can have on the group as a whole. The second will look at how the network of communication that develops in the group, as a whole, affects an individual member of the group and how they react to this. The essay will conclude by describing two ways that I will enhance my teaching practice in the future in light of the reflective case study.

Context: The Individuation of Teaching and Learning
Since the mid-1990s the teaching practices of British higher education have become increasingly individuated. This has been driven by an assortment of international political and economic forces as well as internal shifts within the culture and structure of British universities. Perhaps the most significant influence on this individuation has been the development of the Bologna Process. This process began as ‘The European Process’ at the Convention on the Recognition of Qualifications concerning Higher Education in the European Region held by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in Lisbon in 1997 (UNESCO, 1997). Initially it sought to encourage the
‘mobility’ of university students and staff and the ‘transparency’ of degree awarding structures. This process was developed in the Sorbonne Joint Declaration in 1998 – a declaration by the British, French, German and Italian Ministers for Education that built on the UNESCO Convention’s report, calling for a ‘progressive harmonization of the overall framework’ of University degrees (Allegre et al., 1998). It emphasized the importance of ‘comparison and equivalence’ of degrees as being key to mobility (Allegre et al., 1998).

In 1999 the European Process became the Bologna Process when a full meeting of the European Ministers for Education endorsed the Bologna Declaration1 (Ministers of Education, 1999). Like the UNESCO Convention and the Sorbonne Joint Declaration, the Bologna Declaration emphasises the importance of the mobility of university staff and students and the comparability of degrees. However the declaration also adds a more specifically economic framework to the discussion. It emphasizes the ‘competitiveness’ of the international university system and makes specific calls for ‘comparability of criteria and methodology’ in the assessment of courses and ‘quality assurance’ of degrees (Ministers of Education, 1999).

Since then, the European ministers have released a series of ‘communiqués’ that affirm and develop the project laid out in the Bologna Declaration (ENQA, 2014a). They also established the European Network for Quality Assurance in Higher Education (ENQA) in 20002 (ENQA, 2014b). The ENQA has expanded the general statements of the Bologna Declaration and subsequent communiqués and translated them into specific assessment criteria, methodologies and organisational practices. These are laid out in various documents including the Association’s Standards and Guidelines for Quality Assurance in the European Higher Education Area, first issued in 2005 and subsequently updated and reissued (ENQA, 2005, 2009).

The emphasis that the Bologna Process has, since its inception, put on ‘quality assurance’ and transferability has demanded an approach to the assessment of education that is both quantifiable and individuated. To this end ENQA’s Standards and Guidelines document explicitly endorses the use of learning outcomes. In their simplest form learning outcomes are, according to an advisory paper released by the Learning and Teaching Support Network (LTSN), ‘statements that predict what learners will have gained as a result of learning’ (LTSN, 2003). However, as a key signifier in a complex and evolving discourse, learning outcomes have developed a very complex meaning that will be discussed in the next section.

The ENQA advocates the use of learning outcomes in designing, publicising and assessing courses and degree programmes – indeed its insistence on the role of learning outcomes

1 Interestingly the Bologna Declaration suggests that the origins of the process can be traced back to the late 1980s when representatives of hundreds of European universities signed the Magna Charta Universitatum (1988). This is a surprising co-option because, although the Magna Charta emphasizes ‘mobility’, it actively asserts the universities’ independence from ‘political authority and economic power’ – both of which play an important role in the Bologna Process’ attempt to reshape the university.

2 The Network was renamed the European Association for Quality Assurance in Higher Education in 2004, however they continue to employ the original acronym ENQA (ENQA, 2014b)
at every level of course design and development heavily prefigures Bigg’s concept of ‘constructive alignment’ (ENQA, 2009; Biggs, 2003). Universities and other bodies throughout Europe have followed this tendency towards the use of learning outcomes as a foundation for quality assurance. In Britain the Higher Education Academy (HEA) has been in the vanguard of this movement, releasing guidance documents, like *Quality Enhancement and Assurance – A Changing Picture?*, and endorsing learning outcome oriented training courses in many Universities (HEA, QAA, and HEFCE, 2008).

**Literature and Research**

Brancaleone and O’Brien describe the current conception of what learning outcomes are:

> Learning outcomes describe an action or outcome that is demonstrable and assessable. In particular, they identify the skills and knowledge a learner can prove to have acquired after successfully completing a learning programme. These include the learner’s skills in knowledge and understanding, problem-solving, transferable or professional skills and generic skills. (Brancaleone and O’Brien, 2011)

Learning outcome oriented teaching developed out of the Rational Planning Method of curriculum design that was developed in the 1940s by people like Tyler (Tyler, 1949). Eisner, an educationalist at Stanford University, developed the basis for the modern conception of learning outcomes, in his 1979 book *The Educational Imagination*, by localising the outcome in what the individual student achieves, rather than in what the teacher intended the student to achieve (Eisner, 1979). Over the next thirty years learning outcome oriented teaching was developed into a cohesive field of research, and from the mid-1990s it became increasingly hegemonic in British Higher Education.

The significance of learning outcomes in the quality assurance process is that they are, by definition, quantifiable, transferable and individuated ways of measuring the success or failure of a course or programme. In his landmark book, *Teaching for Quality Learning at University: What the Student Does*, Biggs wrote:

> Learning outcomes are quantified into units of knowledge of equivalent value: a word, an idea, a point. The correct ones are counted and converted by a common currency, usually a percentage, to make them interchangeable. (Biggs, 2003)

Biggs indicates that learning outcomes provide a framework that enables a course designer to identify key pieces of knowledge, bundle them into definite and distinct groups and use them as the basis for course assessment. Moreover by parcelling learning outcomes into units of equivalent size they can be transferred not only within a degree programme, but anywhere within the university, and even to other universities – thus allowing the student international mobility. Key to this mobility is the individuation of the learning outcome. In 1996, even before the European/Bologna Process was underway, Allan emphasized the importance of ‘personal transferable skills’ in the development of the, then ascendant, ‘learning outcome movement’ in Britain (Allan, 1996). To ensure the transferability of learning outcomes they must be assessable and quantifiable in an individual student, indeed Allan explicitly rejected

Through the development of the European/Bologna Process, which initially sought to promote academic mobility, British higher education has become increasingly involved in the discourse of quality assurance. As Brancalone and O’Brien wrote ‘learning outcomes are results-driven and value-quantifiable – learning ‘outcomes’, literally, signify their concrete value’ (Brancalone and O’Brien, 2011). This theory of learning outcomes has been espoused in order to produce quantifiable criteria, to meet the demands for comparability and transferability that this discourse imposed. One result of this is the conception of education as individuated ‘student-centred learning’ in which a teacher supports and facilitates students, as individuals, in their discovery of knowledge. It is an approach very much suited to its time. However, the learning outcome oriented approach is not without its detractors.

The difficulty of prescribing the desired outcomes, objectives or even purposes of education has long been the subject of vociferous debates among educationalists. Learning outcome oriented teaching is only the most recent dominant discourse in these discussions. In the past discourses were oriented towards the discursive processes of the classroom or towards the transmission of subject specific information from teacher to student. One of the most common critiques of the learning outcomes approach concerns the necessary unpredictability of Higher Education.

Throughout the Twentieth Century countless educationalists have argued that many desirable functions of education, particularly small group discursive education, are ‘most difficult to define in operational terms’ (Powell, 1974). This difficulty is at the core of one of the most common critiques of the learning outcomes approach. A vocal set of critics, including Barnett, Cuthbert and many others in the Imaginative Curriculum Project, argue that Higher Education is necessarily creative and, therefore, unpredictable. They argue for, what Barnett called, ‘communicative’ and ‘epistemological pandemonium’ in the classroom (Barnett, 2000). This, they claim, creates a challenging environment in which new and unexpected ideas may emerge. By aligning a course to a narrow set of learning outcomes a curriculum can exclude or discourage the creativity and unintended outcomes which are, according to Cuthbert, the real aim of Higher Education. Indeed Cuthbert called for a ‘rediscovery’ of the work of Cohen and March, who argued that Universities must become ‘organised anarchies’ in order to deal with the chaos of the indefinable goals of education and the transformational processes of teaching and learning (Cuthbert 2002; Cohen and March, 1986).

While the learning outcome approach has many benefits, like enabling student mobility and objective quality assurance as well as demystifying the examinations process for students, Barnett and Cuthbert’s critique cannot be ignored. The classroom is an unpredictable place, particularly in small group and discursive seminars. Such classrooms are a proving ground for excitable, enthusiastic, self-conscious and peer-pressured students, driven by complex forces and relationships both inside and outside the classroom. As such ideas are articulated, connections drawn and skills developed that could not have been foreseen by the course coordinator when devising the courses learning outcomes. This unpredictability is often
related to the group dynamic of the class. The next section examines a case study of the group dynamic in a discursive seminar class – this will illustrate the unpredictability of a class dynamic as an influence on the learners’ experience and teachers’ strategies. As such the case study will examine how the relationships that form in a class effect the alignment of curriculum and outcomes.

**Case Study: Group Dynamics in Discursive Small Group Teaching**

This section will present a critical reflection on a seminar group that I led as a Graduate Teaching Assistant (GTA) at the English Department of King’s College, London. After outlining the nature and context of the seminar, this section will examine two patterns of interaction that were unpredictable and formative of the group’s discursive dynamic. The first is a collusive pairing of two students, a discursive relationship that developed between two students that came to dominate the class to both positive and negative effect. The second is the formation of a Batesonian cultural network of communication within the class and how this manifested in one student’s behaviour. This section will examine how these patterns of communication developed from or adapted to the teaching strategies that I employed in the classroom and the effect that these strategies, developments and adaptations had on the teaching environment and student experience.

The seminar ran once a week from September to December, 2013. Each seminar used short but significant literary and historical texts to open and inform broad discussions. The group met as part of a course entitled *Language in Time*. This was a core first year undergraduate course ostensibly dealing with the development of language and narrative structures. In practice the course was primarily concerned with the role of language in colonial and post-colonial relationships but touched on many other issues. The seminars were almost entirely discursive and concerned emotive and divisive issues, like imperialism, sexism and class politics. The intended learning outcome of the class was the skill of developing, synthesising and articulating arguments.

The seminar group that is discussed in this section consisted of eighteen students who met for one hour once a week over a ten-week period. The sessions were generally well attended and the average attendance was fifteen students. Seventeen of the students were in the first year of their undergraduate degree and one was in her second year of study. The meetings were held on Friday evenings and were the last class of the week for most participants. They were held in a room that was difficult to find and quite distant from the seminar rooms that the students attended immediately beforehand, as a result there were often late arrivals. Moreover the seminar room was hot, had no air-conditioning and faced onto a busy road so the windows could not be left open. This environment was conducive to an informal atmosphere that sometimes helped and sometimes hindered the class. The seminar ran in conjunction with a lecture series, held on Thursday morning, given by the course co-ordinator. As a core undergraduate course, the lectures were regularly attended by between 200 and 240 students.

The discussion in this section relies primarily on the notes that I took after each class regarding the focus of the discussion, the major participants and any notable incidents or ideas that emerged during the session. I will also use the information gathered through
student feedback forms and reports from two peer observers – the course coordinator, a senior lecturer at the English Department, and my seminar leader from the King’s Learning Institute. Throughout this essay I will refer to students using consistent pseudonyms.

In the initial sessions I attempted to tailor my classes to meet the specific interests of the students, which I had ascertained in the first session of the term. However, the first two sessions became a series of dialogues between myself, as the seminar leader, and particularly vocal students. Thus, although I attempted to engage all of the class members, most preferred to remain silent. I soon realised that I would have to develop a strategy to deal with this.

My doctoral research concerns the history of psychiatry, particularly mid-twentieth century group, interactional and transactional network analyses. Building on these psychological theories I began to approach the seminar group as an interactional network. Through my doctoral research I was already familiar with a good deal of literature about affecting group relationships in order to produce new dynamics, which could just as easily be applied to the classroom as the consulting room. After the third session I reconceptualised the class as a network of interactions, rather than a group of individuals. Instead of trying to tailor lessons to particular students’ interests, I concentrated on developing discursive relationships between students within the group. The response was remarkable and from one week to the next the classes went from tedious interrogations to lively discussions.

The first relationship that this section will discuss is a collusive pairing between two students, Jack and Jill. This was a formative relationship in the development of the group dynamic. It sometimes disrupted and sometimes advanced the class’ discussions. This essay borrows the term ‘collusive pair’ from the language of group-analysis. The phenomenon was first described by the group-psychoanalyst Bion in 1949 when he described such pairs in the following way:

Two members of a group would become involved in a discussion; sometimes the exchange between the two could hardly be described but it would be evident that they were involved with each other, and the group as a whole thought so too. On these occasions the group would sit in attentive silence... Whenever two people begin to have this kind of relationship in the group – whether these two are man and woman, man and man, or woman and woman – it seems to be a basic assumption, held both by the group and the pair concerned, that the relationship is a sexual one. (Bion, 2013)

The psychiatrists Laing and Esterson investigated the nature of this relationship further in 1958. They described how the mechanism of the pairing is such that neither person is his or herself in the pair, but rather they each adopt or react against the fantasy system which their partner projects onto them. What is interesting in this situation is not that either person, as an individual, is affecting the group but the relationship itself affects the group. In fact neither person in the pair acts as an individual but as a function of their relationship to the others externalised fantasies (Laing and Esterson, 1958).

This section will discuss the relationship between Jack and Jill, two students who developed a collusive pairing within the seminar group and who had a formative and transformative effect
on the group dynamic. Interestingly this pairing had both a positive and negative influence on the development of the group. Observed on the occasions where one of the pair was absent Jack and Jill were, individually, bright, friendly, sensitive and open to the opinions of others. Together, however, they became argumentative and stubborn. In the initial classes they energetically embraced inter-student discussion. As the discussions wore on they inevitably became the dominant voices ultimately adopting diametrically opposing sides, silently excluding other class members from their discussion. These debates often became entrenched with both students backing themselves into rhetorical corners. The class was both fascinated by the pair and resented their domination of the seminar. As a result when I intervened to bring the discussion back to the class I found that the atmosphere of the room had changed to one of silent irritation. The group simultaneously wanted the argument to continue but were angry that the pair was dominating their class. What is more the positions adopted by the pair were entirely inconsistent. One day Jack adopted a misogynistic position regarding the place of women in the workforce while Jill adopted a radical feminist position, later in the same class Jill adopted, without reference to her earlier argument, an ardently anti-feminist position while Jack argued that feminism was more necessary now than ever. On another occasion Jack made a passing comment in support of Franz Fanon, a post-colonial theorist who had been discussed in the lecture, prompting Jill to come out in support of jingoistic, early-Twentieth Century style British imperialism, a cultural tendency that she had railed against in the previous class. These arguments were clearly a function of their relationship, rather than the product of their conflicting views.

I realised I needed to intervene, but simply ending the discussion or attempting to divert it to include the rest of the group had turned out to be an ineffectual strategy because the class reacted poorly to this perceived imposition. Over time I came to believe that these arguments could be used to advance the group dynamic. At the start of the fifth session I spoke privately with Jack and Jill. I asked, tactfully, if they would help me broaden the discussion to include the rest of the group and be careful not to only engage each other. The two students looked unaccountably disconcerted and embarrassed by my request. However the strategy was extremely successful and Jack and Jill never descended into a one-on-one argument again. Instead, although they continued to take a leading role in the class discussions, any comments or questions that passed directly between them were immediately deflected onto other students and more often than not they refused to engage directly with each other. I was surprised at the effectiveness of this intervention, but when understood in light of Laing and Esterson’s discussion of collusive pairs it may be explained. According to Laing and Esterson (1958), although everyone in the group suspects that the collusive pair is involved in an unconsummated sexual relationship the pair often believe that the rest of the group is unaware of their unfulfilled desire. This may have been the case with Jack and Jill. The class would often, in the pair’s absence, refer to them together with a knowing look or even, on one occasion, explicitly describe them as ‘the class couple’. However, one student informed me that they never met outside class. It seems probable that they were unaware that anyone suspected that their arguments were flirtations. According to Laing and Esterson, a collusive pair’s realisation that the group is aware of them as a pair may lead them to actively try and deny their phantasy relationship (Laing and Esterson, 1958). Thus I had, unknowingly, confronted Jack and Jill with the social knowledge that they were a pair and they began to
deflect any interchange between them to deny their pairing to the group.

This collusive pair had a key influence on the development of the group dynamic. By initially becoming a focus for the group’s attentions they displaced the class’ attention away from me, as teacher, and onto their fellow students. This facilitated my shift away from an interrogative format to a discursive one, bringing the class closer to achieving its learning outcome. Moreover by intervening in the collusive dynamic that the pair developed, I was able to disrupt the pair’s dominance in the group and so get the class to open itself to discussion, rather than forcing discussion onto them.

The second pattern of communication that this section will discuss is the development of, what Bateson called, a ‘cultural network’. Unlike the inter-personal network which formed between Jack and Jill a cultural a network can be less readily identifiable. In a cultural network messages are transmitted from many persons to many persons and the ‘sources and destinations of the messages are... unknown’ (Ruesch and Bateson, 1951). According to Bateson messages in a cultural network are generally normative and often originate with an authority figure but are soon retransmitted by others within the network. My application of this idea to the classroom sought to address the problem laid out by Biggs:

No two classes are ever the same. You may be the same, but the students are not, so you strike a different deal with each group of students each time; in a functional sense, it is not even true that you are the same. Likewise, you and a colleague teaching the same class create a different system, because one of the components is different, the teacher, and accordingly each individual achieves different results. (Biggs, 2003)

Biggs characterizes this change as the teacher striking a different deal with each group of students, but this essay argues that the reality is more complex. A ‘deal’, to use Biggs’ word, is struck not between teacher and students but within the group as a whole. The basis of a social order or culture is laid down. The initial process is unspoken and largely unconscious. However, once it is laid down fragments of the culture are retransmitted, and so reinforced, incessantly in the group’s interactions. The ‘deal’ establishes the power, or lack thereof, of the teacher, which is the aspect identified by Biggs in the above quotation. However, it is infinitely more complex than this. It also establishes the format of valid interactions within the classroom, acceptable levels of dissent and the power relations between the students and their roles in class – who is talkative or quiet, who opens discussions, who shocks, who will not fight back and who polices this order. It is the last of these roles that this section will discuss.

In the fourth week of teaching, when I reconceptualised the group as a network of relationships rather than a group of individuals, I actively and self-consciously changed my role in the classroom. In the first three sessions I had taken an active role in questioning students. Thus, for instance, I might ask one student to interpret a specific section of text, and then ask a second student to elaborate on this or compare it with a section that had already been interpreted and so on around the class. After the third week I greatly reduced the use of this kind of questioning, although I continued to use it sparsely throughout the term, because it enabled me to assess the extent to which learning outcomes were achieved. Instead of using
this strategy, I encouraged the students to question and discuss with each other, using subtle comments or non-verbal cues to indicate what I expected of them.

One of the biggest obstacles to this change was a student whom I will refer to as Sarah. Sarah sought to police and enforce the social order that had been established in the first weeks of terms. She repeatedly interrupted interesting inter-student discussions with statements like ‘we are getting off topic’ or ‘I don’t think that’s what he [the teacher] meant’. She actively sought to draw me into the discussion as a voice of authority whose intervention would keep the discussion ‘on track’. This came to a head after two weeks when she approached me at the end of class and insisted that I should tell her the ‘correct’ answer to the discussion the class had been having. The discussion concerned the nature of meaning in language and whether words have some intrinsic connection to objects or whether they are arbitrary. I explained that it was a complex issue and that neither I nor anyone else had a definitive answer. I suspected that she did not believe my response. I then asked her about why she constantly sought to bring me into discussions. She explained that as the teacher it was my role to teach and that by handing the discussion over to the students I was ‘ruining’ the seminar. When asked what she thought seminars should be, she described the ‘question and answer’ format that I had employed at the outset of term. This, she told me in an exasperated voice, was common knowledge. As a first year undergraduate with no previous experience of seminars, Sarah had taken the format of the first seminars to be the standard format of all seminars. This conception did not rely on the teacher’s authority alone, but was reinforced by every seminar interaction that conformed to this format. Thus she had received a normative message from many sources within the classroom network, believed it and not only was she retransmitting it, but she was actively trying to enforce it at every opportunity. This is the classic interaction with a Batesonian cultural network.

This identification of a cultural network in a classroom is of key importance to understanding the group dynamic. Biggs identified a dichotomy foundational to the learning outcome approach.

What people construct from a learning encounter depends on their motives and intentions, on what they know already, and on how they use their prior knowledge. Meaning is therefore personal. What else can it be? The alternative is that meaning is ‘transmitted’ from teacher to student, like dubbing an audio-tape, which is a common but untenable view. (Biggs, 2003)

Biggs reiterates the same dichotomy elsewhere: ‘the learner’s perspective defines what is learned, not what the teacher intends should be learned’ (Biggs, 2003). However, the identification of a Batesonian cultural network suggests that there is another option that is not accounted for by Biggs – that the learning encounter is determined not only by the learner’s perspective but by the complex cultural network of the classroom. Meaning may be determined on the level of individual psychology, as Biggs suggests, but the weight given to the object of meaning is conditioned by the interactions of the network. Ideas, like the seminar format, that are constantly retransmitted, however inexplicitly, acquire great importance.
Conclusion: Recommendations for Enhancing Practice

A seminar may be a group of individuals with their own personal perspectives and histories, but the discursive classroom is very much more than the sum of its parts. This essay has argued, based on a reflective case study as well as literature and research in both educational theory and psychology, that seminar groups are complex inter-personal and cultural networks. These unpredictable networks profoundly effect the development of the class both as a group and as a collection of individuals. The first example outlined in the case study, for instance, demonstrated the effect that an inter-personal discursive relationship can have on individuals, who advanced arguments that they would not normally agree with simply to disagree with their partner, and on the group, who became fascinated by the pair. Similarly the second example discussed how the details of the group interaction affected an individual student’s experience of the class and this, in turn, effected how that student interacted with the rest of the class. Such interactions are entirely unpredictable and produce unforeseen outcomes in individual learners.

Reflecting on this case study has clarified three ways that I intend to enhance my teaching practice in the future. The first is that I will give careful attention to the format of my seminar groups. It is important to realise that such patterns can become expectations that may negatively affect a student’s engagement with the class. I will strive to forestall undesirable patterns of communication and to ensure that good discursive practice is emphasized in the class from the outset. This could be realized by explicitly explaining the intended discursive format, and the rationale behind it, in the first session of term. Another way of realizing this would be to refuse to immediately fill the silences that sometimes occur in seminars. This would build up an expectation among the students that filling silences is their duty.

The second way that I will enhance my practice is that I will give special attention to the development of relationships within seminar groups. The development of the group dynamic in a discursive seminar should, this essay contends, be one of the primary strategic concerns of a seminar leader. As discussed in the case study, it was only through the identification of the relationships and patterns of communication within the class that I was able to intervene and facilitate the development of a discursive environment in the classroom and to ensure a positive learning experience for the students. I will develop this awareness by keeping notes on the development of the discussions in the classroom – which speakers are dominant, who is changing the direction of the discussion and how are the others reacting etc.

The third and final way I intend to enhance my practice is to accommodate both intended and unintended learning outcomes. Learning outcomes are an important feature of the contemporary world of higher education but the discursive classroom is a complex, creative and unpredictable space. While it is important for a class to achieve its learning outcomes, it is equally important for a teacher to acknowledge that the class will also achieve unintended but still desirable outcomes. I will achieve this enhancement by facilitating the fluid development of the class dynamic and by not over prescribing the intended learning outcomes of the class or course. It is important to give the class clear learning outcomes for them to bear in mind during the course; I believe it is equally important not to reinforce these outcomes to such an extent that they become the only outcomes that the students can achieve.
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ENQA, European Association for Quality Assurance in Higher Education (2014b) ENQA History. ENQA, European Association for Quality Assurance in Higher Education.


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