

Editorial

Jacqui Taylor

AS PROMISED in my last editorial, I have now put together an Editorial Board representing academics, researchers and teachers of psychology across a broad range of interests and expertise. Over the next few months, we will be identifying ways to enhance the presence of *Psychology Teaching Review (PTR)* nationally and internationally and we will be updating and revising procedures – if you have any suggestions please let me know! I'd now like to briefly introduce the articles within this issue.

The first nine papers came about following an invitation to presenters to submit a paper based on their talks at the HEA STEM Conference, held in April this year at Imperial College. A full introduction to these papers, with an insightful review of the current context of psychology within STEM, is provided within the introductory article by Julie Hulme et al. The papers cover the key issues that many psychology teachers and academics are facing (e.g. large class sizes, uncertain recruitment, student satisfaction and employability). In discussions with presenters from other STEM subjects, it is clear that many similarities exist and although approaches to address these issues vary widely, continuing collaboration between those working in STEM subjects at the Conference is a positive direction.

In addition to these themed papers, we have five individual papers. The HEA STEM conference was a useful platform for exploring the major topical issues within Psychology education, and it is clear from the other papers published in this issue of *PTR* that the discussions there were representative of the wider interests of the psychology academic community. Development of students' skills is a clear theme for the first three papers. The work by Lucy

Betts and her colleagues, on using Turnitin to develop student's writing, highlights a positive way to discuss plagiarism with students and at the same time enhance skills. The conceptualisation of students as researchers, in the paper from Pat Roberts and her colleagues at the University of Bedfordshire, will resonate with many of us and illustrates how students can become partners in our research. Steve Jones and Julie Allen present their research using focus groups to explore the experiences of students' library and evaluation skills and identify a series of recommendations to facilitate the transition into HE and to enhance the library skills of psychology students. Supporting students in developing their understanding of research methods, through supportive and engaging teaching, is a theme of John Barry's paper, and student engagement is again emphasised in the paper by Anne Emerson and Gareth Williams on spiral learning.

The next issue of *PTR* will feature papers presented at the Division's Inaugural Conference, held during the British Psychological Society's Annual Conference this year, with the theme, 'Supporting student engagement in a changing economic climate'. If you have conducted research in this area, please consider sending it to us for consideration, as it would be great to have this for the Spring 2013 issue of *PTR*.

In this period of transition between editors, I would like to thank the team helping me to produce the last issue and this issue of *PTR*, and in particular: Liz Winters for co-ordinating and contributing to the book reviews; Jim Hartley for his compilation of abstracts, and Martin Reeves and the Preparation for Publication (P4P) team at the Society whose help is invaluable in finally producing copy! Last and not least, I'd like

to thank Stella Williams for her tireless support over many years to produce *PTR*, and who is standing down from her role as Editorial Assistant. I will be introducing the new assistant in my next editorial, but in the meantime please continue to send articles to me personally or to the address ptr@bps.org.uk. If you are interested in becoming involved with *PTR*, please consider joining us as an article reviewer or join our book review team – details are on our webpage <http://dtrp.bps.org.uk/>

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The science of enhanced student engagement and employability: Introducing the psychology stream of the inaugural HEA STEM Conference

Julie Hulme, Jacqui Taylor, Mark N.O. Davies & Peter Banister

THE Higher Education Academy (HEA) is committed to enhancing the quality of learning and teaching for all university students in the UK, and the inaugural conference for the Science, Technology, Engineering and Mathematics (STEM) subjects, held in April 2012 at Imperial College, London, aimed to showcase research and evidence-based educational innovation in the STEM subjects, including psychology. The research presented in this issue of *Psychology Teaching Review* includes nine of the papers presented at this conference, which demonstrate the high quality pedagogical work taking place in our discipline. Before introducing these papers, we will discuss the context in which the conference took place, highlighting the place of psychology within STEM.

Since the Browne Review (2010), Higher Education (HE) in the UK has been experiencing a period of unprecedented change. The increase in undergraduate student fees alongside a cap on student numbers may dramatically change both the types and numbers of students who enter university in England from September 2012. At the time of writing, university applications for 2012–2013 are down by 7.7 per cent on last year (UCAS, 2012), and there are concerns that working-class, mature and minority ethnic students are being dissuaded from entering HE by the increased fees. Likewise, fees are likely to impact on student choices prior to entry and their expectations once

they arrive. Concurrent with the potential reduction in student numbers and the rise in student expectations and consumerism, the National Student Survey (NSS), the various university league tables and the new Key Information Sets (KIS) will allow students to compare universities in an unprecedented way. Students accruing large amounts of debt in order to study for degrees will be looking for the best possible value for money and the best available learning experience. In addition, they will be concerned about their ability to repay their loans, and as such, employability and skills development are higher on the agenda than ever before. Universities are, as a result, competing in a new type of market place, where students are harder to recruit and are more discerning. Unsurprisingly, universities are keen to increase their attractiveness to potential students through demonstrating their excellence in learning and teaching, high levels of student satisfaction, and the benefits to students of studying with them.

Psychology is very well positioned to respond positively to these opportunities in learning, teaching and research. Psychology traditionally has been popular with students; according to the Quality Assurance Agency (QAA, 2010), psychology is the largest scientific discipline, and the second largest discipline overall. Furthermore, the quality of psychological research undertaken in the UK has recently been judged to be comparable to the best in the world (ESRC Inter-

national Benchmarking Review, 2011). Whilst there is no reason to predict a decline in popularity with students at this stage, it is important to recognise some key challenges that face psychology as a discipline in the face of the more general changes within HE. We need to demonstrate to students the specific value of choosing psychology degrees over and above other options. Having recruited our students, we then also need to ensure that we retain them, engage and satisfy them, and that they succeed. This is often crystallised in terms of the student experience or 'added value' that surrounds the course on paper. The importance of high quality learning and teaching experiences for our students cannot be underestimated, and determining 'what works' in learning and teaching, through rigorous research, is of paramount importance for quality enhancement (Kember, 2000). It is especially important that pedagogic research and innovation are facilitated at a time when the fundamental values of higher education are challenged, and such innovation may be under threat (Naidoo & Jamieson, 2005).

One of the principle measures used by students in choosing university courses comes from the NSS, the results of which are used to inform a variety of university league tables (for example, *The Times*, *The Guardian*, and *The Complete University Guide*). The NSS is administered to all undergraduate students in the final year of their degrees, and through a series of 22 questions, attempts to measure student satisfaction with important aspects of their learning experience. Questions relate to the quality of learning and teaching, assessment and feedback, academic support, organisation and management, learning resources and personal development, as well as overall satisfaction. The NSS is not without its critics (for example, see Cheng & Marsh, 2010), but nevertheless has been the main measure of university performance since 2005, and universities are well advised to attend to their own ratings and to use the data to attempt to enhance learning and teaching within their

institutions. Two papers in this issue demonstrate ways of improving our understanding of the NSS. Chris Pawson presents a fascinating insight into the differences between STEM and non-STEM students in terms of their satisfaction ratings; especially intriguing are the sex differences he reports, and the practical implications for learning and teaching of science subjects including psychology. Chris Gibbons has investigated the influence of personality and stress, amongst other things, on NSS scores and student engagement, and has found, perhaps unsurprisingly, that the picture is complex. Of particular concern are his findings that student motivation to learn is negatively correlated with student satisfaction!

Student engagement with the learning experience is influenced by the teaching methods employed (Ramsden, 1992; Biggs, 1999). This is clearly demonstrated by Naomi Winstone and Lynne Millward's first paper in this issue, looking at ways of increasing student engagement in lectures through interactivity and formative assessment. Interestingly, not only can student engagement be increased in this way, but staff satisfaction with large-group teaching also improves. Content is another influence on engagement, and students can find learning about research methods challenging. Two of the papers here address the ways in which psychology students engage with the scientific content of their studies. Tom Dickins and Peter Donovan present a stimulating and innovative approach to engaging students in scientific thinking about psychology, through delivery of an animal behaviour fieldwork course, which helps students to develop their understanding of hypothesis testing, operationalisation of variables, and scientific method. Whilst not every department may be able to fund psychology field trips, the ideas contained within their article could be adapted to use of video clips, or excursions to the local park.

Research into the student experience, then, can help us to address issues of student

expectations, particularly in the light of increased fees, and the resulting good learning and teaching can help us to produce motivated students, and hopefully more engaged and satisfied students. However, fees have raised other concerns about student (and parent) expectations of university education, particularly around employability. Graduate employability is measured six months after graduation through the Destination of Leavers in Higher Education Institutions (DLHE) statistics; psychology graduate-level employment is relatively low compared to other subjects, with 43.56 per cent of psychology graduates in full-time employment at the census point compared to 51.39 per cent as an average for all subjects (HESA, 2012). The argument can be made that this is, at least in part, due to the nature of psychology. Unlike, for example, medicine, a psychology degree does not equip the graduate for direct entry to a profession, and competition for the requisite postgraduate professional training to become a psychologist is intense. According to the QAA (2010), only 15 to 20 per cent of psychology graduates enter careers as professional psychologists. Six months after graduation, therefore, many of our most able graduates will be seeking to develop their skills and experience of working with a client group in order to compete for places on postgraduate training courses, and will not be employed formally at graduate level (Van Laar & Udell, 2008). This may be evidenced by further data from the DLHE statistics; 3 per cent of psychology graduates are undertaking voluntary or unpaid work only at the census point, compared to 1.95 per cent of graduates across all subjects (HESA, 2012). As a direct response to this, the British Psychological Society are currently undertaking a longitudinal study of graduate destinations over five years, to provide a better insight into psychology graduate careers.

However, experience seeking may not be the only reason for the low recruitment of psychology graduates to graduate-level posi-

tions as measured by the DLHE statistics. According to a HEA analysis of the 2011 NSS data (HEA, 2012a), psychology students appear to be less confident about employability-related skills such as 'present myself with confidence', 'communication skills' and 'tackling unfamiliar problems' (questions 19 to 21 of the NSS) than other students, other STEM students, or students of salient comparator disciplines such as biology and sociology. Whether real or perceived, lack of confidence in these skills may result in underperformance during selection processes and so directly impact on the employability of our psychology graduates. Thus improving both psychology graduates' employability skills, and their own awareness of those skills is an important priority for providers of undergraduate psychology education.

The British Psychological Society (BPS, 2011) accreditation of the psychology undergraduate curriculum places a very strong emphasis on the scientific nature of psychology. Students typically engage with substantive research methods training, make extensive use of statistics and general numeracy skills, develop strong computing skills, and carry out their own experimentation, often in the context of a variety of theoretical models including cognitive, social and biological psychology. They learn to present research and data in an organised, clear and scientifically appropriate report format. In their final year each student will carry out an 'independent and substantive' piece of research in the form of their final year project. The skills required to undertake these elements are very characteristic of any STEM subject, and at a time when the government is decrying the numbers of graduates with STEM skills (House of Lords Select Committee on Higher Education, 2012), one might expect that psychology graduates would be in exceptionally high demand. However, psychology graduates achieve a range of other skills which are perhaps less likely to be associated with STEM subjects, and may be more tradition-

ally found in humanities graduates (QAA, 2010). Psychology students are frequently engaged in activities such as group projects, essay writing, and presentations, all of which help to develop communication skills. They learn about the nature of human diversity, and they are trained to think critically and to reflect on their own development and learning. The subject content of psychology encourages an awareness of interpersonal issues, of ethical practice, and generally raises social awareness. These supposedly 'softer' skills may be enhanced in some programmes in which students engage in extensive personal development planning, option modules providing training in counselling theory, or work placements, especially with vulnerable client groups.

This combination of traditional science and humanities skills led Trapp et al. (2011) to describe psychology as a STEM+ discipline, offering students the advantages of studying a STEM subject with added value from skills such as communication. Psychology graduates are viewed as informed, scientifically literate citizens who can critically appraise evidence to come to an informed view on a variety of issues, and can communicate that view with diverse audiences. In addition, Trapp et al.'s report highlighted the importance of the development of 'psychological literacy' (Cranney & Dunn, 2011), the ability of psychology graduates to use psychological understanding and skills in everyday life, to solve problems and to benefit their communities and workplaces, even when not employed in professional psychology.

Thus it is apparent that psychology as a discipline has a great deal to offer its students and graduates in terms of skills, employability and more generally. Our first challenge, then, is to ensure that students not only develop these skills, but that they become fully aware of their abilities, and are able to articulate them. The pedagogy of employability is becoming well developed in a generic context (see, for example, HEA, 2012b) and it is heartening to see that

psychology academics are engaging in discipline-specific research to develop a strong evidence base that we can use within our own teaching for employability. Within this issue, two papers exemplify this approach. The work of Carolyn Mair on enhancing students' metacognitive skills through student reflection highlighted ways to encourage students to think about their skills both during the degree and importantly to continue after the degree. The paper from Rachel Bromnick, Ava Horowitz and Daniel Shepherd discussed the benefits of volunteering for psychology students, and interestingly part of the presentation from Daniel highlighted a student perspective.

The development of student skills can also be enhanced through peer learning (Topping, 2005), and three of the articles in this issue demonstrate different approaches to facilitating this. Anna Stone, Claire Meade and Rosemary Watling have combined the concepts of peer learning and promotion of employability by employing final year psychology students to mentor first years who were seeking additional support with learning about research methods and statistics. This innovative idea has the potential to engage first years with a sometimes challenging area of the course, whilst developing the leadership and communication skills of the third years in way that directly feeds into employability. Naomi Winstone and Lynne Millward's second paper provides an excellent introduction to the principles of constructivist learning, and utilises psychological models of reducing sociocognitive conflict to promote learning from peers within a cohort during formal classes. This type of approach can sometimes be time consuming, and Jacqui Taylor presents her ideas on the use of online discussions alongside face-to-face teaching to promote similar learning experiences. Usefully, Jacqui also describes her assessment methods, and reflects on the possibility that automated assessment may one day be possible.

In summary, academics, researchers and teachers in psychology are keen to teach our

students well, to engage them and motivate them to become independent learners, and to develop their skills in ways that will support their lifelong learning journey and their employability. As a discipline that is interested in human behaviour, cognition and experience, we are exceptionally well placed to study 'what works' for students, and to apply our rigorous research methods and theoretical frameworks to understanding how to best provide them with high quality learning and teaching experiences. Our final challenge is to ensure that the best practice we identify, and the evidence that supports it, is disseminated as widely as possible. Trapp et al. (2011) note that, in a competitive HE market, collaboration may be challenging, but that in sharing knowledge, the discipline of psychology is strengthened, and we all benefit. The HEA STEM conference papers highlighted within this issue of *Psychology Teaching Review* demonstrate the validity of that observation. The conference brought together psychology academics from universities across the UK, along with technical staff (Dickins & Donovan) and students (Stone et al.; Bromnick et al.) working in partnership, under the banner of the HEA. The team who reviewed and planned the psychology content included Julie Hulme, Discipline Lead for Psychology at HEA, Jacqui Taylor, Editor of this publication, and Mark N.O. Davies, the Chair of the Association of Heads of Psychology Departments. Dr Peter Banister, the current President of the British Psychological Society, opened the psychology strand of the conference with a stimulating talk on the scientific nature of psychology and participated throughout. These types of partnerships, and the sharing that results from them, will help the psychology community not only to cope, but to grow and develop, during these challenging times for HE.

Acknowledgements

The full proceedings of the HEA STEM Conference are freely available at: www.heacademy.ac.uk/events/detail/2012/academyevents/STEM_annual_conf

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Animal behaviour fieldwork: Introducing psychology students to the process of science

Thomas E. Dickins & Peter Donovan

In this paper we discuss the development and running of a residential animal behaviour field trip. The trip has a number of elements that challenge and develop the students. First, this trip is open to students at levels two, three and M. This allows us to engineer a certain amount of peer assisted learning. Second, the students live together and have to cook and maintain the property. This leads to teamwork and sensible methods of dealing with disagreement. Third, the academic work is curiosity led. We expose the students to a number of field sites and allow questions to naturally emerge. From these questions we can develop project hypotheses. Fourth, the students develop appropriate methods for observation and analysis. Fifth, theory is gradually introduced through discussion in the field, the accommodation and at a drop in surgery at the tavern where they can talk one-to-one with a staff member. Finally, when back at university, they can engage in more formal supervision to complete their project. The benefits of this approach are many but include developing a sense of the scientific process, which is lacking in the more prescriptive class-based assessments that typically form research methods teaching. Finally, all of the students report feeling better prepared for future scientific project work.

Keywords: Fieldwork; ethology; scientific method; observational method.

THE British Psychological Society (the Society) accredits undergraduate psychology degrees in the UK, advising on the curriculum, and conferring the Graduate Basis for Chartered Membership upon graduates. The Society recommends a broad representation of types of psychology and the provision of quantitative research methods training up to multivariate general linear models. The Society encourages a focus upon experimental method, but makes some concession for qualitative methods. At the University of East London (UEL) core research methods training is conducted in the first two years, preparing students to enter the final year and conduct an independent research project. Students are exposed to lectures on statistical analyses, and are given structured exercises to do, which simulate a full experiment, generating data that can be analysed. UEL does not provide students with the experience of

developing a hypothesis and designing a study to test it. What is more, students are not exposed to the relationship between observational and experimental studies, as the Society do not demand it. We regard this as problematic for an empirical discipline.

In this paper we discuss the development of an optional module in animal behaviour fieldwork that has been designed to redress the balance between observational and experimental work, as well as to guide the students from initial curiosity to a full study. We begin with a brief history of the fieldtrip, and then a detailed account of the first trip, our pedagogical philosophy and a description of the diet of activities each student is exposed to. We discuss the problems students encounter and the methods they learn, how we have adapted to this and a summary of the students' views. We conclude with our future plans.

History of the fieldtrip

Each June, from 1979 to 1999, David Dickins (Psychology, University of Liverpool) ran a fortnight long animal behaviour field trip on Lundy island, off the north Devon coast. His ambition was to introduce students to field ethology and an evolutionary perspective on behaviour. The trip enabled Level 2 students to complete a short project and Level 3 students to complete their final year thesis. David Dickins collaborated with colleagues within his own department, and also those from the neighbouring Liverpool Institute of Higher Education, bringing this experience to a diverse array of students from Merseyside, and also leading to research on siblicide in kittiwakes (*Rissa tridactyla*; D.W. Dickins & Clark, 1987). To many of these trips he brought his eldest son (the first author), exposing him to the key lessons of this science, as well as teaching him the detail of the island's behavioural ecology. The end result was a happy collaboration jointly teaching on the island in the 1990s.

The initial UEL fieldtrip

In July 2009 we ran the first Lundy field trip for UEL. This was the result of discussion with David Dickins, our then Dean, David Rose, and Stephen Lea at Exeter, who also had much experience of teaching on the island. Our Dean was persuaded that a Level 2 option in animal behaviour would be beneficial to students who had a particular interest in this area, and following a full risk assessment, the Dean part-funded the trip, the rest being paid for by the students.

The first trip was modelled very closely on past practice. The basic philosophy was to immerse students in the phenomena of animal behaviour and to allow them to freely think and comment on what they observed. These observations would be questioned in an increasingly detailed manner, gradually allowing students to realise inadequacies in their first notions as well as the strength of their own observational skills. No question was ever treated as foolish, but rather seen as a seed to generate more questions, with a

mind to testing them in the field through systematic observation, and later, perhaps, experiment. Furthermore, staff exposed their own observations and thoughts to the students, questioned each other publicly, and in this way acted to build a team spirit and a sense of a shared objective. We return to these issues below.

Students were recruited from the autumn of 2008 through a 10-minute presentation to Level 1 students, mass emailing and word of mouth. The trip was the first Level 2 option that students could take, hence our targeting of Level 1 students. The result was a diverse and representative group who were called together for two meetings in the spring of 2009. The first was a briefing on the island, what to expect and health and safety issues. The second was a trip to Richmond Park.

The Richmond Park trip served two functions. First, it enabled us to teach the students how to use optical equipment. Second, it allowed us to assess and adjust how the students operated in a relatively wild area with free roaming animals. The day began with an equipment practical, followed by a walk. On this walk we would stop and ask students to report on what they could see, to describe it, and to hypothesise about the possible function of the behaviours. We would question more anthropomorphic suggestions, and focus the descriptions on increasingly relevant aspects of the observation. On the return we debriefed the students. For many this was entirely novel and they were clearly excited by the prospect of Lundy, which they knew would be far wilder. As such a third function, to maintain enthusiasm, had emerged.

We landed on Lundy on a Saturday afternoon, established our accommodation (a converted barn in the village) and then went on a walk. This was organised in much the same way as the Richmond walk, and served the same purposes but also introduced the students to the species on the island. The next day was an extensive tour of most of the island with planned stops where

students were asked to observe particular species, write notes and speculate on function, with a mind to bringing these observations to a seminar after dinner in the barn. At this seminar we asked each student to present the most interesting observation they had made that day, and we encouraged the other students to ask questions. Our own questions were not too challenging but were focused upon how the observation might be turned into a more systematic study. We also pointed to various sources of information that we had brought with us, and those that were available in the Lundy Field Society Library in the tavern.

The next two days were dedicated to the students working in small groups to produce a far more detailed account of a species, to generate specific questions for possible testing, and to begin keeping a field diary of their work and related events. Students were required to note their daily plan in a safety logbook so that we knew where they would be and when they were due to return. This enabled us to plan a walk taking in all the student study sites. At each visit we would spend time discussing the developing ideas and we would introduce the concept of an ethogram – the exhaustive list of behaviours a particular species will produce – and how to begin creating a partial ethogram with tight motoric or functional definitions (Martin & Bateson, 2007). This methodological lesson in the field informed the evening seminars. We allowed students to present in groups in order to make them feel less exposed, as our questions were becoming more focused and challenging. For example, where students had opted for functionally described behavioural categories they were essentially making a theoretical claim about the behaviour, and we would ask why they had made this claim, what evidence they might have, and how they might deal with alternative accounts.

The next stage was for the students to develop a project over the remainder of the week, with a mind to having a rest day on Friday. They were encouraged to work in

groups, but to ask slightly different questions from one another. Again, we visited each field site at least once each day, discussed the developing behavioural categories, and now issues around sampling decisions and the precise focus of the project. These discussions were the core business of the evening seminar but we began to introduce our own observations that we had made, and discussed some of our own interests, asking for the students' views and opinions. In this way we emphasised that we were all working toward an understanding as a team, and that we did not necessarily know the outcome.

By the end of the first week students were increasingly requesting individual meetings to discuss the details of their emerging projects. At these tutorials we would help each student to sharpen their focus, point to relevant literature, and begin to discuss data analysis. These students had only one year of research methods training, so we did not act to extend their statistical knowledge but rather to use what they had in order to deal with the kinds of data they were collecting. This put some constraints on their projects, but also presented an opportunity to experience how practicing scientists use statistics as a tool.

The second week saw the students working hard to collect data for their projects. The daily round of staff visits to field sites continued, and the evening seminars saw discussion of various issues in ethology. The tutorials began to focus upon the writing of the projects and this supervision was continued back in London before submission in early October.

Types of projects, problems and solutions

Lundy is home to a number of species. Nesting seabirds include herring (*Larus argentatus*), lesser black backed (*Larus fuscus*) and great black backed (*Larus marinus*) gulls, fulmars (*Fulmarus glacialis*), kittiwakes, razor-bills (*Alca torda*), guillemots (*Uria aalge*), puffins (*Fraterecula artica*), shearwaters (*Puffinus puffinus*) and shags (*Phalacrocorax*

aristotelis). Oystercatchers (*Haematopus ostralegus*) are also abundant. Carrion crows (*Corvus corone*), ravens (*Corvus corax*), peregrine falcons (*Falco peregrinus*), swallows (*Hirundo rustica*), and a variety of other passerines are also found on the island during June or July, when we visit. There are also mammals, including Soay sheep (*Ovis aries*; a wild species, once domestic), domestic sheep, goats (*Capra hircus*; feral), Lundy ponies (semi-managed), Sika deer (*Cervus nippon*; wild) and Atlantic grey seals (*Halichoerus grypus*). For the most part student projects have focused upon the Soay sheep, seals, ponies, herring and lesser black backed gulls. But the swallows and goats have also been studied.

Each species presents its own problems. The gulls nest in large colonies. When the students are first confronted with the bustling cacophony of birds they find it hard to focus upon particular behaviours. We tackle this issue by encouraging students to draw a schematic map of a colony on the west coast, with an excellent line of sight. Students soon notice organisation within the colony – more densely packed nest sites in the centre, more dispersed at the periphery; what seemed to be a colony of herring and lesser black backed gulls begins to look more separated, with the herring gulls adopting the steeper stone chute that funnels to the sea, and the lesser black backs the grassy slopes leading to it. More careful examination reveals chicks in various sheltered spots, and adults standing in some relation to them. They note size differences between the birds – the lesser black backs are smaller – and differences in interaction between and within species. We ask them to speculate on the coloration of the birds – why are they darker on the top of their wings and white underneath? Why is there a red spot on the lower mandible? The students are inventive, and some hit on key ideas in the literature to do with camouflage from prey – to fish in the sea the sky looks white – and predators – to the falcons above the sea is grey. We then introduce notions of adaptation and evolu-

tion and reflect upon the behaviours and social organisation within the colony using these concepts. The most recent gull projects worked at the colony looking at differences in aggression across both species of bird, across position in the colony, and as a function of nest attendance, which was taken to indicate parental investment. The students isolated sample nests, using their maps, and adopted a scan sampling technique accumulating in excess of 45 hours of data during the field trip and revealing significant effects.

The Soay sheep are sexually dimorphic, presenting an opportunity to investigate sex differences. They move about the middle and northern part of the island throughout the day in a fission-fusion pattern, but often gathering in mixed ewe and lamb clusters and all ram clusters, with some juvenile males. Students have looked at differences in grazing patterns and vigilance across these two constituencies, as well as flight distance with some ethical field experiments that simulate the approach of brightly clad day-trippers. In their early observations the students often refer to groups of Soay. When asked to indicate a group they point, or state where they are. Quite often the group of five sheep they are looking at are close to more sheep, perhaps having begun to separate or to join. This presents an interesting question – what is a group? Students learn that this can be determined purely on physical indices, such as body lengths apart, or upon functional assumptions around, for example, crèche behaviours in females, and sexual isolation when outside the rut. The students learn to be cautious about their categories and definitions as a result and to look for corroborating measures for any functional claims they might make. Similar issues are raised when studying the goats.

Seals are tremendously difficult to work on as marine mammals and the only opportunity to study them is when they bask on rocks or float and swim in the coves. As a consequence the students can only look at the distribution of behaviours about a cove

and measure the effect of naturally occurring independent variables such as tides, weather and the arrival of dive boats, which makes for mapping and sampling difficulties. In general the students adopt a grid reference technique and scan sample on key behaviours on a fairly tight interval, whilst noting relevant variables. This generates a lot of data, which requires much processing in order to analyse.

The Lundy ponies number only 10, and are all female. It is reported that they have a stable social hierarchy and some students have tried to investigate this by looking at jostling behaviours around scratching posts and grooming interactions, to see which pony is groomed most, and if there are patterns of groom-to-grooming ratio across all possible pairs. Many assumptions lie behind the measures, but the initial problem for students is to learn to identify the individuals from their markings, and to develop observational techniques that allow them to follow the ponies throughout the day. This project presents very specific lessons in field skills, as well behavioural categorisation.

The swallow project has some similarity to the pony project. The focus here is parental feeding decisions at the nest, and the jostling for position of the chicks. What is different is that individuals cannot be readily recognised, so filming is required to track focal chicks and break down rapidly occurring begging and feeding sequences. This project is much more involved than the others above as the film needs to be analysed using specialist software at UEL, and as a result has grown beyond an initial Level 2 project into a final year project and specific staff interest.

Level 2 projects are 4000 words in length, Level 3 are 8000 words and M-level 15,000. All conform to the usual format of introduction, methods, results and discussion, but as a part of the appendices students have to submit field diaries along with raw data and other materials. The field diaries enable us to track the development of their skills and thinking, which in turn helps to make an

academic judgement, but they do not receive a summative mark for these diaries.

As we hope is apparent the projects present specific problems but also more general ones that the students share. The adoption of curiosity led, field and seminar supported research allows the students to reinvent the wheel to some extent, having the same experiences as many of the early pioneers of ethology (see Kruuk, 2003), and as a result developing a conceptual bedrock upon which to build a more advanced theoretical knowledge.

The field trip is extremely challenging and taxing for students. To some extent this was anticipated for the first trip in 2009 and we appointed a teaching assistant (TA), drawn from the final year and graduated by the time we arrived on the island. He was a natural history enthusiast with a good working knowledge of fieldwork, but his status as a fresh graduate was ideal as he bridged the gap between our scientific register and the students' developing understanding. He would let us know where we needed to work on particular issues, and also would relay questions early in the trip that students were too embarrassed to ask. This was successful and since then we have adopted a TA each year, but for the most part we have used students who have previously been to Lundy and had the experience themselves.

After discussion with previous TAs we decided that the initial exercises, described above, would benefit from some formalism in order to make the students feel more secure in their early gains. To this end we developed a worksheet for the first days covering all that we did in the first trip but with some worked examples and a discussion about the kind of data collected and how to think about it for analysis. But the worksheet is not exhaustive and it is designed to prompt questioning. It also makes the job much easier for the TA, who perhaps does not have our authority, but can use the sheet as a point of contact with the students and reassure them about the task demands.

The TA model has been further extended since 2009 by allowing final year project students, some of whom did their Level 2 projects on Lundy, and the occasional M-level student to attend (some M-level students come from Brunel). This has enabled us to build an informal peer-assisted learning element into the trip. For example, we have had Level 3 and Level 2 students working on Soay sheep together, and Level 3 and M-level students working on the gulls. The students face many of the common problems together, but the different levels of experience in the field, along with the different levels of expertise in research methods and behavioural science, enable the more senior students to encourage the more junior whilst simultaneously boosting their own confidence through successful explanation. Sometimes this works in the other direction too. We actively encourage this and take time to make clear good ideas when they are presented, to praise innovation and ideas we had not thought of, and privately to thank senior students for a job well done. We have yet to formally assess this, but we are confident in this system.

Finally, we have introduced a drop-in surgery in the tavern every evening on the second week. This is to augment the existing one-to-one support that we offered from the first trip, giving students a resource for quick questions whilst they are writing their daily field notes and planning for the next day.

Group living

The scientific work is challenging but so is group living. The barn has two dormitories, a shared living and dining space, a kitchen, a shower, a neighbouring shower block, and two toilets. We segregate the dormitories by sex enabling us to bring up to six males and six females. Of these, no more than two are M-level, and the remainder are undergraduates fairly evening split across levels. Students and staff are organised into a rota to cook dinner and wash-up on a couple of occasions each, and all pull together to

maintain the property. The students can leave the barn whenever they wish to find privacy. If they leave the village area they must sign the logbook to say where they are going, but otherwise they are at liberty. To date there have been no serious disagreements or disputes between the students, and certainly nothing that they have not resolved themselves. The initial shift into group living always leads to the quiet establishment of routines and territories, and some negotiation occurs, but the students all seem to operate co-operatively, and in particular mutually as they all face the same task demand – the production of a project. The deliberate engineering of mixed level groups helps with this too as they continue to study together back in the barn and to talk in the tavern. These arrangements survive the trip and continue to operate on campus.

Fringe benefits

Over the last years we have invited David Dickins to visit along with various other academics, who all come at their own expense. They stay elsewhere in the village but we invite them to dinner on the odd evening and allow them to run the seminar discussion. The students very much enjoy this, as they know some of the guests through the literature that we cite and they have an opportunity to discuss their ideas. The students also benefit from seeing debate between our guests and our staff, seeing scientific but friendly dispute and learning more about the process. In general the island attracts many visiting experts and also PhD students from other universities. Given the size of the village conversations necessarily start and the students often come to dinner with new information about the island and its fauna, in this way making a contribution to the shared project that the staff alone simply cannot make.

Student feedback

The students complete an expectations form and a feedback form. Invariably the student expectations are fairly accurate in terms of

the kind of work, for they have read the website information, but they are not aware of the extent of the challenge. Their feedback reflects this – they wish that they had done more preparation. However, in our view they come prepared and these comments are in fact indicative of our approach working, as they now want to know more.

In conversation with former Lundy students they unanimously state that attending as a Level 2 student was excellent preparation for their third year project, even if it was not done on Lundy, and also enabled them to better understand research methods during their second year. Of the students we have taken to Lundy, and have graduated since 2009, four have gone on to do an M-level qualification in the field and one is about to start a PhD on gulls.

Future directions and conclusion

We believe that the benefits of this trip are enormous. The students draw general lessons about science, and specific ones about animal behaviour. They arrive back at campus ready for more advanced project work and primed for other aspects of the curriculum such as psychobiology and evolutionary approaches to behaviour. We are eager to continue the Lundy fieldtrip but also to expand its possibilities, and one route that we are hoping to develop is a virtual one.

As noted, when discussing the swallow projects, we use software to analyse film. This software allows the researcher to code behavioural categories for all animals in real time on a given clip. This data is stored in a readily exportable format that allows analysis in statistical packages, but analysis can also be done without export. Our plan is to develop a virtual field trip, incorporating this software, in order to give students who are unable to travel to Lundy, or elsewhere, the opportunity to learn about field ethology and to develop their knowledge.

We also aim to more rigorously assess the gains made by Lundy students. In July 2012 we will run our fourth trip and we now feel that we have developed a good package. As this is stable it can now be scrutinised. This year we have recruited a former Lundy student to help us collect interview data from current students in order to enrich existing feedback. This will then be used to develop a quantitative measure for use in subsequent years, as well as to help us recruit future students. Our aim is to demonstrate shifts in the conceptual grasp of what science is; our hypothesis is that there will be a transition from concrete, recipe following to more abstract engagement. Science is a creative adventure, and we want as many students as possible to realise this.

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A comparative analysis of students' satisfaction with teaching on STEM vs. non-STEM programmes

Chris Pawson

Recent Higher Education Funding Council research echoes previous findings that student satisfaction scores differ between subject areas (HEFCE, 2011). However, there remains a paucity of research attempting to account for this, and these differences have only been reported for final-year student satisfaction. It is unclear at what stage during a study programme differences in satisfaction might emerge, and satisfaction of first-year students is of particular interest because of its association with student progression and retention (Tinto, 2007). Exploratory analyses of first-year students' responses to National Student Survey (NSS) questions (N=1180) revealed that there were significant differences in students' perception of teaching and available resources depending on whether they were enrolled on a STEM subject course or not. Perhaps unsurprisingly (given funding council bands) the STEM students were more likely to agree that they had access to adequate resources. However, the non-STEM students were more likely to agree that their teachers were good at explaining material and were enthusiastic about their topic. Furthermore, the differences in the perceptions of teaching experienced by STEM versus non-STEM students varied as a function of sex of the student. The implications of these findings are that although the experience of STEM students may be bolstered by access to resources, their experience of teaching and learning (and particularly that experienced by males on STEM courses) is less satisfactory than that of non-STEM students. This finding is of particular interest in light of the increasing use of student satisfaction data to inform league tables and students' degree choice. Furthermore, these data challenge stereotypes of the experiences of males and females in STEM disciplines and have implications for how STEM teaching practitioners approach the learning experience of their students.

Keywords: Student experience; satisfaction; NSS; retention; sex differences.

A NUMBER of Government initiatives have recently been implemented in attempts to increase uptake in the study of STEM subjects in schools and universities, for example, National curriculum changes in 2008, and the *Science So What? So Everything* campaign launched by the Department for Innovation, Universities and Skills (DIUS, 2009). Despite the attempts of successive governments to attend to this issue, there is considerable evidence that the STEM subjects remain relatively unappealing to young people. Recent studies have found that secondary school pupils report that they are put off of studying science by the lack of clear application of their subject to professional practice and

employment (Archer et al., 2010). Furthermore, there is evidence that children drop STEM subjects before post-compulsory education due to a perceived tendency toward transmissive pedagogy and unappealing teaching approaches (Lyons, 2006; Osborne, 2007).

Dwindling numbers of secondary school STEM students is a key priority in addressing the issue of a STEM graduate shortfall (CBI, 2011). However, the author argues that HE institutions (HEIs) need to ensure that they do not further contribute to the attrition of numbers of STEM graduates. There is some evidence to suggest that HE students opt out of STEM for reasons that may to some extent be in the control of HEIs. For example,

Seymour and Hewitt (1997) reported that the leading reasons cited by students for switching out of undergraduate study of STEM subjects were: (1) non-STEM degrees offer a better education; (2) loss of interest in science; and (3) rejection of STEM careers. Furthermore, there is evidence from research within STEM subject fields that suggests that pedagogical issues are influential in poor retention of STEM students (Hewitt & Seymour, 1991; Olds & Miller, 2004).

One approach to identifying whether, and how, STEM teaching practices in HE might influence retention is to compare student's experiences and perceptions of STEM vs. non-STEM degree programmes via analysis of satisfaction surveys. There are large and stable satisfaction differences evident between subject groups (HEFCE, 2010). Interestingly, SurrIDGE (2009) found that course characteristics (e.g. mode of study, RAE profile), and specifically subject area, exert larger effects on satisfaction than the characteristics of students (e.g. age, sex, ethnicity), or the institution (e.g. UCAS entry scores, size). However, to the author's knowledge there has been a lack of comparative analysis of UK students' satisfaction with STEM vs. non-STEM courses.

In an initial pilot study, Pawson (2012) compared the 2011 National Student Survey (NSS) data from STEM vs. non-STEM degree courses at 18 UK universities. Specifically, Pawson compared the mean NSS ratings for the following STEM courses at each university: psychology; electrical engineering; chemistry and maths (or maths &

statistics), with the mean NSS ratings for English; History; Sociology and Law (non-STEM) at the same university. The data revealed that, in terms of students' ratings of the ability of staff to explain things and make the subject interesting, the mean non-STEM satisfaction ratings were consistently higher than those for STEM degree courses.

The current study aimed to further explore the findings reported by Pawson (2012). Specifically, it aimed to control for the possibility that the average class sizes in STEM vs. non-STEM degree courses was related to satisfaction ratings, and to explore at what stage in the degree course STEM vs non-STEM differences in student satisfaction were identifiable. Finally, the longstanding under-representation of females within STEM degree courses and careers (Ceci, Williams & Barnett, 2009) prompted an additional exploration of the potential different experiences and satisfaction of males and females studying STEM subjects.

Method

Participants

1180 undergraduate home students from a post-1992 London university completed a student satisfaction survey in the second semester of their first year of study. Biographical characteristics of the sample are presented in Figure 1 below. STEM students ($N=583$) were studying programmes in faculties of Health and Bioscience (e.g. Biomedical Science; Pharmacology); Computing and Engineering (e.g. Civil Engineering; Technology & E-Commerce) and Psychology (e.g. Psychology; Forensic Psychology).

Figure 1: Frequencies and proportions of participants by sex, age and ethnicity.

		Sex		Age Group (years)			Ethnicity			
		<i>M</i>	<i>F</i>	<20	21–25	>25	<i>White</i>	<i>Black</i>	<i>Asian</i>	<i>Other</i>
STEM	<i>N</i> = (%)	268 (46)	315 (54)	134 (23)	204 (35)	245 (42)	163 (28)	198 (34)	122 (21)	100 (17)
Non-STEM	<i>N</i> = (%)	227 (38)	370 (62)	161 (27)	197 (33)	239 (40)	209 (35)	215 (36)	83 (14)	90 (15)

Non-STEM students ($N=597$) were studying programmes in faculties of Law (e.g. Criminology and Criminal Justice; LLB); Humanities (e.g. Anthropology; Sociology) and Arts (e.g. Fine Art; Fashion Design).

Materials

The survey administered in this study was based on the National Student Survey (NSS) developed by the Higher Education Statistics Agency. The survey consisted of all 22 items deployed in the NSS, with the addition of five items pertaining to institution-specific issues (e.g. helpdesk guidance and virtual learning environment provision). Each item was scored in the same way as the NSS on a five point likert scale ranging from 1=Definitely Disagree to 5=Definitely Agree (with the inclusion of a 'Not Applicable' option). As with the NSS, questionnaire responses provided scores on six sub-dimensions: Teaching (reliability Cronbach's $\alpha=.90$); Assessment ($\alpha=.82$); Academic Support ($\alpha=.85$); Organisation ($\alpha=.87$); Learning Resources ($\alpha=.84$) and Personal Development ($\alpha=.87$).

Procedure

An online approach to survey distribution was adopted. All first-year students were initially emailed an invitation with an individual link to the online survey after the commencement of their second semester of study (February). Four email reminders and a further SMS message were sent to all those that hadn't completed the survey at the end of March. There was also a poster campaign across the university advertising the questionnaire, and there was an incentive of entry to a prize draw for all participants. This approach provided a 22 per cent response rate. Participants' data was fully anonymised for the purposes of this study.

Results

For the purposes of more meaningful analysis, and in a departure from the typical NSS analysis, the mean scores of the items in each sub-dimension were calculated for each

individual, so that each participant provided a mean satisfaction score on each of the sub-dimensions. Mean scores for each sub-dimension by sex and STEM vs non-STEM status are presented below in Figure 2.

On the basis of previous analyses of NSS data (Hardman, 2008; HEFCE, 2010) that identified a relationship between UCAS entry points and satisfaction, the author conducted an independent samples *t*-test to identify any UCAS point entry differences between STEM and non-STEM students. UCAS points ranged from 0 to 690 amongst non-STEM students ($M=76.30$, $SD=136.17$), and ranged from 0 to 700 amongst STEM students ($M=47.72$, $SD=110.09$). The *t*-test revealed that the UCAS entry points for students on non-STEM programmes was significantly higher than those for students on STEM programmes ($t=3.77$, $p=.000$). Furthermore, there is some evidence to suggest that class size may impact student engagement, teacher motivation and student satisfaction (Toth & Montagna, 2002), and, therefore, average introductory class size was compared between STEM and non-STEM courses. There was no significant difference in average class size for STEM ($M=33.76$, $SD=14.04$) vs. non-STEM students ($M=34.51$, $SD=11.40$).

A 2 (STEM, non-STEM) \times 2 (sex) Multivariate analysis of covariance tested for differences between STEM and non-STEM students on the six subscales of student satisfaction. Due to the association between UCAS entry points and satisfaction, and the significant difference in points between STEM and non-STEM programmes, the analysis was conducted covarying for UCAS points. The MANCOVA revealed that UCAS points covaried with satisfaction on teaching ($F(1,1174)=6.37$, $p=.012$); Assessment and Feedback ($F(1,1174)=5.06$, $p=.025$); Organisation ($F(1,1174)=10.90$, $p=.001$) and Personal Development ($F(1,1174)=8.18$, $p=.004$). When taking in to account the covariance of UCAS points and satisfaction, there was a significant effect of STEM status (Wilks $\Lambda=.97$, $F(6,1169)=5.75$, $p=.000$) indi-

Figure 2: Mean satisfaction rating on each NSS sub-dimension by STEM vs. non-STEM status and sex.

	Non-STEM			STEM		
	Female	Male	Total	Female	Male	Total
Teaching	3.72 (0.94)	3.92 (0.90)	3.80 (0.93)	3.74 (0.82)	3.59 (0.95)	3.67 (0.89)
Assess. and Feedback	3.40 (0.96)	3.61 (1.01)	3.48 (0.98)	3.54 (0.92)	3.44 (0.93)	3.49 (0.93)
Support and Guidance	3.40 (1.01)	3.62 (1.02)	3.48 (1.02)	3.56 (0.95)	3.51 (1.01)	3.54 (0.98)
Organisation	3.53 (1.00)	3.67 (1.01)	3.58 (1.00)	3.69 (0.92)	3.55 (0.99)	3.62 (0.95)
Resources	3.57 (1.02)	3.66 (1.06)	3.60 (1.04)	3.78 (0.96)	3.73 (1.02)	3.76 (0.99)
Personal Development	3.54 (0.99)	3.61 (1.03)	3.57 (1.00)	3.55 (0.89)	3.53 (0.97)	3.54 (0.93)

cating that STEM and non-STEM students differed in their satisfaction. Univariate ANOVAs revealed that STEM students were significantly more satisfied than non-STEM students with resources available to them ($F(1,1174)=5.86, p=.016$), but were less satisfied with the teaching on their programme ($F(1,1174)=10.23, p=.001$).

The ANCOVA also revealed a significant STEM status x Sex interaction (Wilks $\Lambda=.99, F(6,1169)=2.75, p=.012$) indicating that differences in the satisfaction of STEM vs non-STEM students differed as a function of the sex of the student. Univariate ANOVAs revealed that the significant interaction effect was found on the satisfaction sub-dimension of Teaching ($F(1,1174)=9.87, p=.002$). Post hoc analyses adjusted for multiple testing (Bonferroni) revealed that STEM males were less satisfied with teaching than non-STEM males ($p=.000$) or STEM females ($p=.022$).

This was an interesting result that was further interrogated by exploring the Status and Sex differences on each specific aspect of teaching and assessment (see Figure 3). A 2 (STEM, non-STEM) x 2 (sex) MANCOVA with each of the individual NSS items on the teaching sub-dimension as

dependent variables was conducted. Once again the analysis was conducted covarying for UCAS entry points and the MANCOVA revealed that UCAS points covaried with satisfaction on each of the teaching items. When taking in to account the covariance of UCAS points and satisfaction, there was an effect of STEM status that approached significance (Wilks $\Lambda=.99, F(4,1167)=2.34, p=.05$).

The ANCOVA also revealed a significant STEM status x Sex interaction (Wilks $\Lambda=.99, F(4,1167)=2.86, p=.023$) indicating that differences in the satisfaction of STEM vs non-STEM students on the NSS teaching items differed as a function of the sex of the student. Univariate ANOVAs revealed that the significant interaction effect was found on each of the items: the quality of explanations provided by staff ($F(1,1170)=7.85, p=.005$); the degree to which staff have made the subject interesting ($F(1,1170)=6.14, p=.013$); the enthusiasm of staff for what they are teaching ($F(1,1170)=10.12, p=.002$) and the degree to which the programme is intellectually stimulating ($F(1,1170)=7.86, p=.005$).

Post hoc analyses adjusted for multiple testing (Bonferroni) revealed that STEM males were less satisfied with every aspect of

Figure 3: Mean satisfaction rating on each NSS item within the Teaching sub-dimension by STEM vs non-STEM status and sex.

	Non-STEM			STEM		
	Female	Male	Total	Female	Male	Total
Teaching staff are good at explaining things	3.72 (0.94)	3.92 (0.90)	3.80 (0.93)	3.74 (0.82)	3.59 (0.95)	3.67 (0.89)
Teaching staff have made the subject interesting	3.40 (0.96)	3.61 (1.01)	3.48 (0.98)	3.54 (0.92)	3.44 (0.93)	3.49 (0.93)
Teaching staff are enthusiastic about what they are teaching	3.40 (1.01)	3.62 (1.02)	3.48 (1.02)	3.56 (0.95)	3.51 (1.01)	3.54 (0.98)
My programme is intellectually stimulating	3.53 (1.00)	3.67 (1.01)	3.58 (1.00)	3.69 (0.92)	3.55 (0.99)	3.62 (0.95)

teaching measured by the NSS than non-STEM males. STEM males were less satisfied than non-STEM males in terms of: the quality of explanations provided by staff ($p=.003$); the degree to which staff have made the subject interesting ($p=.002$); the enthusiasm of staff for what they are teaching ($p=.001$) and the degree to which the programme is intellectually stimulating ($p=.003$). There were no significant differences in satisfaction between STEM and non-STEM females, or between males and females on STEM courses. However, male students on non-STEM programmes did rate teaching staff as more enthusiastic than female students on the same programmes ($p=.005$).

Conclusions

The current study sought to compare the student experience of STEM versus non-STEM students as measured by their response to a satisfaction survey. Analyses revealed that STEM students reported greater satisfaction with resources. This is very likely to be due to the resource funding bands set by HEFCE which result in non-STEM subjects receiving between 60 to 75 per cent of the funding received by most STEM subjects. Despite their greater satisfaction with resourcing, STEM students' experience of teaching was less positive than

non-STEM students. This has implications for teachers of STEM subjects and the retention of students. However, it is important to note that the data do not point to a simple pedagogical solution for STEM educators, because the lower satisfaction in teaching amongst STEM students was found specifically amongst males.

If dissatisfaction with HE teaching practices is responsible for STEM student attrition rates, then these data suggest that it is male students who will be particularly at risk. Further research is required to replicate this finding amongst other university samples, and to identify whether there are specific variations in teaching practices between STEM and non-STEM courses that are particularly salient to the satisfaction of male students. Furthermore, future research should also explore the possibility that these results could be explained by sex differences in first year student's expectations of STEM and non-STEM disciplines. Females may hold generally lower (or more appropriate expectations) of STEM teaching, and may therefore be satisfied when these expectations are met or exceeded. Whereas males' expectations of STEM teaching may not be being met, or may be less adaptive, which in turn results in lower satisfaction.

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Stress, positive psychology and the National Student Survey

Chris Gibbons

The aim was to explore the predictive ability of sources of stress and a range of dispositional and coping behaviours on student satisfaction and motivation. Most research exploring sources of stress and coping in students construes stress as psychological distress, with little attempt to consider positive experiences of stress. A questionnaire was administered to 120 first-year UK psychology students. Questions were asked which measured sources of stress when rated as likely to contribute to distress (a hassle) and likely to help one achieve (an uplift). The sources of stress were amended from the UK National Student Survey (NSS, 2011). Support, control, self-efficacy, personality and coping style were also measured, along with their potential affect on course satisfaction, motivation and feeling part of a learning community. The sources of stress likely to lead to distress were more often significant than sources of stress likely to lead to positive, eustress states. Ironically, factors one would consider would help students, such as the university support facilities, only did so when rated as a hassle, not as an uplift. Published university league tables draw heavily on student course satisfaction but this negatively correlated with intellectual motivation and feeling part of a learning community. This suggests course satisfaction alone reveals an incomplete picture of the student experience. Course educators need to consider how course experiences contribute not just to potential distress but to potential eustress. Teaching quality, effective support and work-life balance are key to student satisfaction and motivation. How educators interact with their students and the opportunities they create in and outside the class to promote peer support are likely to enhance satisfaction and motivation.

Keywords: Student stress; eustress; coping; satisfaction; motivation; learning.

STRESS can be the result of 'too much or too little arousal resulting in harm to mind and body' (Schafer 1992, p.14). There is a growing body of evidence that has looked at stress among university students and its affect on well-being (Leicester University, 2002; Robotham & Claire, 2006)

As illustrated in Figure 1, a certain amount of perceived stress and physiological arousal is necessary if one is to perform at the optimum (B). If a source of stress is perceived as negligible (A) or, more likely, is perceived as exceeding one's capacity to cope (C), then distress results (Yerkes & Dodson, 1908). That optimal level of stress or arousal is called 'eustress' (Lazarus & Folkman, 1984) and little research has looked at sources of eustress in students (Gibbons, 2008, 2010; Association for

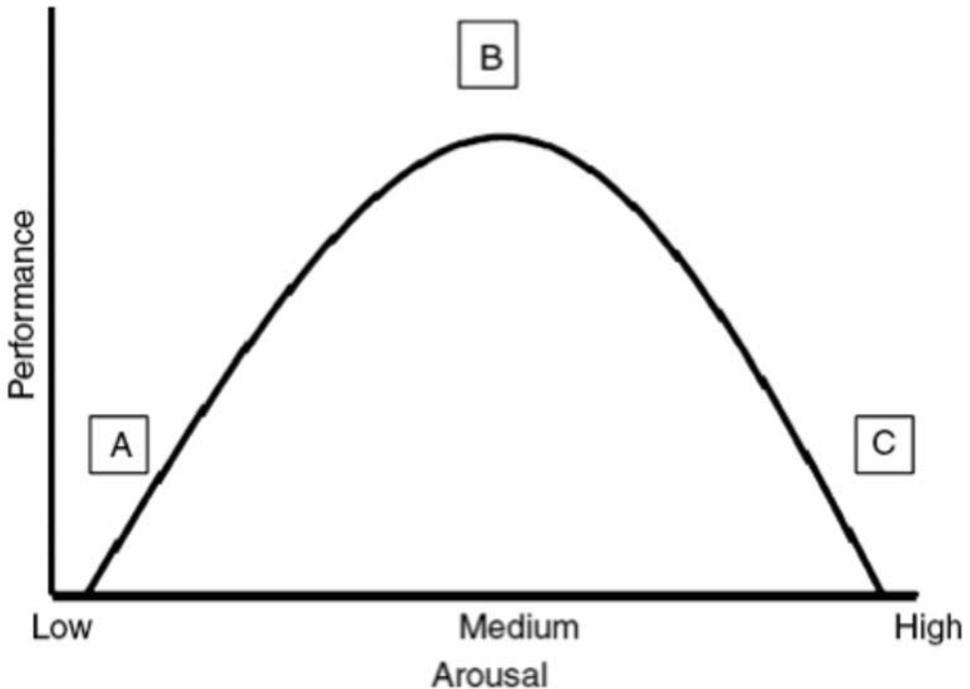
University Counsellors, 2002; Leicester University, 2002).

Sources of academic stress include examinations and assessments (Robotham and Claire, 2006). Fear of failure and the teaching response to student need, as well as lack of timely feedback on assessments, have been reported by students as specific stressors (Gibbons, 2008, 2010). Personal sources of stress include financial concerns; a lack of or difficulties in managing one's apparent free time and a concern about career direction (Leicester University, 2002).

The National Student Survey and stress in students

The National Student Survey (NSS) was first introduced in 2005 and it was the direct result of the 2003 Government White Paper,

Figure 1: The Yerkes–Dodson curve.



The Future of Higher Education, which promised to make students ‘intelligent customers’. It was initially met with resistance by many universities because it was seen as duplicating internal feedback mechanisms. However, once the findings were incorporated into university league tables by national newspapers the NSS took on a new importance. The survey involves respondents rating a number of common student experiences, including teaching and learning, assessment and feedback, academic support, organisation and management and learning resources. In this study each of these was treated as a potential source of stress with respondents asked to rate, not on a Likert scale (as in the NSS) but on both a hassle and uplifting scale, the extent to which each contributed as a potential for distress and eustress.

The results of university league tables, underwritten by the findings from the NSS, focus exclusively on course satisfaction as the

outcome measure, although NSS banked questions also measure intellectual motivation and the extent to which they feel part of a learning community.

Coping with stress

In Lazarus and Folkman’s (1984) Transactional model of stress, the primary appraisal refers to the initial perception about a stressor and whether it is judged to be positive (leading to eustress), negative (leading to distress) or benign. The secondary appraisal refers to the coping responses the individual draws on. Interacting between the perception of stressors and how one responds are a number of moderators. These include personality (McCrea & Costa, 1992); self-efficacy (Schaubroeck & Merritt, 1997); perceived control, support and coping style (e.g. Gibbons, 2010; Van der Doef & Maes, 1999). While these different coping resources or moderators are drawn on to manage perceived sources of stress it is

important to remember that they also affect what is perceived as a source of stress and, in turn, its subsequent impact on well-being. The primary appraisal is also affected by earlier coping experience of dealing with such demands. The NSS measures final year students' perceptions. This study will explore the perception of students in their first and final year with some of the first-year results reported here.

Aims

The aim of this study was to explore stress and coping in first-year psychology students. The Transactional model of stress underpinned the assumptions tested: Significant correlations were expected between the student experience rated as sources of potential eustress and distress and satisfaction and motivation, and between personality, self-efficacy, control, support and coping style with satisfaction, motivation and feeling part of a learning community.

Method

Design

A questionnaire-based study, employing a Between Samples Design, with respondents' scores on different measures compared. Data collection was carried out in 2011.

Sample

A convenience sample of 120 first-year psychology students were invited to take part by the researcher at the start of a course lecture and 88 (73 per cent) consented. The inclusion criteria were first-year students studying their BSc Psychology degree in the host institution.

Measures

The first 63 items of the questionnaire contained items used in the NSS in 2010, together with banked items from earlier versions. As well as course satisfaction, intellectual motivation and feeling part of a learning community were also measured. A continuous response scale was used, with each item rated twice – once from its

perceived distress, called a 'hassle', and once from its perceived eustress, called an 'uplift'. A rating scale from 0 to 5 was used, 0 indicating that it was no source and 5 an extreme source of distress or eustress. This was followed by four items generated by the author measuring context control or one's sense of control in a given situation, and dispositional control, and a further three measuring course satisfaction. Respondents answered the support, control and satisfaction items on a five-point Likert scale from strongly agree to strongly disagree. All these items had earlier undergone reliability and validity analyses. The Cronbach's Alpha for these items grouped as factors, for control, support and satisfaction each exceeded .7 and were judged to have face validity (Gibbons, 2009).

The Generalized Self-Efficacy Scale (Schwarzer, 1992)

This scale consists of 10 items and participants respond on a four-point scale from 'not at all true' to 'exactly true'. It is a context free measure of self-efficacy.

The Brief COPE (Carver, 1997)

This 28-item scale measures a broad range of coping responses. The items are context free and respondents answer on a four point frequency scale. Carver (1997) recommends researchers subject results to their own factor analysis. This was done in a previous study and four coping factors were identified: approach coping; avoidance coping; altering consciousness and seeking support. They explained 57.99 per cent of the variance in coping scores. The Cronbach's Alpha exceeded .8 for each factor and they were judged to have face validity (Gibbons, 2009).

NEO Five-Factor Inventory (NEO-FFI) (Costa & McCrea, 2004).

This is the short 60-item version of the Five-Factor Inventory. It measures Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience and participants respond on a five-point Likert scale.

Reliability and validity studies with a range of populations are described by the authors of the Generalised Self-Efficacy Scale and the NEO Five-Factor Inventory. The remaining items measured age and sex.

Data collection

After being briefed during a course lecture on the project by the researcher, students interested in taking part were given a copy of the questionnaire and asked to return within the week.

Ethical considerations

The study was approved by a university ethics committee. Participation was voluntary and students were told that they were free to leave at any time; that being involved would mean they could gain course credit, and that confidentiality would be maintained at all times.

Results

All the results are shown in Tables 1 to 3 below.

Discussion

The outcome measure in the first regression model, learning community (Table 1), referred to the extent to which students felt part of a group committed to learning and exploring academic interests; to exploring ideas with confidence and to feeling part of an academic community. In terms of sources of stress, those rated as a hassle were *stronger* predictors of scores on learning community compared to those rated as an uplift. The one exception was that when learning resources were rated as an uplift, scores on feeling part of a learning community *declined*. Learning resources refer to library and IT resources and, ironically, the more students rated these as helping the less they

Table 1: Regression model with learning community.

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			B	Std. Error
1 (Constant)	2.524	.302		8.360	.000		
Learning-resources uplift	-.131	.061	-.225	-2.139	.036	.773	1.294
Careers advice hassle	.115	.050	.272	2.275	.026	.597	1.674
Course content and structure hassle	.044	.025	.186	1.787	.078	.792	1.263
Social opportunities hassle	.112	.051	.247	2.198	.031	.676	1.480
Course delivery hassle	-.236	.085	-.434	-2.772	.007	.349	2.867
University support hassle	.138	.050	.334	2.736	.008	.573	1.746
2 (Constant)	3.725	.498		7.480	.000		
Learning resources uplift	-.105	.059	-.179	-1.780	.079	.758	1.319
Careers advice hassle	.063	.050	.149	1.239	.219	.535	1.869
Course content and structure hassle	.041	.023	.171	1.737	.086	.790	1.266
Social opportunities hassle	.118	.048	.261	2.436	.017	.671	1.490
Course delivery hassle	-.208	.082	-.382	-2.551	.013	.343	2.914
University support hassle	.117	.048	.284	2.422	.018	.559	1.788
Dispositional control	-.078	.031	-.230	-2.503	.014	.912	1.096
Openness	-.191	.100	-.184	-1.907	.060	.829	1.207

^a Dependent Variable: learning community. R²=.423, Adjusted R²=.362

felt part of a learning community. It may be that the resources helped nurture learning independence. However, the relationship is a trend rather than significant, so one has to be cautious in any interpretation offered.

Course delivery was a source of stress and referred to the learning materials provided; the pedagogic strategies used and how stimulated the students were by this. The more this was rated as a hassle, and as expected, the less students felt part of a learning community.

The more the university support facilities – from the University Student Guidance centre to tutorials, personal tutors and advisors of studies – the more these were rated as a hassle, the higher were the scores on learning community. The measure ‘social opportunities’ referred to the provision of formal opportunities on the course to interact with other students and across the university, in terms of social events, clubs and societies. The more social opportunities were rated as a hassle the *higher* were the scores on learning community. Again, the opposite would have been anticipated. However, it could be that because there were disappointments in some aspects of the formal support facilities (i.e. university support facilities and social opportunities), students engaged more with other students on their course and through this engagement their willingness to explore and share ideas grew (i.e. the learning community measure). The value of peer support above the infra-structure of support provided by the university has been found in earlier work (Gibbons, 2010). As students adjust to the new and challenging demands on their course they turn to their peers for social comparison and to help manage these demands. Their peers are perceived as being able to offer more immediate support and empathy. Moreover, students may feel that seeking out help through formal support links involves more effort and perhaps may leave the student doubting their competence compared to conversations with other students where learning issues are discussed.

More broadly, it might be the case that rating a source of stress as a hassle might not actually equate to that stress being a source of distress as was anticipated. The dominance of hassles over uplifting ratings across all the regression models may be more indicative of the stage these first year students are at in their transition to university life and in the differences in pedagogy and how one learns at university compared to earlier learning, and this is to say nothing of the demands of financial management, independent living and forming new relationships, common for most first year students. A source of stress that is new and difficult to manage can have significant stress effects as one masters the right strategies and this may explain the dominance of hassle over uplifting ratings.

In terms of coping and personality, only dispositional control and openness were significant predictors. Again, on the face of it, the direction seemed counter-intuitive: the stronger the students’ sense of control or the more open their outlook the *less* they felt part of a learning community. Dispositional control is ordinarily regarded as an effective coping strategy. It may be that as control increases so does autonomy and learning independence and this equates to such students feeling less inclined to engage with others on their learning and this may explain the lower scores on learning community.

One would have expected that openness would have been a positive predictor of scores on learning community – a willingness and interest to explore new ideas would seem to go hand in hand with feeling part of a learning community. That this was not found may relate more to when the students were tested – towards the end of their first semester in their first year. At this point the demands of adjusting to university life are likely to remain high for many – both in the university in terms of the pedagogy students are exposed to and in how one is expected to learn, and outside in terms of the demands associated with being a new student and establishing a work-life balance. This is likely

to explain the prevalence of hassles ratings over uplifting ones and why openness did not positively predict learning community scores.

Intellectual motivation

Table 2 illustrates the regression model with intellectual motivation as the outcome measure. The work-home interface referred to measures on personal and family health; to important relationships and to personal aspects of one’s life. The more these were rated as positive and uplifting the more students felt enthused and motivated in their learning. As with the earlier regression model, the measure on social opportunities was a predictor: when rated as a hassle it predicted *more* not less intellectual motivation. As with the last outcome measure, the same explanation may apply: that is, because of possible disappointments with the formal social opportunities available students focused on and engaged more in the subject. However, given the value of peer support in

enhancing learning, well-being and satisfaction (Gibbons et al., 2008, 2010), it is likely that where students are able to benefit from the support meaningful social opportunities provide, it will have a positive impact on intellectual motivation. The challenge is to make the social opportunities, both those course specific and university wide, of a kind that students feel they can engage in.

Openness was a significant predictor not of higher but lower scores on intellectual motivation. As with the explanation offered with the first model, such a result may reflect more the contextual demands of testing students relatively early in their first year: One needs not just a disposition and interest to explore new ideas to feel intellectually motivated but also a belief in one’s competences to do this. It may be that as students adjust to and develop the skills to manage the demands of learning in higher education such dispositional influences are more likely to have a positive impact on intellectual motivation.

Table 2: Regression model with intellectual motivation.

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			B	Std. Error
1 (Constant)	1.368	.456		2.998	.004		
Learning-resources uplift	-.151	.088	-.192	-1.722	.089	.768	1.302
Careers advice hassle	.122	.071	.216	1.722	.089	.604	1.655
Course content and structure hassle	.049	.035	.157	1.429	.157	.785	1.274
Social opportunities hassle	.157	.071	.261	2.201	.031	.673	1.485
Course delivery hassle	-.096	.110	-.133	-.875	.384	.410	2.440
Work-home interface uplift	.156	.056	.279	2.787	.007	.946	1.057
2 (Constant)	2.906	.757		3.840	.000		
Learning resources uplift	-.131	.085	-.166	-1.531	.130	.761	1.313
Careers advice hassle	.055	.075	.098	.736	.464	.501	1.998
Course content and structure hassle	.043	.034	.138	1.269	.208	.762	1.313
Social opportunities hassle	.158	.071	.263	2.220	.029	.637	1.571
Course delivery hassle	-.088	.111	-.122	-.793	.430	.380	2.629
Work-home interface uplift	.154	.054	.277	2.837	.006	.942	1.061
Openness	-.311	.147	-.227	-2.121	.037	.785	1.274
Conscientiousness	-.107	.132	-.092	-.810	.421	.697	1.434

^a Dependent Variable: intellectual motivation. R²=.328, Adjusted R²=.256

Where learning resources were valued, intellectual motivation declined. This relationship was not significant but it is worth considering if students felt skilled enough to engage meaningfully with the learning resources – in terms of general IT and library resources – to competently carry out literature searches and reviews for example, or whether their level of skill meant they did this superficially and in a way that was not intellectually motivating.

Course satisfaction

As Table 3 illustrates, the more the teaching was rated as uplifting and the more the structure and relevance of the course was clear the higher were scores on course satisfaction. Across all three regression models, social opportunities, when rated as a hassle, was a significant predictor, though in the first two it was not in the anticipated direc-

tion. Learning community and intellectual motivation correlated well with each other ($\rho=.408, p<.01$), but both negatively correlated with course satisfaction ($\rho=-.361$ learning community, $\rho=-.634$ intellectual motivation $p<.01$). Course satisfaction related to the enjoyment associated with the course and the other two, whilst important indications of intellectual meaning and the learning engaged in, are more challenging and are not always enjoyable in the short-term. This is not to suggest that course satisfaction is unimportant – it is after all the key ingredient, in terms of outcome measures, used by HEFCE in the formation of university league tables based on the NSS. However, it is important to recognise that a programme of study can be both meaningful and valuable during the process of learning whilst not necessarily enjoyable at the time!

Table 3: Regression model with course satisfaction.

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			B	Std. Error
1 (Constant)	3.068	.561		5.470	.000		
Teaching uplift mean	.319	.143	.239	2.233	.028	.764	1.308
Course content and structure uplift	.133	.084	.175	1.586	.117	.719	1.390
Course content and structure hassle	-.044	.038	-.115	-1.148	.254	.880	1.137
Social opportunities hassle	-.176	.079	-.240	-2.231	.029	.757	1.321
Assessment hassles	-.069	.071	-.103	-.968	.336	.776	1.289

^a Dependent Variable: course satisfaction. $R^2=.307$, Adjusted $R^2=.263$

Limitations

There were some limitations to the study, notably those associated with a survey design, such as the problems linked to self-reporting, incomplete responses, response sets and state congruence recall. This final weakness suggests that the longer the time between when an event occurs and when one is asked to respond to it in a survey the more dispositional influences, such as personality will filter and modify how that event is perceived, such that the survey responses reveal more about personality than the event, in this case the sources of stress. However, given it was the sources of stress rated as hassles or uplifts that were the most frequent predictors it suggests that this influence was negligible. The sample type was opportunity and while the response rate from the target population was not untypical (73 per cent), a larger sample would have allowed for more variables to be entered into the regression models and interaction effects to be tested.

Summary and conclusions

Effective course delivery is integral to making students feel part of a learning community. Paradoxically, influences one would expect would positively relate to learning community and intellectual motivation, such as the university support facilities and the formal opportunities to interact with other students only did so when rated as a hassle not an uplift. Learning community has been treated as an outcome measure here but where students valued it, it may be because of the support benefits that came from being part of a learning group.

It has been suggested that the time of testing could well be critical and this may explain why many of the influences one would expect to be predictive, such as aspects of personality, control, coping and self-efficacy, were not. Indeed self-efficacy was removed from all the final regression models in the process of arriving at the most parsimonious models and yet it has been found to be very predictive of positive well-

being among student populations (e.g. Gibbons, 2011). The common difference where it was found to be predictive was where the students tested were in their second or third year of study. This supports the interpretation offered here – that the perceived demands of adjusting to being a student both in and out of the university are critical. This is backed by the growing call from the Government and universities (e.g. from the Russell Group universities) to be involved in the setting of A-level exam questions and in driving the content and skills tested in syllabuses. As well as a check on the quality assurance of A-levels it is intended that this would better prepare students for higher education.

The negative correlation between course satisfaction and the other two outcome measures, learning community and intellectual motivation, suggests that course satisfaction alone is insufficient when reviewing a programme of study and there is utility in including all three measures. The structure and perceived relevance of the course and the quality of teaching when rated as uplifting were the strongest predictors of course satisfaction.

Recommendations

To effectively review the student experience one should draw on several outcome measures. Importantly, while course satisfaction is important, a course can be effective at producing successful outcomes where not all aspects are necessarily enjoyable. University league tables based on NSS results would offer more meaningful insights if the results on learning community and intellectual motivation were also considered.

The sources of stress, when rated as hassles were the more frequent predictors than when rated as uplifts (12 to 4 respectively). This along with the presence of little evidence in the regression models to support the benefit of personality, self-efficacy and coping, suggests that the demands of being a student are perceived as disproportionately high in the first year compared with subse-

quent years. This may explain why retention and attrition are particular problems in the first year for so many students. It is important that educators are aware of this student experience and consider ways of building on the existing strategies to support first year students.

It is likely that an effective way to do this is not to offer more formal support but to promote initiatives for students to informally interact and network more with each other and not just during induction week but throughout the first semester, for example, through class exercises, by rotating group composition in group activities in tutorials and lab classes and in supporting subject society events.

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Reframing perceptions of the lecture from challenges to opportunities: Embedding active learning and formative assessment into the teaching of large classes

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Teaching and assessing large classes can be reframed from focusing on overcoming difficulties with large classes, to seeking the unique educational opportunities provided by such learning environments. We discuss data and examples illustrating how active learning and formative assessment can be successfully embedded into the teaching of large groups. Students evaluated these approaches favourably, and recognised that their own learning was enhanced through being active participants in lectures and having opportunities to receive feedback on their understanding within lectures. Furthermore, the experiences of teaching staff using these techniques were found to be largely positive, demonstrating awareness of the benefits for students as well as benefits for their own engagement and development. These data suggest that if we find the unique opportunities for learning afforded by large groups, the lecture has the potential to become a powerful learning environment.

Keywords: *Active learning; formative assessment; problem-based learning; large group teaching.*

AS STEM subjects such as psychology increase in popularity, it is likely that instructors in higher education will be faced with the challenge of effectively teaching ever-increasing class sizes. Large group lectures are often seen as the poor relation to small seminar groups, yet the large lecture provides many unique opportunities to promote active learning and dialogic exchange. Lectures are often viewed as promoting a one-way transfer of information from the lecturer to the students, who adopt a passive role within the learning environment (Fry, Ketteridge & Marshall, 2006). Whilst lectures are seen as effective for transmitting information to a large cohort of students, they are seen as possessing limited efficacy for developing higher-order thinking skills (Bligh, 1998). Active learning is seen as more powerful, yet is much easier to implement within smaller groups of students.

According to Race (2005), lectures can be effective in developing higher-order thinking skills if lecturers adopt a problema-

tising stance and use lectures as a way of enabling learners to ask and find answers to questions. Involving students in lectures and requiring them to be active constructors of understanding rather than passive receivers of knowledge both have the potential to personalise the large class (Benjamin, 1991), and active involvement in lectures can better enable students to achieve specified learning objectives. Research demonstrates that active learning enhances learner engagement and improves retention of information (e.g. Huxham, 2005; Prince, 2004), and students value the opportunity to learn through doing (e.g. Machemer & Crawford, 2007). However, discussions of active learning in large lecture classes are often framed as ways of trying to improve learning in what is a challenging learning environment. For example, Machemer and Crawford (2007) argue that 'active learning techniques transform the passivity of a traditional lecture-based class into a student-centred learning environment... and reduce reliance on the

lecturer and professor as conveyor of all knowledge' (p.11). This is true, but adopting a 'fix-it' approach to improving lectures, and considering active learning in terms of this deficit model, is limiting in terms of the opportunities it provides for developing innovative practice.

Furthermore, there is evidence in the literature that the predominant framing of active learning is that it is not suitable for use in large group teaching. For example, at the end of an interesting article on active learning in large groups, Benjamin (1991) concludes that 'I hope I convinced you that active learning is *possible* in the large class' (p.73; emphasis added). Whilst there is evidence that the teaching of psychology can make good use of active learning (e.g. Meyers, 1997), its use is still framed as a 'fix-it' strategy and the emphasis is still very much on small group teaching, or adopting activities that the large class completes in small groups. We believe that rather than seeing active learning techniques as ways of trying to make the lecture more effective, the lecture itself is a way to make effective use of active learning, by adopting techniques that include, and indeed require, a large group of students. In other words, we propose a reframing of the lecture from a focus on the challenges of effectively teaching a large number of students, to considering the lecture as affording unique opportunities to promote active learning in a student-centred environment.

Another key concern with the large lecture is that it provides few opportunities for learners to receive feedback on their understanding. Many lectures are structured around specific learning objectives, for example, 'by the end of the lecture, students should understand X and Y and be able to critically discuss Z'. The problem here is that students have no way of evaluating their progress towards the learning objectives, and worse still, they may be confident that they have achieved them when their perception of 'understanding' differs markedly to the lecturer that will mark their assignments and

exams. As stated by McAlpine, (2004), 'All too often, students are provided with an introduction to a topic... and left to achieve the learning on their own with... no formative feedback' (p.128). Instead, it is recommended that the learning process should rely on feedback, where learners need to be able to evaluate their own understanding.

Formative assessment, defined as 'information communicated to a learner that is intended to modify his or her thinking or behaviour for the purpose of improving learning' (Shute, 2008, p.154), has the potential to overcome this problem, if implemented appropriately. Formative feedback is not evaluative in the sense that it provides a grade, but provides guidance for learners in terms of future modification and development (Black & Wiliam, 1998). Feedback is incredibly important in terms of student motivation; feedback is crucial in signalling a gap between current and desired performance, which the student wants to close (Song & Keller, 2001). Research also tells us that students are not simply motivated in extrinsic terms by the actual mark that they receive; students genuinely desire feedback that supports a deeper understanding of their subject (Higgins, Hartley & Skelton, 2002). Whilst courses may incorporate opportunities for formative assessment, formative feedback is most effective if received immediately after the learning has taken place (e.g. Dihoff et al., 2003). As Bruner (1970, p.120) argues, 'learning depends on knowledge of results, at a time when, and at a place where, the knowledge can be used for correction'. This is echoed by Shute (2008), who argues that the efficacy of feedback depends on motive (students need it), means (students are able and willing to use it), and opportunity (students receive it in time to use it).

The most ubiquitous feedback practices involve summative feedback on written assignments. The key motive for students when work is summatively assessed is the mark itself (e.g. Taras, 2001). If students are satisfied with the mark, they may not feel the

need to read the feedback. If they are heavily dissatisfied with the mark, they can block out the feedback as a defence mechanism. Thus, Shute's criterion of 'motive' may not be met by this form of feedback. Summative feedback may not also satisfy the criterion of 'means'; students' ability and willingness to use feedback is constrained by the fact that feedback on a piece of summative work is decoupled from the learning event itself in both space and time. Furthermore, the time it takes to assess the written work of an entire cohort means that in terms of 'opportunity', the feedback often comes too late to support key developmental objectives, despite the best efforts of academic staff to turn round feedback in as short a time as is feasible. So what can we do to provide the 'motive, means and opportunity' to use feedback to support development?

Yorke (2003) argues that whilst formative assessment is effective, increasing staff-student ratios in higher education limit the opportunities to provide such feedback to students on an individual level. Yorke suggests that in order to increase the use of formative assessment, the use of formal lecturing should be reduced. However, there is no reason why the large lecture and formative assessment are in competition for curricular time. Indeed, what better time to provide this formative, developmental feedback, than when all students are together, and directly after material has been learned?

One common method for the delivery of formative assessment in lectures is through the use of electronic voting systems and delivery of multiple choice questions (e.g. Draper, 2004; Gier & Kreiner, 2009). However, there are constraints on the type of learning that can be assessed in this way and the type of feedback that can be given (e.g. whether an answer is right or wrong). Therefore, we wanted to find ways of being more creative in the delivery of formative feedback within the lecture context.

In our undergraduate programme in psychology, we embarked on a project to develop creativity in promoting student-

centred active learning in groups of over one hundred students, and to include formative assessment techniques as a normal part of the teaching process. These assessment techniques give students the opportunity to reflect on material as they are acquiring it, and to evaluate their own understanding of the material presented. The use of active learning in lectures is promoted (e.g. Benjamin, 1991), but the emphasis is typically on activities that students do in pairs or groups. This is a way of making the lecture more effective (it can make a large class more like a small class), but our view is that in order to make effective use of active learning we do not need to make the large class like a small class. This implies that smaller is better. Instead, we wanted to look for ways of taking advantage of the large group size, and consider what things can be done with a large group that are harder to do with smaller groups. These endeavours were part of our reframing of the lecture from a focus on challenges to a focus on opportunities. This paper reports an evaluation of lecture-based active learning and formative assessment techniques, from the perspectives of students and lecturers.

Study 1: Student perspectives

Common sense would lead us to expect that students would favour active learning over traditional lecturing; however, reports in the literature are mixed. Some research suggests that students are less positive about active learning than traditional lecturing (Lake, 2001), perhaps because some students like the passivity of the traditional lecture. Some reports are more positive, suggesting that students value active learning (e.g. Huxham, 2005). Some evidence is equivocal; Machermer and Crawford (2007) found that students were no more positive in their ratings of active learning than of traditional lectures.

The majority of studies exploring students' perspectives of active learning rely on ordinal rating data. This limits our understanding of what students actually think

about these methods, and does not reveal whether positive perceptions of active learning are supported by any insight into the benefits of active learning beyond being 'more interesting'. Equally, it is important to know whether students show insight into the benefits of receiving formative feedback in lectures. The present study aimed to address these issues.

Method

This project investigated how students experience the use of active learning techniques and formative assessment within large lecture classes. Whilst students rated the overall effectiveness of the lectures on quantitative scales, the focus here is on the freeform comments that students made in response to the question 'What was good about this module? Please say why'. This is because this question did not specifically ask students about the active learning techniques and use of formative assessment, and we were interested in whether they would view these aspects of the module as part of their positive evaluation of the module overall. It is important to note that students were also asked 'what aspects of the module could be improved' but few responses were given in this section, and of those that were given, none made reference to the active learning or formative assessment techniques, so are not considered further. The evaluation reported here is based on a level HE1 personality theory module, delivered to a cohort of approximately 120 students. This course is taught using lectures only, with a two-hour lecture every week for a period of 11 weeks. There are two summative assessments: a coursework essay and a multiple choice exam.

Class activities

Active learning

The definition of active learning we adopted was inspired by Bonwell and Eison (1991); learning is considered to be active if students are engaged in meaningful learning activities that require higher-order thinking,

rather than just listening, and are provided a learning environment that enables the development of skills rather than just absorption of information. Our further criterion was that the activities should not be things students could work on in pairs or small groups, but an activity that by necessity included all students simultaneously, meaning that no student could either dominate the activity or disengage from the process.

Examples of the kinds of activities undertaken during lectures that were used to involve the whole class in active learning simultaneously included research modelling, role-plays and problem-based learning. In research modelling activities, the whole class played the role of research participants in a published study, with different groups of students undertaking the experimental tasks experienced by different groups of participants in the original study. The results from different groups were collated, analysed and discussed, in order to encourage students to critically evaluate the methods of the study and the conclusions drawn by the authors. An example of a large-scale role playing exercise involved an evaluation of different sources of information about a person's personality. Students were divided into teams and each team had to build up the most accurate personality profile of a fictional person. Some teams were able to base their judgements on psychometric data, such as personality test assessments, some had just observational data of the person's behaviour, and some had to use life record data such as health records, bank statements, and personal possessions. The accuracy of each profile was judged, before a discussion of which type of data was most useful and why.

Formative assessment

Different techniques were used to deliver formative assessment to students within the context of the lecture. For example, after the lecturer had presented a particular concept or series of studies, students were presented with a '60-second exam question' relating to

the material that had been presented. Students had to plan how they would respond to that question, using material from the lecture, in just one minute. Students then discussed their answer with a peer, before the whole class discussed what could be included, with the opportunity to clarify any misunderstanding about the material. Students then passed their answer to a peer again, who provided suggestions for how the answer could be improved.

A further use of formative assessment used within lectures involved student-centred lecture plenaries. Instead of the lecturer summarising the material at the end of the lecture, students were asked to write down what they felt were the three key messages of the lecture. Again, students provided peer feedback and a class discussion followed, in which students were able to check that the key messages they were taking from the lecture were comprehensive and met the learning objectives.

Delivery of formative assessment in lectures often makes use of multiple-choice questions (e.g. Draper, 2004; Gier & Kreiner, 2009). Rather than giving students multiple choice questions to answer, one of our formative assessment techniques required students to write a multiple choice question based on something covered in a section of the lecture. The aim was to force students to consider some of the likely common misconceptions surrounding a topic, of the kind that an examiner might use as foils in a multiple choice question. Thus, the writing of the question served an important function, but then students were also able to test their own understanding by answering a question written by a peer. Students then discussed why they had put particular response options within their question.

Data collection

Module Evaluation Questionnaires distributed at the end of the module asked students to rate various aspects of the module and the teaching, as well as provide freeform comments about the positive aspects of the

module and ways in which the module could be improved. The overall response rate for this cohort was 84.3 per cent. The University Ethical Guidelines permit the analysis of student evaluations for purposes of pedagogical research.

Data analysis

Freeform comments from students were subjected to thematic analysis (Braun & Clarke, 2006). This type of analysis is flexible and thus applicable to many types of qualitative data, and is ideal for considering similarities and differences in subjective experience.

Results

Experiences of active learning techniques

In students' responses to the question 'What was good about the module? Please say why', students made frequent reference to the active learning techniques. These comments fell under two broad themes: engagement, and retention of material.

Engagement

First, students found the active learning techniques engaging, and felt that active involvement renewed their interest in the topics:

When we are part of the process, the material comes alive. Psychology is about people, so we need to experience it for ourselves!

I was made genuinely interested in material I would otherwise not have enjoyed.

These students seemed to value the opportunity to move beyond the 'conveyor belt' of teaching, where material is delivered and then regurgitated. Student comments also showed evidence of insight into why active learning is beneficial:

[Active learning] stimulates independent thinking, and shows the relevance of course material. Lectures were EXCITING!

I do not feel spoon fed but have the confidence to build my own representation of the topics.

Here, reference is made to higher-level independent thinking, the application of course material to other areas of the curriculum,

and student independence. Students also showed insight into the benefit of the activities for self-reflection and perspective taking:

Students are interactively involved in what we are learning – through looking at ourselves.

It is also of note that many students, when discussing the active learning techniques, made strong use of collective terminology (e.g. ‘we, us’) rather than ‘I’ or ‘me’, perhaps indicating that these active learning techniques were framed collaboratively in terms of student perceptions and experiences.

Retention of material

The second theme that emerged from analysis of student comments about active learning was retention of material. Beyond engagement with the material, students also felt that active learning helped them to remember material; by thinking back to the context in which it was learned, the content itself is more memorable:

Tasks were helpful for understanding and remembering concepts.

Tasks are relevant and help learning.

The opportunities to interact helped me to learn.

These comments do not suggest that students feel anxious by not having been taught material directly; instead, students show insight into the value of first-person experience with material for engaging with it on a deeper level that then supports long-term understanding. Students also appreciated the relevance of the activities; far from seeing them as additions to taught material, they show an appreciation of the integral nature of the activities to the learning experience.

Experiences of formative assessment

Student responses that made reference to formative assessment techniques fell under two themes: personal development, and consolidation of understanding.

Personal development

First, students felt that the opportunity to receive formative feedback in the lectures helped them to develop as learners:

Feedback and opportunities for advice helps learning and personal growth.

This indicates that the development afforded by lecture-based formative assessment does not solely operate on an academic level, but also contributes to wider personal development. In addition, other students indicated that the benefits of formative feedback were not restricted to the understanding of lecture content:

Reviews and feedback have helped me to develop more effective learning strategies.

These students show insight into the benefits of formative feedback for their own development, and make reference to its value beyond the immediate context of the course in which it was delivered.

Consolidation of understanding

Students acknowledged that the opportunities to receive feedback in the lectures helped them to understand and consolidate lecture material:

Getting feedback in the lecture helps you to connect it with what you have been learning, which is still fresh, so you can integrate it better. ...the opportunity to test my understanding means that the material glues together and when I leave it's still in place!

Here, there is evidence of clear insight into the value of receiving feedback on one's understanding in the context in which that material has been learned, and immediately after that material has been presented.

In sum, beyond just saying that they ‘liked’ these techniques, student comments showed clear evidence of insight into *why* these techniques were beneficial for them as learners.

Study 2: Lecturer perspectives

If the large lecture is to be viewed in terms of ‘opportunities’ rather than ‘challenges’ this needs to be explored from the perspectives of lecturers as well as students. Do these techniques provide *opportunities* for teachers or are they more of a *challenge*?

On a purely practical level, delivering a standard lecture is easier than incorporating

active learning into the lecture (Benjamin, 1991); designing and implementing active learning techniques increases preparation time. It is also the case that a standard lecture is the 'safer' option; lecture activities, particularly those conducted on a large scale, bring with them the risk that things can go wrong, and this can be a source of anxiety. Furthermore, Machemer and Crawford (2007) report that staff concerns regarding the use of active learning include: ensuring coverage of material; maintaining control in the classroom; and promoting higher level thinking. Furthermore, the shift in the role of the lecturer from 'deliverer of knowledge' to 'facilitator of understanding' can cause just as much anxiety on the part of the lecturer as on the part of the student. Thus, it was felt that in order to fully evaluate the efficacy of lecture-based active learning and formative assessment, the perspectives and experiences of lecturers using these techniques should also be sought.

Method

Data collection

The views of two psychology lecturers using active learning and formative assessment techniques in large group teaching were sought using a survey which very simply asked them to comment on what they felt were important aspects of their experience with these teaching methods. For similar reasons to those discussed for study 1, we did not want to constrain the responses of lecturers when considering their use of these methods.

Data analysis

The comments made by lecturers were subjected to thematic analysis for similar reasons to those outlined above.

Results

The perspectives voiced by the lecturers were largely positive. The lecturers discussed both the advantages of these techniques for students and for teaching staff, but also commented on some of the challenges they had experienced.

Advantages for students

When discussing the perceived benefits for students, the lecturers mirrored some of the views voiced by students themselves. The advantages for students mentioned by the lecturers fell under two broad themes: engagement and motivation.

Engagement with material

Lecturers expressed their belief that personal experience of and engagement with the material can be more powerful than passive reception of content:

They can have an epiphany moment where they suddenly get something – this comes from personal experience with it.

There is something visceral about doing something. It also enhances long term memory and retention. In an exam they may remember the class and the activity, which helps them to remember the concept and the theory.

These comments illustrate that rather than active learning impeding the coverage of course content, the lecturers using these techniques feel that instead, memory and understanding can be enhanced through first-person experience.

Motivation

Lecturers also discussed the benefits of active learning for students in terms of enhanced motivation. Reference was made to the importance of personal agency that can come from active involvement with the material:

[Active learning provides] freedom and autonomy to learn, sense of power, more interesting from their perspective, sparks their curiosity...

In addition, formative assessment was also discussed in terms of increased motivation:

I've seen evidence that if students can leave the lecture thinking, 'Yes, I understand that and I know I do because I got feedback', it can be a real confidence boost, and it can make them want to get straight on with the reading and write up their notes.

Here, the lecturer shows a clear awareness of why lecture-based feedback can be highly

beneficial in encouraging students to take responsibility for their own learning.

Advantages for staff

The perspectives voiced by lecturers also made reference to the benefits to them personally; again, these comments fell under two broad themes: engagement and personal development; and perspective taking.

Engagement and personal development

Lecturers expressed how incorporating active learning into their lectures was beneficial in terms of supporting their own engagement with the subject:

Using active techniques keeps you refreshed – thinking of new ways to incorporate student activity is a constantly evolving process.

Here, reference is made to the use of active learning as continuous and cyclical, but also how developing activities can make the teaching process more interesting. Lecturers also indicated that because active learning requires creative thinking, it can be advantageous in terms of personal development:

It keeps you on your toes and stops you becoming complacent as a teacher.

Here, the lecturer expresses how avoiding the ‘comfort zone’ of more traditional lecturing can be beneficial.

Perspective taking

Lecturers discussed how, by engaging students as active participants in the lecture, and assessing their understanding in that context, they were able to get a better idea of the students’ abilities:

It makes it easy for lecturers to know students, their interests, their levels of knowledge and understanding.

Beyond understanding the abilities of students, one lecturer commented how the use of these techniques enabled them to consider the whole learning experience from the perspective of the students:

...[using active learning] helps me to better understand the psyche of the students, this helps to adapt the delivery of the content to the students.

It seems that just as these techniques encourage students to reflect on their own learning, they also force lecturers to see students as occupying a more central role in the learning process.

Challenges

Whilst the perspectives of lecturers using lecture-based active learning and formative assessment were largely positive, they did make reference to some of the challenges they had experienced: increased preparation time; and anxiety.

Preparation time

Both lecturers discussed how incorporating active learning and formative assessment into lectures can increase preparation time, in comparison to preparing a standard lecture:

Unfortunately, active learning increases your preparation time. It requires thinking. But this preparation time has benefits for me as well, as it forces me to think about the topic in new ways.

Here, the lecturer seems to adopt a positive stance to the increased preparation time, considering how the extra time spent on preparation can have personal benefits. The other lecturer also discussed the increased preparation time created by these techniques, but did not necessarily view this in a negative way:

It may take more time, but it is a completely different kind of preparation. I want students to see a concept in action, so I start from this end point and work back in planning.

Whilst the use of lecture-based active learning and formative assessment can be challenging in terms of increasing preparation time, the experiences of lecturers seem to indicate that this can be advantageous, rather than an inconvenience.

Anxiety

Both lecturers did make reference to the differences between active learning and standard lectures, and acknowledged that active learning can take them out of their ‘comfort zone’:

This type of teaching can create more anxiety because it is less structured. Planning a PowerPoint lecture reduces anxiety because it is all there for you.

However, one lecturer explained how this initial anxiety can be reframed to represent a positive influence on teaching development:

...it's also risky, and it's hard when you first do it. Then it becomes more a constructive challenge to incorporate active things, rather than a source of anxiety.

Thus, lecturers were largely positive about the use of these techniques, seeing clear benefits for themselves and their students. In addition, even where challenges were discussed, these were reframed in positive ways, identifying the opportunities within the challenges.

Discussion

This evaluation represented the first stage in taking advantage of the large lecture learning environment to promote active learning and provide formative assessment to students. Analysis of student evaluations illustrated that students experienced these techniques in a positive way. Not only did students enjoy the opportunities to be active participants in the lecture, they showed insight into the benefits of these activities. For example, there is objective evidence in the literature that active learning can enhance long-term retention of course material (e.g. Huxham, 2005). Students in our study showed awareness of this benefit, being able to explain why active learning was beneficial for their development as learners.

These findings suggest that not only can active learning be used in a lecture to involve the whole class in a task simultaneously, but that also students are positive about these activities and see them as both engaging and useful. Whilst active learning in lectures is useful in personalising the large class (Benjamin, 1991), only the large lecture provides the means to include all students in large-scale activities. Thus, students are involved not only individually but as a cohort, enabling them to learn from one

another and fostering a collaborative approach to understanding course material. Far from active learning being merely *possible* in large classes (Benjamin, 1991), from our perspective, it can also be *dependent* on large classes. Some activities require all students to be involved simultaneously. For example, our research role-play exercises require good group sizes to represent different experimental conditions if group scores are to be meaningful.

The use of formative assessment was also perceived positively by students, whereby students saw how receiving feedback in lectures influenced their learning strategies, and contributed to enhanced consolidation of the material. The findings indicate that incorporating more opportunities for formative assessment within the curriculum does not require a reduction in large group lecturing, as Yorke (2003) suggested. Instead, the large lecture can be seen as an ideal forum within which a large group of students can simultaneously receive feedback on their understanding, in the context in which they have learnt the material. If effective formative feedback requires motive, means and opportunity (Shute, 2008), the large lecture provides an environment in which all three requirements can be met. Students need feedback (motive) in order to chart their progress towards meeting the learning objectives; the opportunity is ideal, since students receive feedback in time to use it whilst their understanding is still malleable; and the lecture provides highly effective means to deliver formative feedback, as students are in the optimum environment to be able and willing to use the feedback. Effective feedback can also be delivered to the entire cohort simultaneously.

When considering the perspectives of lecturers using lecture-based active learning and formative assessment, lecturers showed clear insight into the benefits of these techniques for students, mirroring some of the insights made by students themselves. Perhaps what was most interesting was that, in considering their experiences, lecturers

did not only consider the benefits for students. They also seemed to be reflecting on the ‘What’s in it for me?’ question, and here indicated that these techniques are advantageous in terms of both personal and professional development. Despite mentioning some of the challenges inherent to the use of these techniques, most notably an increase in preparation time, these difficulties were offset by the benefits noted above. Thus, the lecturers were very clear in seeing the opportunities provided by the challenges.

Despite the fact that staff were positive and framed the use of the techniques in a positive way, it is important to consider this approach from a critical stance. First, this evaluation represents subjective opinions only. In future work it is important to consider the effects of these techniques in a more objective way, and to consider the long-term impact of these forms of learning and teaching. Furthermore, the use of these techniques is not straightforward. Active learning requires experimentation; a willingness to take risks, evaluate the outcomes, and modify the activities accordingly. Lecturers also need to be aware of the risks associated with the use of formative assessment in lectures. Whilst there is the potential for students to leave the lecture feeling confident in their understanding, having clarified anything they did not understand, there is also the potential for students to feel anxious about their lack of understanding. As Yorke (2001) argues, effectively implementing formative assessment is not easy: ‘Done well, and the student will flourish: done badly, and the risk of student discouragement or failure is increased’ (p.124). Strong support from peers and an emphasis on what is understood, and encouragement to seek clarification within the lecture context, are likely to be crucial when implementing lecture-based formative assessment effectively.

Whilst the kinds of techniques we have described here could be successfully applied to the teaching of any subject in higher education, it is important to consider the extent to which the findings here might be influenced by the subject matter taught within the psychology curriculum. The student who reminded us that as psychology is about people, students need to be involved in the learning process, provides an insight that reminds us that creativity in delivering material within the discipline of psychology is provided an advantage by the fact that the subject matter and the learners are often one and the same. We need to find new ways to exploit this unique advantage to allow students to critically engage with the material on a personal as well as academic level.

Finally, one factor that is likely to have a large impact on the effectiveness of active learning and formative assessment are student individual differences, including approaches to study, motivation, and self-efficacy. Future research needs to consider these factors in more detail, as there is evidence to suggest that appraisal of active learning is dependent on a student’s own learning orientation (Struyven, Dochy & Janssens, 2011). It is important to ascertain whether the use of these techniques might be able to motivate those who are typically less engaged with course material, whilst not harming the motivation of those who are naturally deep learners.

Taken together, the findings reported here are promising. They illustrate that creativity in teaching and learning has recognisable benefits. However, we also need to be mindful of the inherent challenges, and remember that widespread use of these methods will require a course-wide restructuring of perceptions. Nevertheless, reframing perceptions of the large lecture from emphasis on *challenges* to emphasis on *opportunities* has been effective in enhancing the learning experience from the perspective of both students and lecturers.

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Helping students succeed through using reflective practice to enhance metacognition and create realistic predictions

Carolyn Mair

Understanding how students can better manage their expectations has been a topic of interest in pedagogy for some time, yet solutions remain elusive. This paper describes a recent study which aimed to help students make more realistic predictions by increasing their metacognition. At the outset, participants completed a metacognitive awareness inventory and were asked to predict the grade for their next assessment. They were instructed on how to use a structured reflection spreadsheet and asked to reflect weekly for the study period. At the end of the study, the inventory was re-administered and participants predicted the submission time and grade for the next assessment. Although results showed a significant increase in scores in metacognition, they did not show improved prediction accuracy. Possible reasons for the outcomes and further work are discussed.

Keywords: *Metacognition; higher education; student satisfaction; expectation; reflection.*

AN EXPECTATION is a prediction about a future event or outcome. Predicting the future is notoriously difficult and in an attempt to manage the complexity of processing mental tasks, such as making predictions, humans typically turn to heuristics (Simon, 1957). These are readily available experience-based techniques which allow us to derive a satisfactory, rather than optimal, prediction. Despite evidence suggesting heuristic-based predicted outcomes can differ significantly from actual outcomes (Tversky & Kahneman, 1974), we tend to have high confidence in them (Fischhoff, Slovic & Lichtenstein, 1977). Moreover, predicted outcomes are typically biased in one direction: towards overestimation of ability, skills and knowledge (Dunning, Heath & Suls, 2004; Dunning et al., 2003; Fischhoff et al., 1977; Buehler, Griffin & Ross, 1994). Thus the incongruence between predicted and actual outcomes can result in dissatisfaction which in turn determines students' satisfaction

ratings (e.g. Moore, Moore & McDonald, 2008). A great deal of importance is based on satisfaction ratings in higher education (HE) as they can affect the reputation of the Higher Education Institution (HEI), tutor (2008) and attrition rates. While it is clearly in the interest of all to improve satisfaction, there is a paucity of research investigating the relationship between students' prediction accuracy and satisfaction ratings. Rather, findings from studies investigating student satisfaction typically encourage staff to provide environments that surpass student expectations (e.g. Ferguson DeJong, 2008) without investigating the bases on which the expectations were derived.

Metacognition (Flavell, 1978) has been found to be a predictor of successful learning and academic performance (e.g. Dunning et al., 2003), intelligence (e.g. Sternberg, 1984) and confidence (Kleitman & Stankov, 2007). Metacognition is the awareness, monitoring and control of one's cognitive processes. Thus it follows that

more accurate predictions, as a result of more accurate self-perception, could be developed through increased metacognition (Swartz & Perkins, 1989). In addition, this would increase students' autonomy (Boud, 1995; Livingston, 1997). However, in order to become more metacognitively aware, one needs to be critically reflective (e.g. Schön, 1982; Dewey, 1939) and to learn from reflective practice, weaknesses as well as strengths need to be scrutinised (Dewey, 1939). Evidence has shown that weaknesses are less considered when reflections are read or assessed by a tutor as students tend to demonstrate knowledge and hide ignorance (Boud, 1999; Sumsion & Fleet, 1996). Therefore, not assessing reflections and using information and communication technology (ICT) for reflective practice could be advantageous as it is interpreted as less judgemental, thus increasing disclosure and honesty (Kettinger & Grover, 1997). Additional advantages such as its 24/7 accessibility have often been cited (e.g. Barak, 2006; Paulus & Roberts, 2006; Alevin & Koedinger, 2002; Lin et al., 1999).

Mair (2009) developed a structured spreadsheet for critical reflective practice situated on the university's virtual learning environment (VLE) in an attempt to move from traditional learning journals which are assessed, and others which lack structure and guidance. The aim was to facilitate critical reflective practice in a private, familiar and accessible format. Moreover, because the spreadsheet format makes previous reflections available while current reflections are being entered, the student takes part in meta-reflection (Dewey, 1939; considering past as well as current reflections); reflecting on and in practice (Schön, 1982) such that meaning becomes learning (Mezirow, 1991). In effect, when using the spreadsheet students enter, store and retrieve reflections across rows, guided by column heading and examples such as 'How can I apply what I have learned in other contexts?' whilst previous reflections are displayed in rows above (providing meta-reflection) via the

VLE (providing continuous accessibility). Moreover, to encourage disclosure, reflections are neither read nor assessed. In a body of work since 2009 Mair and Taylor have consistently shown improved metacognitive awareness following use of the reflective spreadsheet.

In order to help derive more realistic self-perceptions, the study described below aimed to encourage students to develop more realistic predictions (expectations) by enhanced metacognitive awareness developed through online, structured, critical reflective practice. To determine the relationship between metacognition and prediction accuracy, participants in the present study were encouraged to reflect critically for six weeks and to predict the outcome of two assessments. The hypotheses were that reflective practice would lead to increased metacognitive awareness and there would be relationships between metacognitive awareness and prediction accuracy, and among the amount of participation and post-study metacognitive awareness and prediction accuracy.

Ethical approval was obtained from the Department's Ethics Committee prior to commencement. Year 2 undergraduate psychology students were asked to complete the Metacognitive Awareness Inventory (MAI; Schraw & Dennison, 1994) and reflect weekly on their learning via the VLE for six weeks as a 'structured learning' exercise in part fulfillment of their coursework. Fifty-five students consented to the MAI data being analysed for the purposes of this study. The MAI was used to measure self-reported metacognitive awareness. The 52-item MAI measures a range of aspects of metacognition such as monitoring, planning, comprehension using a six-point Likert scale. A structured spreadsheet for reflecting, based on Mair (2009) was used to encourage reflective practice on learning. Instructions were given at the outset and were available online. The study required students to: (i) complete the MAI before and after the study; (ii) predict the grade for their next assess-

ment (A1); (iii) reflect on their learning using the structured reflection spreadsheet on the VLE; and (iv) predict the grade they would be awarded for their next assessment (A2). At the outset, participants were instructed on using the reflection spreadsheet. The instructions were also available on the VLE. MAI baseline and post-study scores were compared, and students' grades were compared with actual grades for A1 and A2. Data from the 68 participants completed each of the required aspects of the study were included in the analyses.

The MAI demonstrated high internal consistency both pre- and post-intervention (Cronbach's $\alpha=.92$ and $.94$, respectively). The mean MAI baseline scores increased significantly from baseline to post-study ($t(35)=-3.58, p=.001$) and demonstrated a significant main effect ($F(1,34)=10.42, p=.003$). There was no significant difference between prediction accuracy for A1 and A2 ($t(17)=-1.48, p=.16$), but grade prediction error was positively correlated with baseline MAI scores (Table 1).

Discussion and conclusions

Students arrive at university with high expectations and consequently some become dissatisfied when actual outcomes do not correspond with their expectations. Typically, expectations are built on error-prone heuristic-based predictions (Simon, 1957) which are likely to be biased towards over-estimation of ability (Tversky & Kahneman, 1974). The resulting disappointment can lead to a sense of injustice, provision of poor

feedback on staff and increased attrition rates. Programmes aimed at increasing metacognition, such as critical reflection, can enable students to improve self-perceptions of knowledge and skills (e.g. Boud, 2004) which should enable them to produce realistic predictions.

In the present study, an online, structured reflection spreadsheet (e.g. Mair, 2012; Mair & Taylor, 2012) situated on the VLE was used to enhance metacognition over a six-week period and to investigate whether the intervention would lead to more accurate grade predictions for two assessments (A1 predicted at baseline; A2 predicted post-study). Metacognition, measured at baseline and post-study using the MAI, significantly increased over the period of the study, but this did not correlate with improved grade prediction accuracy. We also investigated the impact of amount of participation on metacognition and on prediction accuracy. We found that although no significant difference was found between grade prediction accuracy for A1 or A2, it was affected by amount of participation, as were post MAI scores. Moreover, participants with greater prediction error for A1 reflected fewer times over the course of the study and the lower the participation, the greater the difference between predicted and actual grade for both A1 and A2. Although MAI scores could be an indicator of engagement, there exists a problem beyond the ability to accurately predict grades given the well-documented benefits of metacognitive awareness. Despite low prediction error in

Table 1: Mean MAI, predicted and actual grade and participation.

	Baseline (mean (SD))	Post-study (mean (SD))
MAI	4.12 (0.47)	4.23 (0.48)
Predicted grade	60 (5.88)	62.83 (4.25)
Actual grade	60.86 (8.80)	60.72 (9.62)
Prediction error	-0.86 (A1)	+2.11 (A2)
Participation	11.21 (4.99)	

this study, confidence in ability did increase over the six-week period and it is unknown whether this trajectory would continue with continued reflection. Although confidence is desirable and can lead to better performance, it can also lead to unrealistic (biased) expectations (Kleitman & Stankov, 2007).

The study was limited by a small sample and by the fact that students were required to participate in part fulfillment of their degree, but the work was not assessed. The latter point benefits disclosure, but is unlikely to encourage participation for less motivated students. In future, it would be interesting to analyse existing data on student expectations to draw out the main factors such 'feedback' and 'staff availability' and investigate those factors at different times during the degree programme. For example by asking students to keep track of the instances these factors are encountered and apply sustained critical reflective prac-

tice on them. Finally, the vehicle for prediction (Year 2 assessment grades) may not be the most suitable as student grades generally do not have great variability and by Year 2, most students can accurately predict what grade they will receive. The findings raise some important questions: first, how can we engage students who are low in metacognitive awareness? Second, how can we increase metacognition while tempering confidence? Third, what are the most influential factors for student expectations.

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The benefits of volunteering for psychology students

Rachel Bromnick, Ava Horowitz & Daniel Shepherd

Within the current economic climate students are seen as needing more than a degree to succeed in securing graduate employment. One way that students chose to enhance their employability is through engaging in voluntary work. In this empirical study, undergraduate psychology students' reasons for volunteering are explored within the context of enhanced employability. Thirty-nine students provided written narrative accounts of their reasons for undertaking voluntary work. Responses were analysed together to identify key themes and subthemes. The main finding from this analysis was the large degree of cluster overlap within individual participants' responses between self and other focused motives, allowing for a model of strongly interdependent motives to emerge. Students clearly benefitted from both volunteering and the opportunity to reflect on their experiences. The findings are discussed in terms of their value for promoting volunteering for psychology students, in and beyond the context of employability.

Keywords: *Employability; volunteering; psychology; content analysis; reflective practice.*

EMPLOYABILITY is a complex, multi-faceted construct that has been variously described and operationalised; cutting across the HE sector both nationally and internationally. Based on a comprehensive review of the literature, McQuaid and Lindsay (2005) provided a framework for understanding and organising employability factors. Their global analysis identified three main interrelated components that potentially influence a person's employability, defined as their propensity to secure employment. These are individual factors (e.g. attributes, competencies and skills); personal circumstances (e.g. household circumstances, work culture and access to resources; and external factors (e.g. labour market factors, macroeconomic factors and recruitment/selection procedures). In total, their framework gives examples of more than 115 competing potential enhancing or impeding factors within the three groupings.

Despite the complex range of definitions of employability that reside within the literature, easily the most dominant description is based on a 'skills, knowledge and experience' model. This places the responsibility at

the level of the individual and, at least in the UK, employability has become almost synonymous with possessing certain transferable skills. The origins of this skill based definition can probably be traced to the Dearing Report into Higher Education (NCIHE, 1997), which argued for a focus on the development of key skills and also highlighted the importance of work experience.

Within the subject of psychology, the number of full time undergraduate students roughly doubled between 1998 to 2008, with currently over 77,000 students studying the subject (Trapp et al., 2011). In recent years, the trajectory of this expansion in undergraduate numbers has coincided with a reduction in employment opportunities as a result of the global economic crisis. This has resulted in a bottle neck of new graduates looking for graduate-level work (or indeed work of any kind), although even in times of economic plenty, positions for psychology graduates are notoriously competitive. There are multiple stakeholders with an interest in promoting employability and the issue is high on the strategic priority of most universities. Recently, the Higher Education

Academy Psychology Network, the British Psychology Society and the Association of Heads of Psychology Departments joined forces to consider the future of undergraduate psychology in the UK. This forum identified life-long employability as a key concern and priority (Trapp et al., 2011). Students themselves have recognised the challenges of securing entry into the labour market and many acknowledge the need to optimise their employment prospects (Tomlinson, 2007).

Although key commentators, such as Knight and Yorke (2004) have argued for employability skills education to have good standing by being integrated into the curriculum, many students are encouraged to enhance their employability, above and beyond what is provided by their academic studies. This may be particularly important for undergraduates enrolled on non-vocational programmes but applying for graduate positions where having some previous work experience could confer an advantage. Work experience obtained prior to graduation has been shown to clearly boost the employment prospects of psychology graduates (Reddy & Moores, 2006), although some commentators are more skeptical about the evidence for a causal link between volunteering and employability (Holdsworth & Quinn, 2010).

Beyond the context of employability, numerous studies have shown that volunteering confers many psycho-social benefits to the individual (see, for example, Mojza, Sonnentag & Bornemann, 2010). There is, however, a paucity of empirical work that has examined students' own motivation to engage in voluntary work. An exception to this is a study of Chinese student volunteers, which used a grounded theory approach (Luping, 2011). The analysis revealed three main motivations: the traditional motivation (focused on responsibility); the modern motivation (focused on development); and the postmodern motivation (focused on pleasure). Luping (2011) used the data to

challenge a simple dichotomy between selfless and self-serving motivations. This unidimensionality of volunteering motivations concurs with earlier findings from factor analytic studies (e.g. Cnaan & Goldberg-Glen, 1991). The overall aim of the current study was to use a phenomenological approach to examine the motivations for volunteering in a sample of UK psychology undergraduates.

Method

Participants

The sample consisted of a group of 112 second-year psychology undergraduate students enrolled on an optional, innovative, extra-curricular employability programme, run by a UK psychology department. This represented just over 50 per cent of the cohort. A total of 86 students completed both parts of the assessment (simulated job interview and portfolio). One of the requirements for the programme was an engagement in a minimum of 40 hours volunteering over a calendar year. The types of schemes the students engaged in ranged from supporting local and national voluntary organisations (e.g. Mind, The Samaritans), approved overseas opportunities (such as a primate therapy initiative in Uganda), as well as volunteering that assisted the work of the university (e.g. helping at open days).

Elicitation of data set

The students were asked to consider the prompt 'Why I do voluntary work' as an optional component for their portfolio of reflective practice. They were encouraged to see this as an opportunity to demonstrate their psychological literacy (McGovern et al., 2010) by not only reflecting on the topic but also demonstrating their skills as psychology students (e.g. by drawing on any relevant literature). The students were presented with six different ways they could respond to the prompt. For this study the written narrative responses from 39 students were analysed.

Ethical protocol

A consent form was included within the portfolio assessment which asked the students to sign that they were happy for the contents to be used, in anonymised form, for marketing or research purposes. Furthermore, the 'Why I do voluntary work' prompt was just one of a range of options for completing their portfolio, with many non-experiential alternatives to choose from.

Results

A thematic content analysis of the written responses was conducted using the analytical guidelines of Braun and Clarke (2006). This revealed two superordinate themes, labelled 'Self-focused' and 'Other-focused' motivations. Within each of these, four subordinate categories were identified. These were for 'Self-focused': Personal Rewards, Employability, Skills and Personal Growth, and for 'Other-focused': Belonging, Helping, Generativity and Valued. The key finding from this analysis was the large degree of cluster overlap within individual participants' responses. An example showing the overlapping subthemes within the superordinate theme of Self-focused was the following contribution by Participant 35, which demonstrates the interweaving of Employability, Skills and Personal Growth. She wrote: *'Volunteering allows you to identify which skills you may not be good at in relation to a particular working environment and so this self-reflection helps you to flourish in a working environment and as a person'* (P35). Similarly, there was clear overlap between superordinate themes, in this example between the Self-focused subtheme of Employability and the Other-focused subtheme of Helping: *'When I admit that I volunteer for my future career development I feel selfish and egoistic. It's not that I don't have a desire to help people; in fact I hope that my job in the future involves helping people'* (P5). Overlap of Generativity and Personal Rewards is demonstrated here by Participant 22 who explained: *'There is a sense of 'passing the torch', giving information to the next generation of students and being there for them when the*

majority of things they experience will be new to them. This kind of satisfaction is what will keep me volunteering' (P22).

The words of Participant 5 above also exemplify a tendency for a number of participants to note the potential tensions between self- and other-focused motivations for volunteering. Moreover, a notable group of students described a journey from a starting motivation of enhanced employability towards experiencing a deep level of personal satisfaction: *'The reason I personally started volunteering was because I wanted to increase my employability by boosting my CV, as I had not had much previous experience. But as I carried out my volunteer work, I found that there were other benefits to volunteering... Volunteering has been a very positive experience for me in discovering my capabilities and highlighting areas where I need improvement, as well as enhancing my relationship with my sister and with other students at university'* (P24). Many participants also took the opportunity to apply knowledge from psychology to themselves and others: *'From a psychological perspective, Maslow (1970) would say that this positive feedback motivates me to volunteer because it helps me to fulfill my esteem needs which help me in my pursuance of self actualisation'* (P20).

Discussion

This research generated a large and rich data set. For the purpose of this paper three key points will be summarised. Firstly, although a number of the factors identified support previous research, for example, the seminal work of Clary et al. (1998), this inductive qualitative approach has revealed how students' motivations are intrinsically interrelated. The tensions between different motives were palpable within the data set and the development between motives was sometimes expressed as temporally unfolding. Secondly, these findings can be used for promoting volunteering for psychology students. Explaining the convergent interface between motivations that student volunteers typically experience may help reduce the tension that some may experience.

rience. Students can feel permitted to concurrently possess self-focused goals for volunteering alongside their other-focused values. Finally, this research has embraced some of the key recommendations from Trapp et al. (2011). In particular, it provides self-report evidence of how the activities undertaken by these students have boosted their psychological literacy through engagement with the wider community and facilitated opportunities to connect their psychological knowledge to their own lived experience. Enhanced employability is achieved for these students by having gained some relevant work experience in addition to their main academic studies. The students took the opportunity to volunteer within a variety settings, including schools, hospitals and prisons; locally, regionally and internationally. This may be particularly important for psychology students hoping to move onto careers in the public sector. However, it has been clearly demonstrated that encouraging students to volunteer and providing them with the opportunity for guided reflection, has many benefits beyond the proximal goal of helping them secure a first graduate position. The career development learning shown here puts the personal into personal development planning and shows that Psychology departments can facilitate learning experiences for their students that are truly transformative. In conclusion, the findings fit with Trapp et al.'s (2011) vision of the 21st century psychology student where the focus on life-long learning, sustained employability and socially relevant activity is prime.

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The assessment of critical evaluation, leadership and reflection skills through participation in online discussions

Jacqui Taylor

Increasingly, educators from all disciplines are using blogs, social networking sites, VLEs and wikis to encourage academic discourse between students. However, a common problem experienced by educators is how these important learning experiences can be assessed and because of this difficulty many are not assessed. For some time now, I have been using online discussions via the University VLE as a way to encourage student debate around key lecture topics (e.g. Taylor, 2002). The key learning outcomes which this assessed activity addresses, in addition to learning more about the topic, are to develop skills in reflective practice, critical evaluation and leadership. This article will review the ways that face-to-face and online academic discourse between students have been assessed, highlighting some of the differences to consider when setting up online discussion activities, compared to face-to-face discussion. I will then provide a case study of the way I set up online discussions and the method I currently use to assess contributions. The final part of the paper will consider the potential for using quantitative content analysis (QCA) and automated methods to assess online participation.

Keywords: *Online discussion; online skill assessment; virtual groups; quantitative content analysis; automating assessment.*

1. Introduction

ONLINE GROUP DISCUSSIONS develop many important traditional and 21st century skills important for graduates in this fast changing world (McGraw, 2009). However, existing models of assessment typically fail to address these skills. This Introduction will consider the similarities and differences between the learning experiences in face-to-face and online group discussions and consider how the setting-up of online discussions can affect the development of skills.

1.1 Assessing 'traditional' and online discourse between students

Academic discourse between students helps them to develop an understanding of different views on a topic and helps to develop public speaking and debating skills; however the learning that takes place during such interactions is rarely assessed.

Although, students may be assessed individually for their presentation skills or for their contribution towards a group project, their actual discourse is rarely assessed, due mainly to the difficulty in assessing communication in real time face-to-face environments. Even if such interactions are recorded via video or audio, the complexity of such interaction makes assessment exceptionally time-consuming and difficult.

With discourse in online contexts, a record is made and interactions take place serially (rather than multiple parties communicating at the same time), and therefore it is easier to assess individual contributions. However, there is very little guidance for educators for assessing these interactions. Vonderwall et al. (2009) highlight the paucity of research and practical advice on how to assess online postings. They discuss assessment processes in asynchronous online discussions, but focus on the

variety of aspects that 'could' be assessed such as self-regulation, learner autonomy, learning community and student writing skills. They conclude that, 'asynchronous online discussions facilitate a multidimensional process of assessment... further research is needed to understand what assessment strategies or criteria enhance assessment and learning' (p.309).

In an early paper, Newman et al. (1994) compared critical thinking in face-to-face and computer-based seminars (where students participated in both), and found that more new ideas emerged in the face-to-face seminars but that more ideas expressed in the online seminars were rated as important, justified or linked together; indicating a difference in quality and quantity. Heckman et al. (2002) compared four face-to-face and four online group discussions and found that the online discussions generated high levels of cognitive activity, which were equal to or were superior to those identified in the face-to-face discussions. However, they provide no guidance on how to conduct assessment.

1.2 Setting up online academic discussions

I have previously identified key factors for educators to consider when setting up online discussions and which affect participation and learning (Taylor, 2002). Three factors will be considered here which specifically relate to assessment (task type, assessment strategy, and individual differences), however other factors (such as group composition and instructor involvement) should also be considered.

As with offline learning activities, task type can have a significant impact on the quality and quantity of student engagement. Kanuka et al. (2007) examined the influence of different types of communication activity on the quality of students' messages in an online discussion and found significant differences between the five activities: the nominal group technique; debate; invited expert; WebQuest and reflective deliberation. They found that the WebQuest and

debate activities led to the highest quality of messages and highlight the similar qualities of these two activities; that they were well structured, provided clearly defined roles for the students and they provoked the students to explicitly confront others' opinions. A number of research articles (e.g. Gafni & Geri, 2010) have shown that assessing online contributions both increases participation as well as enhances the quality of academic discourse. Swan et al. (2008) found that providing students with the assessment criteria led to increases in their participation and fostered deeper learning. Regarding the impact of individual differences, although gender and personality have been shown to affect preferences for online discussion, they did not affect performance. However, an individual difference to consider in assessment that has received little investigation in online learning is the impact of having English as a second language. Similarly, students who have communication difficulties such as dyslexia will need to be assessed according to the relevant marking guidelines.

2. Case study: My assessment of online discussions

Hazari (2004) identified two ways to assess contributions to online discussions: analytic marking which involves assigning marks to specified criteria, and holistic marking where marks are assigned to the whole unit of analysis without scoring individual criteria. I use the analytical method and the unit of analysis that I use for assessment is the message; thus each message is evaluated using the criteria below. In addition to learning more about the topic and encouraging extended research, the key learning outcomes which the online discussion activity addresses are to develop skills in critical reflection, evaluation and leadership. The assignment consists of participation in three online discussions and co-ordination and leadership of one discussion. Each individual message is assessed by hand using similar criteria to that used for other forms

of academic writing, specifically whether it is analytical and evaluative. In addition, marks are awarded for reflection and timeliness of research cited. Each message is graded for these criteria using a five-point scale, from 'basic attempt' to 'excellent'. When leading an online discussion, students: provide an introduction to the key points; respond to other group members' questions; motivate discussion, and send a conclusion. The leader's posts are graded for coordination, responding and motivation. Some brief discussion of each of these skills highlights relevant research and the defining features for assessment.

2.1 Reflection

Students are increasingly required to reflect critically on their learning as part of their coursework, however, as Coutinho (2007) highlights, teaching and encouraging reflective practice is problematic in many ways. For example, agreement on what constitutes reflective practice is vague and the assessment-centred approach to learning in HE often focuses reflection on improving the reflective writing style rather than on reflecting upon learning (metacognition). In addition, when reflections are assessed, the incentive is to demonstrate knowledge and hide ignorance or doubt which is counter to Dewey's (1939) original purpose of reflection in which learning is derived from analysing mistakes and solving problems. Seale and Cann (2000) explored the way learning technologies were used to facilitate reflective thinking in students. They illustrated how a small group of students engaged with the material through online discussion; students were able to make links with other learning experiences and to see things in different ways. For my online discussions, students are encouraged to research widely using both academic sources as well as sources from the media (as long as due consideration is given to their credibility). This allows important concepts from published papers to be illustrated using clips from YouTube and the BBC, and web links to

articles in the mass media. When I assess reflection, marks are awarded for links made to personal experiences and examples from this wider context.

2.2 Critical evaluation and extended research

Mason (1991) proposed that the measurement of online transcripts should be based on the educational value that they exhibited. He broke this down into a number of useful questions, for example, whether a message built on previous messages, whether the participant drew on their own experience, whether they referred to course material or material outside the course and whether they initiated new ideas for discussion. When I assess evaluation, marks are awarded for questioning and building on previous messages and research. The extent and timeliness of research and resources used are recognised in marking, for example, articles published within the last two years and for research not already covered in lectures.

2.3 Leadership skills

In their study on the importance of trust in virtual teamwork, Jarvenpaa and Leidner (1998) found that teams with high trust levels were more capable of dealing with uncertainty and complexity than those with low levels. Prior to the online discussions, students are provided with a handout on the characteristics, benefits and problems of a virtual team, along with some useful tips for effectively managing and creating trust within their online discussions. Regarding the style of the online discussion, students are advised of the need to find a balance between social and task-based communication. The problems of coordinating or leading online teams can be significant, and leaders are encouraged to respond quickly and to include informal comments so that the style of discussion is not a series of long monologues and assessment identifies attempts to encourage interactivity, for example, including participant's names and responding directly to them. This has been shown to be one of the key indicators

demonstrating an awareness of social presence and community. A leader's role is critical at the start and end of a virtual discussion (when the definition of the topic and time plan are identified), therefore, I assess the introduction and summary messages separately. Extra marks are awarded also for motivating comments and students are encouraged to weave the findings of empirical research into responses and questions to others.

3. Potential for using Quantitative Content Analysis (QCA) and software to assist assessment

Due to a change to assessment strategy, the online discussions will form the only assessment for this unit in the future (currently it forms 30 per cent, with 70 per cent coming from an exam). Therefore, there is a need to provide more detailed feedback to students regarding the assessment of their contributions and I am considering the potential for using content analysis or automated techniques as an additional method of assessment. A literature review of this area highlighted the methodologies and software that could be used, but the limited empirical research highlights important factors to consider if assessment is based on these methods.

3.1 Quantitative content analysis (QCA)

Newman et al. (1995) developed a content analysis method to measure critical thinking in online group discussions and provided textual indicators to identify critical and uncritical thinking using sets of paired indicator, for example: relevant/irrelevant; important/trivial; new ideas/repeating what has been said; putting down new ideas/welcoming new ideas. The system certainly has potential for use in the assessment of online discourse as the use of obvious opposites should be easy for an educator (not experienced in qualitative analysis) to identify messages that illustrate these extremes. Other papers have been published since this, but they are not aimed at educators. For

example, drawing on 19 key studies published in the preceding decade, Rourke et al. (2001) cover the potential uses and the methodological challenges of analysing online transcripts using QCA. This classic paper provides a comprehensive discussion of issues relating to criteria, research designs, units of analysis and ethical issues, however, it is not easy for the educator to use and seems primarily aimed at educational technologists and researchers. Indeed in a later paper, Rourke and Anderson (2004) propose that QCA is still not systematic and objective enough to describe academic discourse and provides procedures for developing the validity of a QCA coding protocol that is theoretically valid and to establish its validity empirically. Many of the articles employing QCA in online environments are theoretically driven by the Community of Inquiry (CoI) framework. This framework was developed by Garrison et al. (2001) and consists of three elements: cognitive presence; social presence; and teaching presence. The first two elements can be used to further understand the potential use of QCA in assessing reflection, evaluation and leadership.

3.1.1 Critical evaluation and extended research

Garrison et al. (2001) provided a detailed overview of ways to evaluate online transcripts for evidence of critical thinking based on his five stages: (i) problem identification; (ii) problem definition; (iii) problem exploration; (iv) problem evaluation/applicability; and (v) problem integration. While Garrison's stages are useful they need some simplification if they are to be used to assess online discussions. It is clear that the main focus of later work by Garrison et al. (2006) is in producing a methodology to systematically and rigorously measure cognitive presence in online communications. Their work is very useful in guiding educators in the adoption, design and implementation of online environments for learning, but is less useful as an assessment tool. Kanuka et al. (2007) used the construct cognitive presence to investi-

gate the role of critical discourse in distance education and examined the influence of different types of communication activity on the quality of students' messages in an online discussion. Using QCA to analyse messages from 19 students in an undergraduate course, each message was assigned to one of the four categories of cognitive presence. While the number of contributions categorised in the highest phases of cognitive presence was low (20.21 per cent), interestingly they found that it was highest during activities which were well structured, provided clearly defined roles for the students and that provoked students to explicitly confront others' opinions. Extended research is probably the easiest to assess using QCA and to some extent can even be partially automated. For example, dates can be highlighted to allow easy identification of recent research and using a list of references already used in lectures the extent of new research cited by students can also be easily identified.

3.1.2 Reflection

A study by Mair and Taylor (2011) set out to identify whether students were reflecting online and if so, how deeply. A content analysis was conducted on discussion transcripts using the four types of reflective writing identified by Hatton and Smith (1995). The study found that the level of reflections within the postings became deeper over time. For example, although more reflection was occurring in the early discussions, the majority of the postings were classed according to Hatton and Smith (1995) as level 1 (merely reports events with no attempt to provide reasons) and level 2 (provides reasons, often based on personal judgement). While later discussions contain deeper, dialogic and critical reflections, that is, more at Hatton and Smith's level 3 (discourse with one's self, mulling over reasons, exploring alternatives). Although this study highlighted the method as a potential way to categorise reflections, it has not been used for assessment, due to time constraints.

3.1.3 Leadership skills

A key skill of an online leader is to encourage an atmosphere of trust and collaboration and this has been linked to the concept of social presence. Rourke et al. (1999), drawing on the community of inquiry work above, have produced a template to assess social presence through content analysis. The usability of the template for educators is enhanced through the provision of selections of coded transcripts and inter-rater reliability figures illustrate the validity of this template. However, this article is of most use for conference moderators and researchers as the focus is on setting-up and encouraging social presence, rather than the assessment of this factor.

3.2 Software to assist analysis, assessment and feedback

Over the last five years, there has been an explosion in the use of computer software to analyse text and there are literally hundreds of software products available which can assist analysis of online text (e.g. kdnuggets). Many packages are developed for use in specific fields and contain features appropriate to the type of discourse being analysed, for example: politics (e.g. Hopkins & King, 2010 look at political speeches and campaigns); health (e.g. Kim, 2009 evaluated cancer blogs), and those commercially available for marketing and advertising. There are relatively few packages developed for pedagogic use or for use in the social sciences. A review of papers published over the last two years found that the packages used most often in the social sciences include: Linguistic Inquiry and Word Count (LIWC); QSR NVivo; TAMS Analyzer (Text Analysis Mark-up System); ATLAS.ti, Text-STAT, Ranks NL. These range in features, from those which produce word frequency lists and concordances to those with powerful search possibilities (e.g. to identify regular expressions or phrases).

Despite the advances of methods for automated content analysis in the field of media analysis, most methods are only able to highlight and count instances of pre-specified words or phrases and we are a long way from automated assessment of critical thinking, for example. One potential package that could be used immediately is the free, open-source template NodeXL, which makes it easy to develop network graphs from data entered within a Microsoft® Excel® spreadsheet. This package has great potential to provide assessment feedback in a visual format.

4. Conclusion

It is clear that assessment methods need to be modernised, to reflect the changes in learning activities taking place as a result of using interactive and collaborative technologies made possible by Web 2.0. Additionally, updated methods need to consider the experiences and expectations of the current generation of students (Taylor, 2011).

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The value of peers and support from scaffolding: Applying constructivist principles to the teaching of psychology

Naomi Winstone & Lynne Millward

The legacy and sustainability of a university education requires student independence and ownership of learning. Adopting a student-centred constructivist approach to teaching and learning allows students to develop a web of self-constructed, interconnected understanding, and supports their development into lifelong learners. The efficacy of this approach is illustrated with a case study relating to a series of academic skills tutorials for first-year psychology students. The tutorial materials, activities and teaching techniques were rated as more useful by students when delivered using constructivist principles. The use of constructivist techniques also enabled students to make larger gains in their essay grades over the course of the academic year. The implications of using such teaching methods in higher education are discussed.

Keywords: Constructivism; scaffolding; peer collaboration; student-centred learning; sociocognitive conflict.

A CENTRAL AIM of higher education is to engender in students an independent, lifelong approach to learning. This requires the student to fully invest in the learning process, and take ownership of their learning and development. As neatly argued by Chickering and Gamson (1987, p.3), 'learning is not a spectator sport'. A constructivist approach to education centres around the learner's individual construction of understanding, using support from teachers and peers. In the context of education, the cognitive developmental theories of Lev Vygotsky and Jean Piaget, both examples of constructivist epistemology, have been used to inform instructional design and assessment.

For example, for Piaget, peer collaboration can be a useful source of learning, whereby two peers with conflicting perspectives on a topic experience what is termed sociocognitive conflict, and then work together to reach a common understanding (Davis & Winstone, 2011). The experience of asymmetry in the perspectives of oneself and a peer forces perspective taking, and a detailed examination of one's own under-

standing that promotes metacognitive awareness.

For Vygotsky, learning is an inherently social process, where knowledge and understanding are co-constructed through social interaction (Davis & Winstone, 2011). Indeed, according to Vygotsky, all knowledge exists intermentally (possessed between people) before it is internalised and possessed intramentally by the individual. Interaction between the learner and others in their educational environment allows them to traverse their zone of proximal development, moving from what they are currently able to do to what they have the potential to do through interaction and guidance. The guidance that allows the learner to reach this higher level is termed scaffolding (Bruner, 1983). Scaffolding is a process whereby structured guidance is provided that allows the learner to reach a higher level of understanding or competence; it can subsequently be taken away and the learner is able to achieve that level independently. From an instructional point of view, this means tailoring teaching to involve learner-generated advances in under-

standing, by providing the environment within which learners can reach new levels of understanding, without being prescriptive and providing all the answers.

Within higher education, Vygotsky's principles remind us that there is a difference between what students can do independently and what they can do with structured guidance. We should aim all teaching and learning activities not at what they are already able to do, but what they have the potential to do if provided with effective support from scaffolding. Teaching should support them in reaching a new level of competence, but the advance has to come from them, in order to build personal and academic self-efficacy. Thus, teaching methods become much less directive; teachers need to guide learners towards understanding, not tell them the things they need to understand. For example, case studies are an effective constructivist teaching tool as their exploration allows students to reach conclusions about the material that have been self-constructed through critical analysis (e.g. McDade, 1995; Sudzina, 1997). Problem-based learning has also been framed as a way of enabling students to traverse their zone of proximal development (Harland, 2003), and there are reports in the literature that higher education institutions have effectively implemented a scaffolding approach to both teaching and assessment (e.g. Murtagh & Webster, 2010). The basic principle of providing structured support and guidance whilst allowing the actual advance to come from the student can be applied to any aspect of higher education, from basic study skills to dissertation supervision, and even in written feedback on assignments (e.g. 'You have done X well, and you have obviously thought about Y. Now think about how you could improve Z. Why would this be an important part of communicating your ideas to your reader?').

In our undergraduate and postgraduate taught programmes in psychology, we embarked on a project to explore the extent

to which constructivist principles could be used as key organising themes in the ways in which teaching is designed and delivered. The key ideas were that learning activities should involve problems for learners to solve, and that learning is essentially social in nature (Clements & Battista, 1990). As a case study illustrating how this approach has been implemented, and how it is perceived by students, this paper reports findings pertaining to the use of scaffolding in a first-year academic tutorial programme to support the transition to study in higher education.

Method

Participants

Level HE1 students on the BSc (Hons) Psychology course are assigned to a small tutorial group at the beginning of their course. Each group has a dedicated academic tutor (a graduate teaching assistant) responsible for marking their coursework essays and providing feedback, and running a series of tutorials on basic academic and study skills, to help students make the transition to university-level study. Tutorials cover topics such as essay writing, critical evaluation, citation and referencing skills, presentation skills, reading journal papers and writing research reports.

Of the six academic tutors that deliver the programme each year, three had worked on the programme for two consecutive years. In order to control for individual teaching style, student evaluations of the tutorials were analysed only for those students from two subsequent cohorts taught by one of the tutors that worked on the programme over both years; 78 students from a cohort that were not taught using scaffolding techniques, and 47 students from the subsequent cohort who were taught using scaffolding principles. As data were sourced from anonymous feedback forms, details of participant age and gender are not available. The University Ethical Guidelines permit the analysis of student evaluations for purposes of pedagogical research.

Design

Student ratings of various components of the tutorial programme were compared between two cohorts. The first cohort of students attended the course of tutorials before the use of scaffolding was incorporated into the course. The second cohort of students were the first to experience the new constructivist emphasis. As a key part of the reorganisation of the course to incorporate constructivist principles was an emphasis on the social nature of learning, the size of each small tutorial group was cut from around 12 students to around seven students. It was felt that this would better facilitate the student-activating discussion that was to form a key part of the way in which the course was run.

By the very nature of the tutorial programme, there are many factors that could have varied between the two cohorts. However, whilst it was not possible to control every aspect of the tutorial process, the key variables (e.g. teaching style of the individual tutor, topics to be taught) that could have an impact on the outcomes we were interested in were controlled. Both cohorts were taught by the same tutors, had the same number of tutorials, and covered the same topics. The only key differences between the two cohorts were the group size and the way in which the material was delivered; either with or without scaffolding techniques.

Materials

Each student followed a course of 20 academic tutorials over the course of a single academic year. These tutorials involved preparation for and feedback on coursework essays, as well as study skills. At the end of the academic year, students were asked to provide feedback on their experience of the tutorial programme using a specially-designed feedback form. This feedback form asked students to rate how useful they found the tutorials overall, on a scale from 1 (not at all useful) to 5 (very useful). Other aspects of the tutorials that were rated were the teaching techniques used by their tutor, the size of the group, the use of group work and

group discussions, practical exercises, and handouts. The return rate of evaluation forms was 86 per cent for the non-scaffolding cohort and 71 per cent for the scaffolding cohort.

Procedure

In reorganising the tutorial programme, each aspect of the tutorials was adjusted to embody a constructivist scaffolding approach, such that students were not instructed in study skills but came to develop them through structured guidance. This was motivated by observations that whilst the non-scaffolding cohort followed in-class exercises well, and showed an understanding of relevant principles, they were not able to apply their understanding to new contexts. For example, whilst they seemed to show a good understanding of the factors that make a 'good' essay, they were not demonstrating these principles in their own essay writing. This context was thus seen as ideal for the introduction of constructivist principles, to promote greater independence and stronger self-constructed understanding. The procedure for the constructivist reshaping of each topic covered on the programme is outlined below.

Citation and referencing skills

The non-scaffolding cohort learnt about citation and referencing techniques through following a handout that explained formatting in detail. Students had a clear reference guide to use when presenting citations and references in their own essays, but they were still making many mistakes in their formatting of references and citations. Thus, in order to promote a constructivist approach to this topic, the tutorial was restructured such that students were given limited information, but encouraged to work out for themselves how references and citations should be formatted. Students were presented with examples of publications utilising the appropriate referencing format (American Psychological Association, 2010); this was their only source of information.

They were then given a citation ‘treasure hunt’ requiring them to find, and provide appropriate citations and references for, a series of academic sources. This was also effective in incorporating library and literature searching skills with learning how to reference correctly. Their academic tutor was available to provide scaffolding support, and if students had differing perspectives on the formatting of a particular reference, they were encouraged to discuss it as a pair to reach a common understanding.

Essay writing

The non-scaffolding cohort learnt about effective essay-writing techniques by following a detailed handout and discussing each section of an essay in turn. Example essays were handed out to illustrate the principles discussed. In order to promote self-constructed understanding, the scaffolding cohort were not given a list of factors that make a ‘good’ essay; instead, they were required to generate this themselves through analysing example essays as a group. Students were required to adopt the perspective of a critical marker, and to generate a list of techniques that enabled the writer’s understanding to come across clearly, and to also list the techniques used that inhibited the clarity of the writing. These were discussed as a group, again with scaffolding support from the tutor. Thus, students left the tutorial with not only an understanding of what makes a good essay, but why, from the perspective of a marker.

Critical evaluation

To develop students’ critical thinking skills, the non-scaffolding cohort were given handouts about what critical thinking entails and things to look for when reading sources. The scaffolding group developed critical thinking skills through the analysis of case studies and discussion of research papers, guided by their tutor. For example, students were given a research paper, and divided into teams. Each was required to take a particular section of a research paper, and

create a short report of the section, noting any points of evaluation. The teams then reported back to each other; for example, the ‘results section team’ would look for any unsupported claims in the discussion section when the ‘discussion section team’ made their presentation.

Reading journal papers

It is important that during the first year of their degree students develop confidence in reading and understanding journal papers. For the non-scaffolding cohort, this was addressed by providing a helpsheet that described the main purpose of each section of a research paper. For the scaffolding cohort, their confidence in reading papers was built gradually, using a series of guided reading questions. Each week, a paper that related to one of the topics covered in lectures was posted on the Virtual Learning Environment, together with a list of questions for the students to think about whilst reading that paper. For example, students’ reading of a paper on eye movements during reading (Rayner et al., 2003), relating to one of their cognitive psychology lectures, was supported by questions such as:

‘Why is it important that the order of blocks was counterbalanced across participants?’

‘Why do you think that total gaze duration (GD) is a better measure of processing time for a word than the duration of a single fixation on a word (SFD) or the duration of the first fixation on a word (FFD)?’

‘If eye movements are under visual/oculomotor control (and not cognitive control), then no word frequency effect would be expected under disappearing text conditions. Was this supported by the results?’

In line with a scaffolding approach, over the course of the year the guided reading questions decreased in specificity, handing over more and more responsibility to the student to find and understand the important information within the paper.

Writing research reports

The non-scaffolding cohort were given a detailed handout that explained how to construct a research report, and the purpose and content of each section. The scaffolding cohort were not given this information directly, but generated it themselves through examining research papers. For example, when learning how to write abstracts, students read and discussed abstracts in published papers. They were then given a published paper with the abstract blanked out, and in pairs they were required to construct an abstract by searching for the appropriate information within the rest of the paper.

Presentation skills

Whilst both the scaffolding and non-scaffolding cohorts were required to give a short presentation as a part of the tutorial programme, for the non-scaffolding cohort, discussion of what makes an effective presentation was conducted after all presentations had been given. Before students in the scaffolding cohort began to work on their presentations, they were given the task of paying particular attention in their lectures that week to aspects of information presentation, manner, and style, and to consider what makes a presentation and presenter both easy and difficult to understand. These were discussed as a group. Feedback on presentations came not only from the tutor but also from peers.

Thus, for all topics covered in the tutorial programme, the techniques, discussions, activities, exercises and handouts were all restructured to incorporate the necessary guidance students would need, without providing all the information. Such information was individually constructed using support from peers and scaffolding from the tutors.

Results

The ratings for the usefulness of each component of the tutorial programme, out of the highest possible score of five, were

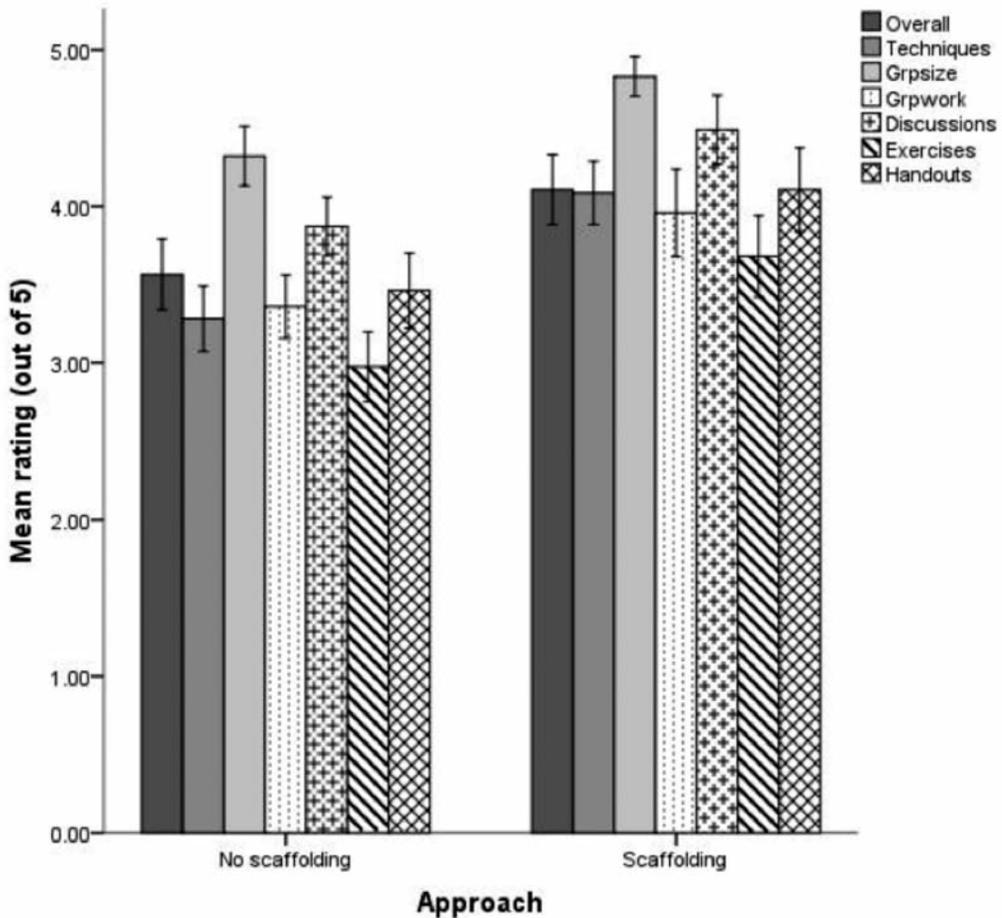
compiled for each cohort. Figure 1 (overleaf) shows the mean ratings for each component of the tutorials, for the non-scaffolding and scaffolding cohorts.

The ratings for each component were compared between the two cohorts using independent samples *t*-tests. The tutorials overall were rated as significantly more useful by students in the scaffolding cohort than students in the non-scaffolding cohort, $t(117)=3.42$, $p<.001$, $d=0.54$. The same was true for the teaching techniques used in the tutorials, $t(118)=5.55$, $p<.001$, $d=0.87$; the discussions within tutorials, $t(123)=4.19$, $p<.001$, $d=0.75$; the exercises used in tutorials, $t(123)=4.01$, $p<.001$, $d=0.71$; and the handouts that were distributed, $t(123)=3.45$, $p<.001$, $d=0.61$. Not surprisingly, as the size of the groups was cut when the tutorials were reworked to have a constructivist emphasis, students in the scaffolding cohort rated the group size as significantly more useful than students in the non-scaffolding cohort did, $t(120)=4.44$, $p<.001$, $d=0.60$. However, the group work undertaken was also rated as significantly more useful by students in the scaffolding cohort, $t(123)=3.53$, $p<.001$, $d=0.62$.

Whilst students rated the scaffolding approach more favourably, did it actually improve their learning? We also compared the 'value-added' to their academic performance, by comparing the average increase in essay grades from the first essay they completed, to the sixth essay they completed, which was the final assignment for the academic year, across the entire cohort (see Figure 2, overleaf).

The non-scaffolding cohort increased their essay marks over the course of the year from an average of 59.81 ($SD=5.70$) for their first essay to an average of 64.12 ($SD=4.93$) for their sixth essay. The scaffolding cohort increased their essay grades from an average of 60.06 ($SD=5.87$) for their first essay to an average of 66.25 ($SD=5.58$) for their sixth essay. A 2 (cohort; non-scaffolding and scaffolding) \times 2 (essay grade; first and last) mixed ANOVA revealed that whilst both

Figure 1: Mean student ratings (out of 5) for the usefulness of each component of the academic tutorial programme (error bars show 95% CIs).



cohorts showed a significant increase in their essay grades over the course of the year ($F(1,235)=140.59$, $p<.001$, $\eta^2=.37$), the increase in grades for the scaffolding group was higher than for the non-scaffolding group, as shown by a significant cohort x essay grade interaction ($F(1,235)=5.30$, $p=.02$, $\eta^2=.02$).

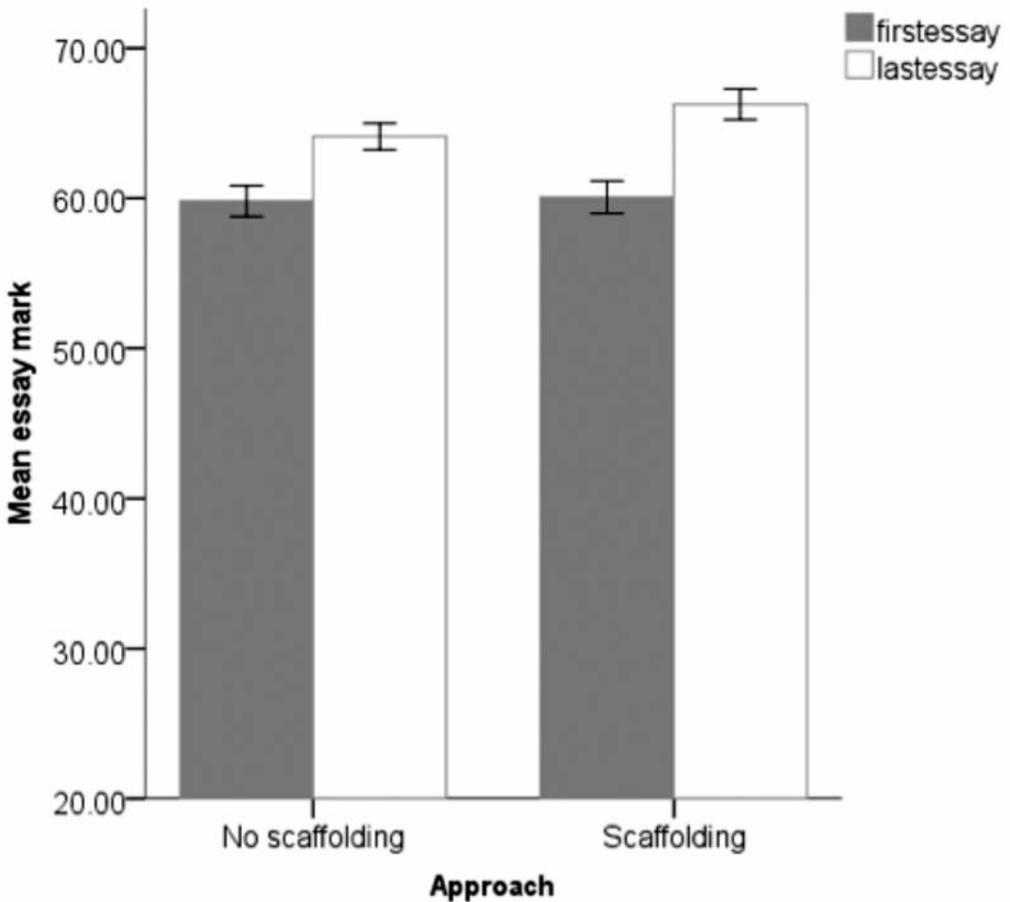
Discussion

Inspired by Chickering and Gamson’s (1987, p.3) reminder that ‘learning is not a spectator sport’, we adopted a constructivist scaffolding approach in the delivery of a series of academic tutorials to first-year undergrad-

uate students by providing an environment in which students generated their own understanding of key academic skills rather than being given the information directly. Student ratings of the usefulness of the tutorials were significantly higher under the scaffolding approach, compared to the previous cohort of students that received the same programme of tutorials delivered without a scaffolding approach.

The overall usefulness of the tutorials was rated significantly higher by the scaffolding cohort, yet each subcomponent of the tutorials was also perceived as more useful from students’ perspectives when it was delivered

Figure 2: Increase in average essay grades for both cohorts (error bars show 95% CIs).



using scaffolding techniques. Students rated the group size as more useful when it was smaller, and it therefore makes sense that students felt the discussions within tutorials were more useful where this group size was smaller, under the scaffolding approach. Activities and exercises were also rated as more useful when they involved structured guidance in the scaffolding approach. Students also felt that the handouts were more useful under the scaffolding approach, even though they contained less information, as the goal was that students would generate the information themselves rather than being provided with it explicitly.

Teaching techniques were also rated as more useful in the scaffolding cohort than the non-scaffolding cohort, supporting the use of structured guidance rather than directive teaching. It is also important to mention that the tutors themselves reported feeling a greater sense of reward from 'scaffolding' students rather than 'teaching' them. In true Piagetian fashion, some of the tutors mentioned that being exposed to the perspectives of students challenged their own thinking surrounding some of the topics covered.

Subjective ratings of the usefulness of the tutorials provide one level of support for

adopting constructivist approaches, but we were also interested in obtaining more objective evidence for the efficacy of this approach. Beyond student ratings, our findings suggest that over the course of an academic year, the use of scaffolding within academic tutorials helps students to make larger gains in their essay writing skills. The content of the tutorials, for example essay writing and critical thinking skills, was the same in both cohorts, yet the scaffolding cohort increased their essay grades to a larger extent than the non-scaffolding cohort. This indicates that reaching a self-constructed understanding of the key principles underlying essay writing, rather than being taught these skills explicitly, better enabled students to apply them to their own essay writing. As well as improved structure, clarity, and critical evaluation in student essays, students in the scaffolding cohort also showed a stronger grasp of citation and referencing skills. Indeed, key skills such as critical thinking cannot be effectively taught in a formulaic way since a strong ability to think critically in an independent way requires students to find their 'critical voice', and develop their own evaluative stance on the material they read and are exposed to in lectures. Similarly, strong essay writing requires students to develop their own style of expression and presentation, and whilst there are general principles that enable effective communication of ideas, there is no 'magic' formula that can be taught to students to make them good writers. Effective writing comes from a self-constructed approach to the subject material.

The efficacy of this scaffolding approach in supporting the development of academic skills in the first year of the degree builds on previous research findings that have demonstrated the positive application of constructivist principles to higher education contexts (e.g. Harland, 2003; McDade, 1995; Murtagh & Webster, 2010; Sudzina, 1997). Whilst

these approaches have a sound theoretical basis, it is important that the use of these techniques is supported by strong support from peers and scaffolding, so that students do not feel overwhelmed by being given the primary responsibility for the generation of information. These approaches can require a reframing of students' perspectives in terms of what we really mean by 'teaching'. Scaffolding approaches can cause anxiety in students, as they can take students out of their 'comfort zone' of teacher as expert, and teaching as the filling up of a vessel of knowledge. Furthermore, this approach does not necessarily involve an answer that is 'right' and answers that are 'wrong', as it is students' own constructions that are important. The finding that students rate these techniques positively is encouraging, and suggests that if we socialise students into these kinds of techniques early on in their degree, we can develop in students a more independent approach to learning that helps them learn how to learn, thus extending the legacy of higher education beyond the university years themselves. Indeed, as one student in the scaffolding cohort commented at the end of the tutorial programme, '...[the approach used in tutorials] builds your confidence, because you're the one helping yourself to improve, not someone else doing it for you. It's like the proverb about either giving a man a fish or teaching a man to fish. Rather than telling me things, you've given me the skills to go and teach them to myself!'

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Peer-assisted learning in research methods and statistics

Anna Stone, Claire Meade & Rosamond Watling

Feedback from students on a Level 1 Research Methods and Statistics module, studied as a core part of a BSc Psychology programme, highlighted demand for additional tutorials to help them to understand basic concepts. Students in their final year of study commonly request work experience to enhance their employability.

All students on the Level 1 Research Methods and Statistics module were invited to sign up for PAL (Peer-Assisted Learning) sessions which offered interactive learning under the guidance of a PAL Student-Facilitator. Five students at undergraduate Level 3 and Masters level were recruited and provided with training to facilitate small group sessions. Session provision also included materials for interactive exercises. A wrap-up session considered how Facilitators could draw on this experience to enhance their employability.

Analysis of feedback from the Level 1 students showed their experience was uniformly good with sessions found to be useful in aiding understanding. Any student-learner dissatisfaction resulted from a continuing inability to feel confident with the basic concepts taught on the module, although students said their understanding had improved overall. Facilitators found the sessions to be rewarding and felt they had developed their interpersonal skills, their leadership skills, and their understanding of the subject matter, and enhanced their employability, particularly in terms of skills transference. Attendance from student-learners was poor compared to the number who signed up, but the small size of many groups enabled individual support which was expressly appreciated.

The greatest student-learner demand was for sessions on topics directly related to coursework. Future PAL sessions will be directly related to these topics and arranged for the middle section of the semester, that is, when the Level 1 students have had time to identify their difficulties and the session can still be of maximum benefit for general learning and assessment completion. Considerations for student development and employability are also discussed.

Keywords: Peer-assisted; learning; research methods; skill development; employability.

Introduction and background

RECENT YEARS have seen an increase in the number of universities and other educational providers incorporating additional group-based learning elements within entry-level programmes for Science, Technology, Engineering & Maths (STEM) disciplines (Dreyfus, 2002). Benefits have included improvements in student retention, academic performance and assessment outcome (Hurley et al., 2003). While there continues to be debate regarding the efficacy of small-group learning provision (Colvin & Ashman, 2010) there is also consensus as to its potential, dependent upon a number of factors, as outlined by

Cohen (1994). The peer tutors or facilitators are closer to the peer learners in terms of their learning experience and so can 'speak the same language' and understand the challenges faced by student learners. Further, their demonstrated success in negotiating the aspect of the course concerned can provide a model of efficacious experience (Bandura, 2007). This, together with greater familiarity in posture, language and tone of delivery, may foster a more positive student-learner experience (see Witt, Wheelless & Allen, 2004). Evidence suggests that learning may be enhanced when peer tutor/facilitators receive training on effective group functioning. For peer tutor/facilitators the

process can facilitate both personal development (Maheady 1998) and foster transferable skills (Topping, 2005).

Here, the students at Level 1 of the BSc Psychology programme delivered module feedback which indicated a disparity between the demands of degree-level study and that at UK Secondary level, reflected in their expectations and performance. Research Methods is, in addition, an unfamiliar subject for many students prior to attending university. This highlighted the need for additional Research Methods learning support among Level 1 students. Peer-assisted learning (PAL) offered the opportunity to meet this need and to enable Level 3 and M-level students to develop their employability and their transferable skills. A PAL programme was developed to reflect the content and requirements of Research Methods material at Level 1, with peer-assistance provided by Level 3 and M-level students who themselves had previously studied Research Methods at Level 1.

Methodology and process

Participants, recruitment and training

The learners were Level 1 students taking the Research Methods module as part of their BSc Psychology programme. Of 350 students registered on the module, 120 self-selected to participate in PAL sessions by signing up during RM classes in the first three weeks of the semester. Students were allocated to their preferred topics as far as possible depending upon the constraints of capacity and of session timetabling.

Five student facilitators (PAL-facilitators) were recruited by making announcements in lectures and posting advertisements on information screens and online student notice boards. Applicants were asked to complete an application form, with attendant role description and person specification, before being selected to attend a standardised two-person interview panel. The important factors in selecting applicants were communication skills, both at group and individual level, and response to

scenarios concerning candidates own Research Methods experience and student queries. All aspects of the application and interview process were developed and conducted in accordance with university practice and following consultation with Human Resources department. Two other recruited facilitators were unable to take up the role post-selection interview, citing availability and personal difficulties.

A one-day training event for PAL-facilitators addressed the role of the facilitator, running sessions, managing boundaries, and responding to queries. The day included group exercises and discussions and was supplemented by a dedicated *Facilitator Handbook*.

Materials

Previous student feedback on the module included repeated requests for additional support regarding key subject topics. These were the topics chosen for the PAL sessions: data management and the use of statistical software (SPSSFW), concepts of statistical significance and experimental validity, specific inferential analyses (correlation and Chi-square), and how to write-up a research study (Lab Report). A maximum of two topic-specific sessions were offered to each Level 1 RM student during academic semester A and a total of 22 topic-specific sessions were provided via the scheme. Session groups were limited to 12 students, in order to enable effective facilitation and maximise learner benefit.

Sessions were designed around interactive exercises tailored to small groups with a summary of the relevant topic offered for revision if required. Within these, scope was also provided for a degree of both topical discussion and facilitator intervention. The materials were developed by module teaching staff.

The PAL Scheme process

The scheme overall was developed and administered by the module leader and 2 other members of the module teaching staff.

The major tasks included the designation of topics for PAL sessions, the development of materials for the PAL sessions, the recruitment of PAL facilitators, the development and implementation of Facilitator training and support, and the evaluation of the scheme by both PAL-learners and PAL-facilitators.

The initial plan was to run sessions for two hours, to incorporate general RM discussion and topic-related learning, but this had to be reduced to one hour combining the two elements. This change was necessitated by the relative excess of learner demand over facilitator availability. In fact, some sessions were facilitated by module teaching staff in order to meet Level 1 student demand.

Level 1 students were allocated to sessions on their preferred topics and then contacted by email by the scheme administrators, as well as posting session listings online. Attendance was monitored by registers taken at session outset. While the PAL sessions were running a designated member of the PAL support team was available on site for additional support and student referral if required.

Evaluation of PAL-learner experience was obtained via an anonymous session feedback form with questions about the usefulness of the session, its impact on learning, subject understanding and confidence levels, as well as whether students would attend further sessions or recommend them to others. Responses were measured using a five-point

Likert scale, with options ranging from 'not at all' to 'very much'. This also included scope for individual comments and suggestions. Informed consent for the collection and use of participant feedback was obtained prior to data collection.

Facilitators were asked to complete anonymous evaluation forms and also a short reflective report after each session to encourage them to reflect on their experience and on the skills they were developing. A wrap-up lunch explored ways in which their role could be applied in further academic and employment settings.

Findings and outcome

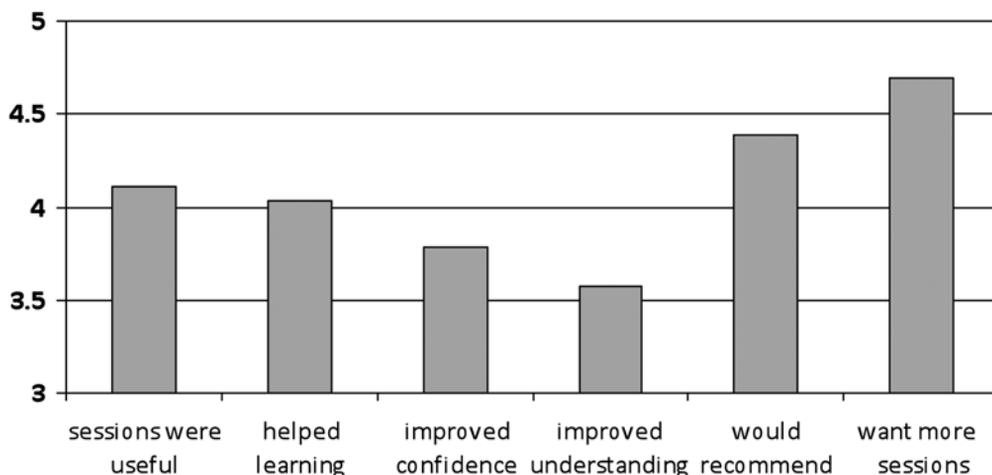
Examination of session registers showed relatively low levels of attendance (N=42), just 35 per cent of that indicated by initial sign-up response. Of those students attending, 85 per cent provided feedback, and of these, 20 students gave additional responses to the questionnaire. All responses were included for analysis.

The data presented in Table 1 and Figure 1 show the PAL sessions to have been perceived overwhelmingly as beneficial. Over 80 per cent of respondents found the sessions had helped their understanding of Research Methods, with 60 per cent stating sessions had done so a lot. Equally, over 85 per cent of respondents stated they would recommend the sessions to others, with more than 55 per cent stating they would do so very much. All respondents stated they

Table 1: The results of the learner evaluations.

Response item	Mean	SD	Max
How useful did you find the sessions?	4.11	0.89	5
How much have the sessions helped your learning on this module?	4.03	0.91	5
How much have the sessions improved your confidence on this module?	3.78	0.90	5
How much do you think your understanding of research methods has improved?	3.57	0.95	5
Would you recommend these sessions to another student?	4.39	0.80	5
Would you have attended more sessions if they had been offered?	4.69	0.62	5

Figure 1: Learner evaluations (maximum=5).



would like more sessions, with over 75 per cent saying they would like more sessions very much. It is also very encouraging to see the high mean response to the question about recommending the sessions to another student.

It is interesting that the highest mean response, 4.69, was given to the question of interest in further sessions, and the lowest mean response, 3.57, was given to the question regarding improved understanding. This might suggest that students felt the need for more of these sessions. Indeed 50 per cent of those who only found the sessions 'somewhat' useful would still very much attend more if these were offered.

The scheme overall, including operation processes were also subject to a reflective review by the project team, the outcome of which was considered in conjunction with student feedback.

Since the sessions were optional a comparison of module achievement between those students who did and did not attend PAL sessions would be confounded by the voluntary nature of attendance. For example, it is quite likely that those students with the weakest understanding of research methods would have been most likely to attend. This is not of crucial concern given

that the primary rationale for this intervention was student support for learners and employability for facilitators rather than specifically enhanced performance or assessment outcome. The primary intention was to enhance student experience and facilitate engagement (e.g. Congos & Schoeps, 1998).

Discussion and future directions

Student Learner experience

For those attending the sessions the emergent experience was a worthwhile one, indicating that participation positively impacted on both levels of confidence and understanding of research methods. This does confirm the observation that the lack of exposure to statistical methods prior to university study has a negative impact on performance at Level 1.

Given the positive feedback from those who did attend, and the expressed levels of interest, it is puzzling that so many students did not attend the sessions to which they were invited. One possible explanation is that students were mainly interested in session content that maps directly to aspects of assessment, and latter sessions were timetabled after the assessment submission deadline; these sessions were particularly poorly attended. A second possible explanation

tion is that the sessions were all optional. Students may easily express interest in an additional class but when the time comes round pressure of other work may prevent them from attending. It is interesting to note that other projects introducing peer-assisted learning to a science course have also found poor attendance from student learners (e.g. Hughes, 2011). This author suggested including the peer-assisted learning sessions in the standard course programme, advertised during registration, and we plan to do the same next year.

This will be addressed in the future by using the positive learner-evaluations to promote the scheme in future years. The sessions will be focused on topics directly relevant to assessments and will be provided in a timely fashion to assist students with their coursework and exam preparation.

Facilitator development

Looking at the Facilitator Session Reports and the direct feedback obtained at the wrap-up session, the facilitators all felt that their experience had been both positive and useful. Although the level of facilitator experience, and related confidence, varied within the group prior to their sessions, all subsequently reported instances within sessions that had been managed successfully. These ranged from attendance issues to topical queries and the need for referral elsewhere. Developmentally, facilitators reported an increase in perceived confidence, and interpersonal, communication and leadership skills. This is consistent with the large-scale study of undergraduate student peer educators in the US by Wawrzynski, LoConte and Straker (2011) in which the peer educators benefitted from developing their intraper-

sonal and interpersonal skills. Similar to the present study, 40 per cent of their students peer educators were motivated by a desire to develop employability skills.

One key aim of the concluding session for facilitators was to ensure the experience gained through PAL could be transferred to other career and development situations. During the session students were shown how this could be applied to an interview process, when making applications as well as in general experience. What was striking was the lack of awareness as to the transferable nature of the skill and knowledge students had already obtained in studying for a psychology degree, as well as those from the PAL process. Consequently, in highlighting the potential for this, the final session for facilitators, incorporating the award of Certificates, was particularly productive. Indeed, two facilitators expressed an interest in presenting the PAL scheme at conference, and in facilitating PAL in the future.

It is somewhat disappointing that the expressed desire for development opportunity among Level 3 students was not reflected in the volume of facilitator applications. This will be addressed in future by including recruitment to the PAL scheme in the Level 3 induction sessions and within employability activities. Direct presentations will be made to students rather than relying on notice boards and online announcements. The PAL facilitators were all quite unsure of their abilities to lead a learning session before the training day, and while it is good to note that they felt much more confident afterwards, it seems likely that some students might be more encouraged to apply in future if the application process were to be simplified with the emphasis on supporting PAL facilitators.

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Encouraging good writing practice in first-year Psychology students: An intervention using Turnitin

Lucy Betts, Stephen J. Bostock, Tracey J. Elder & Mark Trueman

There is growing concern among many regarding plagiarism within student writing. This has promoted investigation into both the factors that predict plagiarism and potential methods of reducing plagiarism. Consequently, we developed and evaluated an intervention to enhance good practice within academic writing through the use of the plagiarism detection software Turnitin. One-hundred-and-sixteen first-year psychology students submitted work to Turnitin and 71 of these students evaluated their learning experiences. For the next assignment the students completed, there was a reduction in academic misconduct cases compared to the previous year and students evaluated the session positively. The findings have implications for teaching good practice in academic writing.

Keywords: Student writing; plagiarism; Turnitin; psychology.

PLAGIARISM involves 'students taking the words of others and passing them off as their own in their coursework assignments' (Hayes & Introna, 2006, p.55) without appropriate acknowledgement (Flint, Clegg, & Macdonald, 2006), and is generally regarded as 'bad' practice or academic misconduct. Although the extent of plagiarism can vary ranging from nothing, to a few words, to an entire document (Bennett, 2005), from a legal perspective plagiarism is regarded as a violation of intellectual property rights that are protected by copyright laws (Anon, undated a). There is growing concern among some tutors and researchers regarding the impact of plagiarism (Larkham & Manns, 2002); consequently, a number of investigations have been undertaken to determine the extent of the problem. In 1999, 69 per cent of tutors questioned reported that they detected at least one instance of plagiarism during the last year in their marking (Young, 2001). More recent figures suggest that the rate of plagiarism seems unchanged with students becoming more accepting of the practice. For example, Szabo and Underwood (2004)

report that 50 per cent of 291 undergraduate science students, from year 1 to year 3, indicated that it was acceptable to use the internet when engaging in plagiarism. Male students were more accepting of academic 'bad' practice than females, and those in the first and second year were more accepting than those in the third year. Further, in a self-report examination of 'cheating' behaviour, researchers have also identified that paraphrasing without appropriate references was the most prevalent form of such behaviour (Newstead, Franklyn-Stokes & Armstead, 1995; Norton et al., 2001).

Although some students regard plagiarism as acceptable, not all students do. For example, 46 per cent of students regarded plagiarism as 'fundamentally immoral and shameful' (Bennett, 2005, p.149). However, 46 per cent of the students reported that they had plagiarised an entire paragraph without appropriate references, 31 per cent reported that they had plagiarised several paragraphs, and 25 per cent reported that they had submitted a complete piece of work that were plagiarised (Bennett, 2005). These figures are in stark contrast to the same

students' perceptions of the extent of plagiarism. Specifically, 33 per cent of the students believed that less than 11 per cent of students plagiarised, and 25 per cent thought that over 35 per cent of students plagiarised. Although a high proportion of students reported engaging in plagiarism, three-quarters of the students believed that it was not easy to get away with plagiarism and that their tutors took the issue of plagiarism seriously (Bennett, 2005). Therefore, it seems that although many students do engage in plagiarism, most acknowledged that it is unacceptable and that tutors take the issue very seriously.

There has been much debate about the motives of students who plagiarise. For example, some argue that plagiarism is the result of a student's lack of understanding concerning what constitutes plagiarism (Hayes & Introna, 2006), whilst others argue that plagiarism occurs when there are lower levels of academic support (Szabo & Underwood, 2004), or when students are not aware of how to apply the appropriate referencing conventions (Landau, Druren & Arcuri, 2002). In a comprehensive study, Bennett (2005) identified a number of predictors of both minor and major plagiarism. With regard to minor plagiarism, students were more likely to plagiarise if they: (a) Were less integrated into the academic community; (b) had part-time employment that disrupted their studies; (c) experienced high levels of parental pressure to succeed but were performing less well academically; and (d) engaged in ineffective study skills. Major plagiarism on the other hand was predicted by: (a) Fear of failure; (b) low fear of being caught; (c) lack of academic integration; (d) lax attitudes; and (e) good relationships with their tutors – due to a perception that the tutor would not penalise the student. Whilst a number of factors have been identified as important predictors of a student's propensity to engage in plagiarism, there appears to be a consensus that plagiarism may occur because students are unsure of what constitutes good academic practice when they start

university (Bennett, 2005; Flint et al., 2006; Hayes & Introna, 2006; Parameswaran & Devi, 2006). Further, as students progress through their studies, they report that their confidence in academic writing and their knowledge of how to avoid plagiarism increases (Pittama et al., 2009). Consequently, some argue that part of the tutors' role is to ensure that students are aware of: (a) What constitutes good practice; and (b) the importance of following discipline-specific reference conventions (Parameswaran & Devi, 2006).

In response to the suggestion that tutors should educate students about good practice in academic writing, there have been a number of interventions developed to help to facilitate psychology students' understanding of referencing conventions. For example, through providing students with feedback on their paraphrasing skills, Landau et al. (2004) reduced the instances of plagiarism in a follow-up task. Similarly, giving students referencing tasks has also been found to increase adherence to referencing conventions (Schuetz, 2004). Although these approaches have been successful, with the increase in the use of plagiarism detection software by universities, we wanted to develop an intervention designed to enhance students' good practice by using plagiarism detection software. The intervention might have an impact both through its educational guidance and through the deterrent effect of knowing that the university was using this software. The intervention we developed involved creating a teaching session that was focused around the plagiarism detection software Turnitin.

The Turnitin online software is becoming increasingly popular with educators, with an estimated nine million users in 2006 (Pilon, 2006) rising to over 60 million pieces of work submitted in 2011 (Anon, undated b). Once a document has been submitted to Turnitin, it compares the text within the document with text: On the web, with databases of previously submitted material, and with material submitted by all students for an

assignment (for collusion). Turnitin then generates an 'originality report' that identifies matching sections of text in the submitted document and the documents that it has been compared with. Turnitin does not find plagiarism *per se* but rather attempts to match sequences of text that may be unacknowledged and so may be plagiarism or collusion (Royce, 2003). Because Turnitin considers such a range of internet sources and previously submitted work, it increases the likelihood that genuine instances of plagiarism or collusion will be detected (Royce, 2003). One advantage of Turnitin, as a method of detecting plagiarism, is that it reduces the amount of time that tutors spend trying to locate plagiarism (Larkham & Manns, 2002). However, originality reports need interpretation. Turnitin gives both false negative matches (failing to detect text sources that would match) and false positives (correctly quoted and cited text, short phrases that randomly match other documents, and short phrases that are in common use in the subject). Further, for some students informing them that their work will be submitted to Turnitin is not always effective in deterring them from plagiarising (Youmans, 2011).

There are few reports of previous interventions where tutors have used Turnitin as a method of teaching good practice in academic writing. However, in a study with year 3 and year 4 pharmacy students at the University of Auckland, Sheridan, Alany and Brake (2005) evaluated students' perceptions of the use of Turnitin. Of the 172 students asked, no student suggested that Turnitin could serve as a method of teaching good practice in academic writing. However, 42 per cent of students reported that Turnitin did help them to understand some of the issues surrounding plagiarism and 55 per cent of the students said that Turnitin helped them to recognise the importance of writing in their own words suggesting that Turnitin could be used in a teaching context. Recent research has also suggested that Turnitin can be used to reduce instances of

internet plagiarism when information technology students were deducted marks according to the percentage of similarity generated from the Turnitin reports in a peer-review context (Ledwith & Risquez, 2008). However, Rolfe (2011) reported that whilst students' confidence in their academic writing increased following submitting a draft essay to Turnitin, the incidence of plagiarism following the submission was not reduced. Together, these findings suggest that Turnitin may serve as a useful tool for teaching students good practice in their academic writing. Therefore, we wanted to embed the use of Turnitin within a first-year psychology teaching session with the aim of enhancing students' understanding of the importance of good practice within academic writing. We also asked the students to evaluate the intervention and examined departmental records of academic misconduct following the intervention to assess the success of the intervention.

Method

Participants

One-hundred-and-sixteen first-year students completing an introductory research methods and statistics module as part of the psychology component of their dual honours degree, participated in the session. Students submitted a formatively assessed laboratory report to Turnitin during one of six laboratory teaching sessions. Seventy-one of these students completed an on-line evaluation of the intervention following the session.

Evaluation measures

Plagiarism rates in subsequent work. As an objective measure of the effectiveness of the intervention, information concerning instances of potential plagiarism was collected from the departmental records for the students' next piece of laboratory coursework.

Student questionnaire. Following the intervention, students completed a short online evaluation comprising seven statements assessing students' satisfaction and the devel-

opment of transferable skills pertaining to referencing (e.g. Having used Turnitin it will help my work in the future'). Questions were also included that assessed how user-friendly Turnitin is perceived to be because if technology is perceived as user-friendly it will be more successful than if it is not (Maier & Warren, 2000). Students responded to the statements by indicating their agreement using a five-point scale (1=*Strongly disagree* to 5=*Strongly agree*). Finally, students were given the opportunity to provide free text comments concerning their experiences of using Turnitin.

Procedure

A teaching session was designed to introduce students to what constitutes good practice in academic writing in psychology. As part of the session, students were given a series of activities to facilitate their understanding of the issues surrounding good practice and plagiarism. Additionally, a tutor-led presentation was also given on the importance of following the referencing conventions within psychology. Finally, students were asked to submit a formatively assessed laboratory report to Turnitin as part of the session. Once students had submitted their work to Turnitin they were given assistance in interpreting the originality report. After the session, the students were then asked to evaluate the effectiveness of Turnitin as a method of increasing awareness of good practice in academic writing. Once the students had submitted the next piece of coursework, the departmental records for cases of suspected academic misconduct were accessed.

Results

Suspected cases of academic misconduct in subsequent work

An objective measure of the success of effectiveness of the session using Turnitin was to examine the number of suspected academic misconduct cases that arose following submission of the students' next piece of laboratory coursework. Following the inter-

vention, there was a significant reduction in the instances of suspected academic misconduct compared to the previous year where no such session was delivered. During the previous year where the same report was submitted but without the session using Turnitin as a tool for promoting good practice in writing there were seven cases of suspected academic misconduct whereas in the year when the students received the session using Turnitin there was only one case of suspected academic misconduct.

Originality reports

For the work submitted during the teaching session, the amount of text Turnitin identified as being similar ranged from 0 to 52 per cent ($M=13.88$, $SD=12.80$). Although there were some instances of matching text identified in the similarity reports, but as reflected in the descriptive statistics, there tended to be low instances of matching text within the documents submitted by the students. Further, some of the similarity scores should be treated with caution as instances where matching text was identified was due to the nature of the assignment. Specifically, there were a number of false positives identified where students used a common phrase or included appropriately referenced quotes.

Students' evaluations

Students evaluated the learning experience associated with using Turnitin positively. For example, 68 per cent of students agreed or strongly agreed that using Turnitin helped to reassure them that their work was their own, whilst 58 per cent of students agreed or strongly agreed that using Turnitin helped them to understand the issues surrounding plagiarism. The frequencies and descriptive statistics are presented in Table 1. A one-sample *t*-test was used to analyse the results of the evaluation where a rating of 1 indicated that Turnitin had been evaluated negatively as a method of enhancing students' knowledge of good practice in academic writing (see Harris & Queen, 2007). The results of the *t*-tests indicated that the

students had evaluated Turnitin as a positive method of teaching good practice in academic writing and as a method of raising awareness of the issues surrounding plagiarism.

Twenty students took the opportunity to provide free text evaluation comments which focused on different themes. Students reported that the use of Turnitin was helpful as a method of increasing good practice in academic writing ($N=8$). However, some students were concerned that Turnitin matched common phrases or appropriately referenced text ($N=8$). A few students reported that they had difficulty using the software ($N=2$) or following the instructions ($N=3$).

Discussion

Due to the increasing concern over the importance of following good practice in academic writing and the importance of making students aware of the conventions of academic writing, the present intervention aimed to enhance students' understanding of good practice through the application of Turnitin. In particular, we asked students to submit a laboratory report to Turnitin as part of a larger session on academic writing. The results were encouraging. There was a reduction in the number of cases of suspected academic misconduct in the piece of coursework that followed the intervention in comparison to previous years. Students also reported a broadly positive experience of using Turnitin and reported that the experience helped to raise awareness of the issues surrounding good practice in academic writing.

The student evaluations were also positive and suggest that Turnitin can be a useful vehicle for teaching good practice in student writing. The students also commented that the use of Turnitin helped them to understand the conventions of referencing and was a valuable transferable skill. Together, these comments suggest that asking students to submit work to Turnitin as part of a session on good practice in academic writing

does facilitate students' understanding and fulfils the requirement of tutors to transmit this information to students (see Parameswaran & Devi, 2006).

Although Turnitin has been regarded by some students as a deterrent to avoid plagiarism (Stapleton, 2012), warnings that work will be submitted to Turnitin are not always effective (Youmans, 2011). There are a number of issues that must be considered when tutors develop and implement similar interventions. For example, Hayes and Introna (2006) criticise Turnitin because it detects direct copies of strings of text and this in itself may be problematic. In particular, Turnitin does not take into account that someone could paraphrase ideas by changing some words but not appropriately acknowledging the source. Consequently, Turnitin may be more prone to detect plagiarism in non-native English speakers because of differences in language abilities (Hayes & Introna, 2006). Tutors also need to be aware that there are copyright issues surrounding the submission of students work to Turnitin. For example, students may be concerned that Turnitin violates their copyright and their privacy (Foster, 2002) and asking students to submit their work could foster an environment of mistrust and suspicion between students and tutors (MacMillian, 2007).

Perhaps the most important issue that tutors must address when using Turnitin, as a tool to encourage good practice in academic writing, pertains to the identification of the source of the text which may be plagiarised. As Royce (2003) notes, and as commented on by the students, Turnitin originality reports may identify text as suspicious that has been properly referenced and acknowledged. Such false positives are a particular issue for the present research. It is important that students understand that, in some instances, a string of text may be identified because: (a) It is a common phrase; or (b) it is a properly referenced quotation. Finally, as Robertson (2007) argues, that by allowing students access to their originality reports this in itself does not facilitate students'

Table 1: The number of students selecting each response.

	Frequency for each rating					M	SD	t
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree			
It was easy to submit the report to Turnitin	7	53	11	9	1	3.59	.94	21.57***
I was able to interpret the originality report	7	30	13	5	2	3.63	.95	21.35***
Using Turnitin helped to reassure me that my work was original	14	24	13	5	2	3.75	1.03	20.53***
Having used Turnitin it will help my work in the future	5	25	21	5	2	3.47	.92	20.74***
Using Turnitin helped me to understand the importance of writing in my own words and with appropriate referencing	16	22	16	4	1	3.81	.97	22.20***
Using Turnitin helped me to understand the issues surrounding plagiarism	10	21	17	7	3	3.49	1.07	17.84***
I was satisfied with the learning experience associated with Turnitin	2	32	20	2	2	3.54	.80	25.68***

Note: *** p<.001

understanding of what they did wrong or how they could improve in the future. Therefore, if this intervention was developed for use with other students, tutors need to be aware that simply asking students to submit their work to Turnitin and view their originality report may not be that beneficial for students. They must be helped to interpret the reports generated by the software.

One of the limitations of this study is that whilst there was a substantive decrease in the rate of academic misconduct in the piece that immediately followed the intervention session, from the current data it is not clear whether this reduction is maintained in subsequent assessments. Further, replicating the findings with another cohort would also increase the evidence of the appropriateness of this intervention. It is also not clear from the current study why the reduction in academic misconduct occurred in the subsequent piece of work. Therefore, future research should examine the mechanism through which this intervention is effective. For example, is it because the students' awareness of Turnitin has increased or is it because of genuine change in their academic writing practices?

In summary, we developed an intervention that embedded the use of Turnitin as part of session with first-year psychology students that allowed students to view the originality reports generated by Turnitin. The students evaluated the session favourably and there was a reduction in academic misconduct cases following the session suggesting that Turnitin could be used, with appropriate support, as a method of increasing students' awareness of good practice in academic writing.

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Individual paper

Developing a psychology undergraduate research community in a new university

Patricia Roberts, Candan Ertubey, Isabella McMurray & Ian Robertson

Psychology is a science-based discipline in which research is inextricably embedded in teaching and learning activities. Educators use different methods to help students in their learning of the nature of research and the practical skills required to conduct research, with students playing either a passive or more active role in the learning process. This paper details the steps taken at a post-1992 university in the UK to involve final-year psychology undergraduate students as researchers in a staff-led neuropsychology project. The theoretical frameworks underpinning this study were the teaching-research nexus and learning communities. The aims of the project were to engage students in active learning and to foster the development of higher order skills – evaluation, synthesis and reflection – through the development of a learning community. A thematic analysis of student questionnaires identified three overarching themes: Bringing theory alive, critical thinking and problem solving skills, and working in research communities. Staff reflections of working on the project are discussed together with future directions.

Keywords: *Students as researcher; theory to practise; learning community.*

GIVEN THE NATURE of psychology as a scientific discipline, there is an established history of research underpinning teaching in psychology. Indeed the British Psychological Society (the Society) represents psychology and psychologists in the UK and details core curriculum requirements for students to undertake throughout their degree programme. One of these requirements is exposure to a variety of aspects of the research process.

Educators have used different methods to enhance students' learning of the research process. Examples include teaching students the mechanics of how research is undertaken, having students participate in class room experiments, or holding undergraduate research conferences (Garde-Hansen & Calvert, 2007). A recurring view is that for students to gain a depth of understanding and knowledge of the research process their engagement in research is essential, for example, through active

learning (Chapdelaine & Chapman, 1999; Healey & Roberts 2004).

Others have examined the relationship between teaching and research (Brew & Prosser, 2003; McWey, Henderson & Piercy, 2006) exploring areas including the research culture in relation to outcome measures such as employability (Urwin & Di Pietro, 2005).

Jenkins, Breen and Lindsay (2003) suggest that the inclusion of staff research in the undergraduate curriculum assists in motivating students in their studies and enhancing the student experience. However, the link between staff research and teaching is not always evident to the students and it is not always easy to achieve. Previous research has investigated the extent to which there is a nexus between research and teaching roles (Neumann, 1994; Griffiths, 2004; Healey, 2005). Healey (2005) argues that utilising a teaching-research nexus framework can assist academics in encouraging students to

be active ‘participants’ in the learning process.

Stefanou and Salisbury-Glennon (2001) investigated the impact of active learning and the development of learning communities on undergraduate students’ motivation, depth of understanding and engagement with the subject matter. They found that students who worked both actively and collaboratively had higher levels of intrinsic and extrinsic motivation, had more internal control over their learning and lower levels of test anxiety.

This paper seeks to integrate two theories and bodies of literature – the teaching-research nexus and learning communities – in order to evaluate the impact of students and staff working together on a neuropsychological research project.

The Teaching-Research Nexus

A theoretical framework exploring the connections between teaching and research was proposed by Griffiths (2004) and further developed by Healey (2005). Griffiths (2004) details three approaches: first, a research-led approach where the class content is determined by the teacher and focuses on research findings; second, a research-

oriented approach where students learn about the research process again directed by the teacher; third, a research-based approach where the division between teacher and student is reduced as both are engaging in the research process through inquiry-based learning. Healey (2005) diagrammatically represented Griffiths’ (2004) framework and added a fourth element: a research-tutored approach (Figure 1) which places emphasis on small group discussions with students reviewing the research process.

In Healey’s matrix, ‘research-led’ and ‘research-tutored’ refers to the approach that much of the psychology curriculum dwells on past research, particularly at Level 1 where students learn the mechanics of conducting research through taking part in staff-led research. Furthermore, students are generally required to write essays and discuss papers, which demonstrates a more passive approach to research.

Psychology degree students, throughout their programme of studies, are often ‘participants’ in the research process. At other times they are the ‘audience’. Also the emphasis varies between research content, process and problems. As a result, both the

**Figure 1: Curriculum design and the research-teaching nexus.
Source: Healey (2005, p.70).**

	STUDENTS AS PARTICIPANTS		
EMPHASIS ON RESEARCH CONTENT	Research-tutored Curriculum emphasises learning focused on students writing and discussing essays and papers	Research-based Curriculum emphasises students undertaking inquiry-based learning	EMPHASIS ON RESEARCH PROCESSES AND PROBLEMS
	Research-led Curriculum is structured around teaching current subject content	Research-oriented Curriculum emphasises teaching processes of knowledge construction in the subject	
	TEACHER-FOCUSED STUDENTS AS AUDIENCE		

structure of the psychology curriculum and the pedagogy employed are already in place to ensure that students' intellectual development is informed by the teaching-research nexus (Neumann, 1994).

To foster active participation in research and student collaboration with their peers and staff, different approaches have been examined. For example, Hughes, Brown and Calvert (2008) offered second-year undergraduate bioscience students part-time paid work in research laboratories. Following an evaluation of the scheme in terms of impact on staff and students, the outcome was reported as positive both from staff and students with students indicating that the scheme had had an influence on their decision to pursue postgraduate study.

The above research implicitly highlights the importance of research partnerships between teachers and students. Partnerships with undergraduate and postgraduate students have been examined within the inter-related frameworks of 'learning communities' (Stefanou & Salisbury-Glennon, 2001) and 'communities of practice' (Wisker, Robinson & Shacham, 2007). Such partnerships ensure that undergraduate and postgraduate students' academic development is enhanced when students and staff become involved in learning communities (Stefanou & Salisbury-Glennon, 2001; Wisker, Robinson & Shacham, 2007). The history of the development of learning communities has been fruitful and such communities can benefit all participants in some way, for example, by increasing motivation to learn and developing problem solving and critical thinking skills.

Developing a research community

Drawing on Vygotsky's (1978) core idea that learning is socially constructed, the terms 'learning society' or 'learning community' have been used to refer to a form of pedagogy where learners share a common goal (and, ideally, shared values) and are actively engaged in the learning process as a group (Zhao & Kuh, 2004). Lave and Wenger

(1991) coined the phrase 'communities of practice', emphasising the view that learning is not just the product of acquiring a set of behaviours or due to information processing, but is best seen as a socio-cultural phenomenon where language, social relationships and context play a large part of the learning process. Wenger (2007) proposed that communities of practice are made up of three elements. The first relates to a shared interest and commitment to a specific topic or domain, the second is the formation of a community that shares knowledge and activities and where relationships are built, and the third element refers to the members of the community becoming practitioners, with a variety of resource including the ability to solve problems. This is in contrast to much of traditional teaching methods where knowledge is abstracted from the practice in which it occurs. Thus, a learning community should facilitate student learning as well as their personal development by taking into account students' individualism as well as their commonalities allowing them to share experiences and build connections that enhance their experience of higher education. Active learning, in the form of research-led teaching, can be seen as a vehicle for developing such a learning community in which problem solving and inquiry-based learning are embedded (Lave & Wenger, 1991).

In a teaching context, the impact of a learning community has far-reaching benefits for students. It provides not only a sense of belonging among the student group but also the ability to achieve a common goal and share learning experiences. These effects serve to increase the interest of the students in the topic they are researching leading, in turn, to 'deep' learning (Mann, 2001).

As educators it is essential that we find ways of bridging the gap between academic studies and 'real world' experiences. Healey (2010) recently reiterated that undergraduate students will benefit more from research if they take an active part in it. He then suggests that staff and students need to

find new ways of working together in that process. There is an established history in the US of psychology students and academics collaborating on 'real world' research projects. For example, Chapdelaine and Chapman (1999) describe how students undertaking a supervised and assessed community-based project with the local police improved their understanding of research methods. The authors also discuss a catalogue of other similar studies that have been conducted with psychology undergraduates in the US. Although others have recognised the benefits of students as researchers (see, for example, Landburn & Nelson, 2002), Garde-Hansen and Calvert (2007) note that the partnership between students and staff working together on research has not been a particularly widespread practice within education institutions in the UK.

The aims of this paper are: first, to detail through a staff-led research project conducted at a post-1992 university how teaching and research links, as detailed by Healey (2005), have seen a shift in the emphasis at one institution from students as audience to students as active participants; second, to examine the development of a student research community during a staff-led project. This is in line with the concepts discussed by Lave Wenger (1991; Wenger 2007). These aims are achieved by describing a research project linked to aspects of teaching neuropsychology and to students' evaluations of this project followed by staff reflections on the whole process.

Planning the project

Funding was secured from the institution's Centre for Excellence in Teaching and Learning to engage third-year psychology undergraduates as student researchers in a staff-led neuropsychological project. As the student researchers in this project were to receive a small financial sum for their work this was included in the funding proposal and accepted. The research proposal also included details of how all the third-year students would benefit from this project in

anticipation that not all the cohort would apply to actively participate in the research. A virtual learning environment was established where information relating to the project was posted and all students could access this site so that they could review progress of the research. As not all students would take an active research role in the project, it was considered an important part of the students' level three development to participate by acting as the adult control group. The student researchers worked with other students in the department and in two community settings. Four members of the staff were involved with the organisation of this research and supported the students throughout the process. A brief description of the research is detailed below. Further details of the project findings are currently in preparation (Roberts et al., in preparation).

The aims of the staff-led project were three-fold:

1. To investigate the effectiveness of two different neuropsychological assessment techniques: computerised neuropsychological assessment and the more traditional paper and pencil methods of assessment of both adults with closed head injury and children in special needs programmes from primary schools (9 years to 11 years with age 8 as a critical age).
2. To compare the results of adults and children with difficulties against normal comparison control groups to see the differences in their level of function with regard to attention and working memory.
3. To compare two neuropsychological assessment techniques (computerised assessment with traditional paper and pencil tests).

The unifying intent of these aims was to provide students with the context to conduct real world research. Chapdelaine and Chapman (1999) note that having good relationships with community agencies can alleviate some of the obstacles of involving students in researching in the community.

In the current research project, the staff team had already established links with a brain injury association. Previous collaborations included student visits to the association as well as visits from staff and clients from the unit coming to the psychology department to give talks. New links were made with a primary school that involved a number of written and face-to-face communications. Therefore, before the commencement of the project, all of the organisations were clear about the aims of the project and exactly what the students' and lead researchers' roles were going to be.

In relation to ethics, the project adhered to the Society's ethical guidelines (2009) and was given ethical approval by both the department and Health Research Institute at the university. Approval was also given by the brain injury association, the school and their Local Education Authority. All participants volunteered to take part. Consent was given from children as well as from their parents. All of the staff and students taking part in the research received cleared Criminal Records Bureau (CRB) checks. This is a mandatory national requirement for any individual who intends to work with vulnerable groups in the UK. The CRB checks were funded by the organisations in which the students would be working.

Recruiting student researchers

The opportunity to take part in this research project was extended to 65 final year psychology students. Following the invitation, 30 students expressed an interest to take part and were subsequently invited to come forward for an interview. A total of 20 students attended interviews which were taken by three of the authors. The criteria the students were interviewed against were their expressions of enthusiasm for the project, their commitment and how they would manage their time. Of the 20 students who were invited for interview, 13 students attended. Eleven out of 13 students accepted the role of student researcher (10 females, one male). The student group was made up

of five students who had entered university through the traditional route, coming straight from school or college and six mature students.

Procedure for the neuropsychological research project

Phase 1: Training students in the use of specialist equipment necessary for carrying out the research.

During a three-week period, students were given an introduction to the staff-led project followed by training on the specialist equipment to be used in the research. During this phase, two students left the group (one traditional and one mature) for personal reasons leaving a total of nine students who were fully engaged in the remaining stages of the research process. Following the training, students were set small tasks of writing up the instructions to support the test administration. Students arranged to meet in small groups to familiarise themselves with the equipment.

Phase 2: Students' data collection from fieldwork

Students collected data from four different groups: an adult control group made up of 20 final year psychology students who were not working as student researchers; adult patients suffering from acquired brain injury; two groups of school children from a local school – a control group and an experimental group (children in a special needs programme). The student researchers worked under the supervision of senior members of the research team using computerised and pen and paper methods to assess all participants' performance on tests of executive functioning, visual-spatial ability, attention and semantic/verbal memory.

Phase 3: From data collection to dissemination

Throughout the research, students applied and developed their existing knowledge of conducting research that they had learnt at an earlier stage in their studies. The practical application of these skills through fieldwork

was a new dimension for the students and their acknowledgement of the benefits of this is commented upon in their evaluation of their engagement in the research. Through the fieldwork, students were able to experience important aspects of data collection: for example, appropriate communication and listening skills to meet the needs of the client groups, delivering clear standardised instructions to accompany each test used and empathy for the needs of the participants. Furthermore, their existing research methods knowledge assisted with data entry, analysis and the write-up of the method section of the final report to funders. Students were also encouraged to become involved in disseminating the findings to the organisations with three students assisting with the preparation of the results sections and two students preparing the method sections for a series of oral presentations. All students attended the presentation of the research with one student assisting with the delivery of the presentation. Students were offered the opportunity of attending a conference with one student accepting the invitation.

Phase 4: Evaluation of the students' experiences of being involved in staff-led research

Following data collection, entry and analysis, students were asked to complete a questionnaire comprising 16 questions designed to evaluate their experiences of being involved in the research project. This evaluation extended from the training phase through to dissemination. The questionnaire was divided into three sections. The first section included general questions relating to the impact of their engagement with the research process on their academic studies. Six questions in the second section related to their experiences of the training and testing phase. Finally, the third section related to their overall evaluation of their experiences and how these experiences might impact on their future employment and postgraduate studies.

Findings from the student evaluation

From engaging in this project we wanted to determine what exactly the benefits were and how we could maximise these, along with suggestions for improvements to inform both teaching practice and future research collaborations. Students recorded no negative comments other than occasional difficulties with equipment and their comments are noted below.

A thematic analysis was conducted on the students' evaluation of their involvement. Thematic analysis is regularly used in psychological research in order to identify similar categories or themes within the corpus of data (Braun & Clarke, 2006). A benefit of this method of analysis is that it is not necessarily joined to a distinct theoretical perspective and can incorporate both inductive and deductive analysis. The research team read through the data line by line and identified three overarching themes which summarised the data: Bringing theory alive; Critical thinking and problem solving skills; and Working in research communities. These are detailed below along with comments from students who took part and their participant number.

Bringing theory alive

Students articulated their enthusiasm and the benefits of taking part in the project. All of the students acknowledged how their involvement provided them with a valuable link between theory and practice.

'I think participating allowed me to put theory into practice in a supported environment.' (P2)

'This project helped to consolidate and clarify my learning, making the theory we'd learnt 'real'.' (P5)

Furthermore, they reported gaining excellent experience from working in a clinical setting where they highlighted an understanding of the link between the curriculum they were studying and working in the field. Moreover, they felt this applied knowledge would benefit their future personal and professional development.

‘Taking part in the project has provided me with practical experience of data collection, data treatment and data entry into SPSS, as well as enhancing my research methods knowledge and report writing understanding. Moreover, the project has enabled me to engage in and work with clients that I may not have had the opportunity to do so otherwise.’ (P6)

Critical thinking and problem solving skills and the research process

Students felt that the project had provided them with the opportunity to gain a deeper understanding of the research process. They were able to explore different areas of the research process, which had the effect of enhancing their critical thinking skills. Within the scope of the Society’s curriculum students are taught the ethical guidelines that frame research activities (BPS, 2009). In the department, students are also given opportunities to evaluate how these guidelines are applied to different individuals and settings. However, in this project students showed a deeper awareness and appreciation of how the ethical guidelines are applied to different client groups prior to, and during, the testing phase.

‘It made me more aware that I had to protect the privacy and dignity of clients and the need to obtain consent forms prior to commencing the testing.’ (P6)

All students reported that the training they received on how to operate the equipment ran smoothly. Three students noted technical difficulties during the administration of the computerised tests to the client groups; however, they considered that some difficulties were to be expected in field work and through applying problem solving techniques and critical thinking skills the difficulties were resolved.

‘There were a few technical hitches, with computer buttons failing but the team coped well and found workarounds’. (P7)
‘The equipment used was sometimes troublesome (laptop) but this could be overcome by flexibility.’ (P9).

When conducting research as part of normal teaching and learning the projects are designed and conducted by staff with students acting as participants and generally the process runs smoothly. However, it was recognised that there is more room for difficulties to occur in ‘real world’ research as this participant noted:

‘Applied research is potentially full of unexpected operational issues, for example, the individual differences of researchers and any impact this has on the reliability of results. Both the researchers and their participants weren’t always available for the tests so a degree of flexibility was needed, and the equipment was sometimes needed elsewhere, temperamental, or simply in the wrong location needing a trip to collect and return it. This has made me reflect on how research is done in the real world and I think enhance my problem solving skills’ (P3).

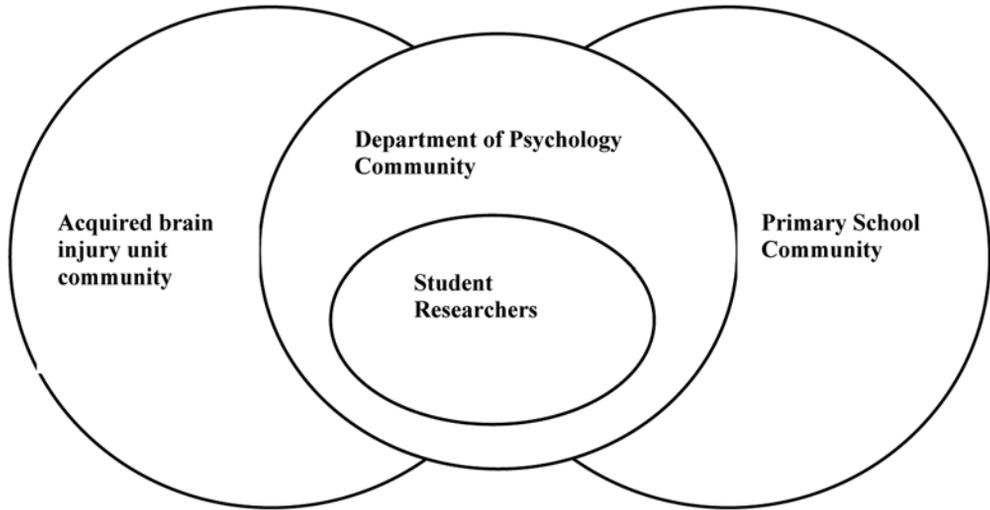
The students’ reflections in questioning the research process cohered with Landrum and Nelson (2002) who conducted a national survey with 211 psychology educators in the US relating to their experiences of research assistantships. They found that students had the opportunity to enhance critical thinking skills was the item rated the most important benefit of being a research assistant.

Working in research communities

The student researchers acknowledged the importance of working within and as part of multiple research communities at different times throughout the project. Figure 2 provides a diagrammatical representation of these research communities. The student researchers are in the centre of the model. Through working together and sharing common interests they evolved into their own community of practice with their fellow student researchers.

The starting point is the existing cohesive nature of the department where all students work together with a common goal to achieve their degree. The students as

Figure 2: Model of working in research communities.



researchers came together because of their shared interest in neuropsychology and working on a project conducted in the 'real world' and as a consequence of their establishing a supportive and effective learning community this extended to their working relationship with the two client groups.

Students reported on their peer collaboration as part of the group of student researchers.

'I enjoyed the sessions where I worked with my assigned partner.' (P5)

Figure 2 illustrates that this student researcher community is within a wider research community of the Department of Psychology, which includes both staff teaching and research, and student learning. The student researchers also acknowledged gaining and sharing knowledge with other students from their cohort who took part in the control group. Indeed, anecdotal evidence from the control group suggested that the student researchers were enthusiastic in conducting the research and were also motivated in the seminar sessions to share their research experiences informally with their peers. This supports Vygotsky's ideas of more skilful students supporting their peers.

What was expected from students was clearly set out within a time frame before the project began, along with details of how the students' role fitted into the broader project. The students were aware of what needed to be achieved and by when. Working in partnership with shared goals and solving problems together as they occurred may have gone some way into minimising any power imbalances between staff researchers and student researchers. These shared goals echoed the community of practice ideals (Wenger, 2007).

'The whole team work very well together, resolving problems as they occurred.' (P1)

Collaborating in these communities provided a cohesive enjoyable research experience.

'We were all very supportive to one another throughout the study, there was such team spirit.' (P7)

There was recognition by some students of what their own role was in the research team and an acknowledgement that they felt a sense of responsibility to their peers, staff and the organisations they were working in.

'I feel I was a reliable and effective researcher who assisted and supported other team members.' (P5)

Student researchers also described the benefits of working beyond the department and learning from the organisations in the local community. For example, one student highlighted that being a student researcher had provided her with a valuable insight into the complexities of working with school children and adults with acquired head injury. She also felt she had gained an understanding of the need to empathise with clients' needs while giving full consideration to the boundaries of the organisations.

'Yes, as it provided me with some valuable 'real life' experience working with young children in a school environment.' (P6)
'I definitely benefited from working with the brain-injured clients and enjoyed it enormously, particularly their candour in discussing their limitations and their willingness to participate in activities which highlighted their limitations as well as their abilities. I developed a greater understanding of the challenges they faced and also the process of rehabilitation.' (P5)

Staff reflections of the process

Staff reflected on the whole process and their reflections concurred with those of the students specifically in relation to the educational value of the students' participation. Moreover, staff described how they saw students developing their research skills through asking questions to staff, and through their interactions with both staff and clients at the two organisations. Staff also commented that the life experiences that the mature students brought to the project were invaluable and they were very supportive to the traditional students particularly during testing of the clinical group. It was noted that the research process was time-consuming for staff working with the students, however, staff felt that the advantages outweighed this. Staff acknowledged the benefits of working in the project in relation to enhancing students' employability and postgraduate study potentials.

Conclusions

The aims of this paper were to detail, through a staff-led research project, how teaching and research can be linked, and to examine the development of a student research community. Students' evaluations of their experience have shown that engaging them as researchers allows them to be more active agents in the research process. These findings support the work of Griffiths (2004) and Healey (2005) in that the students were engaged in the research process through active learning, very much shifting from the left side of Figure 1, passive engagement, to the right side, active engagement, where students are both participants but also involved in the research process.

The findings also support the ideals of a community of practice (Lave & Wenger, 1991; Wenger, 2007). However, rather than developing their skills, knowledge and attitudes in one research community that we originally envisaged, the students described multiple distinct and interlinked research communities (see Figure 2). From the student evaluation it would appear that they felt a sense of belonging to a group that had a common set of interests and goals to be achieved. This is in line with the view of Zhao and Kuh (2004) who reported that a learning community facilitated student learning and personal development.

The project promoted an integrated approach to facilitating both vocational and academic education. It also aided the development of students' knowledge of methodological designs together with the theoretical perspectives that underpin them as evidenced by their evaluations. Furthermore, since the completion of this project a new group of students has been trained in the use of the equipment and is working in the field. It is encouraging that this enthusiasm is continuing and that the project demonstrates sustainability in engaging students in staff-led projects.

Students reported that their understanding of the theoretical explanations of cognitive functions was enhanced by

observing first-hand the cognitive effects of brain damage in adults. This has provided the opportunity for students to gain a broader understanding of working in a 'real world' research setting, which included having to adapt to problems that arose, rather than learning within a more passive research or teaching setting. The project has therefore enhanced the skills that are fostered within the psychology curriculum and provided valuable experience that the students can incorporate in their final year project and curriculum vitae.

Limitations and future directions

The limitations to this study should be noted. The number of students who agreed to take part in the study was a small percentage of students who could have taken part (14 per cent of year group). Some students who did not take part commented that they preferred to concentrate on their academic studies. Therefore, in future, it may be beneficial to offer a similar programme to second-year students, who do not have the same final-year pressures.

There were a number of small managerial challenges throughout the course of the project. The project did not form part of the regular curriculum programme and managing students as researchers in different settings was more staff intensive than using more experienced research assistants to conduct the research. However, as specialist equipment was used for this project, training would have been required for all researchers regardless of experience. Staff involved in the project considered that the time taken to support the students as researchers was outweighed by the benefits in terms of completion of the research project and the group cohesiveness. This would have been more of a challenge if a larger number of students had volunteered to take part.

The student researchers received a small financial sum for their work. This brings into question the extent to which such projects can continue to be sustainable due to financial and management constraints. However, students indicated during their initial interview that the monetary reward was not their prime motivator for taking part. Moreover, during the study students offered to work more hours than required in order to 'help out'. Extra hours were due to 'thoroughly enjoying the experience'. They stated that they had a sense of pride in completing the job.

The students who worked on this project have now graduated; four have become volunteers in a new phase of data collection, which involves the training of a new cohort of student researchers. This will enable knowledge to be cascaded to the next cohort of student researchers.

Despite the limitations noted above the students who did take part in the research project built on their research knowledge and skills gained through their undergraduate studies. As a consequence of undertaking the project the graduates are now in a stronger position to consider working in the area of applied research in the future. In terms of future studies, as previously stated, the staff working on the project would like to take the experience of working in research communities further and engage students in their second year in staff-led research projects. A follow-up study is planned to determine if the final destination of students in relation to postgraduate studies and career choices has been influenced and enhanced by working on the project.

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Evaluating psychology students' library skills and experiences

Steve Jones & Julie Allen

Extensive engagement with current academic sources is expected of all psychology undergraduates. Thirty-eight undergraduate psychology students took part in a series of focus group discussions of their information-searching experiences and skills. The majority of students had not been required to engage with any form of information searching while studying at pre-degree level and were daunted by the sheer scale and complexity of the resources available in higher education. Following consideration of the issues raised by students in the discussions, a series of recommendations is presented to facilitate the transition into higher education and to enhance the library skills of psychology students.

Keywords: Library; information literacy; students, psychology, skills.

THE LEARNING EXPERIENCE of the psychology undergraduate is underpinned by the development of information-searching and specific information-literacy skills. The QAA (2007) subject benchmark statement for psychology includes the expectation that students should be able to 'retrieve and organise information effectively. Psychology graduates will be familiar with collecting and organising stored information found in library book and journal collections, and in computer and internet sources' and 'handle primary source material critically' (QAA, 2007, p.7). Placing this in the broader context, the QAA benchmark statement reflects the sets of skills and abilities that are encompassed by 'information literacy'. The Society of College, National and University Libraries (SCONUL) published a paper introducing the 'Seven Pillars of Information Skills' in 1999 (SCONUL, 1999). This was updated in 2011 to provide a clearer reflection of the range of terms and concepts that form the basis of 'information literacy'. SCONUL (2011) provides a detailed definition of each of the 'Seven Pillars of Information Literacy', dividing each one into elements of understanding and abilities. The headline definitions of the seven pillars are:

- Identify: Able to identify a personal need for information.
- Scope: Can assess current knowledge and identify gaps.
- Plan: Can construct strategies for locating information and data.
- Gather: Can locate and access the information and data they need.
- Evaluate: Can review the research process and compare and evaluate information and data.
- Manage: Can organise information professionally and ethically.
- Present: Can apply the knowledge gained: presenting the results of their research, synthesising new and old information and data to create new knowledge and disseminating it in a variety of ways.

The initial formulation of the seven pillars was that they were built upon the twin fundamental foundations of 'basic library skills' and 'IT skills' (SCONUL, 1999), so there is an assumption that 'basic' skills will have been acquired. The extensive definitions of the seven pillars give some flavour of the complexity of information literacy and the challenges facing students in higher education. The re-framing of the seven pillars by SCONUL in 2011 was intended to capture some of the changes that had taken place in

terms of the conceptualisation of information literacy in the years following the publication of the initial document in 1999. One of the key changes over the last decade has been the rapid growth of electronic sources of information and their availability to undergraduate students. These changes have led Hepworth and Walton (2009) to identify 'e-literacy' as a subset of information literacy and define it as 'the ability to access, use, manage and create information in an electronic environment... to use electronic networks to access resources, create resources and communicate with others' (p.16). It could be argued that much of the information literacy of the psychology undergraduate reflects 'e-literacy' as much as the more traditional notions of 'information literacy'.

It is often assumed that 18-year-old students entering HE will be IT-literate and will, therefore, have little difficulty with the subset of information literacy that Hepworth and Walton identify as 'e-literacy'. The typical student entering higher education in the 21st century has never experienced a world without the internet and Google (the so-called 'digital native'). It is also often assumed that the previous experiences of students entering higher education with using IT will easily and painlessly be extended to an ability to use a university library and all of its related electronic sources. However, in a report commissioned by the British Library and JISC, Rowlands et al. (2008) found that the so-called 'Google generation' (those born after 1993), far from being 'expert searchers' tend to rush information searches and spend very little, if any, time evaluating the quality of the sources that they have found. More recently, it has been found that UK university students from a range of academic disciplines do use Google, but tend not to look beyond the first couple of pages of results (Hampton-Reeves et al., 2009).

There is a growing body of research evidence suggesting that the digital natives of the Google generation use the internet to

search for information in a 'shallow, random and often passive' way (Bennett, Maton & Kervin, 2003, p.781), and that the general experience of using computers does not necessarily mean that young people entering higher education will be any better than their predecessors at the type of research and scholarship required at that level (Head, 2007).

The 'shallow, random and often passive' information searching referred to by Bennett et al. is captured within the framework of 'information behaviour' (Case, 2007). Information behaviour is a substantial area of research within the field of information science. This concept may be useful to help understand the behaviour of undergraduate students, as it encapsulates a broader range of behaviours than merely 'information searching' and 'information evaluation'. According to Case, information behaviour 'encompasses information seeking as well as the totality of other unintentional or passive behaviors (such as glimpsing or encountering information) as well as purposive behaviors that do not involve seeking, such as actively avoiding information' (Case, 2007, p.5). The reference to 'actively avoiding information' is an interesting one, as it may occur as part of an undergraduate's information behaviour when searches produce a very large number of results. This also acknowledges that information searching does not occur as a linear process. As Hepworth and Walton (2009) point out, the process of searching for information, particularly in an unfamiliar area, is likely to be highly exploratory and 'full of dead ends and backtracks' (p.52), as sources are rejected and later returned to, search terms modified, and so on.

One of the key points about the development of information literacy skills in higher education is that it must build on previous experience and knowledge (Hepworth & Walton, 2009). An understanding of the previous experiences of students entering higher education is, therefore, an essential part in developing effective training in infor-

mation literacy that meets the needs of learners and is offered within the appropriate context (i.e. the academic discipline). Given the importance of understanding students' existing skills and prior experiences, it is unfortunate, as Rowlands et al. (2008) reported, that 'there is little research in the UK into the information searching skills of young people in and entering higher education' (p.303). One study that has touched on this area is that reported by Whittle, Pell and Murdoch-Eaton (2010). Over a nine-year period from 2000 to 2008, first-year undergraduate medical students completed a questionnaire in which they self-assessed the opportunities that they had had to practise a range of 31 generic skills in the previous year, along with how confident they felt. Over the period of the study, Whittle et al. found that there had been an increase in the use of the internet to find information and an associated increase in confidence with this. There did, however, also seem to be a decrease in self-reported confidence in selecting information. Other information-handling skills showed a fall in self-reported experience for the first few years of the study, followed by a recovering pattern. The self-reported experiences of 'interpreting information', for example, declined between 2002 and 2006, but then increased in 2007 and 2008. It is interesting to note, though, that this was still below the levels reported in the period from 2000 to 2003.

While the Whittle et al. study revealed some interesting trends over an extended period of time, it did not aim to explore the absolute levels of experience that students had, or the nature of students' information literacy skills and experiences. Whittle et al. do suggest, however, that there is a need to monitor changes to information-handling skills in entrants to higher education, with an associated targeting of support to students.

Students entering higher education will, of course, have had some experience of libraries in their secondary schools or

colleges. The approaches to teaching information literacy in UK secondary schools vary widely, with about 50 per cent of school libraries being run by staff with no formal qualifications in librarianship (Streatfield et al., 2011). The average secondary school library in the UK holds 10 to 15,000 volumes (Streatfield, Shaper & Rae-Scott, 2010) and is most commonly located in a single site (often in a single room). Few school libraries subscribe to academic journals. In contrast, figures for 2009–2010 showed that UK university libraries held, on average, 751,943 catalogued print books, 109,697 e-books and subscribed to an average of 16,670 journals (SCONUL, 2010). As Case (2007) points out, '...all but the smallest libraries can be complex and intimidating' (p.22), so it is important to understand how students experience the transition from using a small school or college library to a much larger university library.

The earlier reference to students searching in an often 'shallow, random and often passive' way (Bennett, Maton & Kervin, 2003, p.781) is evocative of the terminology arising from discussions of approaches to learning and learning styles. An understanding of the information literacy skills and the related experiences of students entering higher education would not be complete without a brief consideration of the ways in which people learn. Generally, approaches to learning have been characterised as 'deep', 'surface' (Marton, 1975, Marton & Saljo, 1984) or 'strategic' (Biggs, 1987). Deep learning involves the learner in trying to understand, seek meaning, and to relate new knowledge and information to existing knowledge. Surface learning is characterised by an intention to complete the task at hand and to memorise its components. The learning of a set of facts is surface learning, while the understanding and application of those facts would represent deep learning. The third type of approach, 'strategic' learning, is characterised by a focus on the final product of the learning process, such as a written assignment. In a

strategic approach, the student focuses on achieving a high mark, while retaining a very pragmatic engagement with the task. Some element of understanding and processing of meaning is involved but the main aim is to use information to produce a good outcome, rather than to develop new knowledge of the area. The 'shallow' searching referred to by Bennett, Maton and Kervin (2003) may reflect a 'surface' or 'strategic' approach to using information. In a similar vein, Hampton-Reeves et al. (2009) found that the main criterion that students used for judging the usefulness of a source was its relevance to an assignment rather than whether it had been peer-reviewed or recommended by a tutor or other students. This very much reflects a strategic approach.

Learning styles have been defined in a number of ways, with learners characterised, for example, as preferring convergent, divergent, assimilation or accommodative styles (Kolb & Wolf, 1984), as 'Activists', 'Reflectors', 'Theorists' and 'Pragmatists' (Honey & Mumford, 1982), or as visual, auditory, read-write or kinaesthetic learners (Fleming, 2001). Gardner (1993) identified eight different styles of learning: linguistic, logical/mathematical, spatial, musical, kinaesthetic, naturalistic, interpersonal, and intrapersonal.

Riding and Cheema (1991) drew a simpler distinction between 'field-independent' and 'field-dependent' cognitive styles. According to Ford (2004), 'field-independent individuals tend to experience the components of a structured field analytically, as discrete from their background, and to impose structure on a relatively unstructured field. By contrast, relatively field-dependent individuals tend to be less good at such structuring and analytic activity, and to perceive a complex stimulus globally as a gestalt.' (p.190). In terms of information behaviour, according to Ford (2004), individuals who are more field-independent make more use of truncated search terms, Boolean ORs, and less use of natural language search terms. They also prefer to use keyword searches

rather than browse for information and are less likely to be distracted by irrelevant information. Generally, field-independent individuals experience less difficulty and confusion while searching the internet and greater engagement in 'differentiating' behaviour. According to Ellis (1989) differentiating behaviour is the stage during information searching at which the individual filters and selects from among the available sources by consideration of the nature and quality of the information offered by each source. This is clearly similar to the SCONUL 'evaluate' pillar of information literacy and represents a major aspect of developing information literacy. There does appear to be a link between field-independence and this element of information behaviour. For the purposes of the present study it may be, however, more useful to appreciate that students will display different approaches to information searching and evaluation rather than classify them as 'field independent' or 'field dependent'.

In a similar vein, a distinction has been drawn between holistic and serialist styles (Pask, 1976). A 'serialist' prefers step-by-step and highly structured learning, focuses on a topic in isolation, concentrates on details and evidence, and adopts a cautious and logical stance. The potential drawback of adopting this type of strategy is 'improvidence': a failure to seek analogies or to make connections with related ideas. A 'holist', on the other hand, takes a broad view and prefers personal organisation, tries to build up their own overview of a topic, makes extensive use of analogy and illustration, and seeks connections between ideas. As a potential drawback, 'globetrotting' involves giving insufficient attention to details and a tendency to generalise and reach conclusions too readily. Studies have found that 'holists' tended to look further ahead in the learning process while, for serialists, the 'overall picture' tended to emerge relatively late in the process (see Ford, 2004, for a review). The serialist/holist distinction can be applied fairly directly to information

behaviour, as the serialist will tend to focus on the details individual sources while, for the holist, the overall 'picture' will develop much earlier in the process and information sources be used to provide more 'colour' to the emerging picture.

The distinctions between different approaches to learning and different learning styles may help to understand the self-reported experiences of students when reflecting on their information-searching skills.

Students do seem to be aware that information skills are important. In a questionnaire study of biological sciences, chemistry and environmental management students and staff at an Australian university, Leggett et al. (2004) found that 'finding information' was rated as highly important as a skill by students in all disciplines and across all year groups. It is interesting, however, that the Leggett et al. study did not ask students or staff to consider the importance of evaluating or using information effectively, although the more general 'organising ideas' and 'critical thinking' were rated fairly highly by students and staff. Leggett et al. argue that, as discipline-related and generic skills are now considered to be explicit knowledge, rather than tacit knowledge that was acquired gradually, they need to be actively taught. They go further and suggest that 'it is impossible to teach skills in isolation and that an integrated, cross-curriculum approach is essential' (p.298).

Wang (2011) suggests that there are currently four main approaches to information literacy education in higher education: extra-curriculum (a course outside the academic curriculum), inter-curriculum (a session added to an academic course), intra-curriculum (integrated into a course), and stand-alone (an independent course within the curriculum). Wang presents a model of information literacy integration and argues that it is important to understand the academic curriculum and identify potential courses in each year for information literacy integration. In the current UK higher educa-

tion context, for the majority of institutions, Wang's use of the term 'course' is synonymous with 'module' rather than with 'programme of study'.

Lantz and Brage (2006) also make a strong argument for the integration of information literacy within the curriculum, including a focus on students learning to evaluate the information that they encounter and on identifying its usefulness for their goals. Kavanagh (2011) describes a successful implementation of an embedded information literacy module within an undergraduate marketing course.

Walton and Hepworth (2011) investigated the effects of online social network learning (OSNL) on the development of information literacy in a group of first-year sports and exercise undergraduates. Students in the intervention group were asked to judge the reliability of webpages and then post their thoughts to a discussion board. They then evaluated the contributions of other students and reflected on their own evaluations of the sources. Finally, the students produced a written assignment. Data from focus groups were analysed and coded using categories drawn from Hepworth's (2004) model of information behaviour. The active nature of the tasks (a *Style State*) was found to increase students' motivation (an *Affective State*) and to reduce uncertainty (*Affective State*). The part of the intervention that involved students evaluating the contributions and activities of other students produced a *Cognitive Questioning State* in which students reflected on their own evaluation skills. Students in the intervention group were judged to have used a better quality of sources in their written assignment and were found to use more evaluative terms and to be better at reflecting on their own information behaviour.

Walton and Hepworth argue that the collaborative working and discussion involved in their intervention helped students to identify gaps in their own knowledge and that undertaking the shared task online led to deeper learning, and to the

development of the skills of *analysis*, *synthesis* and *evaluation*, as defined in Bloom's Taxonomy (Bloom et al., 1956). They also argue that it is important that the higher levels of uncertainty experienced by students as they begin to develop information literacy skills in higher education need to be recognised and, importantly, that students are aware of this.

This shift away from more traditional 'library inductions' reflected in the studies outlined above reflects the view that introductory instruction sessions for library use tend to be ineffective (e.g. Paglia & Donahue, 2003), and that 'one-shot' library instruction sessions are not ideal (Martin, 2008).

As the use of electronic books and journals increases in the teaching of psychology in HE there is a need to develop an in-depth understanding of how psychology students approach their studies, how effectively they are able to use a combination of electronic and traditional sources, and the expectations that they have of the resources to be provided for their studies of psychology.

By encouraging students to actively reflect on their strategies, successes, failures, positive and negative experiences, we can learn how to help students to maximise the benefits that they derive from the available resources. An in-depth understanding of how psychology students interact with electronic and traditional library resources is key in enabling students to utilise and value available resources and to develop information literacy skills.

As noted earlier, the development of information literacy at undergraduate level must build on the existing skills, experiences, and knowledge of students entering higher education. It is, therefore, vital to understand the skills and knowledge that students have developed from their pre-degree studies, particularly in light of the demands placed on them as they enter higher education.

Project aims

The aims of the project are to develop an in-depth understanding of:

1. The information literacy skills that psychology students bring with them into HE.
2. The strategies that psychology students adopt when searching for information.
3. How psychology students use the range of sources available to them.
4. How psychology students evaluate information sources.
5. The specific problems and successes that psychology students encounter with library resources.
6. What students do in response to the difficulties that they encounter.
7. The views of psychology students on how best to increase their academic information literacy.
8. How best to respond to issues that arise from students' use of library resources.

An incidental, but valuable, outcome of the project will, hopefully, be an insight into how psychology students think about library resources, and how their experiences colour their responses to library-user surveys.

Method

Participants

A total of 38 psychology students, from two UK HEIs, took part in focus group discussions. Participants were invited to participate by one of the researchers announcing and explaining the study in a psychology lecture. Students were told that the study was aimed at understanding their use and experience of library resources, including how they used information in their studies prior to going to university. Students volunteered by emailing the research assistant for the study, who arranged the sessions. In total, there were 14 focus groups, each lasting about 45 minutes. The sizes of the focus groups ranged from two to six participants. The initial aim was for each group to be comprised of six participants. Some students volunteered to participate, but did not attend the scheduled session. It was decided to undertake the session with the students who had attended

rather than cancel it. Consequently, the focus group sizes were uneven and, in one case, consisted of just two participants.

Procedure

The focus groups were run by a research assistant employed specifically for this project. It was felt that students may be more reticent about discussing their own abilities, skills and experiences with one of their lecturers, so the employment of an individual with no connection to any higher education institution was made to overcome this. The research assistant was familiar with the types of information sources that were available and appropriate for students of psychology to use in their studies.

The focus group schedule was designed to explore students' experiences of searching for and using sources of information to support their studies. A key element of this was to explore the transition from pre-degree study to undergraduate work, so students were asked about their experiences with information searching while they were at school, college, or elsewhere prior to beginning their degree.

The key areas of exploration, with some examples of the questions used, were:

- Pre-degree studies, including previous experience of studying psychology.
- Sources of information used in previous studies and methods of obtaining it. 'In your previous studies, what types of information did you use, and how did you get hold of it?'
- Guidance provided on how to find sources and how to judge their usefulness and reliability. 'How much guidance were you given about what to use and how to find it?' 'How did you tell whether a source was reliable or not?'
- Comparison of tutor expectations and types of sources between pre-degree study and undergraduate study. 'What were the main differences, if any, that you found when you started your degree in terms of the types or amounts of sources available or the expectations of tutors?'

- Challenges and difficulties faced in finding and using information at degree level. 'What would you say are the main problems that you face in finding and using information for your studies?' 'Can you give me an example of a time when you had a particular problem?'
- Strategies used to overcome difficulties. 'What did you do to try and overcome that problem? What help was available?'
- General approaches to collecting information in order to prepare for an essay. 'Generally, when you are given an essay to write for a particular psychology module, what do you do to collect the information that you need?'
- Factors influencing students' perceptions and ratings of available library and information services. 'When you're asked to rate the library sources on various surveys such as module evaluation questionnaires, learning and teaching surveys or the NSS, what would you say is the main factor that influences your rating?'
- Reflections on how psychology students could be helped to make the best use of available resources. 'What do you think would help psychology students to make best use of the available resources?'

Each focus group session was audio-recorded and transcribed.

Analysis and discussion

A thematic analysis approach (e.g. Braun & Clarke, 2006) was taken to the analysis of the data. The transcripts of the focus groups were read through carefully in order for the researchers to develop an overall impression of the main points and issues that students were raising. These were then coded into themes and all relevant extracts for each theme were collated. Themes were checked against each other to ensure that they were distinctive and that the data had been organised in the most coherent and consistent way.

The themes that were drawn from the data are:

- The prescriptive nature of pre-degree learning.
- Evaluating the reliability of sources
 - Wikipedia: A case in point.
- The transition to higher education: Overwhelmed by resources and expectations.
- Books vs. journal articles.
- Searching for journal articles.
- Complexity of sources.
- Importance of practice.
- Misconceptions and unreasonable expectations.

In the analysis and discussion that follows, representative examples are given of the extracts that led to each theme being developed.

The prescriptive nature of pre-degree learning

Exploration of the typical student experience of studying pre-degree revealed a remarkably consistent pattern of reliance on learning materials provided by the teacher. This took the form of handouts and class notes, sometimes incorporating photocopied sections of a textbook. Where a textbook was used, students were often directed to read specific chapters. The following extracts from the focus groups exemplify the experiences of the majority of the participants.

1. *Mostly handouts. Occasionally a text book. I didn't use the internet, we were given everything you needed.*
2. *For me it was just what the teachers put in front of us really. There wasn't really that much stuff in the library that was useable because you went to a text book and it was the same one that they give you in the class.*
3. *Everything was on a plate for us at my College. Everything was given to us or we were told which text books were relevant.*
4. *I don't think our books ever came out the cupboard we just watched videos all the time. You used to get the teacher doing a handout and you'd read that or she'd photocopy it out of a book that she had and you'd just highlight stuff and dig points out of it and then write practice essays for the exams.*

Interestingly, use of the internet was not widely cited as a method of gathering information, so it does not seem to be the case that students were, as is often assumed, 'getting by with Google' or other internet browsers to support their studies. In fact, only one or two students made reference to searching for information on the internet during their pre-degree studies.

This contrasts with a recent study of US university students (Mizrachi, 2011) in which the majority of participants reported that they began their research by using some form of search engine, typically Google. It also contrasts with what may be a common assumption amongst psychology lecturers that students will have used Google to support their academic studies prior to commencing their psychology degree.

The picture that emerges from students' experiences of studying at A-level is one of reliance on 'spoon-fed' materials. Students did not search for information because, in all but a very small minority of cases, they were simply not required or encouraged to do so.

The use of a limited range of materials is brought into sharper focus by the ways in which students made use of sources in preparing for assignments. The approach to learning in order to 'pass' comes to the fore in a number of comments, as exemplified below:

5. *We did essay plans before every essay so she found the points for us and told us where in the essay they should go.*
 6. *We wrote what we was given so everyone's essay was exactly the same.*
 7. *They basically gave you the answer at college.*
- This is consistent with a shallow (Marton, 1975; Marton & Saljo, 1984) or strategic (Biggs, 1987) approach to learning. It is not entirely clear from the accounts of participants how the preparation of essays in this way ('we wrote what we was given') relates to the learning process. It does seem, however, that the main concern was to be strategic in the use of the provided information in order to achieve the best outcome in terms of the mark for the essay.

This 'spoon-fed' approach to learning is not consistent with the 'deep' learning expected in higher education.

Evaluating the reliability of sources

The heavy reliance on teacher-provided materials meant that few students in the study had been encouraged to consider the reliability and value of different types of source, although the students who had been encouraged to search for their own sources were more likely to have given this aspect of information literacy some thought. At the pre-degree level of study, a broadly held assumption is that books were reliable sources of information, with no apparent appreciation that books can contain errors or be written from a particular viewpoint:

8. *Books are generally reliable because they were obviously written by psychologists most of the time.*
9. *I think before university what you think is that all books are a good source and you're aware that some books are better than others.*

Only one or two participants seemed to have a clear understanding of the reliability of sources prior to beginning their undergraduate studies, but this seemed to focus on the relative usefulness of materials found on the internet:

10. *Depending on where they come from – from websites it was often the end, for example, dot gov, org – that kind of stuff.*
11. *Some other things weren't as reliable because they always had a bias to them but you could always try to figure out the bias and work with it in whatever you were doing.*

It seems that there was an emphasis on the using of sources that were provided by the tutor, rather than a consideration of their academic provenance.

12. *You assume that what you're given by a tutor is a reputable source. Some of it was journal articles and some of it was newspaper articles but at that stage there was no emphasis on reliability of sources, more you digest what you're given.*
13. *I didn't give it a lot of thought, it's information, I don't care where it's from.*

The consideration of the reliability or credibility of sources is not, it seems, an issue that is at the forefront of pre-degree studies. Students do not appear to have had to make these types of judgment, or even to have really given the issue much thought.

The statements made by participants in this study do, however, appear to be similar to the findings reported by Hampton-Reeves et al. (2009) in their study of undergraduate students in a range of disciplines. They found that the main criterion that students used for judging the usefulness of a source was its relevance to their assignment rather than whether it had been peer-reviewed or recommended by a tutor or other students. The relevance of the material to their assignment was also used as the main criterion for judging the academic quality of a source, with other criteria such as currency, whether the source was peer-reviewed or whether the source had been referenced by other researchers being considered less important.

Mizrachi (2010) found some similar findings to those reported here, in interviews with 41 university students in the US. Similarly to the example in the extract above, Mizrachi found that students judged that websites with 'edu' or 'gov' designations were credible sources of information. While, of course, 'gov' websites may well be more accurate, it does not necessarily follow that their content will unbiased and objective. Hepworth and Walton (2009) associate government web pages and university web pages with what they term the 'deeper web', which lies at a shallower level than the 'mother lode' of peer-reviewed content.

Wikipedia: A case in point

Wikipedia merits a section of its own here, because it was repeatedly singled out by students as a source that should not be used, although they were not always entirely certain about why this should be the case. An interesting contrast arose between students' perceptions of Wikipedia and material available elsewhere on the internet:

14. *I always knew not to use Wikipedia, always, and that was just overhearing a conversation, a couple of tutors had said that, but other than that, especially the internet stuff, you would think that it's pretty reliable.*

15. *We were always told to stay away from Wikipedia but I don't know why.*

Since its launch in 2001, Wikipedia has grown from 20,000 articles at the end of its first year of operation, to, as of February 2012, over 3.8 million articles in English (Wikipedia, 2012). The perceived lack of academic credibility of Wikipedia has long been a concern and recent years have seen a burgeoning of research scrutinising the accuracy and reliability of Wikipedia and exploring how students perceive and make use of it (see Rand, 2010, for an overview). For example, Giles (2005) compared Wikipedia articles to those in the *Encyclopaedia Britannica*. Experts rated a selection of articles and found that, on average, Wikipedia articles contained four inaccurate points, compared to three in the average *Encyclopaedia Britannica* article. In total, just four serious errors were found in each of the two encyclopaedias. This evidence does not seem to support the widely held view that Wikipedia articles are entirely inaccurate and unreliable. However, Rector (2008) compared nine historical articles on Wikipedia with their equivalent articles in *Encyclopaedia Britannica*, the *Dictionary of American History* and *American National Biography Online*. Rector found that Wikipedia's accuracy rate was 80 per cent compared with 95 to 96 per cent in the other sources. Wikipedia's main areas of weakness were the inclusion of unattributable quotations, the appearance of plagiarised content, and a lack of reference to credible sources. Although this study was based on a small sample of articles, Rector concludes that 'Academics may question students' or colleagues' use of Wikipedia as a scholarly resource' (p.20).

Consistent with these findings, Kubiszewski, Noordewier and Costanza (2011) found that articles in Wikipedia were

still considered to be significantly less credible than those in the online version of the *Encyclopaedia Britannica*.

Wikipedia is often held up as the prime example of an inappropriate source of information for study in higher education, with some extreme reactions of the part of academics: 'Use Wikipedia and the paper would receive a grade of zero, no questions asked' (Chandler & Gregory, 2010, p.249). While such an extreme response is probably rare, it is not uncommon to hear lecturers in UK higher education tell students that they must not use Wikipedia because it is not a credible academic source.

It is interesting that participants in the present study had very little to say about Wikipedia other than that it was not a source that they should use. This contrasts with a Swedish study by Sundin and Francke (2009) in which 17- and 18-year-old students were found to be aware of some of the potential weaknesses of Wikipedia as a source, but were conscious of the fact that Wikipedia could serve as a useful starting point, especially if the article contained appropriate academic references that could be followed up to verify information and access further sources. As Chandler and Gregory (2010) point out, Wikipedia has the advantage of being constantly updated, and errors are typically very quickly spotted and corrected. Each article has an editing history, so the Wikipedia user can see how the article has evolved and been improved over time. Mizrachi's (2010) participants also considered Wikipedia a good place to start.

Finally, there did not appear, amongst participants in the present study, to be a broader understanding that the type of criticism levelled at Wikipedia (lack of academic credibility, lack of accuracy) may also apply to other internet-sourced materials that are regarded as 'pretty reliable' (Extract 14). There appears to be a need to address the issues around the use of Wikipedia and the internet by psychology students in the UK in a more sophisticated way than by simply banning the use of Wikipedia.

The Association for Psychological Sciences (APS) has begun a Wikipedia Initiative, 'calling on its Members to support the Association's mission to deploy the power of Wikipedia to represent scientific psychology as fully and as accurately as possible and thereby to promote the free teaching of psychology worldwide' (Banaji, 2011). This is in its early days, but it may be that, in the longer term, Wikipedia will become a more credible source of information about psychological topics as a result of academic psychologists taking ownership of the content.

The transition to higher education: Overwhelmed by resources and expectations

Participants were asked about the differences that they experienced when beginning their degree course, in terms of the types and amounts of information sources available and the expectations of tutors. There were different views on the comparison between pre-degree and HE studies in terms of the amount of support available, with some students suggesting that the level of support at degree-level is very high, with others saying that there was less support available at university. The prevailing view was, however, exemplified by the following:

16. *You're an adult here really, aren't you? So you're treated like an adult in the sense that you've got to do it yourself, whereas in college you're more used to having everything done for you and told what you need to do and everything set for you.*

In the main, students recognise that they are very much more on their own, in contrast with their previous studies in which they were very heavily guided in their learning, to the point, in some cases, of being told what to write in an essay and how to structure the content.

On entering higher education, students very quickly learn that there are substantially more, and different, resources available to them than the often extremely restricted resources provided for, and required by, study at pre-degree level. In order to fully

appreciate students' perceptions of the scale of resources available, it is worth noting that the majority of participants were studying at a modestly sized HEI which, while providing extensive resources for students, is served by a library which, in relation to other HEIs would be considered fairly small in terms of its physical size. This is worth bearing in mind when considering the students' reflections on the size of the library and the resources available:

17. *There's a lot more resources in the library than the library I had at sixth form. I didn't realise that a library could be that big.*
18. *Yeah, the library's so big and especially for my course I have to go through all three floors depending on what I'm doing.*

Students appeared surprised by the sheer scale of the resources available to them at what were relatively small universities. They used words such as 'overwhelming', 'scary' and 'stressful' to describe their feelings when confronted with the scale of the task ahead of them to make use of the available resources. The feeling of being overwhelmed may be significant one because, as Case (2007) points out, one aspect of information behaviour is the active avoidance of information. This may be a result of being overwhelmed by the number of results returned from a search or, more basically, by a more general feeling of being overwhelmed by the sheer scale of the resources available, as in this case. This may also explain the findings of Hampton-Reeves et al. (2009) that students tended to look at only the first few pages on search results when using Google.

Students were also very aware that the expectations of them were very different from their pre-degree studies and it was clear that they understood the need to make extensive use of credible academic information when writing essays.

19. *They expect a lot more reading, a lot more referencing, a lot more searching in resources and they expect the evidence to be in the work and that so it's not a case of pretending.*

There was also a significant challenge for students as they took the first steps to using 'proper' sources to help them to prepare their assignments:

20. *It's like the first few essays, I struggled on things like 'go find some sources' they said 'use that' so I went and got a book, assuming that would be OK and it wasn't. It's not that they didn't like say but it's just that there's a big difference that I didn't expect.*

21. *They expect a lot more referencing, a lot more books used, you can't just use one book and get all your information from there you have to look for journals, books, loads.*

The use of books and journal articles is an issue that will be returned to briefly later but, for the moment, it is clear that students are aware that there are different types of sources and that using a single source is not going to be sufficient for studying psychology at undergraduate level.

When faced with the comparatively huge information resources of an HEI, students, quite understandably, find it difficult to judge precisely how many different sources they are expected to use, as well as how to use the specific resources in an effective way:

22. *It's a bit stressful because there's so much information and you think 'am I using enough?' Because you think there's all this information – am I wasting it, but then I think I've put too much in. It's just hard to get the balance right.*

23. *You're taught from a very early age that you read a book cover to cover but text books aren't used like that and I think that is the key of realising that yeah, you're working from this big book but you're not expected to know everything that's in it and you're not expected to understand everything that's in it.*

24. *It's quite overwhelming... you don't know where to start... it's scary actually.*

The extracts presented above really sum up the experiences of students new to higher education. They are suddenly confronted by learning resources that far exceed their experience or expectations and required to be able to make use of them in their studies. Extract 23 presents an interesting example

of reflection on the use of information in the new context of higher education.

It is, perhaps, easy for psychology lecturers in HE to over-estimate the experiences that students will have had in using information, but, as has been discussed, many students will not have had experience of making selective use of material from a single textbook, let alone having been faced with the prospect of searching a database containing hundreds of thousands of journal articles and selecting appropriate sources from amongst the myriads available. This does, of course, lead students into difficulty and there was, again, a real sense amongst the participants of being overwhelmed by the resources available:

25. *I know the first time you start looking on the library database you get absolutely overwhelmed with books and journals and you just think 'oh my gosh, what do I use?' It's like a needle in a haystack, there's so much you don't know where to start or what's your best starting point. So that was a bit daunting.*

This reflects an interesting example of 'information anxiety' (Wurman, 2001) or 'library anxiety' (Mellon, 1986). The student feels a sense of being overwhelmed and a sense of powerlessness when beginning an information search in a library. Not having a clear starting point can lead to a feeling of being lost and unable to find the way around, either in the physical library or within the virtual library. This also ties in with Hepworth's (2004) concept of 'uncertainty' as an affective state associated with information behaviour. Walton and Hepworth (2011) suggested that uncertainty should be acknowledged, and it is possible that the student in Extract 25 might feel reassured by knowing that feelings of uncertainty are quite understandable and to be expected.

So how do psychology students get to grips with the new experience of searching for and selecting information from amongst a huge available selection? When set an assignment, the first ports of call for almost all of the participants in the study were lecture notes followed by books:

26. *So even if you've never come across it before you can get an idea from the title to go and look. I'd go and look for a book just to get a bit of background reading on what I am actually looking for first before I go online.*
27. *I look through text books first and then after I've looked through text books I look at journals and different sources of information then put them all together and write my essay.*

This approach is similar to the overall pattern reported by Hampton-Reeves et al. (2009). They found that the first avenue of investigation when students prepared for an assignment was the library catalogue, followed by an internet search engine. For 70 per cent of their participants, the process began by inputting keywords into a search engine of some kind. However, only 20 per cent of participants in the Hampton-Reeves et al. study reported that they would begin with the reading list provided for the course. Participants in the present study were more likely to begin with a recommended text from the reading list, and work from there, as the extracts exemplify.

The statement in Extract 27 seems to be reflective of a 'serialist' style of learning (Pask, 1976) in which the student collects various individual pieces of information and then combines them at the end of the process. Contrastingly, Extract 26 may represent a more holistic approach, in which the student attempts to get an overview of the area before starting to search for individual information sources. Different learning styles do, in this way, appear to manifest themselves in the information behaviour of the students in this study.

Information literacy training: Library staff, lecturers and fellow students

All of the students in the study had received some kind of introduction to the library service at their institution as well as guidance on how to access the resources appropriate for psychology. Students had, however, different experiences in terms of the timing and duration of the introductory session and whether it was delivered by subject tutors or

by the library staff. In Wang's (2011) terms, the experience of the majority was that the introduction had been partly 'intra-curriculum' and partly 'stand-alone', although this tended to be one or two fairly informal sessions rather than a 'course'. Some students had been offered the 'stand-alone' library session during freshers' week, which was not felt to be particularly effective in terms of its timing:

28. *Within the first week you were doing one thing and doing another thing and then they tried to throw in a kind of 'We'll show you how to use the resources in that' and it was like 'No, there's too much else going on, I'm not worried about that'.*
29. *Maybe they should have integrated that more into the course rather than it was quite a voluntary thing, wasn't it? I don't think a lot of people will have gone and you will have got people a month or two later going 'I don't know how to do it' so you should maybe have had that as a compulsory session then it might have made it easier for everyone to then know how to use it.*

It is, of course, a challenge to ensure that students are properly inducted into higher education and that they are fully prepared for the academic challenges that lie ahead. Library induction sessions that are perceived as optional are not taken up by all students and those who do attend find it difficult to retain all that they have been told. In fact, the significance of this type of information is not always appreciated by students, as they do not yet comprehend the enormity of the differences between a university library service and the types of library that they may have encountered previously.

It should be pointed out, though, that when students had also received some level of instruction in information searching within individual modules, they tended to find this more useful as the information was presented in a specific context rather than as a general introduction. This is consistent with the findings of many research studies (e.g. Lantz & Brage, 2006; Kavanagh 2011; Walton & Hepworth, 2011) and with the

views of Paglia and Donahue (2003) and Martin (2008) that one-off library induction sessions are ineffective.

Interestingly, though, students felt that they might have benefited from the shared experience of other students, rather than just receiving instruction from library staff or even from lecturers:

30. I think it would have helped if, perhaps, another student said 'this is how you do it', because if they can explain to you how they've done it or how they went about it, it might be more relatable than one of the library staff telling you when they don't really have any affiliation with you.

The advantages of this type of approach are that students are able to address directly the issues involved in searching for and using information, including the pitfalls, in order to achieve what other students will be expected to achieve. Students develop their own ways of working with source material and they quickly establish different strategies that prove successful. Rather than wait for each cohort of students to develop their own strategies through painful trial-and-error it seems sensible that some shortcuts through the process could be provided through the sharing of experiences between students on the course. Further, the value of collaborative learning has been demonstrated by Walton and Hepworth (2011) and it may be that a combination of the type of active shared learning advocated by Walton and Hepworth, coupled with the shared experiences of other students may be effective in overcoming the initial uncertainty that students have about information searching.

Finally, students suggested that they would benefit from more ongoing direction and instruction from lecturers:

31. More probing from the lecturers, say like various stuff in the library, 'go and use it' would help you. Because most of the time students think 'Oh no I'll just use the things I've already got at home' [A-level notes, etc.] whereas if lecturers said to you you may need to use other sources then I think more people would be more likely to use the library.

In some ways, this statement seems to be reminiscent of the prescriptive learning that many students will have experienced in their pre-degree studies. Although students do seem to develop an appreciation of the need to find and use appropriate sources, this extract does seem to suggest that they may be waiting for the lecturer to direct them to do what they, essentially, already know is necessary.

Books vs. journal articles

From the outset, students are made aware of the existence of journals, the importance of using these as sources and of not over-relying on books. Students seem to understand that journal articles are more likely to offer an avenue of exploration of more recent research than textbooks, and that these are the types of sources that tutors expect them to use:

32. I think if it was research our first point of call would be journals because those tend to be the more recent. It depends what it is, if you're writing an essay it depends on the context of the essay. If they're wanting really up to date stuff then I think the best point would be journals because they tend to be more up to date. So yeah, depends what it is really.

33. Lecturers are definitely very keen on journal articles – they do like journals a lot... but they don't like the internet. If you can find books and relevant sources like the journals they much prefer them, and have a long reference list.

These are good examples of the development of information evaluation, as reflected in the SCONUL (2011) Seven Pillars of Information Literacy and of the differentiating behaviour referred to by Ellis (1989). Students are learning to make broad evaluations of sources on the basis of the type of source, with journals being given preference over books, and websites being seen as less valuable because lecturers 'don't like the internet'. The comment about the need to 'have a long reference list' raises some interesting points about the amount of information available and how students decide that they have 'enough'. The point at which the

decision is made that just enough data have been collected to feel satisfied is termed 'satisficing' (Case, 2007). Students seem aware of the need to use a number of references but also of the need to be selective and evaluative about the types of sources being used. It appears that students feel satisfied that they have done enough when they have generated a 'long' references list consisting predominantly of journal articles.

In order to be effective in their information behaviour, students must plan searches and gather, evaluate and manage information (SCONUL, 2011). How students actually engage with the resources available to them to achieve this was discussed extensively, particularly with regard to the use of electronic databases to search for journal articles.

Searching for journal articles

Two of the major issues spoken about by many students in the study involved the use of online databases (e.g. EbscoHost, Science Direct) to search for and select journal articles. The two key issues were the effective use of search terms to find articles and the availability of articles in full-text versions.

34. *It's difficult to know how to word it sometimes to get what you're looking for because you can understand it in your head but the database might not necessarily understand what you mean and what you're looking for.*

35. *I find it interesting how if you type it in one way it comes up with certain stuff but if you phrase it slightly differently it comes up with different type of things.*

When searching for articles generally, rather than trying to find a specific one, there are difficulties for students in knowing what key words to use. This can lead to failure to find appropriate source materials and a great deal of frustration. Another major and very common source of frustration for students is the fact that they do not have full-text access to every journal article. Students have some major misconceptions about the reasons for this, which will be returned to later. For the moment, though, it is useful to examine

student experiences with attempting to find journal articles:

36. *Yeah, EBSCO [database], when you search, you can search full text but the results are only on articles that you can get access to. But if you untick that box you can do a full search of everything and it searches articles that you don't necessarily have access to, which I think is pointless, by the way.*

37. *It can be annoying sometimes with EBSCO Host if you find a journal that looks really good, you've got the title, you've got the abstract but that's it, there's no journal for it, it's just the title and the abstract. You can't actually get in so you can't realistically reference it because you haven't really read it.*

38. *We've been told 'use more journals', we go into the library and try to get the information and it's not available.*

The first of the extracts above reveals that the student has learned how to use the system but does not understand its limitations or the reasons for them. The comment that 'it searches articles that you don't necessarily have access to, which I think is pointless, by the way' suggests that the student does not understand that, firstly, not all journals are available in electronic format and, secondly, that it might be useful to know about the full range of publications in a particular area, regardless of whether one wishes to read them all. This is, however, a thorny issue and there is clearly a need to balance student expectations about what they will be able to access electronically with the expectations of tutors about the extent and depth of material that undergraduate students should reasonably access in order to produce work of an appropriate standard. There is clearly a need to address with students the nature of electronic databases and the expectations that students should have. It is quite understandable that students will become frustrated by not being able to have direct access to every journal article, but it is important to ensure that they understand that this would be an unrealistic expectation. This will be returned to later in a broader discussion of the types of miscon-

ceptions that students have about the accessibility and availability of sources, particularly full-text electronic journals.

The complexity of sources

Students inevitably face some difficulties in accessing and making effective use of the types of sources that are appropriate for higher education. Knowing where to start may be daunting for students but overcoming that particular issue and beginning to explore the available literature produces challenges of its own. As students search for information they very commonly face the problem of selecting the most useful sources from amongst the several thousand (sometimes hundreds of thousands) that a search has produced. This, of course, ties in very closely with the difficulties that students face in using the most effective combinations of search terms, but it can be very off-putting for students, especially in their first year in higher education to be faced with a huge number of 'relevant' articles following a search.

39. *Until you actually go and search for something you don't realise how much of it there is. And then trying to figure out what's relevant and what's not, that's a totally different task in itself rather than just searching for information.*

40. *I think just knowing if it's relevant or not, especially if you've only had a lecture on it and you weren't quite sure you try and find it yourself before you went and asked the lecturer 'what are you actually going on about?' Because 9 times out of 10 they'll say, well have you tried to read around it and you're like 'Well no, because I don't even know what that means'.*

Students are very commonly encouraged by their university tutors to 'read around' a subject in psychology, but this does not acknowledge that students will sometimes not know where to start with this. In fact, the comment above suggests that students might not even understand what the phrase 'read around a subject' actually means. This is further compounded by the problems of selecting appropriate sources from amongst

the huge numbers on offer. The concept of 'information overload' is not a new one (see Bawden & Robinson, 2009). If information is potentially useful, and is accessible, then it becomes increasingly difficult for the individual to make efficient use of it as the amount of information increases. Bawden and Robinson (2009) refer to a number of 'pathologies of information', which include information overload, information anxiety and 'infobesity'. One way in which these can be overcome is by the simple strategy of 'information avoidance' (Case et al., 2005). This particular information behaviour, coupled with satisficing, may help students to avoid becoming overloaded and 'infobese'. Bawden and Robinson point out, however, that while satisficing may be a sensible option, given the large variety of choices on offer, it is important that satisficing must have a rational basis. Without this basis, Bawden and Robinson argue, the sensible strategy of satisficing become reduced to information avoidance, which they refer to as 'bad satisficing'.

It is also apparent that the advice to 'read around' a subject might also produce difficulties. Students appear to be confused by this, as they might not know where to start or, just as importantly, where and when to stop.

Another factor that provides a barrier to students in selecting and using sources effectively is that they simply do not understand what they are reading, whether it be in a book or a journal article:

41. *I find that sometimes when you're looking through books you think they're going to be useful and relevant and then they're either too complicated or they don't say what you want them to say.*

42. *I think, like particularly with journal articles, some of them can be really long especially in psychology as well when you've got your results section, like F numbers and things like that, they're really hard to understand and try and find a point that you're looking at.*

43. *Some journals you pull up, they're so complex, they're really difficult.*

Most students entering higher education are not familiar with reading these types of publication. Engagement with psychological journal articles is the experience of a small minority of students before they start their degree. When students are introduced to the need to read 'widely' (whatever that means) and to focus more on primary sources, it is easy to assume that, because they have taken A-levels, they will have had to undertake a lot of reading and that this will have been of the 'right type' and level. This, as we have shown, is an unwarranted assumption.

The statements presented in this section are very similar to some of the examples reported by Hampton-Reeves et al. (2009). They also found that students found difficulty with the complexity and style of journal articles, and suggest that 'students are not always equipped with the skills to read and understand complex research language' (p.22). This presents a barrier to students in making effective use of academic sources. Leggett et al. (2004) point out that lecturers and students may have different understanding of what it meant by 'reading': 'Students know that they can read and have been reading for years, whereas staff know that students often lack the skills to engage meaningfully with texts' (p.309).

Students do realise, however, that some of the difficulties that they face with reading journal articles can only be overcome through persevering and gaining more experience and familiarity with the sources:

44. I think maybe a bit of inexperience as well. The more you practise reading these things and trying to interpret them I think the better you get at it.

This student has reflected on their difficulties and thought about how those difficulties might be overcome. This particular reflective statement, that the task will become easier with practice and experience, was raised by a number of students and largely formed the basis of the type of advice they would offer to other psychology students.

The importance of practice

Students were asked what advice they would offer to other psychology students to help them develop their library skills. Reassuringly, they focused very much on the need to 'get stuck in' with using the library resources:

45. I would just say for them to get used to searching for things, especially the use of all the databases, the journals on the library web. It takes a while to get used to. And if you don't do it straight away then you come to do it and you think 'I haven't got a clue what I'm doing here'

46. I would tell them to use more journals instead because it's more updated and recent instead of books. Journals are more of fact and it's more evident that books are just the author's opinion. So I would advise new students to focus more on journals.

47. Don't be afraid to use the resources that are available in the library. They're there to be used.

The message seems to be clear that students appreciate the importance of searching for information and, critically, that there is a real need to learn how to use the available information sources effectively. As one student put it: 'Because once you get used to it it's fine, isn't it?'

Misconceptions and unreasonable expectations

During the discussions, a number of students revealed some misunderstandings and misconceptions about the sources that are available and how to use them. These provide an interesting insight into students' perceptions of the available information sources and their provision. They also identify issues that could be addressed directly while introducing students to the library resources and using them during the delivery of modules.

1. Tutors have greater access to electronic resources than their students.

Students suspect that they, as students, are provided with 'student-level' access to sources and that their tutors have wider access to a greater range of 'secret' sources.

48. *I searched for a couple of them [articles] and they weren't PDF files and they weren't on Ebsco Host, they weren't on Google Scholar either – you kind of get the abstract. But obviously you can because (named tutor) can because (named tutor)'s got the provision to go on everything.*

In most institutions, including the ones in which the participants of the present study were studying, staff and students have the same access to the sources to which the institution subscribes. Occasionally, tutors will, of course, inadvertently provide a reading list which may contain articles to which they do not, or no longer, have electronic access. This can apparently lead students to erroneously suspect that their own access is restricted and that tutors might not be aware of the differences between their own level of privilege and that of their students:

49. *But maybe they're not aware of the fact that we can't get access to all the journal articles. I think it's definitely a factor.*

2. All journals should be available in full-text versions.

Students seemed to believe that where a journal was searchable via a particular database (e.g. PsycLit or Science Direct) it should always be available in full-text. The perception was that the journal being abstract-only reflected a shortcoming of the institution and that students of other institutions would probably be able to access it on that database. Of course, no institution has full-text electronic access to every psychological journal.

These considerations also impact on student evaluations of the library services (e.g. when competing surveys such as the National Student Survey). The key factor that students cited as determining their rating of their institution's library was the accessibility of the resources. Clearly, if students have unrealistic expectations or feel that they cannot access resources which they feel should be available this may lead to more negative evaluations than if they have more realistic expectations and a better understanding of the provision available to

them. It is possible that students' ratings of library resources in the NSS may be improved through the simple expedient of addressing these misconceptions. This is addressed in the recommendations in the next section.

Concluding remarks and recommendations

The findings provide an interesting overview of the information skills that psychology students bring with them into higher education and the challenges that they face in making the transition into degree-level study. Students' accounts produced a number of themes which, together, shed light on the experiences and library skills of psychology students. They described a very prescriptive learning experience in their pre-degree studies, where learning tended to be very strategic and assessment-related. A narrow range of sources had been used and there was little evidence that students at that level of study had been expected or required to undertake independent information searching or wide reading. Concomitant with this, students had little experience of considering the reliability of sources, although they had some awareness of some of the potential problems of using the internet. Wikipedia was singled out as an unreliable source, and students' arguably unsophisticated understanding of this contrasted with findings from other studies.

Students reported feelings of being surprised and overwhelmed by the scale and complexity of their university library and its resources and this was discussed in relation to information overload, information avoidance and satisficing behaviour. Searching for journal articles was discussed as a case in point. Advice from tutors to 'use journal articles' and to 'read around' can be a source of confusion as students might not always be able to identify for themselves what constitutes something worth reading or how much to read.

The experience of being introduced to the library resources was mainly in terms of a

single library-based induction, although some students had experienced a more embedded and integrated introduction within their programme modules. Students preferred a more integrated approach with input from their lecturer and this is consistent with previous findings as well as studies that have shown that a more embedded approach is more effective. Students also suggested that receiving advice from other, more experienced, students may be useful in providing an introduction from a more relevant perspective.

Students understood the distinction between books and journal articles and recognised that journal articles were a more valuable source, due in part to the currency of the research reported. An unfamiliarity with the complexity of sources led to difficulties in reading and making effective use of them, although students reflected that experience and practice may be important in developing the requisite skills.

Finally, some common misconceptions and unreasonable expectations about the availability and accessibility of library resources were identified, which may have a negative impact on student ratings of the library resources in surveys such as the NSS.

There are, consequently, a number of considerations that can be made when ensuring that students make a successful transition into higher education. The enhancement of psychology students' library skills can be addressed in a number of ways, beginning with a full appreciation of the state of knowledge, experience and expertise that students bring with them from their pre-degree studies. Recommendations to address the issues raised by students during the study are presented below.

Firstly, it is important for HE tutors to understand what skills and experiences students are bringing with them when they begin to study psychology at undergraduate level. As has been shown, a basic level of information-searching experience to support academic work is far from being the norm. Supporting students in making the

transition to higher education necessarily involves understanding what that transition entails for them. The first recommendation to enhance psychology students' library skills is to begin at the beginning and explore with them their previous experience:

Recommendation 1: Gain an understanding of the types of information that students used in their pre-degree studies.

Having an appreciation of the (limited) experience that most students will have had of having to source any type of information will help to make the process of transition less daunting, and will eliminate any unrealistic expectations or assumptions that tutors may make about the 'Google generation'.

Clearly, understanding where students are 'coming from' with regard to their information-searching experiences is just the start. The next step is to ensure that the introduction to the available learning resources and information systems is effective and that it enables students to begin their studies and facilitates a shared understanding of student and tutor expectations. The findings of the present study reinforce the view that the development of information literacy is preferred (and more effective) if embedded within a programme. As has been discussed, an active learning process can be useful here. A new suggestion is that existing students should be involved to provide an understanding of the resources and how to use them from the student perspective:

Recommendation 2: Embed library skills within the curriculum and, if possible, recruit an existing student to speak to new students about the practicalities and their everyday experiences of information-searching.

The findings of the present study show that psychology students beginning their studies in higher education feel overwhelmed and daunted by the scale of the resources available to them. It is important to acknowledge this in order to reassure

students, so an important element of the student induction and ongoing development of their information literacy may be to seek feedback from them about their concerns. As has been discussed, feelings of uncertainty should be acknowledged. A third recommendation is, therefore:

Recommendation 3: Ask students how they feel about the resources to which they have been introduced and provide acknowledgement of and reassurances about any feelings of being 'overwhelmed' and 'uncertain', either in general terms or in the context of specific tasks.

Once students become engaged with searching for journal articles using electronic databases, it is clearly important to manage their expectations and provide them with the specific skills that they need. The misconceptions that students have about the nature of electronic journal provision need to be tackled head-on. This can help students to become more information literate and can help the institution by increasing student satisfaction and the ratings of library services on surveys, including the NSS. The evidence from the present study, particularly as outlined in the 'Misconceptions and Misunderstandings' themes, suggests that the following issues will be particularly important to address:

Recommendation 4: (a) Make sure that students are provided with a full explanation of the nature of electronic journal databases, including why many journals will not be available in full-text versions; (b) Make it clear that tutors are aware that students will not have access to everything and that they, the tutors, also experience restrictions.

There was clear student concern about the complexity of some of the sources that they were expected to read, especially research articles. As discussed earlier, there may be a mismatch between the expectations of lecturers and the experiences of students in terms of their ability to 'read' at the appropriate level.

Recommendation 5: Forewarn students that some journal articles may be highly technical, and provide them with practical guidance on how to read journal articles (including how to deal with the results of statistical tests). As with information literacy, generally, integrating this learning within a module and making it interactive and collaborative is likely to maximise its effectiveness.

The challenges faced by students when studying psychology at undergraduate level should not be under-estimated. Advances in technology have made academic sources much more accessible than ever before, but the flipside of this is that students may become overwhelmed by the sheer scale of the task confronting them in searching for, identifying and making use of appropriate sources. Hopefully, the outcomes of the present study go some small way to understanding the student experience a little more and preparing to assist a new generation of students to develop the academic skills that are necessary for the successful study of psychology.

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Do students who get low grades only in research methods need the same help as students who get low grades in all topics in psychology?

John A. Barry

Some psychology students achieve high grades in all classes except for research methods (RM). Previous research has usually treated low levels of achievement in RM as a unitary phenomenon, without reference to the grades the student is achieving in other subjects. The present internet survey explored preferences for learning RM in 140 psychology students. Students were categorised as: those who achieved higher grades for RM than other subjects in psychology; those whose grades for RM were equal to their grades for other subjects; and those who had lower grades for RM than other subjects. An interesting finding was that whereas wanting to see more humour in RM teaching was significantly associated with lower RM grades, wanting more visual aids in teaching RM was significantly associated with low grades only for RM. Implications of these findings are discussed in relation to explaining low achievement specific to RM.

Keywords: *Research methods; statistics; dyscalculia; learning; teaching; visual.*

NEGATIVE ATTITUDES towards statistics is a major barrier to learning statistics (Mills, 2004). There appears to be a range of causes of negative attitudes to learning statistics and research methods. Motivation to learn RM may be low for psychology students because many do not see much value in it (Ruggeri et al., 2008a). For example, in Britain 20 per cent or fewer of psychology students will become professional psychologists (BPS, 2008), and even amongst those who do, some may not value research methods as highly as clinical skills.

Reid and Mason (2008) highlight some of the many difficulties facing social science students learning statistics and research methods, for example, textbooks may be dull and complex concepts may be presented in a way that doesn't best facilitate understanding. This being the case, many authors have tried to improve the teaching of statistics and research methods. For example, Brandsma (2000) developed a hands-on approach to teaching statistics in an effort to improve

students' understanding, but had limited success. This difficulty might indicate that learning preferences for statistics are more complex or numerous than Brandsma's intervention allowed for.

Some research suggests that there are individual differences in students' learning preferences for research methods. In a review of research on humour in the teaching of statistics to psychology students, Neumann et al. (2009) found that humour can work well for students with negative views of statistics, but works less well with more motivated students. Contextual factors are important too, for example, student anxiety has been found to be reduced by the attentiveness of the teacher (Pan & Tang, 2005), and there is a well-recognised negative association between anxiety and RM grade (e.g. Fitzgerald, 1996). It is interesting to note that 47 per cent of participants in the Neumann et al. study reported that humour reduced their anxiety, and it might be inferred that students who receive lower

grades in RM could have a learning preference for a more relaxed and humorous classroom experience. However, like most studies of learning preferences for statistics and research methods, Neumann et al. did not assess the relationship between students' RM grades and their learning preferences. Similarly, the degree to which learning preferences for RM are related to academic aptitude specific to RM is underexplored in the research literature.

Other factors that may be associated with learning preferences in general remain to be fully explored in regards to research methods. For example, the degree to which some students prefer visual stimulation compared to other sensory input (Kolb, 1985, 1999a) has received limited attention in the field of research methods (Bell, 1998). Some research has been done in regards to learning mathematics, finding a range of visual techniques useful (Presmeg, 2006). The relationship between visual ability and mathematic skill is complex. For example, there is some evidence that visualisation may also be very good in those with dyscalculia (Peard, 2010), and may also be a method favoured among those interested in mathematics, though only a minority (Presmeg, 2006), suggesting that the relationship between learning preferences and mathematical ability is likely to be complex.

It is often anecdotally said that the capacity to learn research methods and statistics is to some degree innate; some students appear to achieve high grades with little effort, whereas others work very hard even to pass. According to the Department for Education and Skills, dyscalculia is 'a condition that affects the ability to acquire arithmetical skills' (DfES, 2001, p.2). Whether RM grade is facilitated by an innate gift for mathematical reasoning, or hindered by some form of 'dyslexia for research methods' similar to dyscalculia, is an interesting question but not the central focus of this paper. The assessment of dyscalculia is best left to those with specialist training and equipment. (Readers interested in dyscal-

culia are referred to the work of Butterworth, for example, Butterworth, 2011.) However if there is a difference in learning preferences for RM between those who find it easy to achieve high RM grades and those who don't, then such information has important implications for students and teachers of RM. The aims of the present study were firstly to find out from students how they thought their learning of research methods might be improved, and secondly to find out whether a student's research methods grade relative to other grades is associated with their preference for teaching methods.

Method

This study was an exploratory cross-sectional internet questionnaire survey. The questionnaire consisted of items created specifically for this survey. Free text responses were encouraged. Because 'research methods in psychology' classes generally teach a mixture of statistics, quantitative, and qualitative research methods, the term 'research methods' in this paper generally refers to this spectrum of materials, except where specified otherwise.

Participants

One-hundred-and-fifty-seven participants were recruited from two online psychology groups, *Psychology on The Net* and *Online Psychology Research* between February 2009 and January 2011. One-hundred-and-forty of the participants answered all questions and were included in the main analyses.

This study was approved by the Senate Research Ethics Committee for City University, London.

Materials

Actual Research Methods Grade (AG)

The survey consisted mostly of closed questions yielding binary (yes/no) data.

The students were asked to state their usual RM grade ('Actual Grade', or 'AG'). From their answers, grades were categorised from 1 to 5, where 5 indicated a top grade (a 'first', 'A' etc), 4 indicated a '2:1' or B, etc.,

down to 1 ('Fail', 'E', or lower). For most analyses below, actual grades were grouped into top grades, second-from-top grades, and other grades. 'AG-A' indicates those whose actual RM grade is an A or a first (i.e. the top grade), 'AG-B' indicates an actual B grade for RM, and so on.

Relative Research Methods Grade (RG)

In order to measure specific ability in RM rather than general academic ability, RM achievement was measured by comparing a student's actual RM grade to their grades for other psychology topics. Students thus were grouped as those whose grades were higher at RM than other topics (called 'RG-A'), those whose grades were equally good for RM and other subjects ('RG-B'), and those whose grades were worse for RM than other subjects ('RG-C').

It should be noted that, logically, being RG-A does not necessarily mean getting a top grade for RM, only that the grade a student achieves for RM is generally better than their grades in other psychology topics. Thus the point of measuring the relative grade is to highlight relative RM ability rather than general academic ability.

Learning preferences

A list of 12 items representing various classroom options was presented (see column 1, Table 1) with a 'yes/no' response option. For example, 'Research methods grades/teaching could be improved by more seminars. Yes or no.'

Stress

Stress was measured using a single question ('How stressful do you find RM compared to other subjects?'). This was Likert-scaled from 1 to 5 with a high score indicating higher stress.

Other variables

Age and gender were given. Socioeconomic class (SEC) was estimated from the occupational status of the main wage earner in the participant's home when the participant was

aged 14. This is based on a method used by the UK government in the 1990s (Rose & O'Reilly, 1997). The responses were divided into three categories as described by the Office for National Statistics (ONS, 2004): managerial, intermediate, and manual. The geographical region that students were studying in was also given using free text.

Students were also asked to identify the subject they found most difficult in psychology from a choice of social psychology, cognitive psychology, research methods, biological psychology, abnormal/clinical psychology, developmental psychology, or 'other'.

Statistical analysis

Missing values (<2 per cent) were deleted pairwise from analyses. Participants that did not identify their actual RM grade were excluded from the main analyses. Parametric tests were used where distributions passed tests of normality. All *p* values are two-tailed. Analyses were performed using SPSS Version 20 (IBM, 2011).

Results

Demographics

Demographic characteristics, and whether they were statistically similar in the AG and RG groups, are shown in Table 1. The sex distribution of participants (118 female and 39 male) was normal for psychology students (APA, 2009). Although there was no difference in actual grades in the UK compared to other regions (AG $\chi^2=0.96$, $df=2$, $p<.618$), proportionally more students from the UK were RG-A, that is, got better grades for RM than other subjects (20 of 59, or 34 per cent) compared to students from other regions (four of 58 in US and Canada, seven per cent; one of 19 from other parts of the world, five per cent) (Fisher's Exact Test=20.21, $p<.001$). Further analysis revealed that differences in preference for learning styles by region were largely due to the greater number of RG-A grades in the UK than other regions, and that little regional difference was observed for the RG-B and RG-C

Table 1: Demographic characteristics of the groups, and whether they were represented differently in the AG or RG group.

					Difference by AG	Difference by RG
Sex	Men N=39 (25%)	Women N=119 (75%)			Ns	Ns
Age in years median (range)	24 (16 to 58)					
Educational level	High School N=18	1st year undergraduate N=42	2nd or 3rd year undergraduate N=37	Masters or Doctorate N=60		Ns
Socioeconomic group	Manual N=62	Intermediate N=40	Managerial N=45		Ns	Ns Ns
Region where studying	UK N=66	US or Canada N=64	EU outside UK N=5	Other regions N=19	Ns	$p < .001$

Ns=non-significant

groups. For this reason the regional difference was not factored into further statistical tests presented in this paper.

Actual research methods grade (AG)

Of the responses that could be coded (N=140), 50 (32 per cent) got the highest grade, 59 (38 per cent) the next highest, 25 (16 per cent) the next, and six (four per cent) got a pass mark. There were no reported failures. Seventeen (10 per cent) participants left this section blank or gave an uncodable response, for example, '[my grade] varies'.

Relative research methods grade (RG)

Twenty-two students had higher grades for RM than other topics (called 'RG-A'), 56 had equal grades in RM and other subjects ('RG-B'), and 44 had lower grades in RM than other subjects ('RG-C'). There were 12 missing or uncodable responses. A higher RG score indicates higher grades in research methods relative to other topics.

Relative research methods grades were strongly correlated with actual research methods grades ($r = .611$, $N = 134$, $p < .005$).

Learning preferences grouped by actual

RM grades

Table 2 shows student preferences for factors associated with learning research methods and statistics, grouped by actual grades. There was only one clear difference between the groups in learning preference, and that was for the use of humour in teaching ($\chi^2 = 6.96$, $df = 2$, $p < .031$). This was emphasised by the linear-by-linear association between humour and grade, indicating that the better the student's grade, the less they wanted humour in teaching ($\chi^2 = 6.70$, $df = 1$, $p < .01$).

Table 3 shows student preferences for factors associated with learning research methods and statistics, grouped by relative grade.

Learning preferences grouped by relative RM grades

Table 3 shows that the students' relative strength in RM made no significant difference for most of the learning options listed. The main significant difference between the three groups was that compared to other students, fewer of the students who were better at RM than other subjects (RG-A) wanted more interaction with the tutor

Table 2: Learning preferences by actual research methods grade, and in order of popularity.

'Research methods grades teaching could be improved by...'	A grade (N=50) % (N) agree	B grade (N=59) % (N) agree	C or D (N=31) % (N) agree	Overall (N=140) % (N) agree	Overall (N=140) χ^2
More interactive teaching/learning	66% (33)	66% (39)	65% (20)	66% (92)	0.25
More practical work, less theory	54% (27)	54% (32)	58% (18)	55% (77)	0.15
Greater use of visual teaching aids	50% (25)	49% (29)	65% (20)	53% (74)	2.18
Greater use of humour in teaching	36% (18)	54% (32)	65% (20)	50% (70)	6.96**¥
Textbooks that are more interesting	48% (24)	48% (28)	65% (20)	51% (72)	2.73
More seminars	41% (18)	43% (24)	48% (12)	43% (54)	1.80
More coursework, fewer exams	36% (18)	49% (29)	39% (12)	42% (59)	2.11
Smaller seminar groups	32% (16)	42% (25)	45% (14)	40% (55)	1.76
More qualitative work	36% (17)	39% (21)	48% (13)	36% (51)	1.01
More teaching of abstract concepts	32% (16)	17% (10)	32% (10)	26% (36)	4.10
More lectures	20% (09)	20% (11)	40% (12)	25% (32)	4.97
More group assessment	20% (10)	19% (11)	26% (08)	21% (29)	0.66

Note: * $p < .05$; ** $p < .01$. Significance values are two-tailed.

¥=significant group difference and linear-by-linear association.

Percentages vary slightly where a student has stated a preference for all 12 items.

($\chi^2=9.69$, $df=2$, $p < .008$). Also, there was a significant linear-by-linear association indicating that the lower the RM grade relative to other subjects, the more students wanted to see visual aids in teaching ($\chi^2=4.99$, $df=1$, $p < .025$).

Group assessment (where students are assessed on a project that requires the combined efforts of several students) was the least popular of the learning preferences listed here. Overall, 21 per cent of students said they wanted more group assessment, and there was a non-significant linear-by-linear association indicating that the better students were at RM compared to other subjects, the less they wanted group assessments ($\chi^2=3.37$, $df=1$, $p < .066$).

Actual grades and relative grades

Table 4 shows the actual grades achieved by students in the three relative grades groups. There was a significant linear-by-linear association between actual grade and relative grade ($\chi^2=47.83$, $df=1$, $p < .001$) demonstrating that actual RM grades were strongly positively associated with relative grades.

Stress

There was a weak negative correlation between stress related to AG ($r^s=-.175$, 140, $p < .038$) and moderate negative correlation between stress related RG ($r^s=-.433$, 140, $p < .001$).

Free text responses

In their free text responses, many students expanded on reasons for their preferences. A typical response was that interaction was important and the tutor should be someone who has patience and can explain RM to the students.

Table 3. Learning preferences by relative research methods grade (RG), and in order of popularity.

'Research methods grades teaching could be improved by...'	RG-A (N=27) % (N) agree	RG-B (N=62) % (N) agree	RG-C (N=51) % (N) agree	Overall (N=140) % (N) agree	Overall (N=140) χ^2
More interactive teaching/learning	43% (12)	76% (48)	67% (33)	66% (93)	9.69**
More practical work, less theory	46% (13)	62% (39)	57% (28)	57% (80)	1.90
Greater use of visual teaching aids	36% (10)	56% (35)	63% (31)	54% (76)	4.99*¥
Greater use of humour in teaching	46% (13)	51% (32)	57% (28)	52% (73)	0.90
Textbooks that are more interesting	39% (11)	49% (31)	61% (30)	51% (72)	3.67
More seminars	48% (13)	32% (20)	45% (23)	40% (56)	2.85
More coursework, fewer exams	30% (09)	50% (32)	45% (21)	44% (62)	2.80
Smaller seminar groups	39% (11)	32% (20)	51% (25)	40% (56)	4.27
More qualitative work	26% (7)	37% (23)	39% (20)	36% (50)	1.97
More teaching of abstract concepts	29% (8)	30% (19)	20% (10)	26% (37)	1.43
More lectures	30% (8)	19% (12)	26% (13)	24% (33)	1.27
More group assessment	7% (2)	24% (15)	27% (13)	21% (30)	4.36

Note: * $p < .05$; ** $p < .01$. Significance values are two-tailed.

¥=significant linear-by-linear association

RG-A=higher grades for research methods than other subjects; RG-B=grades for research methods equal to subjects;

RG-C=lower grades for research methods than other subjects.

Percentages vary slightly where a student has stated a preference for all 12 items.

Table 4: Overlap between actual research methods grades (AG) and the RM grade relative to grades for other topics (RG). Each cells shows the percentage of RG students within each AG category in that cell.

	RG-A (N=28)	RG-B (N=61)	RG-C (N=45)
Actual RM Grade			
A grade	18 (64%)	29 (48%)	0 (0%)
B grade	9 (32%)	27 (44%)	20 (44%)
C or D grade	1 (3.6%)§	5 (08%)	25 (56%)

§ The RG-A student in the 'C or D grade' cell reported generally getting a C grade in RM.

Most difficult topic in psychology

The subject most often cited as the most difficult in psychology was research methods (35 per cent of responses, 39 students). Twenty-four per cent (12 students) of those who got top grades in RM said that RM was the hardest subject, compared to 45 per cent (14 students) getting C grades or lower. Sixty-five per cent (32 students) of the RG-C students said RM was the hardest subject, as did 27 per cent (17 students) of the RG-B students. None of the 28 RG-A students thought RM was the hardest topic. The psychology subjects the RG-A students found most difficult were, cognitive psychology (18 per cent, five students), biological psychology (18 per cent, five students), and developmental psychology (18 per cent, five students).

Discussion

This survey found that research methods students have preferences for certain learning styles, and some of these are related to the grade they receive in research methods assessments.

Reid and Mason (2008) suggest that social sciences students learning statistics and research methods sometimes find textbooks dull, and that complex concepts were not always presented in a way that maximised understanding. The present findings support Reid and Mason's suggestions to a degree, though are statistically non-significant. Fifty-one per cent of students wanted more interesting textbooks, with a non-significant trend towards this preference coming mainly from students achieving lower grades. Only 26 per cent of students wanted to see more teaching of abstract concepts, and this was fairly consistent across students of the various levels of achievement. Brandsma's (2000) suggestion for more practical teaching methods received relatively strong support in the present study, with roughly 56 per cent of students of all abilities wanting more practical work and less theory.

The present study found that better RM grades were weakly but significantly associated with less stress over RM, but that being

relatively worse at RM than other subjects was moderately-to-strongly associated with stress related to RM. This finding fits with previous findings relating RM and statistics grades with stress (e.g. Fitzgerald, 1996). However, the direction of causation is difficult to identify from the present study, being a cross-sectional survey in design. Pan and Tang (2005) found that student anxiety can be reduced by increasing the attentiveness of the tutor, and given that 66 per cent of students of all abilities in the present survey said that they wanted more interactive teaching, and that interaction reduces anxiety, and that anxiety is associated with lower grades, it might be suggested that increasing interactive teaching would reduce student stress and increase student grades. Interestingly, although smaller seminar groups would afford students greater interaction with the tutor, only 40 per cent said they wanted smaller seminar groups compared to the 66 per cent of students who said they wanted more interactive teaching.

Possibly related to the issue of lower grades being associated with stress, few students said they wanted more group assessments. There was a trend, though non-significant, towards the RG-A students wanting group work least and the RG-C students wanting group work most.

The findings of the present study are very much in line with Neumann et al. (2009) who found that humour in statistics classes works best for students who have negative feelings towards the subject, and is less effective for students who are well-motivated. In the present study, students' actual RM grades showed a significant trend reflecting the pattern suggested by Neumann et al. Students' relative RM grades reflected this pattern too, but non-significantly.

Kolb's (1985, 1999a) suggestion that some students prefer visual stimulation compared to other sensory input receives support from the present study, which found that visual teaching aids were a popular suggestion amongst a third to two-thirds of all levels of students, especially those getting

lower RM grades (both AG and RG). It is possible that fewer of those getting higher grades felt the need for more visual aids in teaching, given that they were already achieving high grades. However, perhaps of more relevance is that the trend for preference for visual aids in the teaching of RM was strongest when the association was seen in terms of relative RM grades. This finding supports Peard (2010), who found that people with dyscalculia may have very good visualisations skills. This finding is potentially of importance because it suggests that if RG-C students have some degree of dyscalculia, then RM teachers may be able to capitalise on any visual preference these RG-C students may have, and the grades of these students may improved by the use of more visual teaching methods. Clearly, further research on this hypothesis is indicated.

Relative research methods grades were strongly correlated with actual grades, indicating that those who got the highest grades in RM tended also to get better grades in RM than other psychology topics. This may be unsurprising, but perhaps more importantly, 36 per cent of students (20 of 56) who got a B grade in most psychology subjects got a C grade or less in RM. This means that a large minority of students who were reasonably strong in other psychology subjects achieved relatively low grades in RM. Thirty-five per cent of students got the highest grade in RM. Of these, 62 per cent (29 of 47) got similar grades in other subjects, indicating that these 29 students (22 per cent of the total sample) were generally academically very strong.

The present study has several limitations. Firstly, a central issue is the validity of the students' grades, which may have been over- or under-estimated by the student, or distorted by the process of categorisation used in the present study. Future studies are advised to seek more objective methods of identifying grades, for example, access to actual university records. Secondly, a measure of how each student was currently being taught was not taken. It is possible that

the RG-A students are better at RM because they already enjoy plenty of interaction with their RM tutors. Thus questions like 'How much time do you get to interact with your psychology tutor' may have been usefully included, although answers may suffer the usual distortions associated with self-report. Thirdly, there was a regional difference in relative RM grade: higher relative RM grades were seen in the UK than in other regions. However, regional differences *per se* did not appear to influence student preferences for learning. This regional difference might be the result of a sampling bias towards recruiting English-speaking students only, and a future study should sample students from non-English speaking regions in their own languages.

Table 4 highlights how relative grade is not simply about general ability; many of the RG-B students reported getting top grades across all psychology subjects, making their general academic ability better than some of the RG-A students. It is difficult to avoid the question of how much the results of this study reflect innate ability rather than (or as well as) other factors such as anxiety. None of the RG-A students thought RM was the hardest topic – including the RG-A student who generally got a C in RM – which suggests that the RG-A students did not have to work as hard at RM as other subjects in psychology to get a higher grade. In contrast, 65 per cent of the RG-C students said RM was the hardest subject. These findings – especially the RG-A finding – may hint at some innate ability for RM. Although entry to a psychology degree usually requires some aptitude for numeracy, it is possible that some students may nonetheless have a degree of dyscalculia. In the present sample, the majority of students reported achieving relatively high grades, with roughly two thirds attaining top or second-level grades (A/first, B/2:1) and no reported fails. This possibly indicates sample bias, such that those whose grades are the lowest felt least like participating in the study, but on the other hand the fact that nobody in the

present sample reported failing RM suggests that it is unlikely that anyone in the sample had a very serious problem with mathematics. Future studies should note this issue and might take two approaches: (1) recruit from samples that might yield a more diverse spectrum of abilities; (2) investigate relative RM ability in regards to visual abilities. Regarding the latter suggestion, a preference for visualisation may be something that is common to dyscalculia and RG-C students, and deserves further exploration.

Conclusion

Taken as a whole, most psychology students appear to want the same kinds of improvements to RM teaching. However, differences in preferences can be seen when the students' relative achievement in RM, compared to other topics, is taken into account. Apart from increasing teaching interaction, it seems that if the aim is simply to improve RM grades for those who are doing least well in psychology subjects in general, then using more humour in teaching is the most obvious step forward. On the other hand, if we want to help those who are not simply getting lower grades in all psychology subjects, but getting low grades mainly just for RM, then – apart from increasing interaction with the tutor – teaching should make greater use of visual teaching material. Also, because there appears to be differences in learning preferences based on relative RM grades in this study, future research into improving actual RM grades should take relative RM grades into account.

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An innovative approach to encouraging spiral learning for third-year undergraduates

Anne Emerson & Gareth J. Williams

A series of tutorials was re-designed to further engage students in spiral learning and highlight development of transferable skills. The tutorials focused on self-directed and enquiry-based learning, both of which provided particular challenges to students and staff. The students were randomly allocated a media article related to psychology as a focus to their studies and the module was assessed by presentation and report. Students were encouraged to work together to develop ideas and provide peer feedback on drafts of their work. Feedback from students was overall more positive about the module than in previous years, particularly in respect to the extent to which they were helped to develop transferable skills.

Keywords: Tutorials; spiral learning; real-world application; enquiry-based learning.

THIS PAPER outlines how we approached the re-design of a series of tutorials where the tutorials were not connected directly to a series of lectures. The module had been running for several years, and the revision was felt to be necessary due to negative student feedback which particularly commented that they did not understand the module's purpose or link to future employability. The plan was to address 'the need to prepare students to be independent and self-directed learners, skills which will stand them in good stead for subsequent employment and to become better citizens' (ILTES, 2006–2010, p.8). The emphasis of the module was, therefore, re-focused through increased use of enquiry-based and spiral learning. Feedback was collected from students and staff following the completion of both terms of the module and used to evaluate the changes.

The module

At Nottingham Trent University all third-year combined honours students took part in a 10-credit module entitled Integrated Perspectives (IP). With respect to the module learning outcomes and aims,

students would be able to address a psychological question that was complex and unfamiliar through independent research, be critical of the information, and to show how this could be applied to the real world. In terms of skills, they would be able to apply the knowledge they had learnt to the real world, use evidence in their evaluations, show organisation skills and teamwork, and use oral and written communication skills to present their in addressing their question.

The module ran over two terms, with students attending a single introductory lecture which explained the learning outcomes and the format of the course and assessment, followed by fortnightly tutorials where the student to staff ratio was around 12-to-one. In the past attendance was typically high in the first term, when students were working towards their assessed presentation. They have usually not had access to a tutorial during their second year of study and have reported in feedback to enjoying working with other students. In the second term, when students were working towards an essay, attendance was generally lower and students were more likely to attend the early sessions than the later ones, which they

reported as being due to other commitments such as the need to work on their final year research project and also not seeing the benefit of this module. There are two assessments: a presentation that carries 35 per cent of the marks; and an essay providing the other 65 per cent.

The module did not seek to convey new information by lecture or other didactic means but rather requires students to utilise the knowledge and study skills they have already acquired or are continuing to acquire through other modules. As such, it promotes 'deep learning' (Biggs & Tang, 2007; Shale, 2001) and in accordance with recommended good practice for encouraging 'deep' learning, the teaching focuses on eliciting responses from students that value and build on what they already know and offer opportunities to 'construct knowledge' (Biggs & Tang, 2007). The IP module provides the impetus for students to 'master, transform and create knowledge' (Shale, 2001, p.68).

The problem

Traditionally a module may comprise a series of lectures or a series of lectures and accompanying small group teaching. In that way, content is delivered and, if there is small group teaching it is used to reinforce key aspects of the content or extend the content in some way. It is unusual and, therefore, more challenging, as there are fewer tried and tested templates to rely upon, to design a successful module where there is only small group teaching and only one orientation lecture at the start of the year. As such, the small group teaching cannot rest directly on the content disseminated by a lecturer in a separate large group context. Therefore, the students and tutors do not necessarily have a shared understanding of why the module exists or what purpose the module has in the programme. As noted by Bloxham and Boude (2007) 'the student's conception of learning and their intention when studying are central to the approach they take' (Bloxham & Boude, 2007, p.17).

However, a small group teaching-only module, where assessments are engaged with throughout the term, allows for a framework that can promote spiral learning. Bruner (1977) suggested that learning does not necessarily take place in a linear way, but rather 'deep' learning can be achieved through a spiral process where ideas are repeatedly revisited and built upon in more sophisticated ways until a full understanding is developed. Tutorials offer the opportunity to revisit the same material in a number of different ways, for example, when working towards a group presentation, or developing an essay plan. Part of this revisiting of material requires students to develop their ability to reflect on their ideas and their practice as academic thinkers and writers as well as to reflect on their experiences of the tutorials.

In recognition of the opportunity to promote spiral learning and that 'Appropriate assessment can encourage students to adopt a deep approach to learning, and the contrary is true for poorly designed assessment' (Bloxham & Boude, 2007, p.17), the problem has been in finding a suitable way in which the two assessments can be used to promote a spiral learning process through the tutorial series. Furthermore, the assessments were one way in which shared understanding was promoted in the module. In the past various approaches have been taken including having students consider the psychology inherent in everyday life through being assigned objects such as apples, pens, or packs of cards (inspired by Norman, 1988), or having the module closely aligned to the independent research project that each third-year student completes. While both previous approaches had various positives it was reported, through feedback from students and staff, that neither approach engaged the third-year students in a way that would help fully achieve the learning outcomes of the module.

The solution

The main change was to give each student a 'real life issue' to focus on through a link to

a relevant news item primarily from the BBC news website. A list of articles were chosen so that there was sufficient material for students to be able to identify possible topics from an article and these articles were loosely connected to psychology. The articles were assigned, at random, to individual students who were then supported by the tutorial activities to think of the best ways in which the topic could be explored in terms of psychology. Topics ranged from the loneliness of modern society, through the learning of second languages, terrorism, use of CCTV, Facebook, food and train travel to nightmares and dancing. Within tutorial groups each student had a different focus article and there was little repetition across the cohort of 160 students.

A team of seven tutors taught a maximum of two tutorial groups each. Tutorials were scaffolded to support students in working towards the assessments with activities being applicable to the focus topics in general rather than linked to any student's specific focus.

The first term assessment was a short, two-minute, individual presentation. The brief was to focus on an aspect of the topic, to consider the primary psychological perspectives that related to it, and to use relevant theory and research to prepare a short individual presentation. This assessment was designed to address their learning outcomes related to their oral communication skills, independent research and critical thinking. Students were instructed to include theory from a range of perspectives, for example, if their focus article was primarily focused on social psychology they needed to consider what relevant information from perspectives such as biological or developmental could be relevant. Students were encouraged to be as creative as possible within the limits of time and resourcing. For students, the design and format of the slides, the quality of content, and the efficiency of the delivery had to be considered with great care and these aspects were discussed in tutorials. Students were encouraged to revise and re-draft their pres-

entation through the tutorial activities in the run up to the presentation, helping them to engage in a spiral learning pattern.

An additional aspect of the presentation was to have students consider the audience of the presentation and students were supported in their choice of an audience and how to tailor their material for an audience through the tutorials. This was so that students would be mindful of the learning outcome related to the real world application of their presentation. For the assessment, while many students chose to present to the actual audience (undergraduate psychology students) several were creative in choosing a range of audiences and adapted their material and delivery accordingly.

The need to mark up to 12 short presentations, all of which had follow up questions, within a tight schedule required considerable planning. In order to cut the time between presentations, students submitted their slides to a 'dropbox' in the virtual learning environment which meant every presentation was ready at the start of the assessment session rather than each student taking time to load their presentation from separate USB flash drives. As had always been the case two tutors were present to mark all of the assessments, followed by a meeting to agree the mark and feedback. However, the number of presentations required considerable focus and concentration on the part of the marker. The second assessment was a short report based on material covered in the presentation which provided students with a way of engaging and exploring their topic further. This changed their focus from being about the issue itself to engaging in a more enquiry based learning approach to the topic. As Boud (1985) noted 'The starting point for learning should be a problem, query or a puzzle that the learner wishes to solve' (Boud, 1985; cited in Boud & Feletti, 1991, p.1). Having students begin the second term with the same topic allowed the content and argument of the report writing to be the focus of a revise and re-draft spiral learning

pattern, facilitated by a series of tutorial activities, several of which were designed to encourage peer review to help students with their reports.

Students were required to choose an issue related to their original article for the report. The assessment was targeted at addressing the learning outcomes related to independent research, applying a critical approach to findings in order to address a real world problem and to demonstrate the student's written communication skills. To emphasise the real world aspect, as with the presentation, students were required to consider an official body who would be interested in hearing a psychological solution to the issue. This aspect helped to raise awareness of the sorts of organisations that would be interested in acquiring a psychological perspective and often developed into work-related discussions. Together, the topic and audience served to address the learning outcome so that students were considering complex and unfamiliar problems and research questions in the report that they were writing. Students prepared plans for the report and were required to include a set of recommendations which had to be, as far as possible, feasible and realistic. Plans were subjected to student peer-review with an emphasis on the provision of formative feedback. Pairs of students read the plan of a third member of the group and worked together to complete a feedback proforma.

Tutorials were designed to support the students in preparing for the assessments. There was an emphasis on small and whole group discussion and teamwork throughout the module and to help initiate this the focus of the first week was ice-breaker activities encouraging groups of students to identify links between psychological perspectives and relating these to specific events. Students were also allocated their focus article and given preparation for the next session. In the second session students made brief presentations about their article to two other students and explained what perspectives they were considering including in their presentation

in order to receive feedback. Additionally each small group was given a topic and a non-psychology audience for which they had to prepare a presentation. The students needed to consider appropriate delivery styles and levels of information for different audiences such as primary school students, general practitioners, and school catering staff. This was followed by a whole group discussion focusing on the needs of different types of audience in relation to style of delivery, suitable props and type of information provided. In the following two tutorials more focus was placed on student's own topics allowing them to do practice presentations in small groups with an emphasis on peer feedback. During the fifth and last tutorial of the first term students gave their assessed presentation.

In the second term tutorials initially focused on the purpose and style of reports, looking at a wide range of actual examples from different sources. Students were given a proforma designed to encourage them to record all the information they would include in their reports. They brought this to the third tutorial of term and were given feedback by at least two pairs of students who worked together to review the proformas. The tutor also gave brief feedback, particularly in relation to the extent to which the draft would meet all of the criteria for the report, that is, relevant to an appropriate organisation, answering a question or issue by including a number of different perspectives that were well integrated and delivering a set of specific, practical and feasible recommendations.

Evaluation

Staff perspectives

Four of the seven member teaching team had taught IP for several years prior to the changes outlined. The new format was felt to better address the needs of the students although it presented practical challenges to staff. Staff acknowledged the challenges of marking such short presentations but felt that the approach was a worthwhile one to keep in future years.

Staff found students discussed and planned their presentations with great care and consideration of the key message they wanted their audience to take away. Staff saw this as way of motivating students to reflect and revise on their presentation content as, in order to stay within the strict requirements, students needed to carry out considerable amounts of editing and rehearsal to produce a coherent but short presentation.

Regarding the report, the feedback from staff was generally positive. There were few issues with the tutorial approach and marking. Although the process of working towards the report was novel for students, the approach to tutoring for staff was more straightforward as each tutorial was composed of activities that were the springboard for discussion. Staff reported that, as the students were exploring different topics, they were able to bring different viewpoints of the same underlying perspectives to tutorial discussions. This helped students see how psychology can underpin human experience, from a wide range of different areas. Staff reported that students were often not aware that psychology could relate to certain topics until they had studied the module. Using real world examples allowed students to bring personal experience and viewpoints to tutorial discussion and an opportunity for staff to challenge students to think about argumentation and evidence. As students explored their assigned topic in order to tailor the area to their question and to consider solutions for their target organisation, staff reported that students often developed a depth to their understanding of the relationship between psychological perspectives and topic areas. This newly built knowledge base allowed staff to encourage students to compare, contrast, and evaluate different perspectives with other members of the tutorial group and with different topics in the group so that the tutorial group, as a whole, was able to develop a more complete understanding of the role psychology can play in the real world.

Generally staff saw improved engagement by students both in tutorials and outside tutorials in e-mail discussion and that students showed a general willingness to approach unfamiliar topics and areas in psychology they may not be as proficient in as they engaged in the enquiry based learning experience. The task set proved complex and this encouraged higher rates of attendance in term two tutorials as students sought staff and peer support. Staff were positive about encouraging peer review and having structured activities that facilitated this in the tutorials was seen as very valuable in helping students reflect on their draft reports. The process of marking the report was much in line with the marking for other coursework. So although there was a diversity to the range of topics and ways students could devise solutions for their target organisations, staff felt comfortable when marking the reports that the end result was comparable to other written assessments.

Student feedback

Feedback was collected from students after both assessments. The feedback forms used asked students to rate aspects of the module (enthusiasm of the tutor, degree to which students were given support, whether they were learning relevant work skills, and their enjoyment of the assessment and the module overall) on a five-point scale. In addition three open questions were asked, what they liked most and least about the module and whether they had further comments. The evaluation was in the form of feedback on the module rather than collected for research purposes, and, therefore, brief to encourage all students to complete it, in recognition that students are repeatedly asked for feedback, for example, for every module they undertake and their course as a whole. At the end of the first term following the assessed presentation feedback was mostly collected during tutorials. Distributing feedback sheets in class ensured a higher return rate, however, it was also more likely to render positive results as anonymity

could not be ensured. It is often considered that feedback is best collected anonymously if it is to be objective and honest (Biggs & Tang, 2007). At the end of the second term feedback was collected during the last tutorial, but since this was scheduled as a ‘drop in’ for further questions before submitting the assignment a smaller number of students attended, and the cohort were therefore also referred to an online survey. Although this also collected a small number of responses they tended to be more negative than those collected during class, presumably as either, those who were dissatisfied were more motivated to respond, or because not doing this in front of their tutor freed them to report what they actually believed.

Table 1 shows the percentages of student responses to the feedback questions following the assessed presentation at the end of the first term and before the hand-in date of the report at the end of the second term. Students’ assessments of both tutor enthusiasm and of support given remained high throughout. It appears then that, of the two terms, the presentation was considered more relevant to work skills than the report. Overall, there were falls in scores for both enjoyment and overall module evaluation by

the second term. The quantitative findings were mirrored in some of the qualitative responses that are reported below.

Qualitative feedback

Students were asked to respond to the open question of what they had enjoyed about the course and the quotes below were from the feedback that students gave in 2011. Sixty students responded to the first evaluation and 28 to the second. Since feedback was delivered anonymously it is not possible to know how many of the students responded to one only or both calls for feedback. Qualitative feedback was grouped into themes. In terms of what students liked there were 23 comments within the category of support, tutors and working in groups including comments such as ‘The tutor I had was really helpful, calm and reassuring! Any questions I had were answered clearly and I really felt comfortable with what the tasks asked’ and ‘The tutor was very enthusiastic about the topic and was extremely helpful if a student was unsure about the tasks which they were given’. Of the 60 responses seven people wrote complimentary comments specifically about their tutor.

Table 1: Responses to each question in the feedback sheets for Term 1 and Term 2, as percentage of students.

	<i>Strongly agree</i>	<i>Agree</i>	<i>No opinion</i>	<i>Disagree</i>	<i>Strongly disagree</i>	<i>Means</i>
Term 1 (N=60)						
Tutor enthusiasm	50	50	0	0	0	4.5
Support given	30	59	7	0	0	4.2
Relevant work skills	5	50	20	20	5	3.3
Assessment enjoyment	7	35	20	18	20	2.9
Module overall	4	48	10	27	1	3.3
Term 2 (N=28)						
Tutor enthusiasm	43	50	0	7	0	4.3
Support given	33	43	10	10	4	3.9
Relevant work skills	7	25	22	29	17	2.8
Assessment enjoyment	0	32	17	29	22	2.6
Module overall	0	36	17	33	1	3.0

The second biggest theme of comments concerned working in groups, peer support and the interactive nature of the module. Comments included 'I like working in groups so we can provide each other with feedback' and 'It's very interactive and productive rather than just sitting in a lecture'.

Ten students wrote comments about liking the focus on multiple perspectives 'I enjoy incorporating perspectives of psychology to gain a broader view' and the last significant theme, with nine comments was independent learning. Comments included 'I enjoy the freedom to explore a subject in an independent way and thought the presentation was a unique way to deliver it' and 'I liked the change and freedom given to me to decide how I want to integrate different perspectives, as well as what perspectives I find interesting and relevant to include in my essay and presentation'. Students also commented on liking being able to include information from their 'with' subject 'I enjoy learning to connect to all of the psychology and criminology together which will help me during exams and in the future'. They found the module different to everything else they had done and in many cases it had given them the opportunity to study an area they did not usually focus on 'Maybe it could be worth more credits for the year, increasing the amount of work involved as I really enjoyed adapting and working on my own creations'.

Seven students reported liking the independence of the module 'Freedom for interpreting our own work' and 'I liked the chance and freedom given to me to decide how I want to integrate different perspectives, as well as what perspectives I find interesting and relevant to include in my essay and presentation' and 'Having the scope to choose any aspect of the article given and expanding on it'. In addition there were eight favourable comments about being assessed by presentation; 'the presentation was enjoyable because it was different to a normal boring academic presentation' and 'I enjoy the freedom to explore a subject in

an independent way and thought the presentation was a unique way to deliver it'.

In terms of what students did not like about the module 29 students responded with a variety of comments about presentations, 19 of which just expressed a dislike of presentations in general and the rest complained about this presentation specifically in terms of time 'Short amount of time for presentation as it reduces ability for analysis in it'. In contrast to those who welcomed the opportunity for independent study some students found the openness of the module difficult. The second largest theme, with 15 comments, was the lack of clarity of the module. Students reported feeling unsure of what was required of them and wanting more guidance, for example, 'That I didn't know really what to do in the presentation as it was left to us to decide'. Another student commented they did not like 'the uncertainty of knowing if what I was doing was right or wrong'. There were also a few students who felt the module had not taught them anything new 'It doesn't really teach us anything we didn't know before. If you have reached the third year of a psychology degree and you don't know how to use an eclectic approach then you shouldn't be on the course at all'.

Thirteen comments to this effect were included in the 60 forms collected after the presentations although other students stated that they enjoyed and found the module beneficial. Despite having been assigned topics only two students expressed a dislike for the topic that they were given. Students again complained about having to work on this module at the same time as finalising their independent research projects 'Writing the report at such a busy time of the year for us' – despite the teaching for the module being completed before the end of term to facilitate early submission of the report. The majority of additional comments provided by students related to the structure of the module, for example, thinking that it should be delivered weekly in term one rather than fortnightly over two terms.

Overall some students still commented that this module did not teach them anything new and that they would rather be spending their time on their research project, particularly in the second term. However, there has been a shift from this being a majority view to a minority one. Staff agree with the perception that the module would be better placed all in the first term but this may limit a student's opportunity to bring to the tutorials their new experiences in learning about psychology that takes place throughout the third year. One possibility that might address the workload is to reverse the order of the assessments. However, this had been tried in past years, and when the order of assessments was reversed there was no difference in the level of dissatisfaction at having another piece of work to prepare that was not directly related to the research project. Moreover, the presentation was more valuable to students as a springboard for exploring their topic in preparation for the report rather than as an assessment at the end of the module.

Further development

The changes made this year are felt to be an improvement and provide a foundation for further development. Having run this once, staff will be more aware of how to support students through their anxiety about not knowing what to do when they have to make choices about how best to approach the presentation and the report. Levels of self-confidence, what students believe about their own ability, their expectations of success and to what extent they feel in control of their learning, will have a considerable impact on what they eventually achieve (Green, 2001).

As a team we need to consider how to include more activities of the types the students report that they like, particularly regarding peer work, and communicate the value of the 'transferable skills' that tackling these assessments develops, especially for the report. These developments will be guided by the principle that the extent to which students benefit from tutorials is largely

determined by their perception of what is expected of them in the tutorial and the extent to which they understand the difference between 'deep' and 'surface' learning (Shale, 2001).

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Book Reviews

Your Psychology Project Handbook.

Becoming a Researcher (2nd ed.)

Clare Wood, David Giles &

Carol Percy

Pearson Prentice Hall (2012).

Paperback; 202 pages; £19.99.

ISBN-13: 978-0-27371-556-6

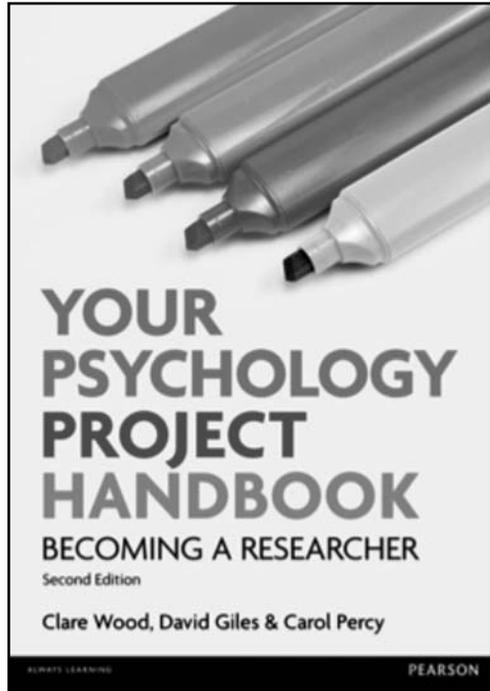
ISBN-10: 0-27371-556-9

Reviewed by Connor Quinn

The sheer number of decisions to be made when setting out on a first research project can be intimidating to a novice researcher. In order for a research manual to be of value, these decisions must be clearly situated in a practical context. My first impressions suggested the book had achieved this with the layout of the book mirroring the warm and welcoming cover. The contents are presented in a useful and straightforward manner, with the 'Brief Contents' page immediately signalling to the reader where the key milestones in the project will lie.

On reading through the book it becomes clear that the authors have spent extensive time guiding new researchers through the difficulties that emerge in the research process. This is apparent in the practical overview of research designs and methodologies. As so many approaches to research fall under the psychology umbrella, it can be difficult to gain a clear understanding of the benefits and drawbacks associated with each. Many other research books tend to lose the forest for the trees, spending so much time discussing specific methodological points that the practicalities of completing a project are never addressed. The sensible layout of this book retains this focus and seems designed to help students complete a successful study with as few unpleasant surprises as possible.

The book covers the whole range of common research methods in psychology. Students are guided through the tricky



process of refining a research question and choosing the study design most appropriate for the specific question. The authors have managed to present an overview of the various qualitative and quantitative options with just enough detail to make informed choices. This is particularly well done for the qualitative sections where both the study design and data analysis sections manage to contrast the wide variety of approaches available.

Most researchers have experienced that the most valuable lessons come from the mistakes you make in a research project. The authors have tried to marshal these experiences to help others avoid them in the future. With this in mind they include regular 'Common Pitfalls' text boxes throughout, containing some of the most helpful tips in the book. My personal favourite and one that struck close to home for me was 'I have to be superhuman or my supervisor will think I am a loser'. These

reassuring nuggets anticipate many of the reoccurring day-to-day issues that all novice researchers run into but that are rarely covered in research methods courses.

The 'Managing your Supervisor' section covers another important part of the research process that often is not covered in research courses. The book provides invaluable tips on how to maximise the benefit of this occasionally tricky relationship. Many of the potential problems are things that all researchers eventually learn the hard way. A particularly noteworthy message reminds students that an imperfect study is not the end of the world. The authors reassure readers that in this situation your supervisor is your best source of support, rather than someone to avoid. These practical asides complement the discussion of research methods to provide very clear directions on how to approach your study.

I was struck that many of the sections of this book offer far more practical advice than is usually available to novice researchers. The chapter on research ethics was particularly useful in this regard. The authors cover many of the day-to-day issues of research, obtaining consent, managing confidential data and achieving a good balance of reflection about the risks of the research and the practical side of recruitment. A very useful checklist is provided to pull together all the important points. Too often students come up with a superb research design only to discover that participants are nowhere to be found. By linking the constraints of recruitment to study design during the planning stages of the project the book helps researchers to plan for this difficulty.

The strength of this book is its clarity, giving concise answers to the many questions that emerge from research. This approach does not work particularly well in the statistical methods section where more systematic decisions that must be made in choosing and running a statistical analysis. A student who does not have a prior understanding of statistics would not be well prepared to make decisions based on this section alone. While the detail needed to address statistical methods fully falls outside the range of this book, the lack of suggestions for further reading in relation to quantitative methods is a weakness. A further section I would like to see given more weight is anticipating how you will analyse your data before data collection begins. Many researchers collect their data only to discover it is not in a form that allows easy or reliable analysis. While this information is covered in various parts of the book the link between study design and data analysis could have more emphasis. Directing students to the relevant sections for choosing a method of analysis would highlight this danger and suggest solutions. Despite these minor issues this book does distinguish itself from the majority of available resources by remaining thoroughly practical in focus throughout.

On the whole this is a hugely accessible and practical book that will be an invaluable resource to any new researcher. Researchers, both undergraduate and beyond, will find this book brings them closer to a successful and valuable research project. I would thoroughly recommend it.

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Applied Psychology

Graham Davey (Ed.)

British Psychological Society and
Blackwell Publishing Limited (2011)

Paperback: 693 pages: £35.99

ISBN-13: 978-1-44433-121-9

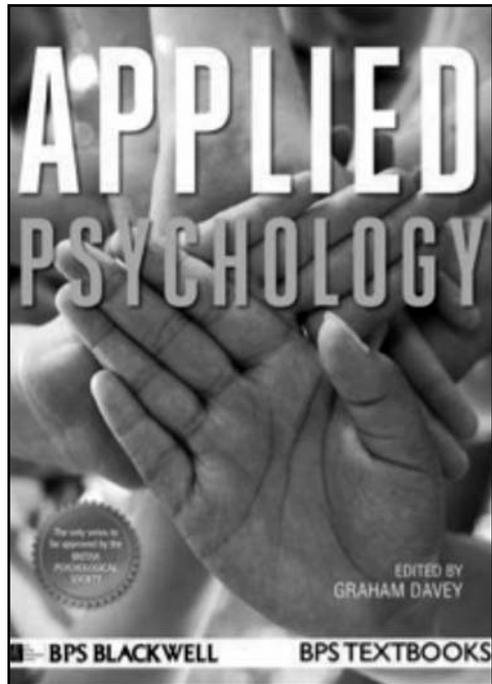
ISBN-10: 0-44433-121-3

Reviewed by Emma L. Davies

At the inaugural conference of the Division for Academics, Researchers and Teachers in Psychology (DART-P), Peter Reddy discussed how the profession of clinical psychology was so often the most common aspiration for psychology undergraduates (Reddy et al., 2012). *Applied Psychology*, edited by Professor Graham Davey, is a comprehensive text that will surely be able to broaden students' understanding of the other psychology professions that their degree can prepare them for.

Applied Psychology introduces six main professional fields in detail: clinical, health, forensic, educational, occupational and sports and exercise psychology. Additional sections on the accompanying website cover counselling, environmental, consumer and community psychology. The book aims to meet the changing teaching needs and requirements at undergraduate level for a more applied curriculum. In the era of rising tuition costs and increased demand for value and employability this type of text could serve to ensure that students clearly see the way in which their degree studies might translate into a career.

Graham Davey is Professor of Psychology in the School of Cognitive and Computing Sciences at the University of Sussex. He has edited a number of text books and published widely in the clinical field. His co-authors in this text are also widely respected names in each of their disciplines ensuring the coverage of relevant current research and debate in each topic area. As a BPS Blackwell publication this text has been written to consider the BPS teaching curriculum and is one of a series of titles to bear this seal of



approval, aimed at UK undergraduates and, therefore, covering a more international spectrum of research than some introductory texts that are available.

In the introduction to this book a brief definition of the six professions is provided along with description link between research and applied psychology, introducing the reader to the notion of evidence based practice. The introduction also includes discussion of the HPC standards of proficiency and the knowledge, understanding and skills required by practitioner psychologists and will ensure that students appreciate the broad range of competencies they will be starting to learn as an undergraduate.

Each subsequent chapter begins with a route map setting out the material to be covered. Key terms are defined in the margin and the text is broken up using diagrams, tables and focus points. Focus points give a more detailed examination of the material covered in the text. Case histories are another way in which the chapters offer the reader the opportunity to think about real life examples of issues that applied psychologists might be tackling.

Although the text is clearly written I was concerned at its accessibility for first-year or Level 1 students, but I felt that the focus points and case histories would help them to contextualise the information in each chapter and aid their understanding. There are also number of self-test questions and essay questions included at the back of each chapter which students might find useful for revision purposes.

There are five chapters on each of the six applied professions and this text covers much more material in comparison to some of the other applied psychology textbooks available. The final chapters of each section valuably describe professional issues and training within each field. The pathways to each career are discussed, the need for relevant work experience is highlighted and the authors present a guide to the timescales and commitment required to achieve the desired career. As an undergraduate, I don't think that I had this level of understanding about what it might mean to become a psychologist, in fact I am sure I felt quite mystified by the process. This will be a useful text book to refer students to that will give them a broader understanding of likely pathways to a profession and will ensure a realist view of how fast and how soon this might happen.

Although *Applied Psychology* is a wide-ranging text and offers a suitable amount of space to each profession, there are limitations to what can be covered in a volume of this size. The list of texts for further reading, web sites and relevant recent journal articles will allow the motivated student plenty of scope for exploration of current issues within each profession.

In addition, the companion website includes a huge number of extra resources including a 46-page guide to essay writing skills, flashcards and a glossary. Furthermore, the reader is given free access to a number of the Wiley published journal articles referred to in the text, a fantastic resource for students and lecturers alike. Although Graham Davey argues on his blog that despite requests for additional resources, lecturers prefer to use their own materials (Davey, 2012), the companion website for instructors has many great features. For each chapter there are Power-Point slides, a glossary and a bank of tests that can be downloaded on registration to the site.

Applied Psychology will surely be enjoyed by students and lecturers alike and as a companion resource it will be a welcome addition to many module reading lists and libraries. The reader will be left with no doubt about the wider career choices other than clinical psychology on offer. Perhaps, as Reddy and colleagues suggest there is also a need to increase students' awareness of the other careers and opportunities that a degree in psychology can provide preparation for and this in itself could be the basis of another large text.

Emma L. Davies

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Discovering Statistics using SPSS (3rd ed.)

Andy Field

Sage Publications Limited (2010).

Paperback: 856 pages: £39.99

ISBN-13: 978-1-84787-907-3

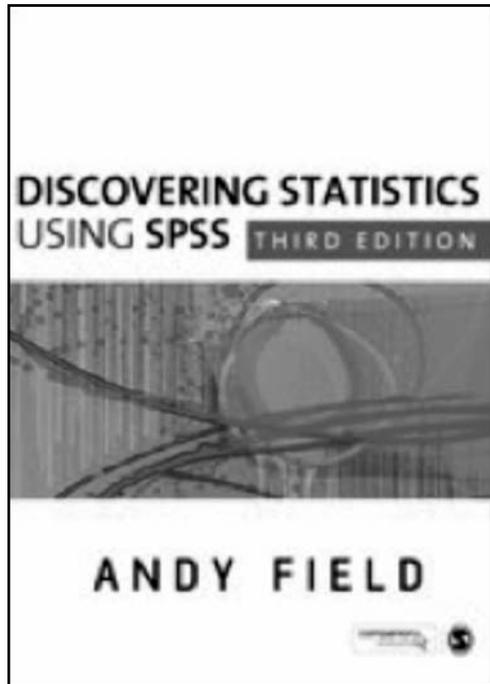
Ebook: 978-0-85702-096-3

Reviewed by Liz Winter

I approached this review with an intention to describe the merits and flaws of this excellent book as a teaching tool. So, I asked my (Masters) students what they thought of it. It was a universally positive response overall albeit with a few reservations particularly reflecting a dichotomy of opinion on the writing style. Some students loved the humorous and engaging tone of the writing whereas others found it went against their need to keep a serious topic serious and found it distracting and occasionally self-indulgent. Personally, I feel the jury is still out on this and think that anything that improves engagement in statistics is a good thing but also have reservations in recommending this book as an essential text to suit all cohorts, particularly those that are out of the mainstream, younger psychology undergraduate demographic.

What I like most about the book is its very refreshing approach to setting statistics out as essentially goodness-of-fit to a predicted model. Locating descriptive statistics early and clearly within this conceptual framework is brilliant and cleverly gives the lesser experienced or virgin statisticians a warm glow of confidence from Chapter 2 onwards. In fact I would recommend students read up to Chapter 2 and then return to Chapter 1, return again to Chapter 2 and then pause for some self-congratulation. If they get no further than this, it's an education in statistics in its own right. I am sure, in some cases, these two chapters afford many a Eureka moment with a philosophy on statistics for life that encourages persistence in attack towards understanding the later chapters.

The next three chapters are all about getting a good handle on the data and



checking it using SPSS. As someone who has seen a lot of rubbish data (mine as well as others), I cannot applaud loudly enough an attempt to get students to look at their data carefully. Testing against assumptions and generally getting a feel for data before reporting summary results and inferences is something that doesn't seem to come naturally. Spotting the obvious outlier and seeming to be in control of the analysis is, in my experience, better done by the student than the marker or else the rest of the marking is not going to be pleasant, especially if pages of explanation based upon a Type I error ensue. Students need to know not to throw away marks for the sake of a few checks and actually, need to do this as an essential mark of their competence. Well done, Andy.

Chapter 6 is correlation. I (and some others) didn't like this topic coming next. It's always difficult, in my opinion, as to how best to manage the transition from descriptive to inferential statistics and I think t-tests (as tradition has it) is the best way and they sweetly lead onto ANOVA. It re-enforces the assumptions around normality and also takes

students towards research design differences that affect the choice of algorithm in hypothesis testing based upon data type. Although correlation represents data-type as visited in terms of Pearson's versus Spearman's, some parts of the chapter are a bit trickier in terms of conceptualisation such as partial correlation and testing for significance especially in relation to the comparison of multiple correlation values. Moving on to thinking about just two variables across groups or conditions is a lot easier first base for the statistics to parameter argument in relation to tests of significance. However, I appreciate having correlation next continues the model-theme and prepares students well for regression (nice to see a full chapter on logistic regression but my students said Chapter 7 should be split in two to make it more digestible). As an aside, also in terms of chapter-ordering, a common under-representation of scale reliability and the part exploratory factor-analysis (Chapter 17) may play in questionnaire design appears in this text as well as in many others. Bearing in mind the almost universal questionnaire assignment in many psychology qualifications and, again, the very poor quality or absence of data-checking or true evaluation of scales that are seen; this is a real opportunity missed. The very late appearance of non-parametric tests such as Chi-squared (Chapter 18) also seem a bit reminiscent of 'only if you have to' and of not being mainstream psychology. At some point, statistics need to be seen and taught not only within the realm of hypothesis-testing of scalar (possibly ordinal) data within a pre- and post-discussion of literature but also as a real

measure of checking the quality of a piece of research, including that involving categorical or other non-parametric data. The actual research design and the handle a researcher has not only on literature but also research method, analysis and appraisal of method needs greater attention. The case of too few examinations of the ubiquitous questionnaire, very much is a case in point. So to give questionnaires, and the analysis of the data forthcoming, a better name, please Andy, can we have more on this and earlier?

Many will have come across this book already. If you haven't, have a look. It won't suit everyone but certainly has some highly commendable content and real clarity of explanation. It's a hefty volume and hence the e-version is particularly appealing, especially with the great PowerPoint and other supporting materials. The printed form is not something to be taken (literally) lightly. Whatever, it's a comprehensive text which might not suit everyone and may be best for the more advanced students at third-year undergraduates and upwards. However, that would be a real shame since it attempts to get students from the outset to think consistently and in a well-structured manner about the purpose behind statistics; to represent data in a model with a certain degree of probability and accuracy. If students want to buy one book to keep them going for the whole degree, it would be a sound investment and one that would get them thinking positively and constructively about a less than popular subject.

Dr Liz Winter

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Recent papers on teaching, learning, writing and assessment

Papers selected by James Hartley

Anon (2012)

Priorities for standardisation of accessible user interfaces

http://www.cardiac-eu.org/user_interfaces/seminar.htm

The design of user interfaces presents interesting challenges for applied psychologists and possibly student projects. This site reports papers given at a seminar on the design of cash dispensers, ticket vending machines, check-in terminals at medical centres, information kiosks and voting terminals in polling stations.

Contact: website

Benjamin, R.G. (2012)

Reconstructing readability: Recent developments and recommendations in the analysis of text difficulty

Educational Psychology Review, 24, 63–88.

Does all that it says in the title. Describes developments since the 1960s in analysing text difficulty in education, psychology, linguistics, cognitive science, discourse processing and computer science. Developments are outlined and critiqued.

Contact: bben81@gmail.com

Betts, L.R. & Hartley, J. (2012)

The effects of changes in the order of verbal labels and numerical values on children's scores on attitude and rating scales

British Educational Research Journal, 38(2), 319–331.

One of a series of three studies in different contexts showing that the results obtained on Likert-type scale scores can be affected by whether or not the scale items run from positive to negative and the numerical ratings run from high to low or vice versa.

Contact: j.hartley@psy.keele.ac.uk for a summary paper of all three studies and/or Lucy.Betts@ntu.ac.uk for a copy of this one.

Doran, J.M. et al (2012)

The perceived relevance and efficacy of a graduate school journal among graduate faculty and training directors

Teaching of Psychology, 39(1), 62–66.

Graduate students like graduate school journals (in the US), but faculty are not so keen. The authors report that few postgraduates in the US contribute to them or publish whilst still in their school. However, the figure they quote of about 50 per cent publishing whilst in graduate school hardly seems to merit the label 'few', and it is comparable with UK students (see Hartley, J. & Betts, L. 2009, Publishing before the thesis: 58 postgraduate views. *Higher Education Review*, 41(3), 29–44.)

Contact: JenniferDoran718@yahoo.com

Estacio, E.V. (2012)

The global module

Unpublished paper available from the author.

This paper describes how the author linked in one of her seminar groups ($N=15$) to a module on critical psychology, globalisation and human rights, run in partnership with 15 universities around the world.

Contact: e.v.g.estacio@psy.keele.ac.uk

Garner, J.K. & Alley, M. (2011)

PowerPoint in the psychology classroom:

Lessons from multimedia learning research
Psychology, Learning & Teaching, 10(2), 95–106.

www.worlds.co.uk/PLAT

<http://dx.doi.org/10.2304/plat.2011.10.2.95>

The use of PowerPoint in lectures has been

widely criticised from different perspectives. This paper focuses (with examples) on attracting attention, reducing the text, using simple visual images, and signalling key points and structure to the audience.

Contact: jkgarner@odu.edu

See also: Johnson, D.A. & Christensen, J. (2011). **A comparison of simplified-visually rich and traditional presentation styles.**

Teaching of Psychology, 38(4), 293–297.

Contact: djohnson@operant-tech.com

Healey, M (2012)

Selected bibliographies on learning and teaching

<http://www.mickhealey.co.uk/resources>

A series of useful bibliographies of research on: (1) active learning and learning styles; (2) discipline-based approaches to teaching and learning; (3) linking research and teaching; (4) pedagogic research and development; (5) the scholarship of teaching and learning; (6) the scholarship of engagement; (7) dissertations and capstone projects; and (8) students as change-agents.

Contact: mhealey@glos.ac.uk

Hegarty, P. & Walton, Z. (2012)

The consequences of predicting scientific impact in psychology using journal impact factors

Perspectives on Psychological Science, 7(1), 72–78.

Almost everyday it seems that there is a new paper on the limitations of measuring academics' performance by considering the 'impact factor' of the journals in which their articles are published. This paper discusses these limitations with respect to journals in psychology.

Contact: p.hegarty@surrey.ac.uk

Holmes, K.Y. (2012)

Tips for incorporating writing into an introductory statistics class

A.P.S. Observer, 25(1), 31–34.

www.psychologicalscience.org/observer

The most common complaint that students in psychology make about statistics classes are that they are boring. This paper suggests

three different ways of using simple writing tasks to reduce boredom in statistics classes.

Contact: kyholmes@nsu.edu

Ibrahim, M. (2012)

Reflections on Wikipedia in the classroom

A.P.S. Observer, 25(1), 29–30.

www.psychologicalscience.org/observer

An informal account of how the author set up teams of psychology students to work together on creating, editing, and revising articles for Wikipedia, with commentary on the strengths and weaknesses of the project.

Contact: ibrahim@cord.edu

Lee, N.L. (2012)

Writing mixed research reports

American Behavioral Scientist, 56(6), 866–881.

There are several books on how to write up quantitative research and several on how to write up qualitative research. This paper outlines various possibilities for writing up research that uses both behavioural and quantitative methods. Extremely useful if this is what you do.

Contact: nancy.leech@ucdenver.edu

Martinez, R.S., Floyd, R.G. & Erichsen, L.W. (2011)

Strategies and attributes of highly productive scholars and contributions to the school psychology literature: Recommendations for increasing productivity

Journal of School Psychology, 49(6), 691–720.

This article is one six discussing publishing processes in this journal of educational psychology. It shows that there is no one way to become a prolific writer, but provides numerous suggestions based on a questionnaire and interview study.

Contact: r.g.floyd@indiana.edu for this and related papers.

See also: Sugimoto, C.R. & Cronin, B. (2012).

Bio-bibliometric-profiling. An examination of the multi-faceted approaches to scholarship.

Journal of the American Society for Information Science & Technology, 63(3), 450–468. This paper describes the varied biographies and

ways of scholarly writing for six distinguished information scientists. Contact: Sugimoto@indiana.edu.

Meyer, K.A. (2012)

The influence of online teaching on faculty production

Innovations in Higher Education, 3, 37–52.

Ten US faculty members were interviewed about the influence of online teaching on their teaching, research and productivity. Despite a variety of responses, several perceived that their teaching productivity had increased. Some had time freed up for research but this depended on their seniority. Contact: kmeyer@memphis.edu

Mogey, N. & Hartley, J. (in press)

To write or to type? The effects of handwriting and word-processing on the written styles of examination essays

Innovations in Education & Teaching International (in press).

Today students typically word-process everything they write except in examinations. Here it seems that administrators fear that new technology will aid – or certainly not prevent – cheating. In this paper a simple device was used to prevent cheating in a mock first-year university Divinity exam. Word-processing software was then used to examine the stylistic features of the answers, 13 written by hand and 24 by word-processor. Most of the differences found favoured slightly the word-processed answers (including the marks obtained) but none of them were statistically significant.

Contact: Norah.Mogey@ed.ac.uk

Sternberg, R., Gabora, L. & Bonney, C.R. (Eds.) (2012)

Special Issue: College and University admissions

Educational Psychologist, 47(1), 1–70.

I regret that I don't know how college and university admissions are handled these days in the UK, but here is an interesting US perspective. In seven papers the authors suggest between them: (i) that current US procedures are blinded by numbers of dubious diagnostic value; (ii) that we need to re-assess what we mean by success at college; and (iii) provide different examples of how this might be done.

Contact: Robert.Sternberg@okstate.edu

Taylor, A.K. (2012)

Students learn equally well from digital as from paperbound texts

Teaching of Psychology, 38(4), 278–281.

There are many studies on this issue from about 1980 onwards... The results depend in part on the technologies used and the experimental questions asked. Current studies (like the present one) tend to argue that students find it as easy to read and learn from digitised texts as they do from print, but these findings seems to depend on oversimplifying the questions that can be asked.

Contact: taylor@sandiego.edu

Tierney, A.M. (2012)

Undergraduate interns as staff developers: Flowers in the desert

Innovations in Education and Teaching International, 49(1), 7–17.

Students learn a great deal from writing textbooks or running journals for fellow students. This study focuses on the experiences of seven medical students who developed, with the help of the author and her colleagues, enquiry-based materials for students on the courses they were taking.

Contact: anne.tierney@glasgow.ac.uk

Tomes, J.L., Wasylkiw, L. & Mockler, B. (2011)
**Studying for success: Diaries of students'
study behaviours**

Educational Research & Evaluation, 17(1),
1–12.

After a review of research using questionnaires and experiments on study methods the authors continue to examine a relatively unexplored approach. Thirty-seven volunteer Canadian first- and third-year psychology students (32F) handed in diaries that recorded their study times and activities in classifications provided by the experimenters for 10 days before testing. Despite the many limitations of this study the results showed that students engaging in active activities (quizzing, using mnemonics, organising notes, and checking alternate sources of information) did better than students engaging in passive ones (reading, reviewing highlighting, underlining, rote memorisation).

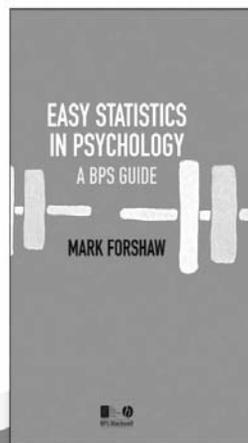
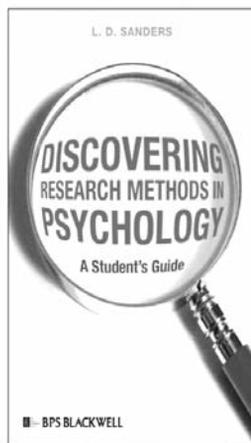
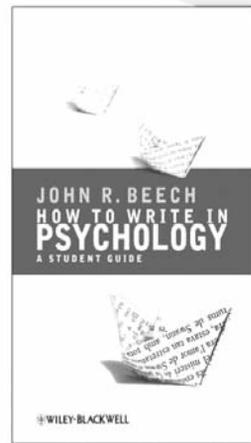
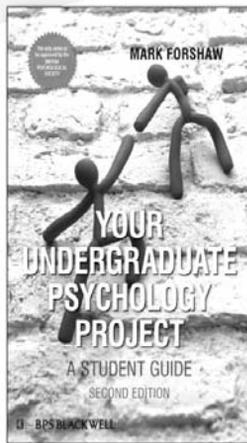
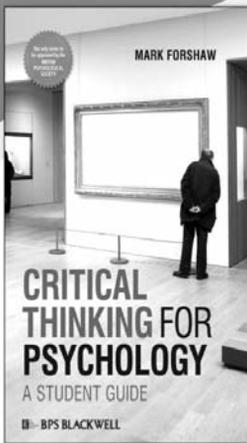
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