



University
of Glasgow

2nd Annual
University of Glasgow

**Learning and Teaching
Conference:**

Promoting student
success through the
curriculum

24 April 2009



Welcome to the second annual University Learning and Teaching conference

Building on the success of our inaugural event, which attracted attendance from over 100 staff, this year's conference is entitled Promoting Student Success through the Curriculum. This theme was chosen as it underpins a core objective and priority of the University's Learning and Teaching (L&T) Strategy, namely 'to develop a student-staff partnership model that promotes student engagement with learning, and enhances student success'.

We have much to be proud of in Glasgow, but our research has indicated that we can improve, in particular in developing the curriculum to improve the engagement of our students. Today's students are a diverse and multicultural body, something which we actively promote and celebrate, but which poses us with challenges as we seek to provide a student centred environment in which those who become part of our learning community thrive. Our institutional research over the last 3 years has indicated that a key factor in student success is engagement with learning, and a critical time for our students is in the first year, indeed we know that disengagement can occur rapidly for a variety of reasons. We want to excite and challenge students at all levels with our curriculum and our approaches to teaching, learning and assessment, yes even assessment.

There is excellent practice, thinking and development ongoing in teaching and learning across the University, the recent 'stock-taking' and mid-term review of progress of the L&T strategy provides ample evidence of this. I hope that by contributing to and taking part in this conference we will celebrate what is good, challenge our current thinking as we look to the needs of our current and future students, learn from each other and as a result of this conference build a better learning environment that enhances our students' success.



Andrea Nolan
Vice Principal (Learning Teaching and Internationalisation)

Keynote Address

“How about we figure a time and get this thing rolling?”: Re-negotiating the teaching-learning nexus with first year students

Mary Gilmartin

National University of Ireland, Maynooth

Engaging first year students is a significant challenge for educators globally. Faced with this challenge, and drawing on our earlier experiences with second year students as well as an opportunity provided by the University to pilot innovative approaches to large group teaching, we radically transformed a pre-existing first year human geography module and delivered it to 400 students for the first time in 2006-07. Underlying our new approach was the desire to be more student-centred, to use inquiry-based approaches, and to blend face-to-face with online and more active learning techniques. In this paper, we discuss our efforts to engage first year students using this approach in the pilot and in subsequent years. We analyze in particular the shift from teaching to learning experienced by all participants, as well as the favourable and unexpected consequences of this change. We argue that this approach has the potential to transform first year engagement, but for this to happen a redefinition of roles and responsibilities within the learning process is required.

Abstracts

Session 1 11.05 – 12.05

1A

1Ai

The factors that determine student satisfaction with Fixed Resource Sessions (FRS) in the first two years of a PBL based medical curriculum.

Nana Sartania

Wolfson Medical School, Faculty of Medicine

Aims: To evaluate the FRS sessions provided in support of Problem Based Learning (PBL) in the first and second year of undergraduate studies in Glasgow in order to investigate what constitutes a successful FRS and what guides students' feedback.

FRSs supplement our PBL-based curriculum with labs, seminars and workshops and are provided to augment core learning, impart basic research skills and foster the confidence to engage in clinical research. Students judge these sessions routinely in web-based questionnaires.

Despite the satisfactory evaluation of FRSs in these non-clinical years, there is a perception that medical students shy away from laboratory sessions, especially those involving open-ended experiments. In this study we aimed to find out what governs students' feedback and identify areas for further improvement.

Methods: Four semi-structured focus groups of 6 members^{1,2} each were formed (5% of each year population). The groups have produced a series of statements on different aspects of FRSs and rank them in order of importance. The entire 1st and 2nd years validated the findings by means of an on-line questionnaire.

Results: 51% of students from year 1 and 55% from year 2 have identified the relevance, guidance and length of sessions, enthusiasm of staff and the handouts as the main

contributors to a positive feedback, while non-enthusiastic staff and badly informed demonstrators in particular were judged to affect the learning outcomes negatively.

Conclusion: Based on students' feedback, we have formed an overview of their opinion and produced a document for the teaching staff with recommendations / suggestions.

References:

1. Solomon S.S., Tom S.G., Pichert J. Impact of medical student research in the development of physician-scientists. *J. Investig. Med.* 2003; 51(3): 149-156
2. Gaskin S. A guide to nominal group technique (NGT) in focus group research. *J. Geography in Higher Education.* 2003; 26: 197-208

1Aii

“There’s so much to study!” Medical students’ perceptions of curriculum relevance and subject balance: results of a survey of three medical schools.

Ewan Gray and Paula Lorgelly

Public Health and Health Policy, Faculty of Medicine

The rapid expansion of knowledge in almost every field in modern times has created a dilemma of curriculum overcrowding. Deciding the optimum balance of content from many diverse subject areas is a key problem of curriculum planning. In medicine this is not a new problem yet remains unresolved despite recent efforts; in particular, the introduction of a ‘core curriculum’ by national professional bodies.

The decision process in setting the curriculum rarely has strong student involvement despite their obvious stakeholder interest and the evidence of potential benefit in promoting academic success.

We surveyed medical students from three UK medical schools, and asked which subject areas in the curriculum required more or less teaching/learning time. Results were compared between medical schools and between different years within schools. Statistical analysis was by Pearson Chi square test and Chi square test for trend.

The results show large differences and some similarities between medical schools and interesting trends between years within the same medical school. For example, statistically significant differences existed between universities in the proportions selecting more Anatomy and Physiology ($P < 0.001$), Microbiology ($P < 0.001$) and Pharmacology ($P < 0.001$). At one school there appeared to be a trend in students selecting 'basic sciences' subjects in later years (surprising as these are the more clinical years).

Implementation of the core curriculum has led to differing student experiences of particular subject areas among medical schools. Differences between years may reflect the content of a particular year but other factors are likely play a part. The results from final year students and the trends from first to fifth years may be a useful form of student feedback as students are able to reflect back on the curriculum.

This study used an innovative method to examine student experience of their curriculum in terms of (academic) relevance and balance. These factors are crucial in designing curricula that tackle expanding knowledge bases and promote academic and practical success.

1B

Engagement with the Scholarship of Teaching and Learning (SoTL): Getting started on a SoTL project.

Lorna I. Morrow, Jane MacKenzie and Robert McKerlie

Department of Psychology, Learning and Teaching Centre and Dental School.

The Scholarship of Learning and Teaching (SoTL) was described by Boyer in 1990 alongside three other types of scholarship: the scholarships of discovery (research), application and integration. Since then, there has been much debate about what SoTL is, how academics might engage in it, and how it might be assessed. Glassick et al. (1997) proposed that the criteria for assessment should be the same for SoTL as for other types of scholarship, namely: clear goals; adequate preparation; appropriate methods; significant results; effective communication; and reflective critique. Academics are encouraged to engage in SoTL for the purposes of developing their teaching, and so enhancing the students' learning environment, thus aiming to motivate and support student learning and so promote student success.

In addition to providing participants with an overview of SoTL, the purpose of this workshop is to facilitate engagement in SoTL for those who are new to the concept or are aware of what SoTL is but are keen to commence their engagement in SoTL projects. Participants will be encouraged to work in small groups in order to make initial progress through the first two stages of Glassick et al.'s framework – formulating an individual statement of intention, and considering the preparation required for such a project.

Participants will then be able to produce an action plan for their subsequent engagement in the SoTL project of their choosing and initial design. Group work will be encouraged in order to facilitate collaborative learning and also encourage peer feedback. Participants will also be made aware of the BeSoTLed resource (www.glasgow.ac.uk/sotl) as a means

of supporting subsequent engagement in this or other SoTL projects. This resource comprises a freely accessible website and a series of online workshops for University of Glasgow staff to enable participants to engage in SoTL through a structured and facilitated process.

1C

1Ci

Students at risk: Early Warning at the Large and Small Scale

Barry McCluckie, Lorna Love, Iain Allison and Quintin Cutts
Science Faculties Support Unit and Computing Science

Student backgrounds and ability levels appear to be varying ever more widely on entry to university. Our typical 'one size fits all' courses are not necessarily appropriate for all students, and a range of initiatives have been tried in Glasgow and elsewhere to cater for the broader range of students, for example, mathematical support units, peer assisted learning schemes, buddy/mentoring, additional motivational phone calls and so on.

By their very nature, these initiatives are not appropriate for all students. But how do we know which student should be encouraged to adopt which initiative? Typically, we don't. Instead, we provide the resources, let students know they are available, and leave it up to them to decide which resource they should adopt.

This presentation reports on two initiatives that aim to assist in the identification of students at-risk.

The LTDF-funded Science Early Warning System works at the macro level, recognising that no one person has an overall picture of a student's progress in the early weeks of his or her course. Attendance and marks are gathered for all students in Level 1, across all subjects, and are used by the system to

form a prediction on whether these students need additional guidance and advice from their advisers and others.

At the micro-level, an initiative in FIMS working particularly with Maths and Computing Science has been developing a much more detailed picture at the subject level of each student's likely performance from all the available data – attendance at tutorials, labs and additional optional study sessions, formative and summative assessment data, reports from both tutors and PAL facilitators. The results are often surprising, with the expectations of a tutor being widely at conflict with, say, an exam result or a facilitator's report.

In the session, we will outline the operation of these two early warning schemes and highlight findings of particular interest.

1Cii

Use of Moodle group forums to facilitate an interactive exercise in a large Second Year class

Avril Edmond, Andrea Brown, Felicity Huntingford, Lorna Kennedy, Mary McVey, Douglas Neil, Ian Reid and Anne Tierney

Faculty of Biomedical and Life Sciences.

The Level 2 Neuroscience and Behaviour course contains an exercise that allows students, early in their university careers, to engage with research within the faculty and think about research design and data interpretation. This exercise originally used research posters, prepared specifically for the purpose, which were designed to make students think about how research is conducted. Another aim was to provide an opportunity for meeting young researchers, for feedback and for discussion about research as a career. However it was apparent from both staff experience and student feedback that, although students were interested in the exercise, it did not fully engage them and that more continuous feedback was needed. In addition, few students took the opportunity to meet the researchers.

In 2008 the exercise was redesigned, to include the use of Moodle group forums, facilitating feedback and communication. Students were shown “trailers” describing nine research projects being carried out by young researchers within the faculty and were asked to sign-up for one. Structured assignments (for example, on research design and data interpretation) were developed and posted on the course Moodle site. Students were asked to post their responses to assignment questions on a forum specific to their chosen research theme. Assignments were given deadlines, after which feedback on and synopses of the students’ posts were published, along with the next assignment. The exercise was designed to lead the students through an investigation of a research project, to allow them to share suggestions with their peers and to provide regular feedback on their responses.

Results from this year’s pilot study will be discussed, as will the changes to be implemented following reflection and evaluation. Conclusions will relate to the benefits to students in relation to accessibility, motivation, engagement and the learning experience, and implications for staff in relation to course delivery.

Session 2 12.10 – 12.40

2A

The role of the Aiming University Learning @ Work Project in promoting student success throughout the curriculum.

Laura Cashman and Lynn Naven

Careers Service.

AUL@W is an innovative project based at the University of Glasgow which seeks to promote student success throughout the curriculum by embedding Work-Related Learning (WRL) in the curricula of non-vocational courses. This paper will outline how our project defines WRL and how this fits into the wider employability agenda. It will present some of the findings of our research addressing the views of staff and students on engagement in WRL, and discuss experiences of on-going AUL@W pilot initiatives.

Project research has revealed that students who opt to study non-vocational subjects do so because they are interested in learning more about that subject rather than with a specific career plan in mind. In addition WRL activities tend to be offered in the third and fourth years of degrees. However, feedback from students and some staff indicates that the introduction of WRL activities at an earlier stage would be more effective as it would then become an organic part of the degree rather than an 'add-on'. It would also allow students to be better prepared for life after graduation by prompting them to reflect on their future plans sooner rather than later.

Our research also revealed that many academics have a rather narrow understanding of what constitutes WRL – many seeing it as relating to work placements only. This indicates a need to engage more with academic teaching staff in order to encourage more creative thinking about how WRL could fit into course designs from Year 1.

Reference to the experiences of some AUL@W pilot initiatives offers insights into the potential applicability of WRL activities

to a broader range of undergraduates, thus promoting success throughout the curriculum and beyond.

2B

Enhancing mindsets through Research-Teaching Linkages: A case study from an Honours course in the Arts Faculty.

Vicky Gunn, Steve Draper, Nicola Hamill, David Malone, Laura McIntyre, Anthony McKeown, Stacey McMichan, Fiona McNeill, Sarah Nicolson, Chris Stinger, Victoria Telford and Mira Wahrn.

Learning and Teaching Centre, Department of Psychology and Faculty of Arts.

Drawing students into the research culture of a discipline is a key aspect of an undergraduate experience. Nonetheless, ensuring that the students know that this process is happening requires that regular explicit linking between the products and processes of research be made in the classroom.

This presentation will discuss one example of an honours course where the content of the course remained the same but the process of how the students were asked to engage with the material was redesigned to mimic more explicitly how a researcher in the discipline would function. This included three key elements - explicit articulation of how the assessment processes aligned with disciplinary needs; identification of one potential subject area for exploration in which the collaborative process between tutor and student was the focus for generating 'new' knowledge in an area of the discipline; explicit formative and summative assessment design which reinforced the idea that the students could 'develop' and improve their initial ideas over a two-semester period.

The aims of these pedagogic changes were to encourage fuller engagement with different ways of 'reading' historical and contemporary topics; to enable students to recognize that they were co-collaborators in the generation of knowledge; to encourage students to see themselves as being part of a discipline that has, if not an explicit professional code of conduct, professional ethics and customs; to assist the academic in her own process of developing innovative understandings about an area of her research.

Although the approach to learning and teaching taken in this course seems most relevant to Honours students, this presentation will suggest that some aspects of the redesign could be transferred into earlier undergraduate levels.

2C

Student generated podcasts: Learning to cascade rather than create.

Joseph Maguire, Susan Stuart and Steve Draper

Humanities Advanced Technology and Information Institute and Department of Psychology.

There is currently an explosion of exploratory uses of podcasts in education, but only a few where the students, rather than the staff, produce the podcasts. Where it has been done, it has mainly been for students where the technology itself was also relevant to their studies (e.g. computing science or media studies courses). Here however we report on one of these on a course for 'non-technical' students from the faculty of Arts. These students were required to produce a single video podcast for their third-year philosophy course. The requirements to present something useful to fellow students and to master a new and fashionable technology are well designed to augment self-confidence and self-efficacy, to engage students, to equip them with a skill that may enhance their employability, and to foster deeper learning. However a

basic reason for student generated content of this kind is that authoring for other students (rather than for marking by a staff member) should give impetus to deeper thought about the content. This would not only cement existing knowledge but also supplement it with new perspectives and considerations. Sceptics might argue differently, claiming it to be a gimmick to boost course numbers. However, crafting a report, essay or regurgitating facts on exam day involve different learning experiences and skills to that of giving a persuasive presentation to a large audience.

Session 3 13.30 – 14.30

3A

3Ai

Assessment is for Learning: how mixed modes of assessment support first year student learning on the BEd (Hons) programme.

Julie McAdam, Margaret McCulloch and Beth Dickson
Department of Curriculum Studies.

The Faculty of Education's new B Ed programme (introduced 2008-9) matches formative and summative assessment processes to student learning development. Research identifies key principles of assessment as:

- The identification of learning outcomes and criteria for achieving these (Black and Wiliam, 2003)
- Rich conversations between teachers and students that continually build knowledge and encourage students to go deeper into topics (Ramsden, 2003)
- The provision of effective, timely feedback to enable students to advance their learning (Brown et.al.1997)
- The active involvement of students in their own learning
- Teachers responding to identified learning needs and strengths by modifying their teaching approach(es).

Our programme builds on these key principles of quality assessment design. Students use a number of summative assessment processes - including journals, essays and exams – and formative processes such as compilation of a portfolio, poster presentations, self and peer evaluations. The programme aligns with the university's objective of widening the range of assessment methods (SO5).

This seminar will outline some of these processes and our ongoing evaluation of their advantages for staff and students. These include variety – there is no single, repeated

assessment mode which can become de-motivating. Variety also accommodates students who achieve higher grades depending on the mode of assessment. Importantly for developing teachers some of these modes foster the collaborative dispositions needed for professional life while balancing that with the need for each student's learning to develop individually. The formative assessment processes, especially those in which students have to assess their own or their colleagues' work allows them to understand success criteria more actively because they have to apply them to their own work or that of others. This understanding of what is being assessed, and the fact that assessment is being undertaken very shortly after a piece of work is completed consolidates learning.

3Aii

Reciprocal peer critiquing reconsidered.

Steve Draper and Lorna Morrow

Department of Psychology.

A continuing practice by some tutors in the psychology department is to get students to perform reciprocal peer critiquing of each others' work: an exercise in which they read and critique a piece of each other's work, and exchange these comments. Data published in 2006 showed clear benefits as measured by student attitudes. This talk, based on some years of experience with this learning activity and further individual feedback from participants, explores a range of theoretical reasons why it might be beneficial, and discusses which of these is the fundamental origin of the benefits. Frequently stated benefits include getting multiple opinions not just one, getting feedback in interactive dialogue not in terse written comments, just seeing how other students approach the task (the variety is the value, not seeing an undoubtedly better or "right" solution), exercising the judgement criteria as a critic not just as a defendant. A

contrasting position and exercise is also discussed based on the recent work of Sadler, who far from getting students to make judgements based on explicit criteria, required them to produce critiques without any given criteria. Having introduced the range of different possible benefits, the learning design is then measured, in a bidirectional comparison, against a) Nicol's 7 principles of feedback and assessment, b) Rowntree's list of assessment proposals, and c) the 5 National Student Survey items relating to assessment and feedback. On the one hand, great (as opposed to merely adequate) learning designs tend to tick many boxes at once in a single coherent activity, and this probably to some extent explains the enduring value of this activity (i.e. adding scores across principles shows the activity to score highly overall). On the other hand, it does not match some others of these criteria, which implies questions about simply adding item scores together when some items seem to predict that this exercise should not deliver value for feedback.

3B (Workshop)

Beyond feedback: education as dialogue and the systematic documentation of learning (systematisation).

Liam Kane

Department of Adult and Continuing Education.

Building on the theories of the Brazilian educationist Paulo Freire, the 'popular' education movement in Latin America understands education as a 'dialogue of knowledges' in which the ultimate aim is to encourage and enable people to bring about progressive social change: in this dialogue, learners as well as educators have important knowledge to contribute. However, the generally informal context of popular education means that learning takes place in a variety of settings and in ways often not anticipated. In an attempt to document and make sense of this learning, and deepen the dialogue on which it is based, popular educators engage in a process

known as the 'systematisation' of (learning) experiences. This presentation will briefly outline the thinking behind popular education, explain 'systematisation', illustrate an adaptation of the process to the university and invite participants to discuss its potential relevance to their own teaching.

3C

3Ci

Experiences in supporting international students during their studies in the UK.

Maria Jackson, Leah Marks and Douglas Wilcox

Medical Genetics, Faculty of Medicine

While many problems are common to all students, international postgraduate students face a number of specific issues during their studies in the UK. These include difficulties in adjusting to a new educational culture – for example, being suddenly faced with concepts such as plagiarism, critical thinking and problem solving - and adapting to UK life.

The MSc in Medical Genetics attracts a majority of overseas students (since September 2005, 76 of 119). As part of our continuing efforts to improve the experience for all students we have adopted the following approaches:

Each student is assigned a 'mentor' – a member of staff who meets them regularly for 'coffee and a chat' and provides ongoing support. This system has helped to identify students who are struggling with their studies or those with health or social problems, allowing earlier intervention. Students also have personal development meetings with a course coordinator, providing overseas students with the help they need to plan their career development. Feedback has been encouraging and suggests that even students who are apparently coping well appreciate these opportunities to establish relationships and discuss their progress and aspirations.

Introductory sessions on academic writing and the provision of feedback on draft assignments have been very well received. The use of PBL encourages language development and highlights awareness and respect for cultural differences. We also promote a sense of community through staff/student social events, including “international” lunches and trips to the country. We maintain a database allowing current, past and prospective students to become part of an international community giving peer support and job opportunity.

These initiatives have enriched the learning environment and fostered a sense of community, to the benefit of both students and staff.

3Cii

Enhancing first year curriculum design: lessons from a QAA enhancement themes project.

Catherine Bovill

Learning and Teaching Centre

This paper will present findings from a First Year Curriculum Design Project that ran between 2006-2008. The project was funded by the QAA (Scotland) and formed part of their enhancement themes work. The paper will present the context to the study and the particular approach adopted within the work. The project methodology included completion of a literature review, student focus groups, staff workshops and also collecting case studies of first year curriculum design that engaged or empowered students from Scotland, Ireland and the USA.

The findings from the project will be presented. In terms of first year curriculum content, findings include the importance of for example, early formative feedback and interactive teaching methods. In terms of first year curriculum design processes, findings include the desirability of undertaking comprehensive overall curriculum design rather than making

small changes to curricula. An argument was also made for providing students with the opportunity to participate in design processes of their own curriculum.

I intend to then pose a number of questions to the audience to stimulate their own questions and promote discussion. I intend particularly to challenge participants to consider how they might engage in these findings within their own practice.

This paper will contribute to dissemination of the First year enhancement themes work within the University of Glasgow academic community. This work links well to the Learning & Teaching Strategy particularly in the areas of enquiry-led learning (through discussion of student participation in designing curricula) and enhancing student success (in this case, in the first year). The work also supports current messages promoting use of early formative assessment.

Session 4 14.35 – 15.05

4A

A Blended Learning approach in teaching languages.

Andrea Pfeil

German Department

The use of interactive web based tools has radically changed the way people communicate with one another. This new technology has had an enormous impact on how users acquire knowledge, manage their knowledge and explore their environment. These changes have led to a new learning culture which opens up new and promising opportunities for language teaching in Higher Education. The presentation will explore the outcome of a new Blended Learning approach in a mainly classroom based Undergraduate German Language Course. The presentation will draw from the experiences of several languages courses developed for the German Section of the School of Modern Languages and Culture in 2008/9. The aim of these new courses was to more effectively utilize the university's VLE MOODLE in an effort to get students more involved in their own learning process and perhaps more importantly to expose students to the German Language as much as possible.

Teaching Languages requires appropriate methods of teaching. The acquisition of different skills such as reading, writing and speaking demand a clear progression and a clear structure regarding the design of exercises, activities and tasks. This Blended Learning approach, however, accommodates different learner types and enables students to work in their own pace. It offers a great opportunity to study according to individual learning needs.

The presentation will show how this teaching style combines e-learning with traditional ways of language acquisition. Examples will be given on how students are encouraged to take more responsibility for their own learning process and

how VLE can create space for students to explore a foreign language in a less inhibiting atmosphere.

4B

Training professionals, preparing theorists; the MSc in Information Management and Preservation 2004-2009.

Adele Redhead,

Humanities Advanced Technology and Information Institute.

In 2004, Humanities Advanced Technology and Information Institute (HATII) launched an exciting and forward thinking one-year MSc programme in Information Management and Preservation. The primary aim of the programme was to give graduates the practical skills to enable them to work as archivists, records managers, and digital curators in the 21st century, and a thorough grounding in the theoretical underpinnings of the profession. In the UK there was then and still is a clear need for graduates with the ability to manage records created in any format including digitally created and captured records, and to address the challenges of and respond to the growing legislative requirements of the new information age. With it's excellent track record in running successful digital preservation projects and courses in digitisation and arts and media informatics, HATII was an obvious choice to develop and host such a programme. Working in partnership with Glasgow University Archive Services, the programme was designed to be delivered by both dedicated academic members of staff and practitioners in the field, making it possible for students to gain a real understanding of both theory and its practical application. Graduates have gone on to work in organisations as diverse as the NHS, local authorities, universities, museums, arts organisations, financial institutions, and specialist repositories. The theory-practice links are not only relevant for would-be practitioners; HATII has a thriving PhD programme, many doctoral students recruited directly from the MSc.

With the MSc now in its fifth year, this proposal will explore the integration of theory and practice within the programme, and look at how the the content and delivery has changed according to graduate and employer need, and to reflect current best-practice in teaching and learning.

4C

Numerical Electronic Voting Systems for Engineering and Physical Sciences.

Tim Drysdale, Eric Yao, Steve Draper, Quintin Cutts, James McMahon, John Williamson, John Davies and Jonathan Weaver,

Departments of Electronics and Electrical Engineering, Physics, Psychology and Computing Science.

Students typically require timely, individual feedback in order to maximise their learning potential. The ability to target students on areas they need help is often lacking in the conventional lecture format, because it is impractical to rapidly assess the class as a whole using traditional methods, so any feedback is usually limited to once a term, following the class test. Electronic Voting Systems (such as those seen on “Who wants to be a Millionaire?”) have shown great success in bringing the benefits of immediate feedback to even large lecture theatres, but the uptake in engineering and the physical sciences has presumably been hampered by the requirement to frame every question as a multiple choice.

In these numerical subjects, multi-choice answers are perceived to be a crutch that does not exist in the real world. However, recent developments in handset technology have now enabled open-ended numerical answers. This is only part of the solution. A key aspect of EVS is the ability to analyse the answers recorded by the class and quickly interpret them. We (TD & SD) have shown in our previous work that the histogram of answers to a well-set multi-choice question

will quickly reveal whether there is general misunderstanding (of new material), a specific misunderstanding or a good understanding. If there is a specific misunderstanding, feedback predicted at the time of setting the question (and in particular, of working out the distractor answers) can be immediately given to the class. However, when open-ended numerical information is recorded by the class, this task becomes more difficult because the alternative answers are not predetermined. In this presentation we will reflect on and evaluate the work undertaken under the auspices of a University of Glasgow Learning and Teaching Development Fund project to specifically address this problem.

Promoting Student Success: Learning and Teaching resources

Assessment and Feedback

[http://www.gla.ac.uk/services/learningteaching/
goodpracticeresources/assessmentandfeedback/](http://www.gla.ac.uk/services/learningteaching/goodpracticeresources/assessmentandfeedback/)

Electronic voting/personal response systems

[http://www.gla.ac.uk/services/
learningteaching/goodpracticeresources/
electronicvotingsystemsandinteractivelectures/](http://www.gla.ac.uk/services/learningteaching/goodpracticeresources/electronicvotingsystemsandinteractivelectures/)

Enquiry-based learning

[http://www.gla.ac.uk/services/learningteaching/
goodpracticeresources/enquirybasedlearningebl/](http://www.gla.ac.uk/services/learningteaching/goodpracticeresources/enquirybasedlearningebl/)

Peer observation of teaching

[http://www.gla.ac.uk/services/learningteaching/
goodpracticeresources/peerobservationofteaching/](http://www.gla.ac.uk/services/learningteaching/goodpracticeresources/peerobservationofteaching/)

Personal development planning

[http://www.gla.ac.uk/services/learningteaching/
goodpracticeresources/personaldevelopmentplanningpdp/](http://www.gla.ac.uk/services/learningteaching/goodpracticeresources/personaldevelopmentplanningpdp/)

Programme and course design and review

[http://www.gla.ac.uk/services/
learningteaching/goodpracticeresources/
programmecoursedesignandreviewguidelines/](http://www.gla.ac.uk/services/learningteaching/goodpracticeresources/programmecoursedesignandreviewguidelines/)

Notes

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Learning and Teaching Centre

www.glasgow.ac.uk/learn

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